PATENTS FOR INVENTIONS

ABRIDGMENTS OF SPECIFICATIONS

CLASS 22

CEMENTS AND LIKE COMPOSITIONS

Period—A.D. 1926-30 [244,801–340,200]

LONDON
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EXPLANATORY NOTE

The contents of this Abridgment Class may be seen from its Subject-matter Index, which includes all index headings, subheadings, and subdivisions allotted to this Class, as well as cross-references under them, although there may be no cases affected within the period covered by this volume. For further information as to the classification of the subject-matter of inventions, reference should be made to the *Abridgment-Class and Index Key* (*Vol. I*), published at the Patent Office, 25, Southampton Buildings, Chancery Lane, W.C.2, price 7s. 6d. (inland); 8s. 1d. (abroad).

It should be borne in mind that the abridgments are merely intended to serve as guides to the Specifications, which must themselves be consulted for the details of any particular invention. Printed Specifications may be purchased from the Patent Office at the uniform price of 1s. (inland); 1s. 0½d. (abroad).

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    - containing naturally-occurring bitumens or asphalts in addition to artificially-prepared tar or pitch—
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      - resins and resinates, containing. 260,505. 267,317.
    - containing naturally-occurring bitumens or asphalts without artificially-prepared tar or pitch—
      - added mineral oils and condensates from tar distillation, containing. 257,114. 275,280. 276,539. 276,866. 277,356. 278,679. 280,085. 290,725. 293,830. 295,267. 304,226. 310,922. 310,923. 311,751 [*Appx*]. 316,017. 322,431. 326,863. 333,433.
      - fats and fatty oils and their derivatives, resin oils, and waxes, containing. 277,356. 304,226. 307,465. 307,466. 320,579.
      - *not* containing fats, mineral and fatty oils, resins, soaps, and waxes. 255,546. 260,621. 263,942. 280,085. 284,246. 287,799. 302,808. 310,922. 310,923. 311,751 [*Appx*]. 322,431.
      - resins and resinates, containing. 267,317. 280,011.
    - *not* containing special bituminous materials, but containing—
      - acids. 277,291. 304,226. 309,634.
      - alkaline-earth solids, clay, marl, ground schist, shale, or slate, in addition to stony materials. 290,886. 291,276. 304,226. 309,634. 317,527. 329,382.
      - alkaline-earth solids without stony materials. 307,465. 322,431. 329,382.
      - ashes, coke breeze, coal, carbon, and graphite. 290,886. 293,135. 307,465. 329,569. 330,440. 334,336. 335,668.
      - clay without stony materials. 246,065. 246,186. 252,784. 291,276. 307,465. 321,948. 329,382.
      - fines for filling interstices. 246,065. 246,186. 304,226. 316,017. 334,588.
      - glass. 290,886. 317,527.

Bituminous &c. compositions—*cont.*
- bituminous compositions—*cont.*
  - concretes *not* containing Portland cement &c.—*cont.*
    - *not* containing special bituminous materials &c.—*cont.*
      - grit from china clay. [*No cases.*]
      - house-bin refuse. [*No cases.*]
      - indiarubber. 254,004. 290,886. 307,466. 320,579. 337,521.
      - lead ore. [*No cases.*]
      - metallic salt solutions. 301,544. 307,465. 322,431. 322,923. 323,896.
      - oxidizing-agents. [*No cases.*]
      - pyrites or iron oxides. 290,886. 307,466.
      - slag or destructor clinker. 290,886. 298,159. 301,544. 307,465. 329,382. 333,937.
      - slate, schist, and shale without other stony materials. 284,246. 290,886. 319,663. 321,948.
      - special grits or stony materials not covered by other Key subdivisions. 271,108. 290,886. 307,465. 316,108. 317,022. 317,527. 319,648. 319,663. 330,271. 333,937.
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      - titanium compounds. 307,465.
    - processes for making not dependent on particular materials. 245,418. 248,752. 258,870. 262,961. 264,496. 266,420 [*Appx*]. 270,649. 273,281. 279,628. 280,085. 284,908. 285,179. 286,552. 287,799. 290,323. 290,725. 291,276. 292,871. 293,135. 298,159. 300,196. 301,544. 301,891. 304,114. 304,226. 308,627. 309,070. 309,634. 310,922. 310,923. 311,751 [*Appx*]. 312,467. 315,846. 319,648. 319,663. 320,357. 320,579. 321,948. 322,923. 323,896. 328,166. 328,969. 330,072. 332,897. 333,433. 333,937. 334,588. 335,525.
  - other than bituminous concretes and calcareous, aluminous, and siliceous bituminous-mastics—
    - containing artificially-prepared tar or pitch without naturally-occurring bitumens or asphalts—
      - added mineral oils and condensates from tar distillation, containing. 312,372. 323,060. 338,206.
      - fats and fatty oils and their derivatives, resin oils, and waxes, containing. 265,181. 268,950. 299,381. 302,710. 307,465. 307,466. 320,579.
      - *not* containing fats, mineral and fatty oils, resins, soaps, and waxes. 256,640. 295,687. 301,720. 316,897. 320,123.
      - resins and resinates, containing. 265,181. 267,317. 299,381. 302,710. 312,372.
    - containing naturally-occurring bitumens or asphalts in addition to artificially-prepared tar or pitch—
      - added mineral oils and condensates from tar distillation, containing. 338,206.
      - fats and fatty oils and their derivatives, resin oils, and waxes, containing. 302,710.

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bituminous, resinous, fatty, oily, and wax-like compositions. *See* Bituminous &c. compositions.

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fibrous materials, compositions consisting largely of. *See* Plastic compositions, [*Class* 70].

mixtures of Portland cement and very finely ground siliceous materials, such as puzzuolana, (*other than* sand). *See* Cements, Portland &c.

oxychlorides, consisting of. *See* Plastic compositions, [*Class* 70].

hardening by addition of oxidizable metals. *See* Plastic compositions, [*Class* 70].

lime and like oxides, and mixtures containing such oxides, apparatus for slaking. *See* Oxides &c., Metallic, [*Class* 1 (iii)].

other than compositions. 258,320. 266,814. 280,813. 281,138. 286,334. 291,784. 295,894. 300,464. 308,207. 319,288. 328,030. 329,291. 332,604 335,521.

rendering porous. *See* Plastic compositions, [*Class* 70].

Concretes and mortars, Treating. *See separate headings, such as* Conveyers &c., [*Class* 78 (i)]; Grinding, crushing, &c., [*Class* 59]; Mixing and agitating machines &c., [*Class* 86]; Moulding plastic &c. substances, [*Class* 87 (ii)]; Stone, Natural &c., Hardening &c.; Testing physical qualities &c., [*Class* 106 (ii)]; Water &c., Raising &c., [*Class* 102 (ii)].

Plaster, lime, and chalk plastic compositions.

Compositions which consist largely of albuminous and gelatinous matters with plaster, lime, and chalk as fillers, with or without the addition of bituminous, resinous, and oily matters, are indexed only under Plastic compositions, (*albumen &c.*), [*Class* 70]; *and compositions which contain bituminous, resinous, and oily matters in important proportions, without albuminous and gelatinous matters, are indexed under* Bituminous &c. compositions.

Plaster &c. compositions—*cont.*

acids and salts, containing, (e.g. Keene's and Parian cements). 245,935. 253,448. 253,929. 258,727. 262,195. 262,224. 298,034. 317,672. 326,625. 326,825. 337,926. 338,242.

albuminous and gelatinous matter, containing. 252,326. 253,448. 260,833. 265,287. 305,591. 326,625. 330,278.

concretes. *See* Concretes &c.

fibres, containing. 255,037. 260,557. 260,833. 262,224. 309,877. 326,625. 329,107. 330,278.

fibrous materials, compositions consisting largely of. *See* Plastic compositions, [*Class* 70].

indiarubber and like gums, containing. *See* Indiarubber &c. compositions, [*Class* 70].

lime, slaking. *See* Oxides &c., Metallic, [*Class* 1 (iii)].

materials not met by other Key subheadings, containing. 252,711. 253,929. 262,224. 272,188. 275,541. 288,202. 298,034. 303,889. 317,496. 317,783. 330,278. 331,207. 332,356. 334,000. 336,860. 337,926.

plaster and lime obtained from special sources, making from. *See* processes &c. *below.*

processes of manufacture and treatment not dependent upon use of particular new ingredients. 245,935. 253,448. 262,224. 275,788. 298,141.

refractory limestone and like blocks. *See* Refractory substances &c.

rendering porous. *See* Plastic compositions, [*Class* 70].

Refractory substances for furnace linings and crucibles, and for other high-temperature purposes.

alloys. *See* Alloys, [*Class* 82 (i)].

conductors for use in electric lamps. *See* Electric lamps, Arc, [*Class* 39 (i)]; Electric lamps, Incandescent, [*Class* 39 (ii)].

electric resistances. *See* Electric resistances &c., [*Class* 37].

fettling-materials for puddling. *See* Iron &c. manufacture, [*Class* 72].

fusing. *See* Glass, Manufacture of, [*Class* 56].

making by heating moulded bodies embedded in carbon. *See* processes &c. *below.*

making by impregnating and coating moulded articles. *See* processes &c. *below.*

materials and compositions containing—

The subdivisions below should not be regarded as furnishing in every case complete lists of Specifications mentioning particular ingredients, as cases are not indexed which include usual ingredients in unimportant proportions.

aluminium silicate produced on or in article. 265,847. 266,751. 282,402. 289,560. 291,524. 306,216. 315,856. 316,129.

barium and strontium compounds. 282,402. 282,403.

basalt. [*No cases.*]

Refractory substances &c.—*cont.*

- materials and compositions containing—*cont.*
  - bauxite, natural and artificial corundum, and emery, (*including* pure or fused alumina *and* alumina fused with other metallic oxides). 245,182. 259,757. 262,383. 262,403. 265,847. 266,751. 276,185. 279,201. 282,402. 289,560. 291,524. 294,179. 299,408. 302,087. 306,216. 307,580. 310,841. 315,196. 315,197. 315,856. 316,129. 319,612. 322,361. 324,312. 326,279. 326,560. 332,902. 337,605.
  - beryllium compounds. 292,529. 322,361.
  - binding-agents of general interest and not covered by other Key subdivisions. 276,185. 306,216. 307,580. 324,638. 326,279. 326,560. 333,240.
  - carbides, nitrides, silicides, and siloxicon. 259,805. 270,300. 284,732. 286,590. 289,031. 294,552. 310,841. 318,696. 322,476. 326,279. 326,560.
  - carbon, (*including* carbonizable binding-agents). 251,982. 271,847. 276,016. 278,367. 284,218. 284,219. 287,556. 312,700. 312,940. 318,696. 321,188. 322,476. 330,745.
  - chrome iron ore and chromium oxide. 250,354. 250,480. 262,383. 301,547. 302,087. 304,492. 321,106. 324,312. 337,605.
  - clay shale or schist. *See* fireclay *below*.
  - compositions consisting largely of both silica and gypsum. *See* Plaster &c. compositions.
  - compositions consisting largely of both silica and lime or cement. *See* Concretes &c.
  - fibrous compositions, (*other than* those containing non-fibrous refractory materials). *See* Plastic compositions, [*Class* 70].
  - fireclay—
    - mixed with asbestos. [*No cases.*]
    - *not* mixed with asbestos. 248,369 [*Appx*]. 250,354. 253,947. 262,383. 263,194. 266,165. 266,751. 270,300. 278,367. 278,821. 279,201. 282,403. 282,404. 286,677. 289,031. 299,408. 301,547. 307,391. 307,580. 312,700. 315,856. 316,129. 321,188. 322,361. 322,476. 329,803. 330,561. 330,745. 336,440. 340,141.
  - fluorides. 294,179. 294,552. 304,694. 326,279. 326,560.
  - ganister and silica. 245,182. 247,994. 249,543. 256,021. 270,300. 278,821. 282,402. 282,404. 286,677. 289,031. 291,524. 303,417. 306,216. 324,312. 324,638. 333,240. 336,440. 340,141.
    - gelatinous silica. *See* soluble silicates &c. *below*.
  - iron ores and oxides, (*other than* titanic iron ores). 282,402. 301,547. 302,087. 307,391. 318,696. 337,605.
  - limestone, magnesia, magnesite, and dolomite, (*including* lime blocks and compositions consisting almost wholly of lime). 245,101. 250,480. 255,195. 260,298. 262,383. 265,847. 271,503. 271,847. 276,016. 278,120. 282,402. 282,403. 282,404. 284,576. 291,524. 292,958. 301,547. 302,087. 306,216. 324,312. 326,279. 326,560. 333,582. 337,605.
    - magnesium oxychloride binding-agents. *See subdivisions above and below.*
  - manganese compounds. 282,404. 301,547.

Refractory substances &c.—*cont.*

- materials and compositions containing—*cont.*
  - materials other than binding-agents and refractory materials. [*No cases.*]
  - metals. 270,300. 318,696.
  - non-refractory clay mixed with sand. *See* Plastic compositions, [*Class* 70].
  - old crucible, firebrick, and like scrap from refractory articles. 253,947. 262,383. 282,404. 286,677.
  - rare metals, compounds of—
    - other than compounds of thorium, titanium, and zirconium. 256,790. 280,907. 282,404. 292,529. 301,547. 306,216. 307,391. 307,580. 319,008.
    - thorium compounds. 256,790. 280,907. 282,795. 292,529. 306,216. 307,580. 319,008.
    - titanium compounds. 301,547. 302,087. 307,391. 322,476. 326,279.
    - zirconium compounds. 245,101. 246,480. 256,790. 262,383. 265,847. 271,503. 280,907. 282,404. 282,795. 292,529. 292,958. 292,997. 299,408. 301,547. 306,216. 307,391. 307,580. 319,008. 322,361. 333,240.
  - sewage. *See* carbon *above*.
  - silica. *See* ganister &c. *above*.
  - silicon. 270,300. 289,031. 294,552.
  - single refractory materials not covered by other Key subdivisions, (*including* single materials mixed with binders which are subsequently burnt out). 304,694. 315,196. 315,197.
  - slags. 286,677. 302,087.
  - soapstone, talc, and like magnesium silicates. 260,298. 282,403. 282,404. 283,791. 284,576. 289,031. 301,547. 304,729. 307,391. 317,449. 319,008. 326,560. 333,240. 337,605.
  - soluble silicates and gelatinous silica. 245,182. 250,354. 250,480. 259,805. 284,218. 284,219. 287,556. 301,547. 318,696. 326,279. 334,831.
  - spinels, (*other than* chrome iron ore). 326,560.
  - volcanic dust. [*No cases.*]
- processes for making, (*other than* processes dependent upon use of particular materials and compositions)—
  - baking or firing processes of interest apart from particular substances treated. *See* Pottery, Manufacture of, [*Class* 87 (i)].
  - other than simultaneous use of high temperatures and pressure and rendering non-plastic materials colloidal. 245,182. 262,403. 265,847. 286,933. 302,087. 310,841. 315,196. 315,197. 329,803. 330,745.
  - rendering non-plastic materials colloidal or plastic, (*including* processes dependent upon extremely fine grinding and upon addition of organic materials of high molecular weight). 263,194. 264,192. 282,795. 292,529. 319,612. 333,240.
  - simultaneous use of high temperatures and pressure. 278,120. 292,997. 333,240.
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- rendering porous. *See* Plastic compositions, [*Class* 70].

Stone, Natural and artificial, Hardening and preserving, (*including* Hardening and preserving bricks). 257,391. 260,031. 260,313. 267,971. 271,203. 276,597. 281,022. 286,334. 290,309. 290,717. 291,784. 300,464. 306,615. 312,216. 315,620. 319,288. 320,160. 320,886. 321,976. 324,038. 324,652. 328,969. 332,604. 333,535. 334,831. 335,521. 338,465. 340,112.

coating with metals. *See* Coating non-metallic surfaces &c., [*Class* 82 (ii)].

enamelling. *See* Enamelling, Vitreous, (*firing processes*), [*Class* 56].

hardening-chambers. *See* Wood, cork, &c., Treating with liquids &c., [*Class* 140].

Stone, Natural &c., Hardening &c.—*cont.*

impregnating-compositions other than those which depend for their action upon chemical reaction with the material of the stone. *See* Proofing permeable materials &c., [*Class* 140].

paints and like coating-compositions. *See* Paints, varnishes, &c., [*Class* 95].

polishing pastes and powders for. *See* Polishing compositions &c., [*Class* 95].

varnishes. *See* Paints, varnishes, &c., [*Class* 95].

waterproofing bricks. *See* Bricks &c., [*Class* 87 (i)].

NAME INDEX

The names in *italics* are those of persons by whom inventions have been communicated to the applicants for Letters Patent.

ERRATA

The following abridgments should be *deleted* :— **271,722. 281,241. 290,331. 317,073.**

CLASS 22

CEMENTS AND LIKE COMPOSITIONS

Patents have been granted in all cases, unless otherwise stated. Drawings accompany the Specification where the abridgment is illustrated, and also where the words *Drawings to Specification* follow the date.

244,963. Billner, K. P. March 11, 1925.

Cement, Portland, treating after manufacture.—An intimate dry mixture of Portland or like cement with 0.3—0.2 per cent of its weight of powdered aluminium or zinc or both is prepared for use in the manufacture of cellular concretes. The mixture is preferably prepared by grinding the ingredients together. It may be mixed, when required for use, with further quantities of cement, lime, or an aggregate. According to the Provisional Specification, the proportions are not limited to those defined above.

244,973. Dufton, W. J. S., Obank, T., Obank, W. J., and **Obank, L. S.,** (*trading as Dufbank Tile Co.*). March 27, 1925.

Cements, Portland, treating after manufacture.—Cement or cement clinker is ground dry with casein, albumen, or protein, and oils, fats, or argillaceous earths containing sebacic or fatty acid are subsequently added, with or without sulphur. According to an example, 500 grammes of cement are mixed with magnesite, powdered glass, or sand, and then mixed with 10 grammes of casein and 3 cubic centimetres of polymerized palm oil or linseed oil, with or without 20 grammes of sulphur. Castings made from the mixture may be treated with an emulsion of paraffin wax in soap solution.

245,101. Deutsche Gasgluhlicht-Auer-Ges. Dec. 24, 1924, [*Convention date*].

Refractory substances containing zirconium oxide.—High grade zirconium oxide is mixed with up to 5 per cent of an alkaline earth oxide, sintered at about 1300° C. and finished by burning at higher temperature to produce a refractory. More porous articles are produced by omitting the sintering stage, and burning the wet-moulded article direct at 1800—2000° C.

245,182. Cox, F. J. Sept. 2, 1924.

Porous refractory substances.—A diaphragm for use in surface combustion apparatus is made from two superimposed layers of refractory granules of different size, the layers being pressed into a plastic structure after the addition of a binding agent and converted subsequently by stoving into an integral rigid structure. The larger granules may be mixed with powder, obtained during the grinding operations for obtaining the granules, a refractory mixing powder, and a binding solution of sodium silicate and compressed in a mould from a layer, the upper surface of which is then slightly roughened. A similar mixture containing the smaller granules is added and pressed down to fill the mould. The upper surface may be fluted or corrugated. The diaphragm is then heated for about 1½ hours at about 200° F. and finally for about 2 hours at 350° F., when it is removed from the mould ready for use. The refractory granules preferably contain from 55 to 60 per cent of silica and from 30 to 35 per cent of alumina, and the mixing powder from 45 to 50 per cent silica and from 35 to 40 per cent alumina. Directions are given for obtaining the weight of each constituent required for diaphragms of a given size suitable for use with a mixture of petrol or coal gas and air. In making curved or cylindrical diaphragms, temporary separators of thin material may be placed between the layers prior to the pressing and stoving operations.

500. Wt. 129/1016. 10/29. C.P. Leam. Ps. 2347.

245,418. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, and **Moser, F. R.** Jan. 2, 1925, [*Convention date*].

Asphalts; emulsified bituminous compositions.—Asphalt, bitumen &c. is emulsified in a known manner, and is then coagulated in the presence of finely divided substances of the colloidal order to form a fine mud which resists further coagulation. The " asphalt gel " thus produced may be added to solutions of magnesium chloride or sulphite lye to make a dust laying composition, or it may be mixed with cement paste, lime paste or paper, or with slag, stone and like granulated substances. The precipitation from the emulsion is obtained by stirring in an electrolyte, in presence of the finely divided substances such as aluminium hydroxide, ferrous hydroxide, clay, humus, barium sulphate, magnesia, silica, calcium carbonates, or by the presence of the finely divided substances alone. According to an example, 1000 kg. of petroleum asphalt are emulsified in such a way that the emulsion contains 50 per cent of water. 5 kg. of caustic soda are added and the emulsion is stirred into a solution of 5 kg. of aluminium chloride in 1000 litres of water.

245,935. Knibbs, N. V. S. Jan. 13, 1925.

Lime and magnesia plastic composition. — Lime, magnesian lime, or magnesia is partly carbonated or hydrated at an elevated temperature which is below the dissociation temperature of the carbonate or hydrate. The product when ground constitutes a cementitious material, which can be used either alone or in admixture with fully hydrated lime or magnesia. Small quantities of sulphates or sulphites may be added during the grinding. The degree of carbonation or hydration should be between 20 and 80 per cent.

246,065. Universal Rubber Paviors (Manchester 1923), Ltd., and **Brown, A. E.** April 4, 1925. *Addition to* 246,186.

Compositions containing bituminous &c. materials, clay, and rubber, &c.—The adhesiveness of the product described in the parent Specification is increased by the addition thereto of residual products of the manufacture of gutta percha known as gutta percha pitch, or those of balata, or low grade rubbers as pontanac, palembang, accra. Suitable proportions are 8 per cent of gutta percha pitch and 92 per cent of the composition described in the parent Specification.

246,126. Imray, O. Y., (*Soc. of Chemical Industry in Basle*). Jan. 17, 1925, [*Convention date*].

Compositions containing organic condensation products.—The condensation products of urea, thiourea &c. with formaldehyde may be incorporated with filling materials such as wood or cork meal, with dyestuffs, with substances such as casein which are hardened by aldehyde, or with materials like plaster of Paris or cement which unite with water, for the manufacture of artificial masses and insulation material.

246,127. Soc. of Chemical Industry in Basle. Jan. 17, 1925, [*Convention date*].

Cocmpositions containing organic condensation products.—Condensation products of urea or a derivative thereof and formaldehyde in the insoluble solid or gelatinous form, e.g. splinters or shavings of waste material, are rendered soluble by heating with an excess of formaldehyde. Any inert filling material may be removed after dissolution and the solution then worked up like a fresh condensation product, for example, by mixing with filling materials or colouring matter and hardening. Examples are given of the treatment of solid condensation products from urea and formaldehyde.

246,186. Universal Rubber Paviors (Manchester 1923), Ltd., and **Brown, A. E.** April 4, 1925.

Compositions containing bituminous materials and clay.—Clay is ground to a state of fineness that 95—98 per cent will pass through a sieve having 200 meshes to the linear inch, hygroscopic water is removed from the clay by heat, and the product is mixed in proportions up to 55 per cent or upwards with bitumen &c. at a moderate temperature, to produce a composition suitable for use in road making and for other purposes. Preferably the clay is dried prior to or during grinding, by heating to 300—400° C., although temperatures of 105° C. upwards are sufficient, to facilitate grinding, and this is mixed with bitumen &c. in a slow-running mixer at a temperature of 80—100° C. The clay ground to the necessary fineness may be dried during mixing with the bitumen, by employing a temperature of at least 105° C., preferably 175°—180° C. The consistency of the product may be varied by the addition of oil flux.

246,202. Walker, F. T. Oct. 17, 1924.

Concretes.—Oolitic stone is disintegrated in such a manner as to separate the oolitic granules from their binding-agent without fracturing them; the granules and the natural binding-agent, with or without the addition of other binders such as cement, are then mixed with water or oil and the mixture is moulded into bricks, blocks, &c., or applied to expanded metal, laths, &c. The disintegration of the stone is preferably effected by passing it through a rotating cylinder with internal projections. Specification 20070/05 is referred to.

246,480. Deutsche Gasglühlicht-Auer-Ges. Jan. 23, 1925, [*Convention date*].

Refractory substances containing zirconium oxide.—Zirconium oxide, obtained for instance by heating basic sulphates, is sintered at temperatures above 1800° C. and is then worked up into refractory articles by known methods without particularly fine grinding. The articles are finally burnt at temperatures exceeding 2000° C. The burning of the articles may be conducted in two stages, at 1300° C. and above 2000° C. respectively, or if pressure is used in forming the articles 1600° C. is a sufficiently high burning temperature.

246,792. Allis-Chalmers Manufacturing Co., (Assignees of *Newhouse, R. C.*). Jan. 30, 1925, [*Convention date*].

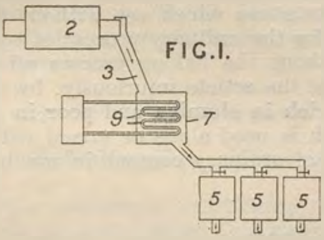


FIG. I.

Slag cements.—Slurry, obtained for example by grinding together limestone and blast furnace slag is cooled immediately after its formation to reduce the tendency of the slag to absorb water and set. Slurry made in a mill 2 passes down a chute 3 to a cooling chamber 7 containing pipes 9 for circulating cooling liquid, and thence to storage receptacles 5. Instead of being passed through the cooling-chamber, the slurry may be treated directly with cold water.

247,097. Billner, K. P., (*Lantz, M.*). Aug. 22, 1925.

Slag cements.—Cements are obtained by adding calcium salts such as gypsum to clinker material in two or more stages, the amount added at each stage being preferably 2—3 per cent of the clinker. The materials are finely ground either before or during the mixing.

247,238. Westrum, L. S. van. Aug. 12, 1924.

Compositions containing bitumens and cement.—A binding composition for wood, stone, rubber &c. for pavements, roads, buildings &c. consists of a mortar of lime, cement, plaster of Paris &c. mixed with a bituminous soap, prepared for example as in Specification 233,371, containing at least 50 per cent of bitumen. For jointing rubber blocks, pulverized rubber may be added to the binder. In an example, 80 parts by weight of a bituminous soap containing 50—80 per cent of its weight of bitumen, 20 parts of lime, cement or plaster, with or without 10—20 parts pulverized rubber, and 10—20 parts of sand, stone dust &c. are mixed together to form a mortar which may be applied to the concrete foundation, and after the blocks are placed in position is broomed into the joints.

247,244. White, A. E., (*Concrete Tile Machinery Co.*). Sept. 11, 1924. *Drawings to Specification.*

Concretes and mortars.—A composition for facing and colouring concrete tiles &c. comprises one part of metallic oxide pigment, four parts Portland cement, four parts of very fine sand and sufficient water to give the consistency of cream. Specifications 228,580 and 228,826, [both in *Class* 87 (ii), Moulding plastic &c. substances], are referred to.

247,620. Boorne, W. H., and **Budde, C. C. L. G.** Oct. 11, 1924.

Compositions containing resinous materials. —A composition suitable for use as a binding agent for moulding compositions is made by treating ordinary resin with formaldehyde in the presence of a catalyst. If the catalyst is a metallic oxide or hydroxide, the resulting compound is converted wholly or partially into a resinate. In an example, four parts of resin in powder, one part of slaked lime, and four parts of 40 per cent formalin are heated to near the boiling point of water when a sudden reaction takes place and a yellow fusible powder results. On heating to 120°, a further evolution of gas takes place and a product results which can be softened, but not melted by further heating. These powders may be mixed with sawdust, cotton, paper, asbestos, sand &c. to yield moulding powders for the manufacture of building slabs &c. The resinous compound may be used in combination with other materials such as synthetic phenol resins.

247,634. Stimson, R. W., and Borchers, W. Nov. 6, 1924. *Drawings to Specification.*

Cements, Portland and Roman, materials and compositions for.—In a process for the production of alloys which comprises the reduction by means of a carbonaceous reducing-agent of a mixture containing ores or other compounds of the constituent elements of the alloy, and fluxes, the proportions of the constituents of the mixture being such that the slag resulting from the reaction is neither strongly basic nor strongly acid, and that its principal basic component is of a mild character such as alumina, it is stated that the slags produced are suitable for cement making and like purposes.

247,957. Bakelite Ges. Feb. 17, 1925, [*Convention date*].

Compositions containing phenol-aldehyde condensation products and filling agents are made by dissolving the condensation products in alkali or salt solutions, or mixtures of the same in the presence or absence of organic solvents, impregnating the filling agents with the solution, and precipitating the condensation product in the presence of the filling agent. The solution of the condensation product may also be mixed with solutions from which a filling ingredient is thrown down by the precipitant. Thus calcium salts may be added, from which gypsum is precipitated by sulphuric acid, or viscose may be added to deposit cellulose. Solutions or mixtures, e.g. glue, gum arabic, tannin or tanning agents, which in part form both precipitant and filling agent, may also be used. The precipitation of the condensation product may be effected by acids in the presence of solutions of hydrotropic salts, or by means of salts without acids, or by water. In examples, wood flour and paper pulp are mixed with an alkaline solution of a phenol-aldehyde condensation resin, and the resin is precipitated by adding aluminium sulphate solution. The process may also be carried out by impregnating the materials with the precipitant and then adding the solution of the resin.

Reference has been directed by the Comptroller to Specification 28155/10, [*Class* 2 (iii), Dyes &c.].

247,994. Trippensee, A. Feb. 23, 1925, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

Refractory substances containing siliceous materials.—Portland cement is used as a binding-agent for refractory materials such as ground chamotte, quartzite, sandstone, or siliceous sand, or mixtures of these substances. The composition may be either used directly to build up furnace linings, &c., in situ, or it may be pressed into bricks, blocks, &c., which do not require to be burned.

248,282. Voisin, U. B. Oct. 14, 1925. *Addition to* 243,876.

Cements, Portland, processes and materials for making.—Aluminous cements are made by heating the materials in a very fine state of subdivision to a temperature below the softening or clinkering point, e.g. 1000—1100° C. White cements can be obtained by using raw materials free from iron.

248,360. Aluminum Co. of America, (Assignees of *Horsfield, B. T.*). March 2, 1925, [*Convention date*].

Treatment of slags.—The Specification as open to inspection under Sect. 91 (3) (a) states that oxides and oxide mixtures generally may be converted into hollow globules and purified by injecting a gas at high velocity into a stream of the molten oxide. This subject-matter does not appear in the Specification as accepted.

248,514. Davidsen, M. J. Dec. 24, 1924.

Concretes.—Articles made of concrete, cement or like substances which set without firing, are enamelled by the ordinary process of coating and baking without the baking process affecting the structure of the article injuriously, by the use of a cement rich in alumina and poor in silica and lime, which is used alone or mixed with a small proportion of ordinary cement in making up the article.

248,619. Radcliffe, J. Aug. 30, 1924.

Bituminous compositions. — A bituminous material for making surfacing or patching roads by a cold process consists of a mixture of powdered oil-pitch having a melting point of substantially 230° F. and a fine mineral or organic aggregate such as sand. The aggregate is preferably wetted with fuel-oil which acts to soften the pitch when the mixture is rolled in. Specification 236,050 is referred to.

248,729. Pollak, F. March 3, 1925, [*Convention date*].

Compositions containing urea formaldehyde condensation products.—Hydrophobe condensation products of urea or its derivatives with formaldehyde may be mixed, prior to hardening, with organic or inorganic substances in the colloidal, powdery or fibrous form.

The Specification as open to inspection under Sect. 91 (3) (a) refers to cellulose as a filling material and is not restricted to formaldehyde as a starting material, but mentions aldehydes in general. This subject-matter does not appear in the Specification as accepted.

248,752. Jachzel, J. March 4, 1925, [*Convention date*].

Compositions containing bituminous and calcareous or siliceous materials.—Limestone, sand, or similar material is added to a " solution " or emulsion of bitumen, and while the mixture is being agitated an electrolyte is added to precipitate the bitumen on to the filler. The mixture is allowed to settle and the composition removed from the water and dried. Specification 245,418 is referred to.

249,101. Soc. of Chemical Industry in Basle. March 10, 1925, [*Convention date*].

Compositions containing urea formaldehyde condensation products.—Before hardening condensation products of urea or its derivatives with formaldehyde, the mass may be incorporated with fibrous, pulverulent or liquid filling materials, colouring matters, or agents conferring elasticity; pyridine is mentioned.

249,543. Schüller, N. March 18, 1926.

Refractory substances containing silica. — Waste sands obtained from the glass industry are used instead of quartzite, &c., in the manufacture of silica stones. The substances may be mixed with slaked lime with or without organic binders and with or without pieces of quartzite, and subjected to the action of superheated steam, hot gases, or hot air. The material is said to undergo rapid conversion into tridymite during the baking process.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the use of waste sand of any other origin, such as from grinding and washing processes. This subject-matter does not appear in the Specification as accepted.

249,720. Cordrey, W. S. Jan. 12, 1926.

Concretes.—Compositions for use in the manufacture of bricks, tiles, &c. consists of approximately 76—80 parts of sand, 8—4 parts of cement, 8 parts of hydrated lime, 7 parts of water, and 0.446 parts of alkaline silicate. The sand and cement are first mixed dry and a mixture of the other ingredients is then added.

249,899. Novocrete & Cements Products Co., Ltd., and **Burney, C. D.** Oct. 25, 1924.

Concretes.—Fibrous materials such as sawdust, shavings, coir, cork, wood waste, sizal, paper pulp, &c. are mixed before or after moistening, with a dry hygroscopic substance which acts exothermally when brought into contact with moisture, and while heat is still being evolved the mixture is added to cement, concrete, &c. and cast in moulds. The dry hygroscopic substance may for example be dry caustic soda, quicklime, or magnesium chloride. The fibrous material may be subjected to a preliminary treatment to reduce its tendency to change in volume with change of moisture content, such as washing with a weak solution of alkali or acid. It may also undergo a preliminary impregnation with any suitable solution followed if desired by treatment with a precipitating agent, or the dry hygroscopic substance may itself act as a precipitating agent. For example, sawdust may be impregnated with ferric chloride solution and then mixed with flaked caustic soda; cement and water are then added while heat is still being evolved, and the mixture is moulded under pressure as described in Specification 244,178. Specifications 236,450; 252,906, [*Class* 70, Indiarubber &c.]; and 253,007 also are referred to.

250,246. Soc. Anon. des Chaux et Ciments de Lafarge et du Teil. April 4, 1925, [*Convention date*].

Cements, Portland, processes for making. — Aluminous cements are made by heating the raw materials in a very fine state of subdivision to a temperature below the clinkering point, preferably 1000—1100° C. It is unnecessary to use pure materials, and limestone, clay, hydraulic lime, iron ore, and siliceous, silico-aluminous, and silico-alumino-calcareous rocks may be utilized. The composition of the resulting cement may be varied within wide limits, namely, silica 0—5 per cent, alumina 40—55 per cent, iron oxide 10—25 per cent, and lime 20—40 per cent.

Reference has been directed by the Comptroller to Specification 243,876.

250,354. Grosvenor Scientific Products, Ltd., and **Turner, B.** Feb 2, 1925.

Refractory substances containing chrome ore, China clay, and soluble silicates are prepared by mixing chrome ore, which has been crushed to pass through a $^1/_{10}$ inch mesh, with China-clay and silicate of sodium or potassium, packing the mixture in a mould, submitting to pressure, removing and firing. The silicate preferably has a specific gravity of 1.6 and contains 2 parts of silica to 1 of soda or potash. The chrome ore may be Rhodesian chrome ore which is crushed and graded and particular proportions of the grades mixed together.

250,439. Dulac, A. July 14, 1925.

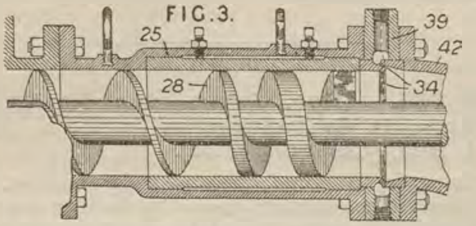
Compositions containing oil.—A plastic composition or cement for coating wood, stone, cement &c. to render them impermeable to gas oil or other mineral oil derivatives comprises Portland cement, river sand, white lead, litharge, quick lime, manganese borate, fucose algae and a special oil. The special oil comprises linseed oil boiled with litharge, other drying oil, glycerine, sodium silicate, liquid drier, and an aqueous solution of gelatine. The drier is made by macerating litharge and manganese borate with turpentine.

250,480. Youngman, R. H. Oct. 24. 1925.

Refractory substances containing magnesite, chrome ore, and sodium silicate.—An unburned refractory brick is moulded from a mixture of calcined magnesite (preferably about 60 per cent), chrome ore (about 35 per cent), and sodium silicate (3—10 per cent).

250,599. Fuller, J. W. April 9, 1925, [*Convention date*].

FIG.3.



Cements, Portland, treating after manufacture.—The hydration and carbonation of the free lime in Portland cement is effected by subjecting the ground cement to mechanical pressure in a pipe line and injecting air or gas under pressure into it, the mixture of gas and cement being thus caused to flow along the pipe to storage bins, &c. A gas rich in moisture and carbon dioxide is more effective than air, and the kiln gases may be used for the purpose after moistening or partly drying them if necessary. In one method of carrying out the invention the cement is fed into a hopper and compacted in a conduit 25 by means of a differential screw 28. Gas under pressure is admitted at the further end of the conduit from an annulus 39 provided with a number of forwardly directed orifices 34, causing the cement to flow along the pipe line 42. Specification 152,300, [*Class* 78 (i), Conveyers &c.], is referred to.

250,652. Brown, T. W. H. Jan. 12, 1925.

Concrete.—A colloidal solution of wax, preferably paraffin wax, is mixed with the ingredients of concrete, artificial stone, or mortar for waterproofing purposes. It may also be applied as a coating to existing work.

250,678. Idris, W. H. W. Jan. 16, 1925. *Addition to* 222,192.

Compositions containing oils and resins or gums.—A composition for forming floors and hard courts for games consists of porous mineral material, such as ground pumice, ground tiles or brick, or sand, and a drying oil containing gums, resins, or gum resins. The drying oil may contain 10 to 30 per cent by weight of gums &c. As an example, 5 gallons of drying oil containing gums are mixed with 95 lbs. of ground pumice and 5 lbs. of colouring matter. Gums of the kauri or copal type may be employed.

250,949. British Thomson-Houston Co., Ltd., (Assignees of *Peterson, C. F.*). April 14, 1925, [*Convention date*].

Compositions containing phenol aldehydes; esters.—The curing of artificial resins of the type formed by the reaction of a polyhydric alcohol with a polybasic acid, such as those described in Specifications 8417/13, and 3271/13, is accelerated by the addition of a phenol resin. A small quantity of bakelite added to glyptal (a compound of glycerine and phthalic acid) will produce the same degree of polymerization in two minutes at 150°—250° as is produced by heating glyptal alone for 25—30 min. A solution of glyptal in alcohol, benzol and methylacetone to which bakelite varnish is added may be used as a cement for mica as described in Specification 203,232, [*Class* 70, India-rubber &c.].

251,369. Cadett, J. W. T., and **Cadett, E. V.** Feb. 7, 1925.

Compositions containing resinous materials and abrasives.—A composition for application to bows for musical instruments consists of a powdered abrasive, such as amber, powdered glass, pumice powder, silica, carborundum, ruby, sapphire or diamond dust, mixed with colophony resins, oleo resins, balsams, or like carriers. In an example, resin is melted, one-fourth of its weight of powdered silica is stirred in, and the mixture is cast into blocks.

251,558. Heyl, G. E. Dec. 14, 1925.

Cements, Portland, materials for making.—Town refuse is dried by waste heat from either a refuse destructor or a cement kiln; cement-forming ingredients such as lime or bauxite are added to the dried material, and the mixture is burned in a cement kiln and ground up to form cement.

251,618. Martin, E. April 30, 1925, [*Convention date*].

Cements, Portland, materials for making. — Small quantities of alkali salts, calcium chloride, calcium fluoride, fluorspar, or cryolite are incorporated with the raw materials of aluminous cement to facilitate the production of hydraulic compounds. A typical mixture comprises 100 kg. of bauxite, 100 kg. of limestone, and 5—10 kg. of sodium chloride. Specification 222,122 is referred to.

251,964. Schumacher'sche Fabrik Ges. May 8, 1925, [*Convention date*].

Compositions containing organic condensation products.—Porous artificial stones for filtering and other purposes are obtained by mixing a suitable mineral aggregate with a synthetic resin, moulding the mixture under pressure, and heating it to 100—200° C. The porosity is controlled either by selection of a suitable size of the granular material or by the addition of volatile substances, e.g. heavy mineral oil, paraffin, earth wax, &c. Acid- and alkali-proof stones are obtainable by the use of suitable aggregates, e.g. fluorspar, coke, and quartz. Specification 156,675 is referred to.

251,965. Schumacher'sche Fabrik Ges. May 8, 1925, [*Convention date*].

Compositions containing organic condensation products.—Porous artificial stones for filtering, grinding, and other purposes are obtained by mixing with a stony aggregate the raw materials from which synthetic resin is produced, e.g. phenol and aldehyde. The mixture is moulded under pressure and heated in order to produce and harden the synthetic resin. Catalysts to promote the reaction may be included in the mixture. Suitable aggregates are alumina, silicon carbide, chamotte, silica, coke, &c. Volatile substances may be added to increase the porosity.

251,982. Roessler & Hasslacher Chemical Co., (Assignees of *Gilbert, H. N.*). May 9, 1925, [*Convention date*].

Refractory compositions containing carbon. — In the manufacture of carbon compositions in which a binder such as pitch is carbonized, by baking, the mixture is submitted to high mechanical pressure, which pressure is maintained during carbonization of the binder. In an example, a mixture of 80 parts of powdered graphite and 20 parts of hard pitch is pressed at 250° C. in a mould. The plunger is clamped and the mould is heated to a dull red heat to carbonize the pitch; the gas liberated escapes between the plunger and the mould. The article is removed, and may be further heated to 1000° C. to give an article having an apparent specific gravity of 1.8—1.9. Specifications 3382/76, 445/77, and 18487/95, [all in *Class* 87, Moulding &c.], are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) is not limited to carbon compositions, and describes a process in which the composition is placed in a mould and prevented from expanding during baking. This subject-matter does not appear in the Specification as accepted.

252,186. Prikelmayer, J. May 13, 1925, [*Convention date*].

Compositions containing resinous materials. — Sealing-wax consists of a mixture of shellac, venetian turpentine, colophony, and mastic, the preferred proportions of the ingredients being 36, 24, 6, and 3 parts respectively. The mixture is translucent and may be applied in a thin layer over signatures &c. as a protection against fraud.

252,210. Lindemann, O. May 18, 1925, [*Convention date*].

Cements, Portland, treating after manufacture; concretes and mortars. — Finely ground glass is added to cements and mortars to improve their strength, increase their density, and render them waterproof. Waste glass from glass furnaces may be used. A substance such as water-glass may also be added to promote the decomposition of the vitreous substance.

252,269. Queneau, A. L. J. Feb. 24, 1925.

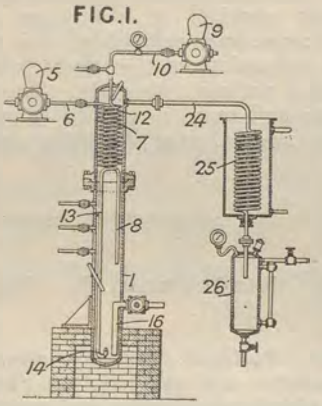
Slag cements.—The interior walls of a retort and the surfaces of its moving parts or of the charging or discharging apparatus are automatically cleaned by incorporating in the more or less finely divided charge a proportion of larger pieces of the same or other material so that during the passage of these pieces through the retort the deposits or adhesions are removed. In the case of destructive distillation of shale, and when spent shale is treated subsequently in a fusion producer to obtain cement, the elements required for cement making may be added in the large pieces.

252,326. Hermann, H. P., and Hermann, J. A. May 25, 1925, [*Convention date*].

Compositions containing plaster and albuminous and gelatinous matter.—A binding material for plaster to be applied on any backgrounds comprises linseed oil, amber-lacquer, soft soap, glycerine, shellac, glue, flour and water. In a preferred method of preparation 1000 grams of glue are boiled in 3300 grams of water, and about one fifth of the mixture or solution is mixed with 1000 grams of flour. A third mixture of 100 grams of linseed oil, 26 grams of amber lacquer, 150 grams of glycerine and 26 grams of soft soap is prepared, and the three mixtures are stirred together. Finally 300 grams of dissolved shellac are added. Amber-lacquer is made by heating to 300° C. a mixture of resin, machine oil, china wood oil, lime and inorganic oxide and diluting the product with turpentine oil.

252,327. Penniman, W. B. D. May 20, 1925, [*Convention date*].

FIG.I.



Asphalts.—Asphaltic oils and asphalt are oxidized to yield motor fuels, burning oils, aldehydes, fatty acids, alcohols, ketones, solvents, gums, &c., by passing air or other oxygen-containing gas under, say, 300 lbs., through a heated layer of the material of a depth sufficient substantially to deoxygenate the air &c., the material being in the liquid state or suspended in a suitable liquid carrier. The oxidizing gas may be enriched with oxygen or be diluted with steam. The process is preferably carried out at a temperature of 600—900° F., though the temperature range may extend from 300 to 1000° F. Catalysts such as aluminium chloride, the oxides of manganese, lead, iron, chromium, vanadium, zinc, copper, or calcium may be added, and also neutralizing agents such as quick lime, limestone, or alkaline carbonates. The depth of the layer under treatment is preferably maintained substantially constant, as by intermittently or continuously feeding fresh material to, and withdrawing treated material from, the reaction chamber. Baffles may be provided in the reaction chamber to impede the passage of air therethrough, to assist circulation, or to cause any separated solid material, such as carbon, to be deposited in a desired part of the apparatus. The reaction chamber may be externally heated, or the material and air &c. may be preheated, and the temperature in the chamber be maintained solely by the heat of reaction. The oxidation and disintegration products of the material removed by the current of air &c. are condensed with or without pressure, and the deoxygenated air may be passed through silica gel or absorbent carbon to extract residual vapours. As shown in Fig. 1, the apparatus for carrying out the process may comprise a vertical still 1 adapted to be heated by a gas fired furnace, a condenser tube and coil 24, 25, and a receiver 26, the members 24 - - 26 being preferably constructed of copper, chromium or nickel chrome steel, monel metal, or other acid-resisting material; or enamel lined condenser tubes may be employed. Material is supplied to the still by a pump 5, pipe 6, coil 12 and pipe 8, and air by a pump 9, pipe 10, coil 7, and pipe 13 having at its lower end an upwardly directed nozzle 14, or a series of radially extending perforated pipes. More than one air supply line may be provided, and a battery of stills may be employed, each being fitted at its upper part with a dephlegmator and heat-interchanger. Residual material may be withdrawn by a pipe 16.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the carrying out of the process at atmospheric pressure. This subject-matter does not appear in the Specification as accepted.

Reference has been directed by the Comptroller to Specifications 16182/05 *and* 131,303, [both in *Class* 91, Oils &c.].

252,367. I. G. Farbenindustrie Akt.-Ges., (Assignees of *Platsch, M.*). May 23, 1925, [*Convention date*].

Cement, Portland, materials for making. — Cements as well as phosphorus are obtained in the process of reducing crude phosphates with carbon and silica at high temperature in an electric furnace by adding alumina or materials rich in alumina such as clay and bauxite to the fused residue. The heat required for the fusion and also the residue are thus utilized.

The Specification as open to public inspection under Sect. 91 (3) (a) comprises also the addition of the alumina or materials containing alumina to the raw materials before they are fused. The fusion may also take place in any furnace. This subject-matter does not appear in the Specification as accepted.

252,656. Poller, A. May 30, 1925, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

Compositions containing resinous materials. — A material, more particularly for making casts, consists of a foundation of hard resins, such as colophony hardened by the addition of zinc oxide, copal, dammar, mastic, shellac, sandarac or amber, with the addition of balsams or soft resins, such as copaiba balsam, Canada balsam, Peruvian balsam or gum elemi. The hard resin may be added as a solution in linseed oil or linseed oil varnish, or amber may be added as a very fine meal. The brittleness of colophony is removed by the addition of starch, for example wheat starch. The viscosity of the mixture is decreased by adding paraffin wax, beeswax, spermaceti or the like and the melting-point is then raised by the addition of carnaüba wax. Fillers, such as whiting, marble meal, kaolin, talc, glass powder or gypsum, colouring matter, such as iron filings, silver or gold bronze powder or pigments, such as ochres, and fibrous materials, such as Harris wool may be added. The material may be cast by heating it and brushing into a mould fibrous substances, such as wadding, tow or calico bindings being added for strengthening purposes. The first coating may be made more pliable by the addition of one or more of the following: oil of turpentine, turpentine, benzine, copaila, balsam, Canada balsam and an oil varnish. The first layer may be painted so that the colour is visible through the layer. The composition may also be used for electric insulation, for connecting substances together and for coating packing materials and surgical bandages.

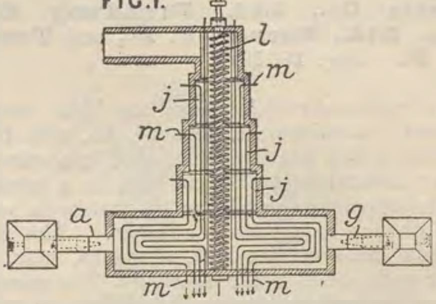
252,711. Schilling, L. C. May 26, 1925, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

Compositions containing plaster and bituminous &c. materials. — A material for building and other purposes is formed by adding a colloidal solution, emulsion, or suspension of bituminous, oily, fatty, waxy, or resinous substances, or mixtures of the same, to substances which harden with water, such as magnesite cement, gypsum, or mixtures containing these substances. As an example, an emulsion containing 50 per cent of asphalt is added to a mixture of magnesite, magnesium chloride, and sawdust till the total mass contains 20 per cent asphalt. For a light coloured material, paraffin is used instead of asphalt. Ozokerite, ceresine, and other mineral, vegetable, or animal oils, fats, or resins, or mixtures of them, may similarly be used.

252,780. Heyl, G. E. March 3, 1925.

Cements, Portland, processes for making. — A process for burning lime or cement consists in blowing the dry powdered material into a combustion chamber so as to encounter a flaming jet of fuel. Fig. 1 shows in plan a suitable apparatus, in which the fuel and the raw material are blown in through nozzles *a* and *g* respectively, and the product, settling in the flue *j* is removed by a conveyer *l*. The pipes *m* are traversed by a cooling fluid, and the heat so extracted may be utilized for raising steam or for other purposes.

FIG.1.



252,784. Leyland, A. Aug. 11, 1925.

Compositions containing tar and clay. — Natural clay is dried and ground and immersed in boiling tar from which the more volatile constituents have been driven by heat, for example, by heating to 230° F. The mass may be applied to brickwork, woodwork &c. as a plastering, or it may be moulded into slabs or blocks, with or without a wood base. If a concrete facing is to be applied, small stones may be heated and rubbed into the surface to provide a key. Suitable proportions are 40 parts of tar and 60 parts of clay. Specification 23271/06, [*Class* 20, Buildings &c.], is referred to.

252,802. Pine, J. A. W. March 7, 1925.

Asphalt.—Trinidad lake or similar asphalt is pulverized, washed if necessary, compressed into briquettes with a moisture content of about 10 per cent, and dried until a product containing about 6 per cent of water is obtained. The dried briquettes may be transported in bulk, and when required for use are pulverized and mixed with the sand, &c. for producing paving cement.

252,975. Rotinoff, A. G. Oct. 23, 1925.

FIG.3. FIG.4. FIG.5. FIG.6.

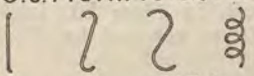
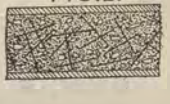


FIG.2.



Concretes. — Reinforcing elements having laterally deflected or extended ends or a spiral configuration as shown in Figs. 2—6, and formed of steel or other material, are mixed with concrete which is used in conjunction with reinforcement of the ordinary kind.

253,007. Novocrete & Cement Products Co., Ltd., Broadway Trust Co., Ltd., Burney, C. D., and **Temple, J. E.** Dec. 16, 1924.

Concretes.—Artificial wood or light concrete consists of a mixture of cement, &c. with fibrous material which has been subjected to a mineralizing or indurating treatment and to a treatment which reduces its tendency to change in volume with change of moisture content. The fibrous material may be sawdust, shavings, coir, cork, paper pulp, wood waste, sizal, &c. The mineralizing or indurating treatment consists in precipitating mineral matter in and on the fibrous material with the object of increasing the adhesion between it and the cement; suitable processes being those disclosed in Specification 244,178. Various methods of treating the fibrous material to reduce its tendency to change in volume are described. One such method consists in heating the material for several hours to 120° C. A second process consists in impregnating the material with water-repellant substances such as petroleum jelly, oils, resins, bitumen, waxes, or soaps, these substances being conveniently used in the form of emulsions. Insoluble soaps may be precipitated in and on the material by impregnating the latter firstly with a soluble soap solution and subsequently with a metallic salt solution, an excess of the latter being used which by subsequent treatment with a precipitating agent or by spontaneous decomposition effects the mineralization of the fibres. Ferrous and ferric chlorides, chromates, and bichromates and chromium and copper chlorides are referred to as suitable salts; the soap solution may be sodium or potassium stearate, oleate, or resinate. A third method of treatment consists in extracting the fibrous material before mineralization with a solvent which removes the more soluble bodies; suitable solvents are weak solutions of mineral or organic acids (e.g. acetic acid) or of alkalis (e.g. sodium or potassium hydroxide, carbonate, bicarbonate, or silicate or calcium hydrate). A fourth process consists in treating the fibres with a substance which combines with the cellulose or lignin and forms a hard impervious skin upon the fibres; ammoniacal copper solutions are suitable for this purpose. The Provisional Specification describes another method of treating the fibrous material, consisting in treatment with dehydrating agents such as anhydrous magnesium chloride. Specifications 236,450; 238,948, [*Class* 20 (iv), Floors &c.]; 244,142; 245,812 and 252,906, [both in *Class* 70, India-rubber &c.]; and 258,665 are referred to.

253,246. Soler, R. G. March 25, 1925.

Compositions containing resinous materials and white lead.—A packing composition comprises gum lac, powdered white lead and a solvent, such as alcohol. Graphite and colouring matter may be added.

253,448. Illemann, R. Dec. 31, 1925.

Lime cements.—Waste lime from the Leblanc process which has been exposed to the atmosphere is heated to 100—1500° F. and ground up to form a cement. A small quantity of alum, potash, or borax, is added either before or after heating, or ground glue is added after heating. Specification 25572/13 is referred to.

253,519. Metropolitan-Vickers Electrical Co., Ltd., (Assignees of *Weber, H. C. P.*). June 10, 1925, [*Convention date*].

Compositions containing organic condensation products.—A liquid or a solid and fusible phenol-furfural condensation product is mixed, with or without the addition of solvents and fillers, with a liquid or a solid and fusible condensation product of a polyhydric aliphatic alcohol and a polybasic carboxylic acid. The mixture may be rendered insoluble and infusible by the usual methods. In an example, 10—30 parts of a phenol-furfural condensation product dissolved in 10 parts of alcohol are mixed with 90—70 parts of a glycerol-phthalic anhydride condensation product, also dissolved in 10 parts of alcohol, and 20 parts of a filler are added. The solvent having been evaporated, the dried composition is ground and moulded under heat and pressure to produce an insoluble and infusible product.

253,647. Stanton, W. P. April 3, 1925. *Drawings to Specification.*

Concretes.—A wet mixture for making hollow building-blocks in open moulds which are removed vertically before the concrete has taken an initial set contains substantially 1 part of cement, 8½ parts of sand, and 2½ parts of stone &c. by volume.

253,929. Kraus, C. E. June 18, 1925, [*Convention date*].

Compositions containing aluminous and alkaline earths.—Clay, kaolin, bentonite, and the like, to which may be added diaspone, bauxite, or like materials to produce a composition containing 12 per cent or upwards of alumina, is heated to a temperature insufficient to drive off all the water of crystallization, mixed with materials containing alkaline earths such as limestones, calcium oxide or hydroxide, gypsum, Portland cement, marl, made into a slurry, and digested with sulphuric acid. For some purposes the slurry may be roasted without additional alkaline earth, but usually further alkaline earth is added, producing further reaction, and the product is burnt with or without the addition of more alkaline earth, to make a cement. With a high percentage of sulphates, a temperature of 250°—450° F. gives a quick-setting product; where a high percentage of calcium hydroxide is present, a temperature of 400°—600° F. is preferred. The reaction is accelerated by adding alkali to the aluminous earth before heating. Numerous examples are given in the Specification. Specification 18145/92 is referred to.

253,947. Scheidhauer & Giessing Akt.-Ges. June 22, 1925, [*Convention date*].

Refractory substances containing chamotte. — Binding clay in the form of a slip produced in the known manner by the addition of alkali is added to ground chamotte, so as to produce a non-castable mass which is moulded by heating or stamping and burnt. By burning the chamotte at temperatures higher than usual, for example, Seger cone 14 or higher, mixing with the minimum of clay slip, and moulding under high pressure, blocks are produced which may be built into furnaces &c., without previous burning.

253,963. Hughes, C. M. C. Feb. 21, 1925.

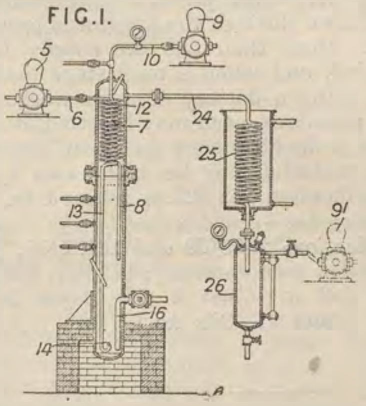
Concretes, lime and cement. — A waterproof concrete for road making and roof coverings consists of ordinary cementitious concrete mixed directly with cold liquid bitumen, pitch, tar, or similar hydrocarbon free from added inorganic matter, the proportions being such that the concrete sets by hydration as usual. In one method, 1 part by volume of cement, 3 parts of sand or like material, and 2 parts of granite chippings are mixed dry and hydrated, and 13⅓ gallons of liquid bitumen per cubic yard of the mixture are added. In another method, sand or the like is mixed with $^1/_{16}$ part by weight of the hydrocarbon, and cement, lime, or other calcium compound capable of setting is added and the whole mixed and hydrated.

254,004. Levy, F. March 25, 1925.

Compositions containing bituminous &c. materials and indiarubber.—An emulsion in water of bitumen and indiarubber may be mixed with stone or other mineral aggregate and the mixture consolidated by pressure, or may be broken down, as by adding an electrolyte, to yield a plastic product. The indiarubber may be added as an aqueous suspension of vulcanized indiarubber, as a volatile-solvent solution of unvulcanized indiarubber, or as rubber latex which may be vulcanized in situ, and reclaimed rubber in solution may be incorporated and fillers added at any stage of the process.

255,020. Penniman, W. B. D. July 7, 1925, [*Convention date*].

FIG.I.



Asphalts.—The oxidation of asphaltic oils, and asphalt, is effected by passing air or other oxygen-containing gas through a layer of the material of a depth sufficient substantially to deoxygenate the air &c., the pressure being at or below atmospheric pressure. Or the oxidation may be carried out in a series of treatment zones, the pressure in one of them being at or below atmospheric pressure, and the pressure in the other zones being below, at, or above atmospheric pressure. The products of oxidation include aldehydes, fatty acids, alcohols, ketones, solvents, gums, and substances adapted for use as motor fuel or burning oil. The oxidizing gas may be enriched with oxygen or be diluted with steam and the process is preferably carried out at a temperature of 600—900° F., though the temperature range may extend from 300 to 1000° F. Catalysts such as aluminium chloride, the oxides of manganese, lead, iron, chromium, vanadium, zinc, copper, or calcium may be added and also neutralizing agents such as quick lime, limestone, or alkali carbonates. The depth of the layer under treatment is preferably maintained substantially constant, as by intermittently or continuously feeding fresh material to, and withdrawing treated material from, the reaction chamber. Baffles may be provided in the reaction chamber to impede the passage of air therethrough, to assist circulation or to cause any separated solid material, such as carbon, to be deposited in a desired part of the apparatus. The reaction chamber may be externally heated, or the material and air &c. may be preheated and the temperature in the chamber be maintained solely by the heat of reaction. The oxidation and disintegration products of the material removed by the current of air &c. are condensed, and the deoxygenated air may be passed through silica gel or absorbent carbon to extract residual vapours. As shown in Fig. 1, the apparatus for carrying out the process may comprise a vertical still adapted to be heated by a gas fired furnace, a condenser tube and coil 24, 25, and a receiver 26, the members 24—26 being preferably constructed of copper, chromium or nickel chrome steel, monel metal or other acid-resisting material; or enamel lined condenser tubes may be employed. Material is supplied to the still by a pump 5, pipe

6, coil 12, and pipe 8, and air by a pump 9, pipe 10, coil 7, and pipe 13 having at its lower end an upwardly directed nozzle 14 or a series of radially extending perforated pipes. Alternatively, air may be drawn through the apparatus by a suction pump 9. More than one air supply line may be provided, and when a multistage oxidation is effected, using a battery of stills working under different pressures, each may be fitted at its upper part with a dephlegmator and heat interchanger. Residual material may be withdrawn by a pipe 16. Specification 252,327 is referred to.

Reference has been directed by the Comptroller to Specifications 2666/80 *and* 16182/05, [both in *Class* 55, Gas manufacture]; 131,301, 131,302 *and* 131,303, [all in *Class* 2 (iii), Dyes &c.]; *and* 181,034, [*Class* 91, Oils &c.].

255,037. Haggerty, J. F. July 13, 1925, [*Convention date*].

Compositions containing plaster and fibres. — Plaster wall boards are formed by mixing 100 lbs. of dry plaster of Paris with 100 to 150 lbs. of water containing 1½ to 5 per cent by weight of wood fibres, and shaping the paste into boards with a lining of paper on both sides. The wood fibres are preferably obtained by pulping waste paper. Raw gypsum, about 3 to 5 per cent by weight of the plaster, may be added as an accelerator, and resin and alum as a sizing material.

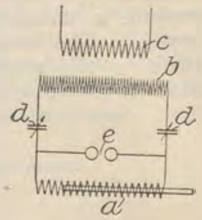
255,195. General Electric Co., Ltd., and **Smithells, C. J.** May 26, 1925.

Refractory substances containing magnesia. — Refractory supports for electric lamp and like filaments are prepared by sintering magnesia powder at about 1800° K. to form a compact body which does not shrink on further heating, grinding the sintered magnesia, moulding the ground material, mixed if necessary with a small proportion of unsintered magnesia, into the desired form, and finally heating the moulded body above 3300° K. by contact with or radiation from tungsten heated nearly to its melting point, so that the magnesia is fused on its surface.

255,311. Morton, F. Dec. 18, 1925.

Compositions containing bituminous materials. —Paving stones are moulded from a mixture of 60—75 per cent granite or stone chippings with 35—25 per cent of blast furnace or coal tar pitch having a twisting point between 40—65° C. 5 per cent of the pitch may be substituted by bitumen.

255,497. Uhlmann, A., (Assignee of *Jenaer Glaswerk Schott & Gen*). July 18, 1925, [*Convention date*].



Stone, artificial. — Non-metallic substances are caused to cohere by means of electric or magnetic fields. Fusion does not necessarily take place, but the particles are more or less welded with one another. The cohesion may be assisted by using very finely-divided raw materials by pressure, heat, or by admixture with a liquid, preferably of low boiling point, e.g. alcohol. Substances of higher conductivity, such as salts, may be mixed with the raw materials. The process may be used to produce porous or dense ceramic bodies, glass, &c. The substances compressed to the required shape are placed within a coil *a* in circuit with the secondary winding *b* of a transformer the primary winding *c* of which is traversed by an alternating current. Two condensers *d* and a spark gap *e* are placed between the ends of the coil *a* and the winding *b*.

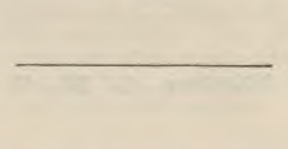
Reference has been directed by the Comptroller to Specification 224,164, [*Class* 39 (iii), Heating by electricity].

255,546. Talbot, B. April 24, 1925.

Compositions containing vulcanized bituminous materials.—Compositions for lining and coating metal pipes and other articles, particularly by the process described in Specification 220,156, [*Class* 99 (ii), Pipes, tubes, &c.], are obtained by heating a bituminous material with 5—10 per cent of sulphur and adding to the product a powdered mineral material such as granite, silica, or slag.

255,569. Jorgensen, M. Vogel-. May 4, 1925.

FIG.I.



Cements, Portland processes and apparatus for making. — In a process for burning slurry in rotary kilns, for instance in the making of Portland cement, the nodules formed by drying the slurry in the drying zone of the kiln are ground before they pass to the calcining zone. Nodules 3 at the end of the drying zone pass beneath a grinding member 4 rolling on the kiln-lining 2, and held in place by two series of projections 5, 6. In a modification, a number of grinding chambers are attached to the kiln, and communicate therewith through inlets for the nodules and outlets for the ground material.

255,837. Dyk, L. A. van. June 29, 1926.

Compositions containing organic condensation products.—Shaped articles may be obtained from a solution in monochlorbenzene of a polymer of vinyl chloride, which is soluble in monochlorbenzene and insoluble in acetone, by the usual processes, and plastifiers such as *o*-, *m*-, or *p*-dichlorbenzene, α-chlornaphthalene, α or β bromnaphthalene, or tetramethylchlorbenzene may first be added. The plastifiers preferably have a boiling point of 150° C. or over. Colouring matters or metallic powders may also be added to the solutions. Products resembling ivory or ebony may be obtained.

256,021. Haddan, A. J. H., *(Celite Co.)*. June 27, 1925.

Refractory substances containing diatomaceous earth.—A refractory heat-insulating material consisting principally of silica of higher specific gravity than diatomaceous earth is made by calcining bodies made of a mixture of diatomaceous earth, a catalytic inversion agent such as lime, and water. A binder such as ball clay, china clay, or feldspar is preferably added to the mixture, and a grog of calcined material may also be added. An example of a composition consists of 93 parts of diatomaceous earth, 5 parts of clay, and 2 parts of quicklime, mixed with 170—180 parts of water, moulded under low pressure. and fired to 1370° C. whereby most of the silica is converted into tridymite.

256,079. Wellings, G. A., and **Johnstone, E.** Nov. 24, 1925.

Compositions containing bitumen, cork, and sulphur are used for surfacing roads, floors, roofs, tennis courts, &c. A typical composition is made by adding 40 parts of cork in small particles to a heated mixture of 20 parts of sulphur and 40 parts of bitumen with the addition of flux oils if necessary. The mixture may be applied to the surface either in the form of sheets or by spraying or spreading it. In a modification the hot mixture of bitumen and sulphur is sprayed or painted on the surface and the cork is subsequently strewn thereon.

256,248. Rohm & Haas Co., (Assignees of *Lauter, F.*). July 28, 1925, [*Convention date*].

Compositions containing organic condensation products.—Condensation products of urea, thiourea or their derivatives with formaldehyde are made in the presence of a polyhydric alcohol, such as glycerin, or an ester thereof. The products are flexible and can be used for the manufacture of photographic films. Preferably 2.7 moles of formaldehyde are employed to each mole of urea, with an additional mole of formaldehyde for each mole of glycerin present, which latter, however, should not exceed the proportion of 1.2 moles of glycerin per mole of urea. The formaldehyde may be employed in the form of paraformaldehyde or hexamethylenetetramine. Acidic or basic condensing agents or both may be present. According to the example, paraformaldehyde is dissolved in hot ethyl alcohol containing ammonium hydroxide, urea and glycerin are added, and the mass heated; a little nitric acid is further added and boiling continued until the desired consistency is reached.

256,513. Marks. E. C. R., *(Benzol-Verband Ges.)*. March 15, 1926.

Compositions containing bituminous materials &c. and oils.—Plastic compositions suitable for paving materials are obtained by mixing tar, pitch, oils, coumarone resin &c. with the spent materials from the iron oxide purifiers of gas works and heating the mixture. Lime and similar basic materials may be added.

256,565. Marlier, A. Aug. 4, 1925, [*Convention date*].

Compositions containing linseed oil.—A facing-material for walls and other surfaces comprises lithopone, chalk, white cement, gypsum, white sand, diamantine (powdered glass), linseed oil, white spirit, driers, and colouring matter such as yellow ochre and colcothar. The material is applied by stippling with a brush. While the coating is still soft it is worked over with a spatula, and when sufficiently hard, sandpapered.

256,622. Kyber, W. Aug. 4, 1925, [*Convention date*].

Cements, Portland, materials for. — In the manufacture of phosphorus by the fusion of phosphorites with carbon, aluminous material is added to the charge to produce a slag suitable for use as aluminous cement. The raw materials may for example be bauxite, Redonda phosphate, and carbon.

256,640. Prodorite, Ltd., (Assignees of *Continentale Prodorit Akt.-Ges.*). Aug. 6, 1925, [*Convention date*].

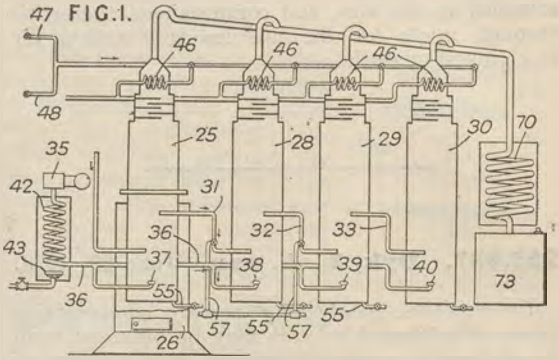
Hard pitch compositions.—Non-brittle compositions capable of being machined are made by mixing hard pitch of the character decsribed in Specifications 201,650 or 237,010 with inorganic or organic fibres, flakes, or like fillers, with or without the addition of pulverulent substances such as stone dust. Suitable fibres are asbestos, hemp, cellulose, hair, &c.; mica is an example of a flake material.

The Specification as open to inspection under Sect. 91 (3) (a) refers also to Specifications 202,248, [*Class* 87 (ii), Moulding plastic &c. substances]; 202,598, [*Class* 87 (i), Bricks &c.]; 228,257; and 238,035, [*Class* 87 (ii), Moulding plastic &c. substances]. These references do not appear in the Specification as accepted.

256,790. Wolfsholz, A. Aug. 24, 1925.

Refractory substances containing zirconia &c. —A plastic fireproof substance is composed of a highly refractory mineral, such as zirconium oxide or silicate or the like and a binding agent obtained by dissolving metal salts in the corresponding acid. Preferably, a salt of a light metal is used, for example aluminium, or calcium, or magnesium phosphate dissolved in phosphoric acid or calcium sulphate in sulphuric acid.

256,922. Penniman, W. B. D. Aug. 13, 1925, [*Convention date*].



Asphalts.—The oxidation of asphaltic oils and asphalt, by passing air or other oxygen-containing gas through a layer of the material of a depth sufficient substantially to deoxygenate the air &c., is carried out in stages in a series of treatment zones under pressure. The products of oxidation include aldehydes, fatty acids, alcohols, ketones, solvents, gums, and substances adapted for use as motor fuels or burning oils. The oxidizing gas may be enriched with oxygen or be diluted with steam, and its point of entry into the layer may be varied to promote or retard settlement of suspended solid matter. The process is preferably carried out at a temperature of 600—900° F., though the temperature range may extend from 500—1000° F. Catalysts such as aluminium chloride, the oxides of manganese, lead, iron, chromium, vanadium, zinc, copper, or calcium may be added and also neutralizing agents such as quicklime, lime-stone or alkali carbonates. The depth of the layer under treatment is preferably maintained substantially constant, as by intermittently or continuously feeding fresh material to, and withdrawing treated material from, the reaction chambers. Baffles may be provided in the reaction chamber to impede the passage of air therethrough, to assist the circulation of the material, or to cause any separated solid material such as carbon, to be deposited in a desired part of the apparatus. The reaction chambers may be externally heated, or the material and air &c. may be preheated, and the temperature in the chambers be maintained solely by the heat of reaction. The oxidation and disintegration products of the material removed by the current of air are condensed with or without pressure, and the deoxygenated air &c. may be passed through silica gel or absorbent carbon to extract residual vapours. As shown in Fig. 1, the apparatus for carrying out the process may comprise vertical stills 25, 28 - - 30, the first of which is adapted to be heated by a furnace 26, a common condenser line and coil 70, and a receiver 73. Material is passed from the first still to the other stills in succession by pipes 31—33, and air is supplied to the stills by a pump 35 through a coil 42 which may be heated by a burner 43, a main 36, and distributors 37—40. Each still may be provided in its upper part with a dephlegmator and a heat interchanger, and each still head may be fitted with a coil 46 connected to live and superheated steam mains 47, 48, so that the temperature of the vapours passing to the condenser may be controlled. Residual material may be withdrawn from the stills by pipes 55, and pipes 57 may serve to withdraw partially treated material from the stills 25 or 28. The temperature maintained in each succeeding still may be 50° F. higher than that of the preceding one, and the stills may work under different pressures, though the pressure used is usually 300—400 lbs. The products from each still may be separately collected and treated, and fractional condensation may be used to facilitate separation of the distillates. More than one air supply line may be provided, and the air may be distributed into the oil by a series of radially extending perforated pipes.

257,114. Berger, O. H. Sept. 28, 1925.

Compositions containing bituminous materials.—A composition comprising hard asphalt and a nearly equal amount of oil flux containing a substantial proportion of oil volatiles, forms, when fluxed, an asphaltic cement adapted for mixing with an aggregate to form a cold-lay paving mixture. A suitable asphalt is that known as Cuban asphalt, and petroleums of the asphaltic, semi-asphaltic and paraffin base type, either in the crude or slightly topped form, such as Mexican petroleum, may be used as fluxing oils. The temperature of fluxing should be below that which would cause any substantial loss of volatiles e.g. 200—250° F. The asphalt cement is mixed with a warm mineral aggregate such as concrete, dried sand, rock &c., at a temperature not materially above the fluxing temperature such as 150—200° F.

257,391. Wade, H., (*Carborundum Co.*). July 23, 1925.

Concrete, hardening.—An abrasive or other aggregate excluding slate is mixed with Portland cement and calcium hydrate, and the mixture is subjected to the action of carbon dioxide. The amount of lime is generally 10—30 per cent of the Portland cement The materials may be mixed dry, sufficient water being added for moulding, and the article placed in water until the initial set takes place, or a mortar may be poured into a mould and allowed to set. After the initial set, the articles are exposed to carbon dioxide which may be under pressure, for example 30 lb. per sq. in. The alternate water and gas treatment is repeated until the desired hardness is obtained.

257,854. Grote, A. April 14, 1926.

Slags, treatment of; stone, artificial.—In the manufacture of moulded products by fusion of refuse to which lime has been added, the ingredients are so proportioned that the lime content of the mixture does not exceed 20 per cent while the silica content is raised to 50—55 per cent, special additions of silica being made if necessary. By cooling this mixture to 900° C. a plastic mass is obtained which can be rapidly shaped in a rotary or other moulding press.

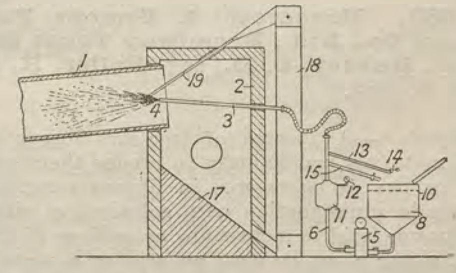
257,886. Penniman, W. B. D. Sept. 5, 1925, [*Convention date*]. *Drawings to Specification.*

Asphalts.—The volatile oxygenation and disintegration products of asphalt obtained by the processes described in Specifications 252,327, 255,020, and 256,922, are utilized in the preparation of motor fuels. The process of Specification 252,327 is fully described.

258,073. Eriksson, J. A. Aug. 31, 1925.

Concretes.—Porous artificial stone is made by mixing a finely divided intimate mixture of lime and silica-containing material with water and a gas-generating agent, and hardening the resulting mass by steam under pressure. The preferred silica-containing material is calcined slate or alum shale. A powdered metal such as zinc or aluminium is preferably used to generate gas, but porosity may be obtained by any other means, e.g. the use of soaps or of ice.

258,199. Nielsen, N. May 4, 1926.



Cements, Portland, processes and apparatus for making.—In a cement-making process in which liquid slurry is fed to the rotary kiln 1 through an atomizing nozzle 3, a screen 10 is provided in the slurry tank 8 to prevent the passage of large particles to the nozzle and means are provided for returning to the kiln, as dry dust, any slurry carried out by the waste gases. As shown, the escaping dust collects on the inclined floor 17 of the smoke chamber 2 and is carried by an elevator 18 to a pipe 19 leading to a point in the kiln immediately in front of the nozzle 3. Instead of this arrangement, the dust may be returned to the kiln with the pulverized fuel used for burning or it may be collected in a trough below the kiln and be re-charged through slots in the kiln wall by shovel devices secured to the outside of the kiln. The slurry is pumped from the tank 8 by a pump 5 and delivered to the nozzle 3 bv a pipe 6 in which is arranged a pressure-equalizing chamber 11, having a gauge 12, and valved overflow pipes 13, 15, the former being fitted with a safety-device 14 which may be connected to an alarm and also to a relay device serving to start a pulley for withdrawing the nozzle 3 from the kiln.

258,320. Fitzgerald, F. W. V. June 9, 1925.

Concretes.—Cement and the like is mixed with a substance containing water of crystallization, and the mixture is submitted to heat and pressure in a mould to hydrate the cement, and the article produced is subsequently heated to a higher temperature, with or without the mould. Bitumen, wax, stearine, shellac, sulphur, fillers, colouring matters &c. may also be added. In an example, 5 parts of powdered bitumen, 8 parts of borax, and 40 parts of Keene's cement are mixed together, and pressed in a mould at 100° C. The article is then heated to 150°—200° C. Other substances containing water of crystallization specified are alkaline silicates solidified with soap or stearine, and the precipitate formed when ammonium carbonate is added to alum. Specification 201,121 is referred to.

258,665. Novocrete & Cement Products Co., Ltd., Broadway Trust Co., Ltd., Burney, C. D., and **Weller, H. O.** May 6, 1925.

Concretes.—A process of treating fibrous organic materials, particularly to render them suitable for use as aggregates in fibrous concretes, consists in impregnation with solutions of either (3) chromic acid or potassium or sodium dichromate, either alone or with an acid or a metallic salt such as ferric chloride, or (2) manganese salts such as manganates and permanganates with or without an acid or a metallic salt. The impregnation may be preceded by treatment with a weak solution of sodium bicarbonate or other suitable liquid to reduce the tendency of the material to change in volume upon absorption of moisture. Zinc or copper salts may also be applied to the material to act as fungicides, &c. The impregnated material, with or without an admixture of larger pieces of wood &c. which have been similarly impregnated, is mixed with cement, preferably a blend of ordinary Portland cement and aluminous cement, and optionally with a filler composed of pulverized slate or limestone. Sufficient water may be added to form a slurry, which is pressed in suitable moulds to force out the surplus water. Specifications 220,677 and 225,912, [both in *Class* 70, India-rubber &c.]; 236,450; 238,948 and 240,561, [both in *Class* 20 (iv), Floors &c.]; 244,142; 244,178; 245,812 and 252,906, [both in *Class* 70, India-rubber &c.]; and 253,007 are referred to.

258,727. Budnikoff, P. Sept. 7, 1925.

Plaster compositions.—Natural or artificial anhydrous calcium sulphate is rendered cementitious by the addition of a mixture of an alkali bisulphate with copper or ferrous sulphate. The hardness of the product may be increased by adding a small quantity of calcium phosphate. Fillers, such as glass, sand, quartz, pottery waste, marble, pumice, asbestos, heavy spar, corundum, metallic oxides, calcined pyrites, coal, peat, wood shavings, and colouring agents may be added.

258,870. Hack, E. B. Sept. 23, 1925, [*Convention date*].

Compositions containing bitumen and mineral aggregates; asphalts.—Bitumen is expanded into a bulky cellular form by heating it to 220—350° F. and adding it to a comparatively small volume of a solution or emulsion of a substanec which lowers the surface tension between steam and bitumen. Ebullition occurs and the bitumen becomes permeated with small bubbles. The dissolved or emulsified substance may be an alkali oleate or stearate, casein, gluten, peptone, starch, sulphonated oil, glycerine, alcohol, or other substance promoting the formation of bitumen-water emulsions; in the case of soap a suitable proportion is 1—5 oz. per gallon of water, and 8 c.c of this solution suffice for the treatment of 10 lb. of bitumen. An aggregate may be added to the bitumen either before or after the treatment and the resulting composition may be used, either with or without further additions of bitumen or solutions or emulsions thereof, for making roads, footpaths, floors, roofing, damp-courses, insulators, &c. The treated bitumen may also be applied to roads as a surface dressing.

258,950. British Cyanides Co., Ltd., and Rossiter, E. C. July 1, 1925.

Compositions containing organic condensation products.—For the manufacture of articles from synthetic resins obtained by condensing thiourea with formaldehyde, the first or second condensation product thereof is mixed with a filler and an acid condensing agent and the product then hardened by subjection to heat and preferably simultaneously to pressure, or even at normal temperature and without pressure. The acids in acid compounds which accelerate the hardening are those which are solid at ordinary temperature, for example, oxalic, tartaric, citric and other organic acids, hydrogen sodium sulphate, potassium, tetroxalate and similar salts, aniline hydrochloride, tuluidine hydrochloride and other hydrochlorides or organic bases. An example is given in which woodmeal is employed as the filler and potassium tetroxalate as the hardening agent.

259,030. Chemische Fabriken Dr. K. Albert Ges., Amann, A., and **Fonrobert, E.** Oct. 5, 1925.

Compositions containing resinous materials and organic condensation products. — Oil-soluble resinous bodies of high molecular weight are obtained by treating a natural acid resin, or a natural acid resin which has been partly esterified or neutralized, with the reaction product of a phenolic body and a substance containing a carbonyl group or groups, this treatment being followed by esterification or neutralization with a polyacid reagent. The phenol-carbonyl reaction product is preferably produced in presence of a basic catalyst and may be a phenol alcohol or the product obtained by combining a phenol first with a ketone and then with formaldehyde. The esterifying or neutralizing agent is preferably a polyhydric alcohol or the oxide of a polyvalent metal. The product of the initial treatment may be distilled, preferably in vacuo, to remove any uncombined natural resin wholly or in part. According to examples:—cresol, colophony, and formaldehyde are heated together and the product treated, after distillation, with glycerol; a cresol-formaldehyde condensation product, or the reaction product of phenol, acetone, and formaldehyde, is added to melted colophony and the product treated, after distillation, with glycerol, glycol, or other polyhydric alcohol; a cresol-formaldehyde condensation product treated with acetic anhydride is similarly employed; colophony is treated with *p*-cresol dialcohol and the product esterified with glycerol or glycol; a cresol-formaldehyde condensation product prepared in presence of caustic soda is added to melted colophony and the product esterified as before. The esterification may be substituted by neutralization with lime, and the operations may be carried out in vacuo or under pressure in the presence of air or indifferent gases.

259,203. Voisin, U. B. Oct. 2, 1925, [*Convention date*].

Aluminous cements. — An aluminous cement clinker which becomes spontaneously pulverized on slow cooling contains at least 25 per cent of alumina and has a silica content of between 0.4 and 0.5 of the alumina content while the lime content is 3—3¼ times the silica content. White bauxite and pure limestone may be used as raw materials with production of a white cement.

259,409. Linebarger, C. E. Nov. 16, 1925.

Plastic compositions containing stearic acid and chlorinated hydrocarbons in substantially equal parts are used for making hydrometer floats, &c. Chlorinated naphthaline is preferably used. The properties of the composition may be varied by additions of wax such as carnauba or montan wax, varnish gum such as copal, congo, rosin, &c., or inorganic fillers such as asbestos, talc, or mica. Oil-soluble dyes may be added.

259,503. Heyl, G. E. May 31, 1925. *No Patent granted (Sealing fee not paid).*

Cements, Portland, materials for making.—Town refuse is calcined in a preferably rotary kiln at a temperature not exceeding the melting-point of the resultant ash. The combustion may be supported by the use of additional fuel or of hot combustion gases. The ash is mixed with the necessary ingredients, such as lime, to produce a cement-forming mixture, and this mixture is again calcined, preferably in a rotary kiln. Specification 260,182, [*Class* 111, Sewage &c.], is referred to.

259,635. Case, G. O. May 19, 1925.

Concretes.—Fibrous materials such as peat, cork, wood pulp, and particularly sawdust, are saturated with water, mixed with a small proportion of dehydrated hydraulic lime, and exposed to the atmosphere to form a mineralized coating on the particles, to render them suitable for use as an aggregate for concrete. Suitable proportions are 1¼ gal. of water and 3 lb. of hydraulic lime such as blue lias lime to 1 cu. ft. of sawdust. The mixing should be exposed to the atmosphere for at least 24 hours. The aggregate is added to Portland cement in volumes varying from 2½ to 6 to 1 of cement. The concrete may be gauged with 2°—4° Bé calcium chloride solution or 0.5—1° Bé hydrochloric acid solution.

259,636. Case, G. O. May 19, 1925.

Concretes. — Fibrous materials such as peat, cork, wood-pulp, and particularly sawdust, are saturated with a weak solution of hydrochloric, formic, or other acid having a hardening effect, and are then mixed with a small quantity of dehydrated hydraulic lime, and the mass is exposed to the atmosphere to form a mineralized coating on the particles. Suitable proportions are 1¼ gallons of hydrochloric acid of 1½—2½° Bé. mixed with 1 cubic foot of sawdust (9.14 lb.) to which is then added 3 lb. of hydraulic lime. The treated sawdust is mixed with cement or lime, preferably in the proportions of 2—6 parts sawdust to 1 of cement. The concrete may be gauged with a solution of calcium chloride (3—10 per cent) or a 2° Bé. solution of hydrochloric acid. Specification 259,635 is referred to.

259,679. Salerni, P. M. July 16, 1925.

Compositions containing resinous materials and abrasive agents are compressed in moulds while the binding-agent is in a substantially dry state, the compression not being followed by any step of drying, baking, &c. which might distort the articles. The binding-agent, which may be shellac or resin, is preferably dissolved in a solvent, the solution is then mixed with the abrasive material, and the solvent subsequently evaporated. The abrasive particles thus coated with binding-agent are compressed in the moulds, and may afterwards be subjected to a final compression in a finishing mould of true shape.

259,757. Riddle, F. H. Oct. 9, 1925.

Refractory substances.—Minerals of the sillimanite group other than sillimanite e.g. cyanite, and andalusite together with the natural fluxes occurring therewith e.g. titanium compounds and lazulite are fired, at a temperature less than seger cone 15, to obtain ceramic ware.

259,805. Sieurin, S. E. Dec. 29, 1925.

Refractory substances containing silicon carbide and silica.—Fireproof bricks are obtained by mixing 30—90 per cent of silicon carbide with a binder comprising mainly free silicic acid mixed with a little clay or lime. When the binder contains clay the proportion of SiO_2 should be at least 80 per cent but when lime is present which may be up to 2 per cent the proportion should be at least 90 per cent.

259,959. Harvey, M. T. Oct. 16, 1925, [*Convention date*].

Compositions containing reaction products of cashew nut shell oil.—The Specification as open to inspection under Sect. 91 (3) (a) describes a non-drying oil obtained from the shell and from a protective layer about the kernel of the cashew nut which may be condensed by heating it to 100—200° C., preferably in presence of an acid or alkali catalyst, or by heating it with an aldehyde such as formaldehyde, or with hexamethylene-tetramine. The condensation may be stopped at any stage as the product changes from liquid to solid. The liquid may be mixed with fillers and further condensed to a desired hardness. For the production of moulded articles oil and aldehyde are heated together, with or without catalytic hydrochloric acid, to 100—200° C. The aqueous layer is rejected, and the oily residue heated at 80—140° C. under sufficient pressure to hold in escaping gases. This subject-matter does not appear in the Specification as accepted.

260,031. Ros, D. de, and Barton, F. July 18, 1925.

Stone, hardening and preserving.—Natural and artificial stone, concrete, &c. is hardened and preserved by treatment with a volatile silicon compound in the presence of water. Suitable compounds are silicon tetra-chloride, tetra-fluoride, oxychlorides, disulphide, disilicon hexachloride, silico-chloroform, silicon methane, silicon methide, &c. These substances may either be applied by spraying to the previously moistened stone or they may be dissolved in water and the solution applied to the stone. Other substances, e.g. sodium aluminate, may also be dissolved in the water. The volatile compounds may also be used in conjunction with a solution of silicic acid.

260,171. Keay, H. O. April 29, 1926.

Compositions containing organic condensation products.—An abrasive cement for joining blocks of sandstone together to form grinding stones consists of 90 parts by weight of sand, 10 parts of Redmanol or other synthetic resin, 3⅓ parts of furfural, and 2⅓ parts of ethyl alcohol. The proportions may be varied, but the amount of furfural should not exceed one third of the synthetic resin. Specification 9291/14 is referred to.

260,298. Borgestad Fabrikker. Oct. 24, 1925, [*Convention date*].

Refractory substances containing magnesium orthosilicate.—A ceramic or refractory material comprises artificial magnesium orthosilicate obtained by heating a correctly proportioned mixture of calcined magnesite and talc to a temperature of 1000—1400° C. Excess of silicic acid in the mixture should be avoided. Silicates such as olivine, magnesium orthosilicate, &c. may be incorporated in the mixture as fillers. The compositions may be used either for making refractory articles or as cements for binding other refractory substances, particularly those containing magnesium compounds.

260,313. Melandri, J., and **Spun Concrete Construction Co., Ltd.** May 29, 1925.

Stone, hardening.—Building blocks, &c., are moulded from a mixture of fibrous material such as peat or sawdust and cement containing lime or to which lime has been added, and are then treated with dilute sulphuric acid to promote the setting of the composition. Surplus acid may be subsequently removed by washing.

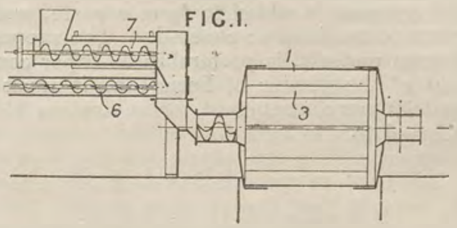
260,319. Wilding, S. W., and **Amalgamated Dental Co., Ltd.** June 27, 1925.

Compositions containing organic condensation products.—A composition to be used as a backing for translucent material in the manufacture of artificial dentures consists of a phenol-formaldehyde condensation product rendered opaque by the addition of zinc oxide, barium sulphate, tin oxide or other pigment.

260,447. Pontoppidan, C., and **Buntzen, S.** Jan. 4, 1926.

Cements, Portland, treating after manufacture.—In the addition of gypsum to Portland and like cements precautions are taken to prevent the conversion of the gypsum into plaster of Paris by the heat of the clinker. The precautions may consist in either (*a*) cooling the mill in which the clinkers and gypsum are ground together, (*b*) cooling the clinker before it is ground with the gypsum, or (*c*) adding ground gypsum to the previously ground and cooled clinker. Fig. 1 shows an apparatus for performing the third modification, comprising a water-jacketted conveyor 7 supplying the cement, a conveyor 6 supplying the gypsum, and a revolving mixing drum 1 fitted with elevating vanes 3.

FIG.1.



260,505. Abrey, R. H. May 11, 1926.
No Patent granted (Sealing fee not paid).

Compositions containing bituminous materials. — A plastic composition suitable for moulding electric insulating and acid proof material comprises 20 parts of Gilsonite or Grahamite, 1 part Carnauba wax, 5 parts refined coal tar pitch and 1 part of shellac melted together and treated when cold with 1 part of flowers of sulphur the product being mixed with 6 parts of deironized blue asbestos fibre and 15 parts of ground mica, pumice, or silica.

260,550. Dyk, L. A. van. July 26, 1926.

Compositions containing organic condensation products.—A polymer of vinyl chloride which, as described in Specification 255,837, is soluble in chlorbenzene but insoluble in acetone is prepared and formed into films, with or without the addition of plastifiers, as described in that Specification. The plastifiers mentioned are dichlorbenzene, α-chlornaphthalene, naphthalene, diphenylmethane, acetophenone, *o*-chlorphenol, dichloracetone, benzyl chloride, methyl ethyl ketone, xylene, ethyl acetate, ethyl benzoate, trichlorethylene, glycoldiacetate, and anisole; colouring materials may be added also.

260,557. Haggerty, J. F. Oct. 27, 1925, [*Convention date*].

Compositons containing plaster and fibres. — Finely divided fibrous material such as paper or wood pulp is intimately mixed with water to form a flocculent mass; plaster of Paris or dehydrated gypsum is added to form a paste, and the mixture is moulded or sheeted. The proportion of fibrous material is preferably 5—8 per cent by weight of the plaster of Paris, and it must not exceed 50 per cent thereof. Specification 255,037 is referred to.

260,621. Schröder, H. H. Nov. 2, 1925, [*Convention date*].

Compositions containing bituminous materials and marl.—An asphalt-like composition comprises a bituminous substance, preferably petroleum bitumen, having a penetration value of 100—300, and in incompact limestone marl rich in calcium carbonate and having a density of about half that of compact rock limestone, with or without other granular or pulverized materials. The materials are intimately mixed at raised temperature. The product may be used either alone or in conjunction with a bitumen-coated coarse aggregate.

The Specification, as open to inspection under Sect. 91 (3) (a) states that the limestone marl may be replaced by other materials having similar properties. This subject-matter does not appear in the Specification as accepted.

260,653. Brown, A. H., and **Siluminite Insulator Co., Ltd.** July 8, 1925.

Compositions containing organic condensation products. — Electric insulators and the like are manufactured by forming an intimate mixture of a binding material, such as Portland or like cement, with or without fillers such as asbestos fibres together with under 10 per cent of incompletely condensed synthetic resins, such as described in Specification 255,516, [*Class* 2 (iii), Dyes &c.], moulding without the addition of water, removing from the mould and subjecting the moulded article to a final heat treatment. Clay may be added to the moulding mixture. The synthetic resin may be liquid or solid, and in the latter case the moulding operation is a hot one. After the article has been set and hardened it may be impregnated with a liquid synthetic resin before the final heat treatment.

260,833. Heyl, G. E., and **Kunze, O.** Feb. 26, 1926. *No Patent granted (Sealing fee not paid).*

Concretes &c.: compositions containing plaster, chalk, fibres, and glutinous matter. — A composition to be applied by a brush or sprayer to a rough brick or concrete wall as a coating resembling wall paper, consists of fibrous material such as paper or wood pulp disintegrated either wet or dry to a non-felting degree of fineness and mixed with a mineral cementitious or filling material or mortar, an agglutinant such as glue, and a lubricant such as china clay, chalk, or bauxite to promote free flow. This mixture is diluted with water to a pasty consistency, and pigments may be added. The mineral filler may be plaster of Paris or Portland cement, or a mortar formed of lime and clay. The coating may be embossed by a moulding roller. As an example, 40 parts of paper pulp not exceeding 18 to 20 per cent water content are mixed with 10 parts of plaster of Paris or Portland cement, 20 parts of glue, and 30 parts of china clay, chalk, or other lubricant, and sufficient water to form a paste.

261,029. I. G. Farbenindustrie Akt.-Ges. Nov. 7, 1925, [*Convention date*].

Compositions containing organic condensation products. — In the production of urea-formaldehyde condensation products, the urea and formaldehyde comprising the starting materials are replaced by dimethylol-urea, and the condensation is effected in an organic solvent in the absence of water using an acid condensing agent. It is advantageous to add resins, plasticizers, talcum, diatomaceous earth, plaster of Paris, or the like.

261,260. Morton, F. April 20, 1926.

Compositions containing bituminous and siliceous materials.—Paving-blocks are moulded from a mixture comprising 60 per cent granite or other hard stone clippings, 30 per cent sand, and 10 per cent blast furnace or gas tar pitch having a twisting point between 40 and 65° C. The pitch may be replaced by bitumen up to 5 per cent.

261,378. Wintsch, V. Nov. 11, 1925, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

Compositions containing bituminous emulsions and cement, particularly alumina cement, are used for road-making, coating surfaces, &c. The cement either in a dry state or previously mixed into a paste with hot water is stirred into the bitumen or tar emulsion until a homogeneous paste results. When required for use the product is caused to set by the addition of a very small amount of lime.

261,453. Graveman, W. H. Aug. 5, 1925.

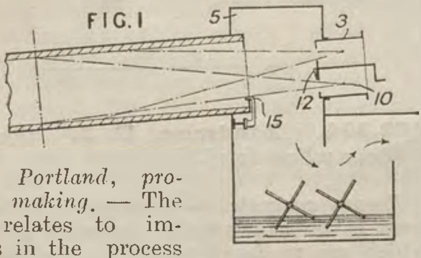
Stone, artificial; refractory substances containing carbon. — Materials for use in building, shingles, &c. are made by slowly baking a mixture of coal-tar pitch and ashes, slag &c. so as to carbonize the entire mass, the temperature then being slowly raised to harden the article. The preferred composition consists of 25—40 per cent of coal-tar pitch, and the balance ashes or slag (such as that produced by industrial power plants). The composition is ground and pressed and heated to about 100° C. It is then hydraulically pressed, preferably in a hot press, and heated to about 450° C. in a minimum of air, and preferably in a covering of coke, to carbonize it. The temperature is then raised at the rate of about 50° C. per hour to a temperature of 700—1100° C. to harden the article. The article may be dipped into hot asphalt, and, if desired, baked or enamelled. Asbestos may be included in the mixture.

261,523. Piggott & Co., Ltd., T., and **Dyson, A.** Oct. 14, 1925.

Bituminous compositions.—A mixture of bitumen and powdered slag to which 1 to 2 per cent of sulphur is added is employed for making or for lining pipes. A mixture containing 75 per cent by weight of basic slag 23 per cent of bitumen and 2 per cent of sulphur and a mixture containing equal parts by volume of " blown " bitumen and 1 to 2 per cent of sulphur are mentioned.

261,814. Rigby, T. July 24, 1925.

FIG. I



Cement, Portland, processes for making. — The invention relates to improvements in the process of making cement by the wet method in rotary kilns, wherein the slurry is sprayed into the kiln. According to the invention the dispersed slurry is caused to fill a substantial portion of the kiln, so that the drying is so controlled that the deposited material though still moist is no longer sufficiently moist to agglomerate in large masses. The deposited material should contain at least 10 per cent of moisture but should have lost at least 20 per cent of its original moisture content. The spraying devices should be so situated that the axes of the sprays coincide with that of the kiln at the points at which the sprays attain their maximum diameter, which should correspond with that of the kiln. One or more sprays may be used, and in the latter case they may project the slurry either to the same part of the kiln or into different parts as shown in Fig. 1. The spraying devices 10 may be situated either inside or outside the kiln but are preferably mounted in a chamber 3 situated in the rear of the kiln head 5 and capable of being projected forwards into the kiln head, or if the latter be narrow the sprays may be mounted in a rearward extension of it. Scrapers 12, 15 may be fitted to clear the chamber 3 or the kiln mouth respectively of deposited material, and the base of the kiln head contains slurry or other liquid which catches any material removed by the scrapers or carried away by the kiln gases. If the interior of the kiln is provided with the customary slurry agitating devices such as chains or fins these should not extend upwards into the zone where the slurry is deposited, and the brick lining may also be omitted from the zone. Specifications 22734/02 and 243,410 are referred to.

261,964. McClatchy, J. H. March 8, 1926. *Drawings to Specification.*

Concretes.—A building slab comprises a mixture of one to eight parts of crushed brick with one part of cement and a suitable proportion of water the surface of the slab being grooved to outline the shapes of bricks and treated with acid to expose the coloured aggregate.

261,976. Crawford, A., and **Crawford, J.** March 26, 1926.

Slags, treatment of.—A small quantity of acid steel slag is added to blast furnace slag, preferably white molten, to reduce the tendency of the latter to disintegrate.

262,195. Jackson, J. E. Evans-, (*Whittle, G. H.*). Sept. 8, 1925. *No Patent granted (Sealing fee not paid).*

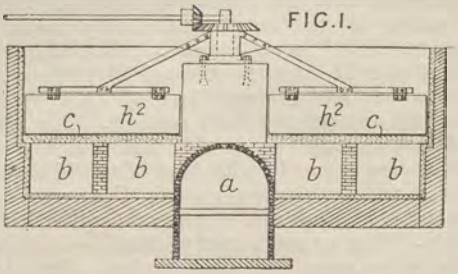


FIG.1.

Compositions containing plaster and salts. — A plaster for building purposes &c. comprises a mixture of powdered quickly-calcined gypsum, powdered rock alum, and powdered rock nitre, to which may be added sodium carbonate or colouring matters. The gypsum to be calcined may be disposed on fireclay slabs *c* forming the roof of a furnace *a* having flues *b*, the gypsum being kept in motion during the calcination by rotary scrapes h^2. Preferably 19 lbs. of alum and 16 lbs. of nitre are added to each ton of dry calcined gypsum, water being added to the mixture before it is used. The plaster may be employed for dental moulds, modelling, coating walls, ceilings &c.

262,224. Mulligan, F. Oct. 14, 1925.

Compositions containing calcium sulphate cements.—Moulded articles such as bricks, tiles, slabs, heat or electric insulators, and the like are made from a composition consisting of the gypsum cement described in Specification 238,949, an aggregate, and colouring material. Portland cement and non-conducting materials such as asbestos may also be added. As an example, the following is typical,—90 parts of the product of Specification 238,949, 10 parts of Portland cement, 300 parts of sand, and colouring matter as required.

262,232. Ditter, J. H. Oct. 30, 1925.

Cements, treating after manufacture: concretes and mortars. — A mixture of a magnesium compound or compounds, such as asbestos, talc, magnesite, or dolomite, and an alkali silicate or silicates in a colloidal form is added to mortar-formers or mortars. The magnesium compounds preferably contain fluorine, for example magnesium silico-fluoride, or are mixtures of magnesium and fluorine compounds, such as magnesia minerals colloidally mixed with hydrofluoric acid, hydrofluosilicic acid, alkali fluoride, or calcium or magnesium silicic-fluoride or silicon-fluoride. In the case of fluorides they are caused to act on the magnesium mineral by an acid, such as sulphuric acid. Hydrofuge substances, such as greases, oils, bitumen, albuminoids, or albumen-reduction products, or neutral or hydraulic substances, such as lime, stone, scoria or brick powder, may be added. The production of the colloid is promoted by the addition of alkaline substances, such as milk of lime, and the colloidal condition is maintained by the addition of carbon tetrachloride.

Reference has been directed by the Comptroller to Specification 21456/97.

262,294. Schneider, C. Jan. 28, 1926.

Cements, Portland, treating after manufacture; concretes and mortars.—The invention relates to the treatment of salts, such as calcium chloride, which are used to accelerate the setting of cements and mortars or to activate substances such as slags which possess latent hydraulic properties, and consists in impregnating the salts with a colloid such as gelatinous silicic acid to render them resistant when being stored. Oxides such as lime and retarding agents such as calcium sulphate may also be added to the mixture. According to one mode of procedure solid calcium chloride is added to a solution of silicic acid until a dry mass which can be ground is obtained. According to another method the mixture of calcium chloride and silicic acid is obtained by dissolving Portland cement or the like in hydrochloric acid and evaporating to dryness with or without the addition of lime, calcium sulphate, &c. The product is preferably mixed with cement &c. during the grinding of the latter.

262,383. Scheidhauer & Giessing Akt.-Ges. Dec. 4, 1925, [*Convention date*]. *Addition to* 253,947.

Refractory substances.—Non-plastic refractory bodies, e.g. sillimanite, cyanite, chromite, alumina, carborundum, zirconium, magnesite, dolomite, or the ground fragments of saggars and bricks are used instead of chamotte for making the clay-bonded products described in the parent Specification.

262,394. Lindman, E. I. Dec. 5, 1925, [*Convention date*].

Porous concrete. — A porous clay clinker is used as an aggregate in concretes of the type which are rendered porous by the injection or generation of gas within them. One kind of clinker is produced by heating the clay to a temperature just above the sintering point and interrupting the heating before the material commences to shrink. Another kind of clinker is obtained by heating the material at increasing temperatures until it melts to a viscous mass.

262,403. Aluminum Co. of America, (Assignees of *Horsfield, B. T.*). Dec. 7, 1925, [*Convention date*]. *Drawings to Specification.*

Refractory substances. — A refractory article consists of hollow globules of fused refractory oxide, particularly alumina, cemented together by means of a binder such as sodium silicate, sodium or calcium aluminate, clay, &c. The binding agent preferably contains a considerable proportion of the oxide forming the globules, brushed refractory material may also be added to the composition. The globular material may be obtained by subjecting the fused oxide in a relatively thin stream to the action of a transverse air or steam jet, as described in Specification 248,360.

262,410. Ohio Chemical & Manufacturing Co., (Assignees of *Axelrod, M. L.*). Dec. 7, 1925, [*Convention date*]. *Drawings to Specification.*

Compositions containing organic condensation products.—Dental plates are formed of a plastic composition containing both solid and liquid Bakelite resins. The composition is hard at ordinary temperatures but softens on warming, and is " cured " or hardened after moulding the denture, by dry heating under pressure. The exposed portions, or the whole denture, may be made of such a mixture containing also wood flour, lithopone, zinc oxide, and a dye or pigment such as toluidine toner. A mould of plaster of Paris, Keene's cement, or the material, containing also powdered metal, described in Specification 260,287, [*Class* 87 (ii), Moulding plastic &c. substances], is prepared in the usual manner, packed with previously warmed plastic material, and the denture " cured " or hardened by dry heating to a temperature of 280° to 300° F. under pressure. The mould is strongly heated for a long period before packing in order to remove all moisture. After packing the flask is closed and pressure applied, but full pressure (preferably 500 lbs. to 1,500 lbs. per sq. in.), to completely close the flask, is not applied until the denture material has become highly plastic by heating to a temperature of about 260° F.

The Specification as open to inspection under Sect. 91 (3) (a) refers to a mixture of Bakelite resin " SH225 " and Bakelite liquid resin " LA677." This subject-matter does not appear in the Specification as accepted.

262,413. Krüger, C. Dec. 2, 1925, [*Convention date*].

Stone, artificial; slags, treatment of.—In the production of castings from volcanic rocks or slags the temperature is so regulated that the more infusible crystalline particles do not melt, but remain to act as inoculation centres for the recrystallization of the remaining material. Further quantities of infusible crystals may be added to the melt to increase this effect.

262,738. Deutschen Bergin-Akt.-Ges. fur Kohle-und Erdolchemie. Dec. 11, 1925, [*Convention date*].

Asphalts. — The products of the destructive hydrogenation of coal, are, after removal of water and low-boiling constituents, mixed with aliphatic hydrocarbons such as gas oil and allowed to stand, whereby first the solid matters such as unacted on coal and its inorganic impurities, and then the asphalt settle out. In an example the products of the destructive hydrogenation of coal are freed from water and other ingredients distilling off up to 280° C., and 100 kilograms of the still residue are briskly stirred at 200° C. with 20 kilograms of raw petroleum. After standing 1 hour the liquid is decanted from the 40 kilograms of hard asphalt and solid ingredients settled out. After 3—5 hours more 40 kilograms of soft asphalt free from solid impurities deposit. 40 kilograms of a thin reddish brown oil poor in asphalt are run off and fractionally distilled into light lubricating oils and gas oils. Residual gas oil may be removed from the asphalt &c. by distillation with steam.

The Specification as open to inspection under Sect. 91 (3) (a) describes also the treatment of other bituminous materials containing asphalt. This subject-matter does not appear in the Specification as accepted.

262,818. I. G. Farbenindustrie Akt.-Ges. Dec. 14, 1925, [*Convention date*].

Plastic compositions containing cellulose esters and ethers, and organic nitrogen derivatives.—Lacquers, and the like are made by adding to urea formaldehyde condensation products, preferably in an organic solvent, one or more non-volatile or difficulty volatile substances capable of forming solid solutions with the condensation products, in amounts equal to or greater than the condensation product. Suitable substances are cellulose esters or ethers, with or without plasticising or softening agents, and natural or artificial resins. Solvents specified include methanol, dichlorhydrin, formamide, ethers of glycols, lactic acid esters. When insoluble colouring matters are added, they should be very finely ground to prevent them from separating out. According to an example, 10 parts of a 50 per cent solution of a condensation product of urea and formaldehyde in methanol are dissolved in 40 parts of a 20 per cent solution of collodion; 20 parts of ethylene glycol monoethyl ether, 24 parts of cyclohexanol, 8 parts of butyl alcohol, and 8 parts of propyl alcohol are added to produce a glossy lacquer.

The Specification as open to inspection under Sect. 91 (3) (a) also includes the manufacture of plastic masses by the same process. This subject-matter does not appear in the Specification as accepted.

262,961. Illemann, R. Dec. 31, 1925.

Bituminous compositions. — An elastic waterproof composition is made by adding a liquid bituminous substance or a mineral wax to a heated creamy suspension of stone flour in water. the mass being boiled and stirred until it assumes a stiff pasty condition.

263,028. Campbell, J. May 29, 1926.

Compositions containing bituminous, resinous, calcareous, and like materials are obtained by boiling together 70 parts of rubber and 30 parts of bitumen and incorporating therewith small quantities of pitch, resin sulphur, rubber solvents or solution, plaster of Paris, and fibrous material.

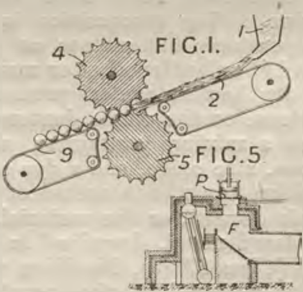
263,124. I. G. Farbenindustrie Akt.-Ges. Dec. 15, 1925, [*Convention date*].

Slag cements.—The slag resulting from the fusion of phosphate, sand, and carbon with elimination of phosphorous or its oxides is converted into cement by additions of calcareous, aluminous, or like materials after it has left the furnace. The additions are made to the slag while still in a molten state, but the mixture may undergo a further fusion if necessary. The process is applicable alike to the production of Portland cement and of alumina cement.

263,194. Scheidhauer & Giessing Akt.-Ges. Dec. 19, 1925, [*Convention date*].

Refractory substances containing kaolin; rendering non-plastic materials plastic. — In the manufacture of refractory, acid-proof, and other ceramically bonded articles from non-plastic materials such as grog, fused alumina, corundum, sillimanite, carbides, zirconium compounds, chromium oxide, magnesia, silica, &c. these materials are mixed with an alkaline kaolin slip in such proportions that a non-castable mass results. This is moulded by beating, stamping, or pressing into articles which are then dried and burnt, or in some cases used without burning for furnace linings, &c. A portion of the non-plastic material may be added during the preparation of the kaolin slip. When the slip is to be used in small proportions it may be diluted for admixture with the other materials, the excess of water being subsequently removed before moulding. Instead of kaolin a colloidal slip prepared by adding an electrolyte to pure alumina or aluminium hydroxide may be used. Specifications 253,947 and 262,383 are referred to.

263,221. Lanhoffer, I. E. Sept. 19, 1925.



Cements, Portland, processes and apparatus for making. — Cement raw materials are introduced into the furnace in the form of very small bodies, previously freed from dust, of uniform dimensions and of a shape which facilitates rolling of the bodies over one another. For example, the plastic raw mixture may be extruded from nozzles 1, Fig. 1, on to a conveyer 2 which passes it between indented rollers 4, 5 which initiate the breaking up of the sheet of material, the complete separation of which takes place as the material subsequently falls from the conveyor 9 into a rotary drum which causes the granules to adopt a spherical form. Alternatively the rollers may be dispensed with and the conveyer 2 provided with cutting plates fixed perpendicularly to its surface to subdivide the material. In another modification the raw materials in the form of paste are squirted through perforations P, Fig. 5, into a space F traversed by hot gases, with the formation of strings which break up under their own weight into short cylinders. These may be passed through a rotary drier heated by the kiln gases as described in Specification 240,161, [*Class* 51 (ii), Furnaces and kilns for applying &c.], and subsequently through a rotary screen for the removal of dust.

263,497. Soc. Anon. le Carbone. Dec. 22, 1925, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

Compositions containing organic condensation products. — A bearing bush is formed of agglomerated graphite and bakelite. In the process of manufacture, graphite and powdered resin are intimately mixed together, highly compressed in a mould and heated to the polymerization temperature of the resin. After cooling the inner surface of the bush is rectified.

263,942. Tapping, A. Oct. 6, 1925.

Bituminous compositions. — A binder for briquetting fuel, minerals, earths &c. consists of a homogeneous mixture of a solid bituminous substance and an aqueous pulp of a starch-bearing vegetable material with or without a small amount of alkaline substance and a preservative, the incorporation of the ingredients in equal or any other proportions being effected under heat and pressure. An enclosed vessel having stirring gear and a pressure gauge and valve may be employed, the vapour pressure being controlled so as to maintain the temperature above the melting point of the bituminous ingredient and so as to regulate the amount of moisture required in the final product. As the bituminous substance may be employed coal tar pitch, bitumen, natural asphalt or the residue from the distillation of asphaltic petroleum or mixtures of these substances; the aqueous pulp may be made from prepared starch, the flour or meal of wheat, barley, rice maize &c., or from peas beans, potatoes, artichokes, acorns, chestnuts, cassada, cotton-seed, flax-seed, hemp-seed, or waste products such as bran, chop, brewers' waste, husks, peelings, shells, &c. Soda, ammonia or sodium silicate may be used as the alkaline substance, and salicylic acid, cresol, phenol, or formaldehyde as the preservative. As discharged from the mixing vessel the binder is in semi-liquid form and may be added directly to the pulverized material to be briquetted, or it may be allowed to set and then ground before mixing with the material.

264,192. Scheidhauer & Giessing Akt.-Ges. Jan. 11, 1926, [*Convention date*]. *Addition to* 263,194.

Rendering non-plastic materials plastic.—In the production of refractory, acid-proof, and like ceramic products from non-plastic substances, a small proportion of the raw material is converted into a colliodal solution to act as a binding means for the remaining material which is in granular form, the proportions being so regulated that a slightly plastic mass capable of being moulded by stamping or pressing is obtained.

264,496. Soc. Anon. la Trinidad. Jan. 12, 1926, [*Convention date*].

Bituminous compositions. — Mineral matter such as cement or ground limestone is added to bituminous material to form a mastic which is then emulsified with the aid of a solution of an emulsifying agent such as soap.

The Specification as open to inspection under Sect. 91 (3) (a) states that the mineral matter may occur naturally in the bituminous material. This subject-matter does not appear in the Specification as accepted.

264,550. Hope, E. Oct. 26, 1925.

Compositions containing polymerized itaconic esters.—Vitreous masses are obtained by heating the esters, particularly the dialkyl esters, of itaconic acid to effect a partial polymerization, adding filling and/or colouring materials to the product, and then completing the polymerization. The filling &c. materials may alternatively be added to the initial material, and the partially polymerized product may be moulded before the polymerization is completed. Specification 254,668, [*Class* 121, Starch &c], is referred to.

264,711. Cadre, P. May 7, 1926.

Cements, Portland and Roman, processes and materials for making. — In the manufacture of cements by mixing a form of calcium sulphate, a slag or a puzzolanic material, and cement clinker, the ingredients are separately completely dried, pulverized, and cooled before being mixed. If gypsum is used as the source of calcium sulphate it should be subjected to a series of alternate pulverizing and drying processes until its total moisture content does not exceed 5 per cent. Suitable proportions of the ingredients are 80 per cent of slag or puzzolanic substances, 15 per cent of calcium sulphate, and 5 per cent of cement or cement clinkers. The slag &c., should be ground to leave a residue of 7—10 per cent upon a sieve of 4900 meshes to the square centimetre and the calcium sulphate should be more finely ground so that equal numbers of particles of the two ingredients are present.

265,181. **Langevin, P.** Jan. 27, 1926. [*Convention date*]. *Drawings to Specification.*

Compositions containing bituminous and resinous materials, waxes, and indiarubber.—A cement for use in a diaphragm vibrator of the piezo-electric crystal type consists of 250 parts of pitch, 190 of rosin, 400 of wax and 160 of pure Para Rubber.

265,287. **Hampton, J. C., Hampton, D.,** and **Hampton, V. A.,** (*trading as* Hampton, D.). Nov. 3, 1925.

Plaster compositions.— A plaster composition for forming the basis of head and figure moulds for display purposes consists of plaster and gum arabic, with the addition of a little borax or dextrine, or both borax and dextrine.

265,484. **Vinden, J. H.** Sept. 15, 1926.

Compositions containing waxes and resins and having a light colour suitable for making traffic markings on roads and for building purposes comprise 10 parts light pure resin, 10 parts paraffin wax, 40 parts powdered whiting, and 40 parts marble powder or chips heated and fluxed together to the required consistency.

265,494. **Hertzka, G.** Oct. 5, 1926.

Aluminous cements are obtained by heating the raw materials for at least 30 hours to a temperature between 1150° C. and the melting point of the mixture, and preferably cooling the product slowly over a further period of at least 30 hours. A preheating treatment lasting 24 hours or more may precede the heating process. The raw materials may be comparatively coarsely ground.

265,847. **Haddan, R.,** (*Corning Glass Works*). June 25, 1926. *Drawings to Specification.*

Refractory substances. — Refractory articles composed of crystals embedded in a glassy matrix are obtained by fusing suitable substances, casting, and annealing. As raw materials, pure alumina, magnesia, zirconia, &c. may be used. Mixtures of kaolin with diaspore clay or bauxite are particularly suitable. The materials are fused in an electric furnace and cast in iron or sand moulds. Three methods of annealing are described, viz:—(1) small articles cast in iron moulds are removed from the mould when sufficiently set to permit handling and transferred to a kiln which is maintained at the annealing temperature for a few hours and is then slowly cooled. (2) larger articles cast in sand moulds are removed from the mould, covered with insulating powder and allowed to cool. (3) the mould containing the casting is covered with insulating powder and allowed to cool. Hollow articles may be obtained by allowing the material partially to solidify in an iron mould, and pouring out the remaining molten material.

265,901. **Morton, F.** Jan. 6, 1927. *Addition to* 261,260.

Bituminous compositions containing siliceous materials. — The proportion of bitumen used in the composition described in the parent Specification is increased up to 7.5 per cent, according to the quality of the pitches used.

266,125. **Hills, A. E.** Feb. 17, 1926.

Concretes and mortars. — Compositions containing hydraulic cements for making sheet roofing &c. are prevented from setting during storage by the addition of organic colloids e.g. india-rubber, gutta-percha, balata, gutta percha resins &c., which are destroyed on exposure thus allowing the setting to take place. 35 parts rubber dissolved in 324 parts naphtha are incorporated with 274 parts asbestos fibres, 40 parts ground chalk and 200 parts Portland cement and the mixture made into sheets by rolling.

266,165. Carborundum Co., Ltd., (*Carborundum Co.*). April 9, 1926.

Refractory substances containing clay. — Porous ceramic materials which resist shrinkage at high temperatures are obtained by the use of a clay substantially free from fluxing impurities such as iron oxide, titanium oxide, lime, magnesia, alkalies, and excess silica. A suitable clay is a kaolin melting not lower than Seger cone 32 and having two molecules of silica to one of alumina. According to one method of procedure the clay is converted into a slip, mixed with half its weight of wood flour, and burned; the resulting porous grog is crushed, mixed with more kaolin and wood flour, moulded, and refined.

266,358. Haller, P., and **Kappeler, H.** Feb. 17, 1926, [*Convention date*].

Compositions containing condensation products of arylamines.—Filling materials and/or pigments are added to the products obtained by condensing in an acid medium one or more arylamines or one or more salts thereof with formaldehyde, or a substance which yields formaldehyde, and subsequently treating the product with an alkali or alkaline salt. In an example, a mixture of aniline with hydrochloric or acetic acid or potassium bisulphate is treated with formaldehyde, the reaction mixture containing (1) glycerine, urea, or tannin, or (2) cellulose, ground leather, asbestos, heavy spar, calcium phosphate, or emery, and a pigment such as indigo or chrome yellow, and the product, after washing, is treated with a solution of caustic soda, sodium carbonate, alkali sulphite, or ammonia, or with caustic lime. The final product may be heated above 100° C., with or without the addition of an impregnating agent such as linseed oil.

266,389. Pollak, F. Oct. 1, 1924, [*Convention date*].

Compositions containing organic condensation products.—The hard final condensation products of urea or its derivatives with formaldehyde are dissolved in mineral acids, e.g. by boiling with a 10 per cent solution of hydrochloric, nitric or sulphuric acid, a powdery mass is precipitated by cooling, and this powder is then employed as a filling for liquid urea-formaldehyde condensation products, phenol-formaldehyde condensation products, caoutchouc natural resins, &c. Specifications 202,651 and 240,840 are referred to.

266,751. Hartford-Empire Co., (Assignees of *Willetts, P. G.*). March 1, 1926, [*Convention date*]. *Drawings to Specification.*

Refractory substances containing aluminous and siliceous materials.—In a process for manufacturing a dense, homogeneous, refractory body particularly suitable for use in glass furnaces, siliceous and aluminous materials are ground to about 325 mesh, intimately mixed, made into a slip with water, agitated preferably at 190° F., screened, filter-pressed, and dried. One portion of the dried material is converted into grog by calcination at about cone 31 (3182° F.) and crushed to pass a 12 mesh screen. The other portion re-ground to 325 mesh is then added together with about 20 per cent of water; the mixture is pugged, partly dried, and moulded under heavy pressure. The pressed blocks are dried and calcined to a temperature of at least 2700° F. and preferably 3146° F. (cone 30). The raw materials preferably contain more alumina than silica; a suitable mixture comprises 4 parts of raw aluminium hydrate (diaspore or bauxite), 4 parts of calcined aluminium hydrate, 2 parts of commercial calcined alumina, 3 parts of raw Grossalmerode clay and 5 parts of a raw plastic clay which acts as a filler and may be omitted.

Reference has been directed by the Comptroller to Specification 216,514.

266,752. I. G. Farbenindustrie Akt.-Ges. Feb. 27, 1926, [*Convention date*].

Compositions containing organic condensation products.—Urea-formaldehyde condensation products are admixed with plasticisers, natural or artificial resins, and cellulose esters. Specifications 261,029 and 262,148, [*Class* 2 (iii), Dyes &c.], are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) describes the use of condensation products from the homologues and derivatives of urea, such as thiourea, N-methylurea and N-methylthiourea, and formaldehyde; it also specifies phenols, colophony, casein and yeast as additive materials. This subject-matter does not appear in the Specification as accepted.

266,775. Hills, A. E. Oct. 20, 1925.

Cements, Portland, treating after manufacture; concretes. — Hydrated oxides of iron or aluminium or both are added to hydraulic cements or mixtures containing them to increase strength and to prevent efflorescence. The residue from the extraction of alumina from bauxite is particularly suitable as an addition. The invention is particularly applicable to the manufacture of asbestos-cement products. The Provisional Specification describes also the use of other hydrated oxides having a weak acid reaction, such as the reactive forms of silica.

Reference has been directed by the Comptroller to Specifications 24718/08.

266,789. Jakob, J. Nov. 23, 1925. *Addition to* 244,724.

Stone, artificial. — Forsterite (magnesium olivine) is obtained by fusing a more acid magnesium silicate or silica itself with the magnesium salt of an acid (other than sulphuric) liberated by silicic acid in the heat. Magnesium carbonate is particularly suitable. Fluxes may be added or the fusion may be commenced with a more fusible mixture such as quartz and magnesium sulphate. The process is also applicable to an equimolecular mixture of calcium and magnesium salts yielding diopside as product.

266,814. Knipe, A. C. Dec. 3, 1925.

FIG.1.

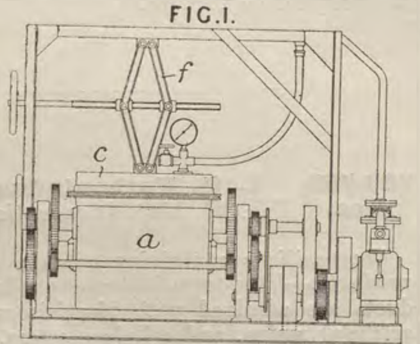
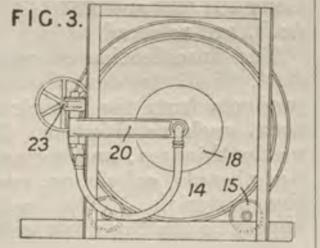


FIG.3.



Concretes.—A sub-atmospheric pressure is maintained in the apparatus in which concrete is mixed in a wet state, in order to withdraw entrained air from the materials. Previously mixed concrete may also be agitated in a reduced pressure chamber for the same purpose. Fig. 1 shows an apparatus for carrying out the process comprising a tiltable paddle-type mixing chamber *a* having a removable cover *c* fitted with toggle-like means *f* for pressing it into position. Fig. 3 shows an alternative apparatus comprising a rotating drum 14 supported on wheels 15 and having at each end a charging door 18 mounted in a trunnion on a radial arm 20, the two arms being simultaneously actuated for opening the apparatus by means of a worm and hand wheel 23. The connections to the air-pump are made through the trunnions.

267,317. Universal Rubber Paviors (Manchester 1923), Ltd., and **Brown, A. E.** Sept. 12, 1925.

Compositions containing bitumens &c. and guttapercha or balata residues. — The residual products of the manufacture of guttapercha or balata pitch described in Specification 246,065 are added to bitumens or bituminous mixtures other than those described in Specification 246,186, to improve their properties for road making and like purposes. In an example 10 per cent of balata pitch are added to 43 per cent of Mexphalt E, 43 per cent of fine mineral filler, and 4 per cent of fluxing oil.

267,518. Kyber, W. March 10, 1926, [*Convention date*].

Portland cement.—In the reduction of phosphates in a shaft or electric furnace in the presence of iron ore or scrap iron, a flux composed of alumina, lime and/or silica is added whereby a fused cement as well as iron phosphide is obtained. When the starting material is an aluminium phosphate, the alumina need not be added to the charge.

267,539. Michelsen, S. March 10, 1926, [*Convention date*].

Slag cements.—Gypsum or other sulphur compound is added to molten slag under reducing conditions so that the manganese oxide in the slag is transformed into sulphide. The lime content of the product is then corrected by addition of limestone, &c.

267,971. Mulliez Frères et Cie. March 20, 1926, [*Convention date*]. *Void [Published under Sect. 91 of the Acts*].

Stone, artificial, hardening. — The exhaust gases of internal-combustion engines, particularly those using producer gas are purified and used for hardening cement and lime products.

268,011. Haddan, A. J. H., (*Celite Co.*). Dec. 18, 1925. *Drawings to Specification.*

Compositions containing calcareous and siliceous materials; compositions containing bituminous and siliceous materials and organic condensation products. — A voluminous almost gelatinous mass of hydrated calcium metasilicate is produced by treating finely ground silica (diatomaceous earth &c.) with lime in the presence of water, with or without heating. Instead of lime, oxides or hydroxides of magnesium, strontuim or barium may be used. The product is dried and pulverized, or the wet mass may be calcined and carbonated during or after calcination. Examples of the process are given, in one of which the reaction takes place in a closed tank and the suspension of silica is highly concentrated to produce a fine product. The product may be used as an ingredient in concrete and cement or as a filler for phenol condensation products.

268,633. Shellard, I. F. Aug. 27, 1926.

Concretes and mortars.—Dust and sand containing clay are employed instead of the sand and clay used separately in the composition suitable for moulding walls &c. described in Specification 241,724. The clay or stone dust is graded to pass through a $\frac{1}{8}''$ mesh sieve and mixed with stone chipping graded on a [illegible]″ sieve in the proportion of 4 parts to 1, and the mixture is graded on a sieve having 30 meshes to the inch, the residue passing through being sufficient to fill in the voids of the material left on the sieve. The percentage of clay in the mixture is calculated and additional stone chippings added if necessary to bring the percentage of clay to 5 per cent. One part of Portland cement is then added to 5 parts of the mixture and the product mixed with water and moulded in situ.

268,736. Eckel, E. C. March 31, 1926, [*Convention date*].

Aluminous cement and ferro-silicon or high-silicon pig iron are simultaneously produced by fusing in a blast or electric furnace a mixture comprising lime, alumina, silica, and iron oxide in suitable proportions in the presence of sufficient carbon to reduce most of the iron and part of the silicon. The resulting cement should contain lime and alumina in the proportion of $5CaO, 3Al_2O_3$, and should contain not more than 5 per cent of ferrous oxide and 15 per cent of silica. The ferro-silicon may contain 10—45 per cent of silicon. The invention renders possible the use as aluminous raw materials of siliceous bauxite or of high-alumina clays such as siliceous diaspore, kaolin, and halloysite.

268,950. Child, R. O. March 23, 1926.

Compositions containing tar or pitch and casein.—A small quantity of casein dissolved in sulphonated oil is added to tar or pitch reduced with tar oils or other solvents. If the tar is insufficiently acid partly to coagulate the casein a reagent such as formaldehyde may be added for this purpose. Specification 238,586 is referred to.

269,384. Erslev, K. Aug. 17, 1926.

Compositions containing fats and gummy substances. — Plastic and pliable fats are obtained from naturally occurring hard and brittle fats, such as coconut oil and palm kernel fat, by adding to the latter one half per cent or more of a gummy plastifying substance, such as unvulcanized rubber, rubber latex, chicle, kauri gum, or gum elastic. A solution of the plastifying substance, e.g. in ether or carbon-disulphide, may be added to the molten fat, the solvent being subsequently distilled off; or the plastifying substance may be added directly to the fat, a heated gas or vapour, preferably of an inert nature, being simultaneously or subsequently passed through the mass.

269,549. Portland-Cementwerk Balingen Ges. April 13, 1926, [*Convention date*].

Cements, Portland, materials for making.—An acid-proof hydraulic cement resembling Portland or Roman cement contains barium instead of calcium compounds. As raw material barium sulphate or carbonate may be used; this is mixed with sand, clay, or the like, crushed and burned at or below the sintering temperature, or alternatively the material may be completely fused. Reducing agents such as coke may be added. When using barium sulphate the resulting sulphur dioxide may be used for the production of sulphuric acid. The chemical-resisting properties of the cement are increased by treating it with SO_3 ions; this may be effected by adding sulphates before or during the final grinding, or by treating articles made of the cement with sulphuric acid or magnesium or ammonium sulphate solution. The setting time may be controlled by additions of gypsum. The cement should preferably contain a proportion of aluminium silicate or of iron oxide.

269,974. Ros, D. de, and Barton, F. Jan. 27, 1926.

Stone, colouring.—Stones, cements, plasters, &c. are coloured by mixing therewith a colloidal solution of a hydroxide and/or a basic oxychloride of a metal, iron and aluminium being specified. Other colouring materials or pigments may be added to the mixture. The surface of the stone &c. may be hardened as described in Specification 260,031.

269,975. Westrum, L. S. van. Jan. 27, 1926.

Compositions containing bituminous materials and cement.—A dry mixture of a mineral aggregate and cement, lime, plaster or the like is mixed with a bituminous soap prepared by adding a saponifiable oil, with or without resin, to a bituminous substance and treating the mixture with dilute alkali. According to an example a mixture of 100 parts of bitumen with 10—20 parts of vegetable oil is saponified with weak alkali lye, and 4—20 parts of the resulting emulsion are added to a mixture of 20—75 parts of broken stone and 1—7 parts of Portland cement. The concrete may be used as a mortar between larger pieces of broken stone or between paving blocks of stone, wood, or rubber.

270,271. Volet, R. A. L. April 29, 1926, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

Compositions containing synthetic resins and graphite in which the latter ingredient predominates are used for self-lubricating bearings, &c. Suitable proportions are 4—6 parts of graphite to 1 part of resin. If high electric conductivity is required, as in the case of brushes, powdered copper, bronze, or similar metal may be incorporated. The composition is moulded under pressure and then heated to polymerize the resin.

270,300. Hauser, M. April 28, 1926, [*Convention date*].

Refractory substances containing metals.—In a process for producing ceramic articles in which metals or alloys in pulverulent or granular form are mixed with ceramic materials to form the paste or slip, provision is made for ensuring that the metal remains in the finished product in the metallic or uncombined state, notwithstanding the intermediate firing process. To effect this, the firing may be conducted in an atmosphere free from oxygen, the ceramic material may be chosen so that it sinters at a temperature well below the melting-point of the metal, or the moulded article may be coated with a glaze before firing which sinters below the firing temperatures. Reference is made also to the production of acid-proof appliances for the chemical industry in which the ceramic material contains silicon or silicon alloy; to bodies having a high fusion or softening point in which tungsten, tantalum or like metals are used in conjunction with refractory oxides such as magnesia or zirconium oxide; and to grinding materials containing tungsten-silicon or chromium-silicon. Magnets may be produced from such a mixture having an iron content.

270,336. Mulliez Frères et Cie. May 1, 1926, [*Convention date*].

Figured artificial stone.—Marble veins are produced in artificial stone &c. by superimposing differently-coloured layers of material in dry or slightly-moistened powder form and then tracing out ribbed lines penetrating the layers and following the run of the veins by means of a tool or with the fingers. The layers may be arranged in a mould, and after the ribbing operation the mould may be filled with cheaper material and conveyed to a press. With setting materials, the watering of the material is effected carefully so as not to destroy the veins.

270,356. Rigby, T. Nov. 3, 1925. *Drawings to Specification.*

Cements, Portland and Roman, processes and apparatus for making.—Relates to processes for making cement by the wet method in rotary kilns, in which slurry is atomized in a finely-divided condition into the gases in the kiln as described in Specifications 243,410 and 261,814, and comprises (*a*) dividing the kiln into two parts, into the first of which the material is sprayed, deposited and dried before being passed on to the main portion of the kiln, and (*b*) the application more broadly to the treatment of cement slurries of features claimed in Specification 261,814 only in connection with particular processes of cement making. Specification 233,764 also is referred to.

270,496. Voisin, U. B. May 19, 1926.

Cements, Portland, processes and compositions for making. — The manufacture of aluminous cement consisting in heating a very finely ground or intimate mixture of bauxite and lime or limestone for a long period (8—12 hours) at a temperature well below the softening point (e.g. below 1100° C.) is conducted in a rotary furnace heated by hot air or by gases, e.g. the waste gases from a Portland cement kiln. The process is particularly applicable to the treatment of mixtures very poor in lime, yielding a final product having a hydraulic index of 2 or more. Specifications 233,698 and 243,876 are referred to.

270,649. Alexander, D. B. W. May 4, 1926, [*Convention date*].

Compositions containing bituminous and siliceous, calcareous, &c. materials.—A method of obtaining an improved bituminous or like substance such as asphalt from a distillation process or the residuum therefrom consists in charging the still, preparing a slurry of finely divided particles of vegetable or mineral matter and a liquid which is miscible with the charge, introducing the slurry into the still for mixture with the charge, and distilling the mixture. The finely divided material, which is thus distributed evenly through the asphalt &c., may consist of wood pulp, lampblack, ground silica, Tripoli, slaked lime, limestone, or Portland cement, and is mixed with a liquid such as kerosene, gasolene, naphtha, or benzine. The slurry may be passed through a preheater, heat exchanger, or dehydrater connected with the condenser of the still, so that the whole mass receives the usual agitation as soon as it enters the still. In the case of steam agitation, however, such agitation is not begun until the contents of the still have reached such a temperature that the steam will not condense on entering the still. The kerosene &c. distilled off is recovered and used repeatedly.

270,724. British Thomson-Houston Co., Ltd., (Assignees of *Moehle, H. F.*). May 4, 1926, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

Compositions containing modified oils.—Drying and semi-drying oils are heated until formed into gels; the gels are then maintained at about 300° C., until reliquified. Oils specified are linseed oil, perilla oil, soya bean oil, cottonseed oil, castor oil, and a mixture of 99 litres of china wood oil with 1 litre of linseed or other oil specified. The " degelled " oil may be used as an addition to raw or boiled linseed or other oil to form moulding materials. It may also be blended by heating with resin, gums, asphalt, or other materials.

271,037. Kunstharzfabrik Dr. F. Pollak Ges. May 15, 1926, [*Convention date*].

Compositions containing organic condensation products.—The hydrosol formed by condensing urea, thiourea or derivatives with aqueous formaldehyde, when diluted with water and a flocculating agent added, precipitates a white powder which, after washing and drying, can be converted into solid homogeneous products. The powder may be mixed with fibrous or pulverulent filling materials of organic or inorganic nature, such as cellulose, asbestos and china clay, or with colouring materials and then subjected to heat and pressure.

The Specification as open to inspection under Sect. 91 (3) (a) refers also to rare earth oxides, e.g. titanium or zirconium oxide, and to oils as filling materials. This subject-matter does not appear in the Specification as accepted.

271,087. Bührmann, H. May 15, 1926, [*Convention date*].

Slags, treatment of.—A process for incorporating added substances, such as silica, with slags in order to render them suitable for building purposes consists in subjecting the mixture of slag and added substances in a fine state of subdivision to the direct action of furnace gases. For example, the slag may flow through the furnace in a thin layer or in thin streams, or it may be subjected to a whirling motion or caused to fall over cascades. The added substances are preferably heated to a high temperature before addition to the slag. Fluxes such as alkalis, alkaline earths, or metallic oxides may be mixed with the slag or with the added substances to lower the melting point.

271,108. Harnisch, M. May 14, 1926, [*Convention date*].

Bituminous compositions.—The ground residues of asbestos-containing minerals, such as serpentine, are agglomerated with tar to produce a stone-like mass suitable for building and other purposes. Preferably the residue is first treated with dilute sulphuric acid.

271,203. Anderson, W. March 17, 1926.

Stone, preserving.—A composition for preserving stone, brickwork, &c. consists of one or more silicates and one or more silicofluorides, with or without the addition of fluorides. The salts used are those of the alkali or alkaline earth metals, particularly sodium.

271,503. British Thomson-Houston Co., Ltd., (Assignees of *Steele, W. R.*). May 20, 1926, [*Convention date*].

Refractory substances containing zirconia.—A refractory substance of particular value where resistance to the electric arc is required comprises zirconia, lime or other basic material and short white asbestos fibres. These ingredients are mixed, moistened with water, moulded under pressure, and subjected to a steam pressure of 120—150 lb. per sq. in. for 6—12 hours.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also compositions in which other refractory oxides replace zirconia and from which the asbestos may be omitted. This subject-matter does not appear in the Specification as accepted.

271,553. Kaye, F. Feb. 23, 1926.

Compositions containing modified fats or oils.—Emulsified oils or fats or mixtures are treated with a vulcanizing agent whereby a gel is obtained, which after addition of a coagulant, can be dried. The emulsified oil may be mixed with rubber or like latex prior to treatment with the vulcanizing and other agents. To oil &c. emulsified in a usual manner is added a sulphide, or polysulphide such as that of ammonia, sodium, potassium, calcium, barium, and after a time a gel forms. The addition of a coagulant such as aluminium sulphate produces quicker drying of the gel. The gel may be mixed with fibres, fillers, or it may be dried in sheet form, or spread on or between sheets of woven material, paper &c. In examples, (a) to 100 parts of linseed oil emulsified with alkali are added 10—30 parts of sodium sulphide and 2 parts of " Trimene " (the stearic acid salt of the condensation product of ethyl amine and formaldehyde), and the mixture is agitated until it darkens. This can be added to paper pulp with rosin size and alum, or spread on paper, fabrics &c. (b) To 25 cc. of latex containing 10 grm. of rubber is added 5 gms. of unboiled linseed oil, 5 gms. of sodium sulphide, and 1 gm. of sodium phosphate. The mixture is agitated for three days and can be applied as above. When used in paper making the emulsified oil, treated with sulphide is added to the pulp in the beater, together with latex, when employed, and after mixing, a coagulant such as alum, magnesium sulphate or sulphuric acid is added. The amount of vulcanizing agent may vary, but 0.5 per cent of the final product is suitable. Accelerators such as sodium or calcium phosphate may be employed. When added to paper the solutions should be dilute, a suitable strength being a solution containing 2 per cent of palm oil. For sheeting 50 parts of rubber to 50 parts of oil is suitable, but other proportions may be used.

271,713. Debauche, H. Oct. 11, 1926.
Drawings to Specification.

Compositions containing resinous materials.—A fuel and like binder consists of Kauri gum and a mineral oil, preferably a paraffin. The impure residue of Kauri gum may be utilized and in pulverized or heated condition mixed with about half its volume of oil, the mass being heated and stirred and then allowed to cool in trays from which it is discharged as a brittle substance melting completely at 130—135° C.

271,722. Cohen, L. Oct. 26, 1926.

Stone, hardening.—Natural or artificial stone is heated to about 250° C. and brought into contact with a bituminous substance heated to a lower temperature. Sulphur is either added to the bituminous substance or applied to the impregnated stone, which is then heated to vulcanize the bitumen.

271,847. United States Metals Refining Co., (Assignees of *Marks, A.*). May 6, 1926, [*Convention date*]. *Addition to 244,391.*

Refractory substances containing magnesite.—In the manufacture of magnesite refractories wherein the ground material is mixed with linseed or other organic siccative oil to render it plastic, as described in the parent Specification, one or both of the followng modifications are introduced, viz.:—(1) the magnesite consists of a mixture of particles of different degrees of fineness, (2) the moulded articles are dried firstly in a humid atmosphere at low temperature and the humidity is gradually diminished while the temperature is raised. The magnesia is preferably of a dead-burnt mixture of Austrian and American magnesite; about half of it should pass a screen of 100 meshes per inch while all passes a screen of 30 meshes per inch. The oil, preferably linseed, is used in the proportion of 5—7 per cent by weight of the refractory material. The dried bricks &c. may be used in an unburnt condition.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the following features; (1) the oil may be heated to increase its viscosity before or after mixing with the body material (2) thinners and driers may be added to the oil if required, (3) the bricks may be burnt at 1400—1500° C. This subject-matter does not appear in the Specification as accepted.

272,163. Forsen, L. June 3, 1926, [*Convention date*].

Cements, Portland, treating after manufacture.—Portland cement is obtained in a very finely divided condition in which it reacts quantitatively with water by grinding it together with a harder siliceous substance such as quartz, granite, macadam slag, or quartz sand. The ground cement may be separated from the coarser particles of added material by blast separation methods. If a portion of the added material becomes very finely disintegrated during the grinding, lime is added to react with it, and the advantages of a high lime content are thereby obtained without the deleterious presence of free lime.

272,188. Herlt, F. June 1, 1926, [*Convention date*]. *Drawings to Specification.*

Compositions containing lime &c.—Matrices for aligning the types of typewriters or like machines on their carriers, preparatory to being secured thereto, are impressed by means of duplicates of the types in a soft composition which hardens after receiving the impression, for instance, (1) 56 parts of burnt gypsum, 4 parts of powdered mallow roots, and 40 parts of water, or (2) 5 parts of water glass, 20 parts of precipitated chalk, and 2 parts of air-slaked lime, or (3) iron-rust cement.

272,582. Idris, W. H. W. March 10, 1926.

Stone, colouring.—Aggregates such as sand, ground brick, slag, stone chips, pumice, shingle, &c. used in the manufacture of tennis courts and like surfaces are coloured by coating with an enamel comprising a colouring matter and a flux of low melting point. For example, 6—10 parts of the aggregate are heated to 800° C. with 1 part of a mixture of 1 part of green chromium oxide, 2 parts of borax, and 2 parts of litharge.

272,947. Schroder, R., Schroder, (*née* Jaroslaw), **M., Jaroslaw** (*née* Labrinus), **E.,** and **Levis,** (*née* Jaroslaw), **S.,** (*trading as* Jaroslaw's Erste Glimmerwaren-Fabrik in Berlin). June 17, 1926, [*Convention date*].

Compositions containing phenol-aldehyde.—An alkaline solution of an albuminous substance, such as casein, blood, or intestinal mucus, to which phenol, creosol, &c. has been added is heated with an aldehyde in the presence of ammonia, and the plastic mass is precipitated or separated by heating and moulded. Oils, such as wood oil, linseed oil, or turpentine, resins, varnishes, hydrocarbons, tricresyl phosphate, or mixtures of these may be added, and also fillers, such as fibrous substances, fabrics, wood-meal, kaolin and pigments. Several examples are given of which the following are typical :—(a) 100 parts of casein are moistened with alcohol and dissolved in 500 parts of water containing alkali. 50 parts of creosol are added, the mixture is precipitated with an acid, and the precipitate is freed from water. A further 50 parts of creosol, 10 parts of sodium hydroxide and 50 parts of alcohol are then added. After the mass is dissolved, 20 parts of aqueous ammonia and 40 parts of paraformaldehyde are gradually added The mass is heated and cast, or may be precipitated by an acid, dried, ground, and moulded under heat. (b) 100 parts of casein are dissolved with 50 parts of water and 10 parts of sodium hydroxide. 200 parts of cresol are added, water is evaporated, and the mass dissolved in alcohol. 20 parts of ammonia and 20 parts of paraformaldehyde are added, and the solution is heated until a resin is formed, whereupon it is filled into open or closed moulds, and allowed to harden. Another example describes the treatment of dried blood.

The Specification as open to inspection under Sect. 91 (3) (a) comprises examples in which phenol, creosol &c. are not added to the casein &c. prior to the treatment with the aldehyde. This subject-matter does not appear in the Specification as accepted.

272,981. Hadfield, G. H. March 13, 1926.

Concretes.—Mixtures of coal, coke, or ash with vegetable matter obtained from house refuse by wet-separating processes, such as those described in Specifications 248,449, [*Class* 111, Sewage &c.], and 249,247, [*Class* 50, Fuel, Manufacture of], are heated to a temperature such that the vegetable matter is dried substantially to the point of charring or is actually charred or burnt. The product may be used in the manufacture of breeze partitions or building blocks. The apparatus must comprise means for quickly adjusting the temperature. A slowly rotating or reciprocating furnace or one with a travelling grate, heated by an oil burner the flame from which comes directly into, and near the top of, the furnace so that the material is subjected mainly to heat reflected from the top and sides of the tube, may be employed.

273,281. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. June 28, 1926, [*Convention date*].

Bituminous compositions. — The coating of paper-fibres or other materials with bituminous substances is effected by using a gel obtained by coagulating a bituminous emulsion in the presence of a colloid preferably with the addition of a finely divided substance. According to an example a bituminous roofing-paper is obtained by stirring an asphalt gel into paper pulp in such proportions that the pulp adsorbs twice its weight of bitumen, and making paper from the mixture in the usual manner. Fillers to decrease inflammability or for other purposes may also be added to the pulp with the bituminous gel.

The Specification as open to inspection under Sect. 91 (3) (a) refers to Specification 245,418. This reference does not appear in the Specification as accepted.

273,290. British Thomson-Houston Co., Ltd., (*Assignees of* Adams, L. V.). June 25, 1926, [*Convention date*]. *Void* [*Pubilshed under Sect.* 91 *of the Acts*].

Compositions containing oils &c. and synthetic resins.—Resinous materials capable of being rendered infusible by heat, such as the condensation product of a polyhydric alcohol and a polybasic acid, of phenols and aldehydes, or the resin produced by the interaction of shellac and tannic acid, are blended with a non-resinous ester of the aliphatic series, by heating these materials, preferably in the presence of a high boiling point liquid dispersing agent, which may or may not be subsequently removed, to make varnish bases, mouldable compounds, insulating enamels for wires &c., cements for laminated mica &c. The esters generally employed are oils, those specified being linseed, perilla, soya, blown fish, castor, olive, rape seed, and cotton seed oils. Dispersing agents include benzyl benzoate, benzyl acetate, nitro benzene, toluidine, benzyl alcohol, cresol, resin, aniline, cumaron, diphenyl, glycol diacetate, phenylhydrazine, *o*-cresyl benzoate, having boiling points of 175°—325° C. In an example, the condensation product of glycerine and phthalic acid (glyptal) is incorporated in any proportion, preferably equal, with china wool oil, by heating in the presence of benzyl benzoate to about 200° C. The glyptal is preferably used in its fusible state, although the product may be used in its infusible state, or the condensation may take place simultaneously with the incorporation of the oil. After removal of the high boiling point liquid, the mass may be moulded, with or without fillers, or dissolved in benzol, acetone, solvent naphtha, or the like, to form a varnish. Degelled oil, for example linseed oil which has been heated to 300° until it has thickened, and then under continued heating, become liquid again, may be employed in the process, no dispersing medium being required in this case. The use of a dispersing medium may be dispensed with, decomposition products of the reaction serving the same purpose. Natural resins such as kauri may be blended with oils by the same process. Specification 235,595 is referred to.

273,477. British Dyestuffs Corporation, Ltd., Baddiley, J., Shepherdson, A., and **Davidson, A.** June 19, 1926.

Stone, colouring.—Cement, concrete, plaster, &c. are coloured by the addition of vat dyes in a highly dispersed form before, during, or after the gauging process. Preferably, the dyestuff in the form of paste or of powder which readily disperses is added to the gauging water. Examples are given of the use of thioindigo Red B, Bromindigo 4B, Duranthrene Golden Orange Y, and Duranthrene Claret. Specification 277,389 is referred to.

273,748. British Thomson-Houston Co., Ltd., (Assignees of *Adams, L. V.*). July 1, 1926, [*Convention date*].

Compositions containing organic condensation products. — The condensation of a polyhydric alcohol with a cyclic polybasic acid or its anhydride is carried out rapidly to produce a product in the heat-hardened or insoluble-cold condition (C stage), and the product is ground and treated with a liquid or a material liquefiable at the treating temperature until complete solution occurs. Suitable treating liquids comprise glycol diacetate, diethyl phthalate, acetone oils, benzyl alcohol, acetate or benzoate, toluidine, cresol, tricresyl phosphate, triacetin, anisol, *o*-cresyl benzoate, ethyl lactate, indene, and indene polymer, or low boiling solvents such as acetone may be employed. In an example a glycerine-phthalic anhydride resin is heated for 36 hours at about 170° C. with one of the above liquids in a closed container. The product, whose viscosity may be varied by partial or complete evaporation of the solvent or by thinning with acetone &c., may be used as an adhesive. The solvent may be largely evaporated, and the product, with or without inert fillers used as a moulding resin. Oils, gums, natural and synthetic resins, asphalt and cellulose derivatives may be incorporated with the solution for various purposes. Solid or semi-solid materials, such as resins, cumar, ester gum, shellac, copal, pitches such as wood tar or coal tar pitch, asphalts, gums, benzoic anhydride, &c. may be used as solvents. Other materials mentioned in this connection are vulcanization accelerators such as diphenyl guanidine, and degelled oil (a drying oil, solidified by heated and reliquefied by continued heating). In general, it is preferred to retain some of the solvent in the product for plasticizing purposes. Specifications 3271/13 and 22544/13 are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) states that the invention may be applied to other synthetic resins, such as resins of the phenol-aldehyde and urea-aldehyde types, and in connection with urea-aldehyde resins diphenyl amine, toluidine, pyridine or other amine compound are mentioned as suitable solvents. This subject-matter does not appear in the Specification as accepted.

273,768. Jorgensen, M. Vogel-. July 2, 1926, [*Convention date*].

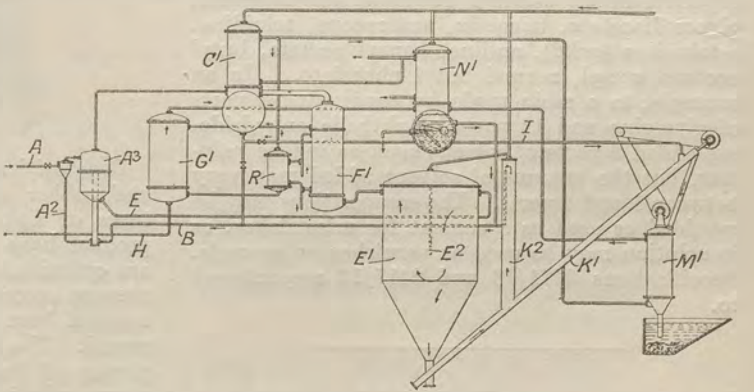
Cements, Portland and Roman. — A method of producing a homogeneous mixture of pulverulent materials in definite proportions consists in homogenizing each separate material by stirring after admixture with air to render it fluid, as described in Specification 255,375, mixing the materials in the required proportion, and homogenizing the mixture. The process is particularly applicable to the correction of the composition of raw cement meal; in this case the contents of a number of silos are homogenized, their compositions are ascertained, and they are mixed in such proportions as to give a mixture of the correct composition and finally homogenized again. The process may be carried out before or after the final stage of grinding of the raw material.

Reference has been directed by the Comptroller to Specification 255,375, [*Class* 86, Mixing &c.].

274,248. Bennett, J. F., and Hadfield, J. June 4, 1926.

Compositions containing bituminous materials, oils and sulphur.—Plastic material suitable for surfacing roads &c. is obtained by heating 32 parts of a mixture containing equal amounts of an organic vulcanizable oil, e.g. castor oil and bitumen with 13—64 parts of sulphur until evolution of gas takes place. The mixture may contain tar, resins, filling and colouring materials, and is applied hot by spreading and rolling or dissolved in creosote and applied by spraying. Specification 216,602 is referred to.

274,540. Testrup, N., Boberg, T., and Techno-Chemical Laboratories, Ltd. March 20, 1926.



Asphalts. — Bituminous materials such as Trinidad asphalt are melted and freed from water, a substantially equal weight of a vapourizable solvent is added, insoluble matter is allowed to settle out, and the solvent is recovered. The amount of solvent is sufficient to maintain the mixture in a liquid condition at ordinary temperature. The invention facilitates the transport and storage of asphalt, which may be pumped into tank steamers for transport before removing the solvent, or may be melted and pumped after such removal, the material being again melted for example by steam pipes in the hold of the steamer, and pumped out at its destination. Molten asphalt is led by pipes A, A^2, to a chamber A^3 where it mixes with a solvent such as a high-boiling petrol fraction led by a pipe B from the sand washer K^1, and from the condensers N^1 and C^1. The solution flows by the pipes E to a settling tank E^1 provided with a baffle E^2, where the sand &c. settles and is withdrawn by a conveyer K^1. The dilute solution passes to a condenser F^1, solvent passing into the condenser C^1, and the concentrated solution to the condenser G^1, where the last traces of solvent are removed by steam from the condenser C^1 which has been passed through a superheater R, the purified bitumen being withdrawn by the pipe H. The sand &c. in the conveyer K^1 meets a stream of solvent which enters by the pipe I, and leaves by the pipe K^2, to remove adhering asphalt. Before being discharged, the sand passes through a separator M^1, where a current of steam removes the last traces of solvent.

275,011. Marks, E. C. R., (*Bakelite Corporation*). July 12, 1926.

Bituminous compositions.—Moulded phenolic resin compositions after the usual heat curing treatment are subjected to improve the insulating qualities to a further prolonged heating at a temperature below the curing temperature. A temperature of 125—135° C. is preferably employed for 48—80 hours, and products are obtained having a dielectric strength at 100° C. which is at least 50—70 per cent of that measured at 20° C.

275,219. British Thomson-Houston Co., Ltd., (Assignees of *Kienle, R. H.*). Aug. 2, 1926, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

Compositions containing synthetic resins. —Condensation products of a polyhydric alcohol and polybasic acid, are rendered tough and flexible in their fully hardened condition, by the addition to the ingredients, or to the resin in its soluble, fusible form, of non-volatile liquid or readily liquefiable materials which are retained in the final resin. The following materials are specified as suitable:—Indene polymer dibutyl phthalate, triphenyl and tricresol phosphates, benzyl benzoate, benzyl alcohol, indene, diphenyl, diphenyl ether, *o*-cresyl benzoate, ethyl lactate, glycol diacetate, triacetin, anthracene, toluidine, *p*-toluidine (solid), aniline, benzyl acetate, butyl acetate, cresol, normal butyl phthalate. In an example, to a resin made by condensing 8 parts of glycerine and 12 parts of phthalic anhydride, are added 2 parts of solvent such as indene polymer, but the amount of solvent added may vary between 1 and 6 parts. The compositions may be moulded or used as a cement for mica flakes, or in solution may be used as varnishes or enamels. Specifications 3271/13 and 8417/13 are referred to.

275,280. Armstrong, J. J. V., (*Janin, A.*). Feb. 27, 1926. *Drawings to Specification. Grant of Patent refused.*

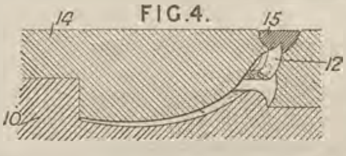
Bituminous compositions.—A top-dressing or seal-coating for macadamized roads comprises aggregate of sand size each fragment of which is coated with a film formed from a light volatile oil and a small amount of bituminous material sufficiently thin to cause the fragments to be tacky to the touch and yet capable of being handled, preferably at atmospheric temperature, without matting. The light volatile oil such as paraffin naphtha, or petrol is preferably applied as a priming or fluxing coat to the aggregate which afterwards receives a thin coat of heavy bitumen less than two and one half per cent by weight with or without the addition of lime.

275,364. Westrum, L. S. van. May 31, 1926. *Addition to 269,975.*

Bituminous concrete.—A mineral aggregate is mixed dry with either (*a*) a cementitious material such as lime, Portland cement, or plaster of Paris, or (*b*) a mixture of such cementitious material with stone or slag flour, with or without iron oxide. The mixture is then further mixed with a bituminous soap, excluding in modification (*a*) the particular bituminous soap described in the parent Specification. For example, the aggregate is mixed with 5—20 per cent of a cementitious powder containing 4 parts of Portland cement, 3 parts of lime or plaster, 2 parts of oxide of iron, and 6 parts of stone or slag flour. A bituminous soap is made by mixing hot 30—50 parts of bitumen and 2—5 parts of vegetable oil with or without resin, and saponifying with 20—40 parts of weak alkali lye. The bituminous soap is added to the mixed dry ingredients in a quantity which is at least equal to that of the cementitious powder.

275,541. Ohio Chemical & Manufacturing Co., (Assignees of *Wardell, C. H.*). Aug. 4, 1926, [*Convention date*].

FIG.4.



Compositions containing plaster, metal powder, and rubber or resin.—Moulds for making dentures of Bakelite or other phenol condensation product have the part 15 in which the teeth 12 are embedded made of a yielding composition to prevent excessive stresses on the teeth due to the unequal heat expansion of the Bakelite and the mould. The yielding composition may comprise plaster of Paris or the like mixed with a substance which softens when heated such as hard rubber, a natural resin or an artificial resin such as Coumar. Metallic powder may be added to increase the heat conductivity. Suitable proportions are plaster of Paris 62 parts, hard rubber 35 parts, and bronze powder 3 parts. A composition which is yielding when cold may be used, such as plaster of Paris mixed with a granular material such as carbon, calcium carbonate, or talc. Suitable proportions are plaster of Paris 50 to 57 parts, carbon about 40 parts, and sufficient metallic powder to give the required thermal conductivity. The other parts 10, 14 of the mould are preferably made of a cement composed of plaster of Paris or Keene's cement 9 parts and aluminium powder 1 part.

275,678. Burmeister, H. Feb. 10, 1926.

Compositions containing phenol-aldehydes. — Plastic materials made from polyhydric phenols and solid polymers of formaldehyde, with the addition of fillers, may be obtained by (1) mixing resorcinol, paraformaldehyde, and a filler at atmospheric temperature or at about 75° C., (2) mixing resorcinol and paraformaldehyde separately with a filler and uniting the mixtures, and (3) heating resorcinol with paraformaldehyde at 65—70° C. to form a liquid condensation product and incorporating a filler therewith. In any event, the resorcinol and paraformaldehyde are taken in about the proportions by weight of 2 : 1. The filler may constitute 60—90 per cent of the mixture, and a reaction-retarding material, such as glycerine, may be added.

275,680. Robins, F. A., and **Taylor, F. M.** Feb. 12, 1926.

Cements, Portland, materials and compositions for.—Building-blocks are made of a mixture of 9 parts by volume of wood chips, one part of Portland cement, and 3 parts of a suitable grit, such as ashes, to act as a binder.

275,788. Schoenhoefer, R. Aug. 5, 1926.

Compositions containing plaster.—Calcium sulphate of any origin is wet ground to obtain a viscous highly plastic mass which is self-setting and hardening; the resulting product may be dried and ground to powder, and the operations may be repeated, if desired. By regulating the amount of water added at any stage of the process, a stiff paste mouldable under pressure, a soft paste mouldable in a string press, a mortar, or a casting paste may be obtained; and the product may be transformed into burnt gypsum, or be added to burnt gypsum, stucco &c., or be used as a pigment carrier. Filling substances, such as sand, gravel, stone powder, stone turf. pumice stone, kieselguhr, ashes, clinkers, slags, throat dust from furnaces, asbestos, peat, sawdust, wood shavings, pulped paper reeds, fibres, or hair, or substances which influence the setting time, such as alkali sulphates, alum, borax, or glue, or substances which increase the density, such as alum, borax, waterglass, fluorides, or sulphate of iron, or colouring materials, e.g. bauxite waste, or such substances as caustic lime, lime paste, milk of lime, kaolin, clay, cement, or glue, may be added to the calcium sulphate during or after its treatment.

275,897. Chemische Fabrik Grunau Landshoff & Meyer Akt.-Ges., and **Kirchner, W.** April 5, 1927.

Concretes.—Setting is accelerated by the use of mixtures of calcium and aluminium chlorides and nitrates; these may be added to the binding agent in advance, or in the course of working. Solutions of such mixtures may be used for working up the material. Setting times are given for various solution strengths and proportions of the salts of the two elements, as well as those obtained when they are used separately. The material may be used for houses, canals, tunnels, and artificial stone articles such as buttons, plates and terrazzo.

276,016. United States Metals Refining Co., (Assignees of *Marks, A.*). June 8, 1926, [*Convention date*]. *Addition to* 244,391.

Refractory substances containing magnesite.—In the manufacture of refractory articles by moulding a mixture of dead-burned magnesite and a siccative oil, the oil is allowed to become oxidized by heating or standing to enhance its binding properties. If raw linseed oil is used it may be heated either before or after mixing with the body material, but before moulding. Alternatively the plastic mass of magnesite and oil may be allowed to stand for some time before moulding. The moulded articles are preferably dried slowly under conditions of increasing temperature and decreasing humidity, as described in Specification 271,847. Finally, the articles may either be burned before use or built into a furnace &c. and burned in situ. To obtain a compact product the magnesite is preferably composed of a mixture of different degrees of fineness, and the moulding is performed under pressure. Any vegetable or animal siccative oil may be used; driers such as oxides of lead, manganese, or cobalt, and thinners such as light mineral oils may also be added. The best proportion of oil is about 6.5 per cent of the magnesite.

276,143. Norris, W. C. Aug. 17, 1926.

Statuary. — Ornaments, such as challenge cups, statuettes, and vases are secured to their bases or plinths by means of projections and bayonet slots which are housed within the hollow base of the ornament when the parts are interlocked. As shown in connection with a challenge cup, a flanged plate 5 with recesses 3 leading beneath inclines 7 is attached to the plinth, and two lugs 10 are secured to the base of the cup. In attaching the cup, the lugs 10 are passed through the recesses 3 and the cup is

FIG. 2.

rotated until the lugs become wedged under the inclines 7. The base 9 of the cup completely encloses the plate 5 when in position

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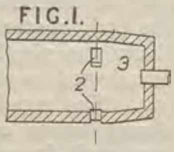
276,185. Marks, E. C. R., (*Polysius, G.,* [Firm of]). Oct. 19, 1926.

Refractory substances.—A refractory material particularly suitable for lining furnaces, but also suitable for other purposes such as the manufacture of grindstones &c. is obtained by baking a mixture of aluminous cement and corundum.

276,438. British Portland Cement Manufacturers, Ltd., Baxter, J. G., Bamber, M. K., and **Dickinson, W. J.** May 28, 1926.

FIG.I.



Cements, Portland, processes for making. — In the manufacture of fused cement in a rotary kiln the material is discharged from the kiln through holes 2 situated at the hottest point. The end 3 of the kiln may be tapered to facilitate the discharge.

276,518. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). Oct. 4, 1926.

Compositions containing synthetic resins. — Artificial resins are produced by subjecting to alkaline neutral or acid condensation either mixtures of several cyclic ketones or mixtures of one or several cyclic ketones with aromatic or hydroaromatic hydroxyl compounds such as cyclic alcohols or phenols. Mixtures of cyclohexanone with *m*- or *p*-methylcyclohexanone or both, or mixtures of several methylcyclohexanones, which are obtainable by hydrogenation of purified industrial cresylic acid, subsequent dehydrogenation and fractional distillation, or mixtures containing considerable quantities of cyclic hydroxyl compounds, such as the crude dehydrogenation product obtained by passing vapours of methylcyclohexanol over copper, may be employed. The resins obtained may be used in conjunction with other natural or artificial resins or cellulose esters or ethers or natural or artificial caoutchouc to produce lacquers, cements, lutes, films and insulating and other coatings, and may contain filling masses such as saw-dust, diatomaceous earth, asbestos and the like. In examples (1) cyclohexanone is mixed with crude methylcyclohexanone obtained by catalytically dehydrogenating methylcyclohexanol without subsequent fractional distillation, and the mixture is boiled with a solution of caustic potash in methyl alcohol. After separation of the alcohol and alkali the resin is again heated until no oily liquid distils over; (2) a crude mixture of methylcyclohexanones and methylcyclohexanols obtained by catalytically dehydrogenating isomeric methylcyclohexanols is heated with a mixture of cyclohexanone and cyclohexanol obtained by catalytically dehydrogenating cyclohexanol and a solution of caustic potash in methanol. Higher cyclic ketones whether derived from hydrogenated benzene or naphthalene or their homologues may also be used; (3) a soft resin is obtained by passing gaseous hydrochloric acid into a mixture of crude cyclohexanone, containing cyclohexanone, cyclohexanol and phenol, and crude methylcyclohexanone containing methylcyclohxanone, methylcyclohexanol and cresol. The reaction may be carried out in the presence of an inert solvent such as benzene; (4) gaseous hydrochloric acid is passed into a mixture of crude cresylic acid and cyclohexanone or crude methylcyclohexanone or all three, while cooling. The product is distilled in vacuo. Dehydrating agents such as zinc chloride or ferric chloride may be added; (5) a product suitable for coatings is obtained by mixing copal resin dissolved in linseed oil with the resin obtained according to example (2) dissolved in linseed oil, and turpentine oil or substitutes therefor, siccatives and the like are added. This product may also be obtained by melting the copal resin with the artificial resins and dissolving them together with the above additions in linseed oil. Specifications 146,498 and 170,351, [both in *Class* 2 (iii), Dyes &c.], are referred to.

Reference has been directed by the Comptroller to Specification 273,684, [*Class* 2 (iii), Dyes &c.].

276,539. Armstrong, J. J. V., (*Janin, A.*). Feb. 27, 1926. *Grant of Patent refused.*

Compositions containing bitumen, oils &c. — Asphalt paving mixures are formed by applying to mineral aggregate a primary coat of light volatile mineral oil such as paraffin or naphtha having a density between 27° and 44° Bé., a second coat of bituminous cement being then spread over the primed aggregate which is preferably at a temperature between 65° and 85° F. Lime, or a mineral filler in sand sizes, may be added to the aggregate. The bitumen coat is preferably less than two and one half per cent by weight, the primary coat acting as a flux to the secondary coat.

276,597. Thompson, C. H. May 11, 1927.

Stone, hardening—Lime-sand bricks &c. are subjected to a hardening treatment with waste lime-kiln gases before, during, or after the usual treatment with high-pressure steam. For example, articles moulded from a mixture of siliceous sand with 6—7½ per cent of lime and 3 per cent of a colouring agent such as iron oxide are treated in an autoclave with steam at 150° C. for 6—8 hours and with lime kiln gases under 3 atmospheres pressure for 2 hours.

276,836. Howard, J., and **Howard, W. J.** Sept. 15, 1926.

Concretes and mortars.—Facing, glazing and building material has the following composition· 1 cubic yard of debris or spoil from iron mines, 4 cwt. cement, one pint paraffin oil and 2 ozs. naphtha. For producing a building material, the ingredients are passed through a quarter-inch sieve, but for the facing or glazing material they are ground finely in a mill and the plastic mixture applied with a stiff brush.

276,866. Armstrong, J. J. V., (*Janin, A.*). March 6, 1926. *Grant of Patent refused.*

Bituminous compositions.—A surface layer of bituminous paving material as described and claimed in Specification 276,539 is placed on a prepared foundation to form a multi-layer bituminized road with a non-slip surface. The surface layer is prepared from aggregate having a primary coat of volatile oil such as paraffin, naphtha, or petrol applied at atmospheric temperature and a secondary coat of bituminous cement, the volatile oil being gradually released through the film of bituminous cement. Aggregate of sand size may be added as a filler after the bituminous cement, and lime may be added at any stage of the coating process. The invention also includes a series of bituminous mixtures prepared as above from aggregate graded as to size for subsequent use in forming a road in compacted interlocking layers. Specifications 275,280, and 276,538, [*Class* 107, Roads &c.], also are referred to.

277,291. Bolgar, L. Sept. 13, 1926, [*Convention date*].

Bituminous compositions for making building elements, hollow-ware, insulators, road coverings, moulded articles, &c. are obtained by heating petrol pitch, asphalt, or asphaltic oil to 250° C. with sulphuric or nitric acid, or coal-tar pitch to 200° C. with sulphuric acid, and mixing the liquid thus obtained with a filling material, e.g. sand, stone-meal, clay, sawdust, graphite, sulphur, or copal.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the treatment of the bituminous materials with other acids and with acid salts. This subject-matter does not appear in the Specification as accepted.

277,356. Colas Kaltasphalt Ges. Sept. 9, 1926, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

Bituminous compositions.—Bituminous emulsions in which the proportion of saponifiable material or other reagent used as an emulsifier is relatively small, as in Specification 202,021, [*Class* 81 (i), Disinfecting &c.], are rendered suitable for coating aggregate in the making of macadamized roads by adding an agent, such as glycerine or other multi-valent alcohol, a light mineral oil or a salt, which increases the viscosity of the emulsion and retards the tendency to disruption on meeting the aggregate. The retarding agent is added in the proportion of 5 per cent or less reckoned by weight of bitumen. Specifications 230,177, 233,784, 236,641, 243,398, 252,260 and 268,411, [all in *Class* 81 (i), Disinfecting &c.], are referred to.

277,389. White, G. N. March 8, 1926.

Stone, colouring.—Building-materials such as cement, plaster, lime, asbestos, &c. are coloured by means of vat dyestuffs or colouring agents used in a state of dryness or suspension, e.g. in colloidal solution. The dyes may be applied either to the loose material or by way of painting or impregnation to the finished product. They may be converted into a finely divided state either by grinding or by oxidizing a solution of the leuco compound in presence of a dispersing agent. According to one example, 5 lb. of Caledon brilliant purple 2R standard paste is intensively ground in a Follows and Bate mill, optionally with addition of 6 pints of sodium silicate. The product is made up to 2½ gallons with water and used as the gauging water for cement mortar containing 100 lb. of cement. In another example, 5 lb. of standard paste is mixed with 2½ gallons of 5 per cent caustic soda and reduced with sodium hydrosulphite. 6 pints of sodium silicate and 3 pints of sodium carbonate solution are added. The mass is oxidized by blowing air through it, then made up to 2½ gallons with or without a prior grinding operation, and used to gauge 100 lb. of cement.

277,577. Zimmermann, W. April 28, 1927.

Slagwool, preparation of.—Magnesium-containing minerals such as hornblende, dolomite, magnesite, steatite, &c., with or without the addition of fluorspar are fused and converted into threads by blowing with compressed air or steam in the known manner. The product is useful for insulating and filtering purposes.

278,120. Duffield, F. L. July 26, 1926.

Refractory substances.—Bricks, &c. made by moulding under pressure a fused or sintered mass of dolomite or magnesite are allowed to cool in the moulds after removal of the shape-forming pressure. Fluxes such as ferric oxide, clay or slag may be added to the basic material; the temperature employed may be 1200—1700° C.; steel or cast iron moulds may be used.

278,367. British Thomson-Houston Co., Ltd., (Assignees of *Unger, M.*). Oct. 1, 1926, [*Convention date*].

Refractory substances containing fireclay and carbon.—The pores of a fireclay crucible are filled with, say, carbon by impregnating it with, say, coal-tar pitch and gradually baking to drive off the volatile components, the treatment being repeated if necessary. Impregnation may be effected in vacuo.

278,461. Dome, E. M. July 17, 1926.

Concretes.—Bricks are made from a composition consisting of cement, sand, oxide of iron (yellow or red), and hydrated lime. The preferred proportions are 4 parts of sand to 1 part of each of the other ingredients, but these may be varied according to the strength and colour required.

278,465. British Dyestuffs Corporation, Ltd., Cronshaw, C. J. T., Baddiley, J., and **Chapman, E.** July 21, 1926.

Compositions containing oily materials and organic condensation products.—In order to counteract the effect of moisture on the operative surfaces of brakes, friction clutches, belts, pulleys or the like, the surface is treated with water soluble protective colloids or wetting-out agents of the sulphonic acid class, which may either be added to the asbestos or other material forming the friction surface during the process of manufacture or may be applied to the surface subsequently. Substances which may be used, preferably in the form of their sodium salts, include the sulphonic acids of condensed hydrocarbons, e.g. the condensation products of aromatic sulphonic acids and aldehydes, or lignone sulphonic acids. The products obtained by sulphonating certain petroleum fractions and condensing with isopropyl alcohol as described in Specification 274,611, [*Class* 2 (iii), Dyes &c.], are also suitable, an example given being the sulphonating of 84 parts of the liquid sulphur-dioxide extract of Borneo petroleum with 92 parts of sulphuric acid monohydrate and condensing with 76 parts of isopropyl alcohol and 53 parts of sulphuric acid.

278,679. Verkaufsvereinigung für Teererzeugnisse Ges. Oct. 7, 1926, [*Convention date*].

Bituminous road compositions.—Tar or tar oil is subjected to mild oxidation before mixing with stone, thereby obviating the necessity for the stone to be in dry condition. In one example, coal tar at 150° C. is stirred with 5 per cent strong nitric acid until the reaction is complete. Chromic acid, permanganate, hydrogen peroxide and air are also mentioned as oxidizing agents. The oxidized tar may be mixed with bitumen.

According to the Specification as open to inspection under Sect. 91 (3) (a), oxidized tar or tar oil may be mixed with petroleum residues. This subject-matter is not described in the Specification as accepted.

278,788. Garrow, J. R. July 7, 1926.

Concretes.—Organic material such as wood, sawdust, shavings, coir, sizal or other fibres, or paper pulp, for use as an aggregate with cement, concrete, &c., is prepared by subjecting it to the combined influence of heat and moisture so as to cause it to expand or dilate to the maximum, or above the maximum, degree of dilation to which it will be subjected in service, and then stabilizing the treated material by causing a substance adapted to act as a support or filler and to maintain the material in its expanded condition to be deposited in the pores or cells of the material. The material is treated, for instance, with a liquid at temperatures of from 120° to 220° F., preferably at or somewhat above atmospheric pressure. The expanded material may be maintained in its dilated condition by means of a solute introduced in solution and subsequently by physical or chemical means converted into a solid, for instance by deposition from solution on cooling, or by reaction with a second solution to form a precipitate. In the first case, a solution of three per cent of lead chloride may be used, or other solutes such as barium ferrocyanide, barium hydrate, ferric phosphate, oxalic acid, magnesium phosphate, calcium borate, or uric acid. Two or more of these compounds may be used, provided that no harmful reaction takes place. In the second case, treatment with a hot solution of lead chloride may be followed by treatment with a solution of a soluble sulphate or chromate such as zinc sulphate or potassium sulphate or chromate. Other compounds used in the first stage may be aluminium chloride, sulphate, acetate or soluble aluminates; barium hydrate, chloride or ferrocyanide; calcium chloride, borate, nitrate or hydrate; copper sulphate, chloride or acetate; chromium sulphate or chloride; lead acetate, chloride nitrate or soluble plumbates; magnesium sulphate, chloride, phosphate or nitrate; mercury chloride, nitrate or sulphate; iron acetate, bichromate, chromate, chloride, oxalate, or sulphate; potassium or sodium resinate, palmitate, oleate, bichromate, sulphate, chloride, ferricyanide or ferrocyanide; zinc chloride, nitrate, sulphate, or soluble zincates. Mixtures of two or more of these salts may be used. Appropriate reagents to combine with these salts are used in the second stage; for example if barium hydrate is used in the expanding solution, zinc sulphate may be used to produce barium sulphate and zinc hydrate in the pores of the material. The strengths of the solutions may vary, but 3 per cent to 10 per cent solutions give satisfactory results. The compounds produced in the material should preferably be without loosely combined water of hydration or crystallization; suitable compounds are calcium carbonate, oxalate, phosphate, borate or chromate; barium sulphate, carbonate, chromate, hydrate or ferrocyanide; lead carbonate, chloride chromate or sulphate; magnesium carbonate or phosphate; copper carbonate, oxalate, chromate or ferrocyanide; or mixtures of these substances. Either of the reacting compounds may be used in the solution in which the material is first expanded. Salts may be selected which have a preservative action on the material, or preservative substances may be added. For example, when lead chloride is used, an addition of $\frac{1}{2}$ to 4 per cent of mercuric chloride may be made. A salt of high osmotic pressure, such as calcium chloride, may be added to the solution used to expand the material.

278,821. South Metropolitan Gas Co., and **Lamprey, R. H. B.** July 23, 1926.

Refractory substances—A refractory composition suitable for making gas retorts, &c. comprises tridymitic and quartzitic silica and fireclay which has been purified by elutriation and treatment with acid. The proportion of total silica to clay is such as to produce a desirable reduction of the shrinkage of the clay during drying or burning. The proportion of quartzite is sufficient to counteract the after-shrinkage occurring during use of the product, and the quartzite should be of a kind which undergoes modification into tridymite slowly. To avoid reduction of the softening point the silica should not be too finely divided; $^{1}/_{8}$—$^{3}/_{8}''$ for the tridymite and $^{1}/_{8}$—$^{1}/_{40}''$ for the quartz are suitable sizes. A typical composition consists of 40—45 parts of clay, 20—25 of calcined flint (No. 4—No. 8 mesh), 20—15 of calcined flint (No. 8—No. 12 mesh) and 20—15 of sand. Alumina or carborundum may replace the sand.

278,983. Bates, H. L. May 13, 1927. *No Patent granted (Sealing fee not paid).*

Stone, artificial.—Artificial marble is moulded from a mixture of calcined magnesite, asbestos, alum, hydrated lime, casein, saltpetre, glue, and sand or ground stone. Pieces of pearl or other thin substances may be inserted in the moulding.

279,157. Green, S. C. C., and **Tussaud, L.** July 19, 1926.

Statuary.—The projecting parts of wax figures are reinforced by means of a core of twisted or corded fibres of animal, vegetable, or mineral material, so that they will yield slightly to pressure without breaking. Cotton, hemp, hair, wool, silk, paper, and flexible wire are mentioned as suitable fibres.

279,201. South Metropolitan Gas Co., and Lamprey, R. H. B. Aug. 21, 1926.

Refractory substances.—Gas-fired retorts &c. are protected from erosion at the parts subjected to the highest temperature by the application of a highly aluminous material, either in the form of paste or thin tiles. A suitable paste consists of 20 parts of plastic refractory clay, 60 parts of calcined alumina, and 20 parts of grog.

279,355. Pickstone, C. June 16, 1927.

Concretes and mortars.—Waterproof cement mortar, concrete, &c. is obtained by substituting fine slate flour for 5—15 per cent of the usual aggregate, and adding $\frac{1}{4}$—$\frac{1}{2}$ per cent of sodium silicate of 50—55° Bé. to the gauging water. Specification 217,388 is referred to.

279,360. Robertson Co., H. H., (Assignees of *Young, J. H.*). Nov. 8, 1926, [*Convention date*]. *Drawings to Specification.*

Cellular bituminous materials.—Cellular bodies of asphalt, bitumen, &c. are obtained by saturating the bituminous substance under pressure with a gas which is soluble in it, and then releasing the pressure causing the gas to form bubbles, which however are not permitted to migrate from their points of origin. The bituminous material is preferably heated and agitated to facilitate solution of the gas, which may for example be natural gas, but it is cooled to a state of plasticity before the pressure is released. The release of pressure may be caused by extruding the material through orifices which give it the desired form.

279,628. Hines, J. Oct. 22, 1926.

Compositions containing bitumens and mineral aggregate.—Aggregate, rendered warm and moist by treating it with hot water or steam, is dipped whilst in this condition into a bituminous or tarry coating medium which may be in the form of an aqueous emulsion. The process is preferably carried out by placing the stone in perforated buckets which are dipped into boiling water, drained, and then dipped in the coating medium.

280,011. Brown, A. C., and **Hines, J. T.** Oct. 11, 1926.

Bituminous compositions.—Road making materials containing bitumens are preserved in a soft condition suitable for laying by treating the crushed stone &c. with a colloidal solution of resin oil dispersed in kerosene or similar mineral oil before mixing therewith the bituminous binder and filling materials. The solution should contain about 25 per cent of resin oil. Suitable proportions of the materials are—2030 parts crushed stone, 12 parts colloidal solution, 123 parts asphaltic compound or bitumen, 60 parts filler and 11 parts lime.

280,085. Dicker, S. G. S., (*Naamlooze Vennootschap Nederlandsche Bims-Cement-en Asphaltindustrie*). March 7, 1927.

Artificial asphalts. — Liquefied bitumen is mixed with a porous filler under heat and at a pressure above that of the atmosphere. Ground natural limestone with or without burnt limestone is heated in a mixer at about 80° C. and under a pressure of 3—5 atmospheres with 9—12 per cent bitumen dissolved in benzol, carbon disulphide, ligroin or carbon tetrachloride. Still-lime, tuff, infusorial earth, trass, or dolomite may be used instead of limestone.

280,567. Lindman, E. I. Nov. 10, 1926, [*Convention date*].

Concretes.—In the process for obtaining porous bodies suitable for use as aggregates for concretes, building blocks, &c., by heating clays, rocks, and the like which expand on heating, the material is crushed, mixed with fuel, and burnt in a current of air, the crushing being such as to produce pieces of such size and form that their solid volume is at most 40 per cent of the volume of the mixture. 80 per cent of the material should be retained by a sieve having a 2 mm. mesh, but not more than 10 per cent should have a burning depth of more than 15 mm. After crushing, the small particles are rendered plastic by water and clay if necessary, and moulded, or drawn into strings which are broken up, and added to the larger particles, or the whole may be drawn into strings of **I**, **U**, **H**, or like section and broken. Fuels specified include anthracite, coke, coal slack. The burnt porous mass may be crushed and used as an aggregate for concrete, or mixed with clay for making bricks. The burning may be carried out in moulds to produce blocks &c. In this case the sides and bottom of the mould may be covered with a layer of sand, clay, &c. to prevent dissipation of heat, and to form an outer coating for the block. Such blocks may be reinforced by embedding iron rods, preferably coated with clay, in the mass before burning.

280,763. Urbain, E. Jan. 20, 1927, [*Convention date*].

Cements, materials and compositions for.—In the process of preparing phosphorus by heating together calcium triphosphate, silica and carbonaceous substances, a portion of the silica is replaced by alumina or clay to obtain a fusible slag having the composition of an alumina cement.

280,813. Doughty, H. E. June 7, 1927.

Cement mortars.—Mixtures of cement, cement plaster, gypsum &c. with colours, sand, &c. are made by grinding the materials together and drawing off the fine particles by air flotation under the influence of vacuum. The known additions of waterproofing agents, e.g. sodium silicate, or hardening agents, e.g. alumina, silica, gypsum, may also be added during the process.

280,902. Musag Ges. für den Bau von Müll-und Schlacken-Verwertungsanlagen Akt.-Ges., and **Grote, A.** Nov. 20, 1926, [*Convention date*].

Slags, treatment of.—Granulated slag is formed from waste materials, such as domestic and industrial refuse and gutter residues, by passing the material through an oblique rotary furnace. The combustible parts of the material are burnt out in the first portion of the furnace and the resulting slag is superheated and fused in the remaining portion and is broken into small lumps or grains by the rotation of the furnace.

280,907. Deutsche Gasglühlicht-Auer-Ges. Nov. 22, 1926, [*Convention date*].

Refractory substances.—A method of making articles of refractory materials such as oxides of zirconium, of thorium or of the rare earths, consists in heating mixtures of sintered and non-sintered materials as rapidly as possible to temperatures of 1300° C. and above.

280,930. Baume, G., Chambige, F., and **Boutier, D.** Nov. 17, 1926, [*Convention date*]. *Addition to* 255,074, [*Class* 81 (i), Disinfecting &c.].

Bituminous compositions.—In the preparation of emulsions as set forth in the parent Specification the soap employed may be replaced by ingredients forming soaps or like emulsifying agents inter se or with other added ingredients. Examples of such ingredients are caustic alkali, carbonates, sulphites, alkaline borates, sulphitic lyes such as sulphite cellulose lye. The emulsions may be kept in concentrated form as described in Specification 262,724, [*Class* 81 (i), Disinfecting &c.]. Two or more principal ingredients may be employed such that their physical properties are combined in the final product. For example, emulsions for treatment of roads prepared by the use of sodium carbonate and comprising coal tar pitch and petroleum pitch in the proportions 80 : 20 and 30 : 70 respectively give surfaces having anti-skid properties both as regards mechanically-propelled and horse-drawn vehicles. Inert substances or mixtures of such substances may be added in any proportions to the emulsions. Such substances comprise asbestos in pulverized or other condition, kieselguhr, infusorial earths, powdery or other clays, sands, gravels, wood waste, sawdust, vegetable fibres such as the residues from vegetable fermentation processes, bone powder and the like resulting from the calcination of offal, slags from blast furnaces or foundries. By such additions it is stated that the physical properties such as the elasticity, tenacity, specific gravity or porosity of the final product may be modified. For example, 20 parts of one of the emulsions referred to above may be mixed with any of the following substances or mixtures in the proportions stated—(1) sifted river sand, 100 parts; (2) porphyric gravel, 100 parts; (3) blast-furnace slag, 100 parts: (4) pulverized asbestos and infusorial earth, 100 parts each; (5) powdery clay, 10 parts, wood chips or shavings 5 parts, sawdust 5 parts, porphyry screenings 50 parts, blast furnace slag 100 parts, and river sand 30 parts.

281,022. Doggett, E. Aug. 27, 1926.

Stone, hardening and preserving. — Articles made of concrete are waterproofed by treating them with a mixture of alum and dissolved shellac. In the preferred method of preparation, an aqueous solution of alum is boiled until a thick liquid is obtained, and this is mixed with shellac dissolved in alcohol, acetic acid, soda, borax or potash, to form a thin paste, in the proportion of 8 parts by weight of alum to one part of shellac solution. Sufficient water is added to the paste to carry it into the pores of the concrete.

281,138. White, A. E., (*Blaw-Knox Co.*). Feb. 15, 1927.

Concretes &c.—The quantity of stone to be mixed with a given quantity of mortar is determined from the volume of the voids. In making the mortar, the interstices in the sand are taken into account and cement and water are used sufficient in quantity to fill such interstices and provide an excess sufficient for workability. Similarly with regard to the stone, the voids are determined and to a fixed quantity of mortar a quantity of stone is apportioned such that the voids will be filled and a workable excess of mortar allowed. From samples of the stone the specific gravity, and the maximum percentage of voids likely to occur may be determined, and thence the smallest volume of stone that may be used with a batch of mortar is calculated. The weight of this volume is then taken, and compared with the weights of similar volumes of actual quantities to be mixed. The voids in these quantities may then be determined, and the total volume of stone to be used with the batch of mortar adjusted. Charts or schedules may be prepared indicating the amount of stone to be added according to the weight of the standard volume of stone.

281,241. Rostock, R. Nov. 24, 1926, [*Convention date*].

Preserving artificial stone.—A method of impregnating and coating concrete and like surfaces with pitch &c. consists in forming all over the surface small holes, channels or grooves which allow the impregnating medium, such as pitch, hydrocarbons, natural or artificial resins &c. to penetrate into the deeper lying layers. In an example there are 15000 holes 8 to 10 mm deep to the square metre.

281,249. Patent-Treuhand-Ges. für Elektrische Glühlampen, (Assignees of *Mohr, R., and Becker, H.*). Nov. 26, 1926, [*Convention date*].

Stone, artificial.—A material which can be fused at reasonable temperatures and cast is made by melting siliceous rock, such as phonolith or its decomposition products, with fluorspar or other fluorine-containing material in a quantity equal to, or exceeding, 20 per cent of the mixture. A suitable mixture consists of 100 parts by weight of phonolith with 50 parts by weight of fluorspar. If the alumina content of the material is insufficient, additional alumina, or clay or kaolin, may be added. The alumina facilitates devitrification and enables a finished product to be obtained which resembles porcelain. Alkali may also be added to the materials, and the melting-operation may be prolonged if a finished material of more glass-like character is required.

281,711. British Thomson-Houston Co., (Assignees of *Barringer, L. E.*). Dec. 3, 1926, [*Convention date*].

Compositions containing artificial resins. — Grinding-wheels, whetstones, sand paper, and the like are made by mixing an abrasive such as alundum, carborundum, emery, garnet, with a polybasic acid, polyhydric alcohol condensation product of the class described in Specifications 3271/13 and 8417/13, to which a plasticizing agent such as indene polymer, tricresyl phosphate, glycol diacetate, diethyl phthalate, benzyl benzoate, triacetin, cumar resin, ester gum, pitch, diphenyl, or a natural gum may be added. Specification 273,748 is referred to. The resin may be dissolved or powdered for admixture with the abrasive, or a surface may be coated with a solution, and the grains of abrasive applied when tacky, and the whole baked. A mixture may be moulded at 150° C., cooled to 75° C., removed from the mould, and cured by heating without pressure for 50—150 hours at a temperature rising from 75° C. to 190° C.

281,717. Soc. of Chemical Industry in Basle. Dec. 4, 1926, [*Convention date*].

Compositions containing artificial resins. — Softening or filling agents may be added to a porous urea-formaldehyde condensation product either during the condensation or to the finished material; as softening agents, triaryl phosphate, diethyl phthalate, linseed oil or latex are mentioned, and as filling materials, cellular bodies, asbestos or kieselguhr.

281,742. Marks, E. C. R., (*Selden Co.*). July 7, 1926.

Compositions containing organic condensation-products and resins.—Resinous plastic compositions capable of being rendered infusible by heat are obtained by incorporating with a resinous substance capable of hardening by heat a liquid, high boiling nonresinifiable ester of an aromatic polybasic acid, e.g. phthalic acid, the ester being added before hardening in amount such that during hardening a material portion of the ester will not be removed. 85 parts glycerol phthalate resin cooked hard but not to the infusible stage are mixed with 15 parts diethyl phthalate at 150° C. until a homogeneous product is obtained which can be poured about 130° C. and may be converted into the infusible form by heating from 80—150° C. The glycerol phthalate resin may be replaced by similar resins obtained by heating a polyhydric alcohol with a polybasic acid and the diethyl phthalate may be replaced by similar esters having boiling points above 250° C. The artificial resins may be replaced by natural ones, e.g. shellac. 70 parts shellac and 30 parts diethyl-phthalate are heated together with stirring to 140°, and the liquid is converted to the infusible state by heating to 150—200° C.

281,993. Schmidt, F. Dec. 8, 1926, [*Convention date*]. *Samples furnished.*

Compositions containing artificial resins.—Condensation products of urea or its derivatives with formaldehyde are formed in the presence of carrier substances, or mixed with such substances prior to dehydration, and are then dehydrated while being kept in motion. It is preferred to mix urea with the carrier and then to add formaldehyde, but the reagents may also be mixed with the carrier simultaneously or after the reaction has begun. Other substances forming resinous products with formaldehyde, such as urethane, aniline, benzanilide and other anilides, *p*-toluenesulphonamide and other amides, and other phenol may be added with the urea. Suitable carrier substances are casein, cellulose and its derivatives. natural and artificial resins, polymerized vinyl esters, and fibrous or amorphous fillers such as wood meal, peat meal, or alumina; mixtures of carriers also may be used, such as casein and wood meal or methyl cellulose and peat meal. When casein, cellulose, or a cellulose derivative is used, softening agents, gelatinizing agents, and/or volatile solvents may be incorporated therewith. The dehydration of the condensation products may be effected in kneading or rolling apparatus under ordinary or diminished pressure. In one example, casein is kneaded with water, with or without a volatile solvent such as ethylene chlorhydrin, and the mass is mixed with urea and ethyl urethane. Formaldehyde is then added and the mixture is kneaded or rolled, at ordinary or diminished pressure, at 40—50° C. while dehydration proceeds. The product may be moulded directly or after pulverization. In another example, the same procedure is followed except that wood meal and a black colouring matter are included in the mass to which the formaldehyde is added. Specifications 171,094, 181,014, 238,904, 246,126, and 249,101 are referred to.

282,402. Singer, F. Dec. 17, 1926, [*Convention date*].

Refractory substances; artificial stone.—Materials highly resistant to the action of acids, including hydrofluoric acid, and of alkalies, which may be used for the construction of muffles or as material for stones consist of double silicates of the type $R.O.Al_2O_3 2SiO_2$ and are produced by reacting the oxides, carbonates, sulphates, silicates, or aluminates of divalent metals (such as magnesium, calcium, barium, strontium, zinc, and divalent iron), or mixtures thereof, with alumina and silicates at temperatures below the fusion point of the mixture, and preferably at temperatures at least 50° C. below the fusion point, the value of the latter being taken as the softening-point of the Seger-cone. Alumina is preferably introduced as oxide, hydroxide, silicate, double silicate free from alkali, or aluminate, and silica as quartz sand, alkaline-earth silicate, or double silicate free from alkali. In an example, a mixture comprising 10—20 parts magnesium oxide, 33—43 parts alumina, and 40—50 parts silica is reacted at a temperature somewhat above 1000° C.

282,403. Singer, F. Dec. 17, 1926, [*Convention date*].

Refractory substances.—To produce a ceramic material having a low coefficient of expansion, steatite, or other compound of magnesium or of the alkaline earths, is mixed in the solid state with aluminium compounds and heated until three phases are formed, one phase being a glass having a refractive index of 1.53 to 1.55 and the other two phases being crystallites, the first crystals of the sillimanite type, including mullite, and the second crystals of the forsterite and eustatite type.

282,404. Singer, F. Dec. 18, 1926, [*Convention date*].

Refractory substances.—A process for preventing the ageing of ceramic materials, described in Specification 282,403, i.e. for minimizing the formation of vitreous amorphous constituents, consists in adding compounds of cerium, zirconium, chromium, manganese, phosphorus, tungsten or vanadium to the main ingredients comprising silicates of alumina or magnesia and double compounds of these fundamental constituents such as kaolin quartz and felspar, clay steatite and aluminium hydroxide, kaolin and magnesite &c. The compounds may be oxides, carbonates, silicates or aluminates. The added compounds cause an increase in the number of crystal nuclei in the crystallites occurring in the ceramic material.

282,458. Wacker Ges. für Elektrochemische Industrie, Dr. A. Dec. 21, 1926, [*Convention date*].

Cements, Portland, materials for making.—Dry calcium hydroxide which has been obtained in making acetylene from calcium carbide by treatment with a small proportion of water is mixed with clay or other siliceous and aluminiferous material to form Portland cement.

282,635. I. G. Farbenindustrie Akt.-Ges. Dec. 23, 1926, [*Convention date*].

Compositions containing phenol aldehydes, organic nitrogen derivatives.—Methylol compounds, especially of ureas, are mixed with fillers such as wood, lignin &c., which have been previously impregnated with phenol, urea, thiourea, their derivatives, or condensation products with aldehyde and dried, and the mixture is hardened. Catalysts or buffer mixtures to maintain the hydrogen ion concentration constant, may be employed. Aldehydes or substances such as trihydroxy methylene may also be added. The composition may contain casein, horn, yeast or the like. In an example, 120 parts of lignin are impregnated with a solution of 30 parts of thiourea in methanol, dried, and mixed with 160 parts of dimethylol urea. The mixture is subjected to a pressure of 300 atmospheres for 2 hours at 100°—105° C. The product has good electrical insulating properties.

282,704. Liljenroth, F. G. Dec. 31, 1926, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

Cements.—Raw calcium phosphate is treated by a wet method to give phosphoric acid or a soluble salt thereof, and a hardly soluble or insoluble calcium salt which is mixed with silica, clay, or other aluminiferous material, and heated to drive off the acid radicle from the calcium salt and leave a cement clinker. The regenerated acid, free or as a salt, is used to treat further phosphate. Silicon tetrafluoride is led into an aqueous suspension of calcium phosphate; silica and hydrofluoric or hydrofluosilicic acid are formed, which react to give phosphoric acid and calcium fluoride. Clay, iron oxide and silica are added to the residue after filtering off the acid, and the whole burnt to yield a cement clinker, the fluoride being driven off as silicon tetrafluoride. Steam may be blown into the lower hotter part of the furnace, and hydrofluoric acid so formed becomes silicon tetrafluoride, which may be led to phosphate directly or after decomposition as hydrofluosilicic acid. Raw phosphate is treated with sulphuric acid, and the calcium sulphate separated, mixed with sand, clay and bauxite, and calcined in an oxidizing atmosphere preferably with coke to facilitate the evolution of sulphur dioxide, from which sulphuric acid may be prepared; or the raw phosphate may be leached with an acid having a soluble calcium salt, e.g. nitric or phosphoric acid, and calcium sulphate is precipitated by an alkali metal or ammonium sulphate.

282,755. Soc. Anon. de Matériel de Construction. Dec. 29, 1926, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

Cements, Portland, materials and compositions for.—The decomposition of calcium sulphate by ammonium carbonate to form ammonium sulphate and calcium carbonate is carried out in presence of clay, kaolin, bauxite or other substances containing silica, alumina and oxide of iron, so that the pasty residue after separation of ammonium sulphate solution is suitable for making Portland cement. A mixture with water of gypsum, clay, kaolin, &c. is treated with ammonia gas or mixed with ammoniacal liquor, and carbon dioxide under pressure is passed through. The temperature is maintained preferably at 34—45° C. at the commencement and is regulated so as not to rise above 75° C. Carbon dioxide recovered in the making of cement may be used again in the process.

282,795. Deutsche Gold-und Silber-Scheideanstalt vorm. Roessler. Dec. 27, 1926, [*Convention date*].

Refractory substances containing compounds of zirconium and thorium.—Objects are made from zirconia by first mixing, in the dry state, zirconia with small amounts of hydrolyzable substances such as zirconium tetrachloride, aluminium chloride, magnesium chloride &c., mixing into a plastic mass with water and finally shaping and burning. Other substances such as thoria may be added.

283,124. Bakelite Ges. Jan. 3, 1927, [*Convention date*]. *Addition to* 282,414, [*Class* 2 (iii), Dyes &c.].

Compositions containing resinous materials and organic condensation products.—The process of the parent Specification, according to which phenol-aldehyde condensation products are rendered soluble or readily dispersible in oils by heating them with polyhydric or polycyclic phenols, is modified in that natural resins are added to the reaction mixture or to the products; suitable resins are colophony, dammar, dragon's blood, copal, mastic, shellac, and grass-tree gum. In one example, a phenol-aldehyde condensation product is melted with β-naphthol, with or without hydrated manganese oxide, and the product is melted with colophony, and in another example the same reagents are melted together directly. In either of these examples, β-naphthol may be replaced by α-naphthol, diphenols, dihydoxydibenzyl, dicresols, or resorcinol, and colophony may be replaced by any other of the natural resins mentioned above. In other examples, products obtained by the method of the parent Specification are mixed with a natural resin, or ground with a solution of a natural resin in a fatty oil, in a varnish, or in a solvent such as alcohol. The products may be dissolved or dispersed in oils or varnishes, such as linseed oil, poppy-seed oil, wood oil, castor oil, soya-bean oil, or linseed oil varnish, with or without the addition of diluents such as turpentine, benzene, alcohol, acetone, carbon tetrachloride, or camphor oil.

The Specification as open to inspection under Sect. 91 (3) (a) refers to xanthine as an alternative treating agent. Thi ssubject-matter does not appear in the Specification as accepted.

283,187. Liljenroth, F. G. Jan. 8, 1927, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

Cements.—Raw phosphates containing calcium phosphate are treated with acid to recover phosphoric acid, and the lime is converted by the addition of sulphate solution into calcium sulphate, which is separated with or without other insoluble matter from the phosphates and treated with ammonia and carbon dioxide to form ammonium sulphate and calcium carbonate, which latter is mixed with silicia, aluminiferous material and, if desired, other sesquioxides and heated to drive off carbon dioxide and form cement clinker. The ammonium sulphate solution may be used to precipitate calcium from the solution obtained by treating raw phosphates with insufficient sulphuric acid or an acid with a soluble calcium salt, e.g. nitric acid, the solution finally being neutralized with ammonia and concentrated to form a mixed manure. Carbon dioxide from the cement furnace is used to precipitate calcium carbonate.

283,791. Goldschmidt, V. M., and **Knudsen, R.** June 22, 1927.

Refractory substances. — Furnaces and other apparatus which are exposed to heat or chemical action are constructed of natural olivine rock, in the form of either rough pieces as quarried, or blocks &c. sawn or ground to shape, or agglomerated masses obtained by heating the disintegrated rock with or without a binding agent. Suitable binding agents are colloidal magnesium silicate, magnesium oxide, magnesium hydroxide, talc, lime, clay, as well as organic binders of a bituminous nature. Specification 284,576 is referred to.

283,803. Harvey, M. T. Oct. 11, 1926.

Compositions containing artificial resins.—The resinous products obtained by condensing cashew nut shell oil (cf. Specification 259,959), with an aldehyde in the presence or absence of hydrochloric acid or a basic catalyst are used in admixture with a filler such as slate dust, in making moulded articles.

283,868. Traun, H. O., (*trading as* Traun & Söhn vorm. Harburger Gummikamm-Cie H.). Jan. 18, 1927, [*Convention date*].

Compositions containing synthetic resins. — Bottles or other containers for hydrofluoric acid and like corrosive substances are made from artificial resin, such as a phenol-formaldehyde condensation product, mixed with graphite, preferably in a finely-divided state, and may be given a protective coating of varnish or other material. The necks of the containers may be provided with an external layer of hard indiarubber in which a durable screw thread can be formed, and the containers preferably have enlarged, flanged bases.

The Specification as open to inspection under Sect. 91 (3) (a) states that the containers may be made of or covered with artificial resin alone. This subject-matter does not appear in the Specification as accepted.

284,218. Laboratoire de Perfectionnements Thermiques, (Assignees of *Courturaud, P. E. J. J.*). Jan. 24, 1927, [*Convention date*].

Refractory substances.—To prevent the adherence of soot or like deposits to the heated surfaces of boilers, superheaters, air heaters, retorts, &c., the surfaces are coated with graphite mixed with an agglutinant such as silicate of soda or potash, and the mixture is applied with a brush or is sprayed upon the heated surfaces.

284,219. Laboratoire de Perfectionnements Thermiques, (Assignees of *Courturaud, P. E. J. J.*). Jan. 24, 1927, [*Convention date*].

Refractory substances. — A composition for coating the walls of chimneys &c. comprises graphite and a soluble silicate.

284,246. Laderer, H. Jan. 25, 1927, [*Convention date*].

Compositions containing bitumen and shale.—A bituminous composition comprises natural bitumen and shale in the form of a fine impalpable powder. The composition can be used for road making and for the manufacture of roofing tiles, building blocks, drain pipes, pillars, &c.

284,276. Fasting, J. S. Jan. 27, 1927, [*Convention date*].

FIG.1.

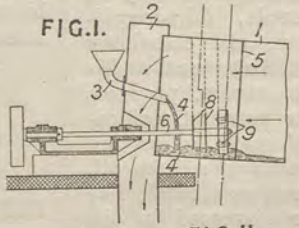


FIG.6.

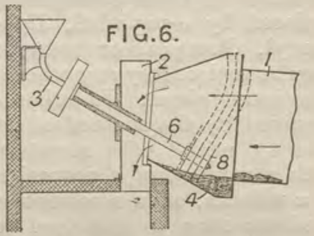


FIG.11.

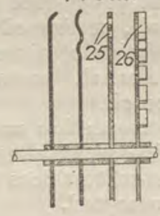
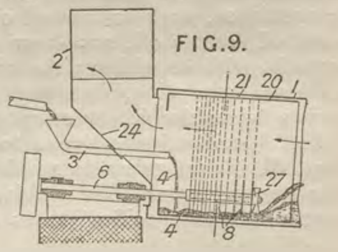


FIG.9.



Cements, Portland.—In a rotary kiln fed with wet slurry, the drying and distribution of the latter is facilitated by subjecting it, in the upper end of the kiln itself or in a chamber in front thereof, to a repeated flinging action. As shown in Fig. 1, an agitator projects into the kiln 1 and comprises a rotary shaft 6 carrying a series of discs 8 which extend into the slurry 4 retained in the upper end of the kiln by a ring 5. The last disc is formed of two plates between which are arranged pivoted wings 9. In a modified form of this construction the discs 8 operate in an enlargement of the kiln tube 1, there being provided at the entrance to the main part of the kiln, one or more radial vanes which dip into the slurry in the upper chamber and are formed with inclined guiding members to direct it into the kiln. Fig. 6 shows an arrangement in which the shaft 6 serves as the slurry supply pipe and is inclined so that the last discs 8 function to project the slurry into the kiln. In a further construction, the agitator is disposed in a downwardly tapering fixed chamber in front of the kiln, the last discs 8 being, in this case, replaced by a screw which feeds the dried slurry into the kiln. Fig. 9 shows another modification in which the slurry pipe 3 delivers into a mantle 20 secured to and spaced from the kiln 1, the annular space 21 thus formed serving for the passage into the kiln of any dried slurry which is deposited on the slides down the inclined base 24 of the smoke box 2. The inner end of the shaft 6 carries a propeller 27 to project the slurry into the kiln proper. The discs 8, as shown in Fig. 11, may be bent or corrugated at their edges, formed with perforations 25, or provided with wings or teeth 26.

284,294. Amme-Luther Werke Braunschweig der Miag Mühlenbau und Industrie Akt.-Ges. Jan 27, 1927, [*Convention date*].

Cements, Portland.—A process for producing a white Portland cement from coloured raw materials, for example from ferruginous materials, consists in adding small quantities of inorganic substances which on heating give colourless melts with the colouring components of the raw materials. Suitable inorganic substances are phosphates and borates alone or combined with metallic halogen compounds such as calcium fluoride or chloride. Reducing agents such as coke may also be added or the material may be heated in a highly reducing zone. In an example coke, flux, and borax are added to a mixture of ferruginous raw materials and after calcination under reducing conditions the clinkers are first coarsely ground and then finely ground, iron being removed magnetically after each grinding. The process may be applied to the raw materials separately before mixing.

284,295. Amme-Luther Werke Braunschweig der Miag Mühlenbau und Industrie Akt.-Ges. Jan. 27, 1927, [*Convention date*].

Cements, Portland. — Coloured Portland cements are produced from coloured raw materials, such as ferruginous materials, by adding thereto metallic pigments, such as oxides of chromium, nickel, cobalt and copper, together with inorganic salts such as metallic halogen compounds, phosphates and borates adapted to combine with the pigments to form coloured melts on heating. In the case of ferruginous materials, the calcination is effected under reducing conditions, the metallic iron being afterwards removed. In an example a green cement is produced by adding a flux, borax, coke and chromium oxide to the raw materials.

284,576. Knudsen, G., (*trading as* Borgestad Fabrikker). Oct. 30, 1926.

Refractory substances; artificial stone. — A heat and alkaline resisting building material, composed substantially of magnesium ortho silicate, is made by mixing a filler of granular olivine mineral or of magnesium ortho silicate with a binder of materials such as talc and magnesium oxide, which combine when heated to form magnesium ortho-silicate. The composition is formed into a paste with water, syrup &c., and is moulded and heated to a temperature below the fuzing point of magnesium ortho silicate.

284,589. Soc. of Chemical Industry in Basle. Jan. 29, 1927, [*Convention date*]. *Samples furnished.*

Compositions containing aldehyde-amine condensation products.—Homogeneous masses which can be easily worked are obtained from the condensation products made from an aromatic amine and formaldehyde (or a substance which yields formaldehyde), in the presence of an acid, by treating them, at any stage of their production, with an agent which can eliminate the action of the acid and then subjecting the products to compression, preferably after drying, while in a comminuted state. Prior to compression, the products may be mixed with natural or artificial resins or other filling, colouring, &c. materials. In one example, aniline and formaldehyde are condensed in the presence of hydrochloric acid and the mixture is treated with caustic soda lye. The precipitated powder is washed to remove excess of formaldehyde and electrolytes, the removal of which may be completed by osmosis, and is then dried and pressed hot. Alternatively, the product may be pressed cold, and may then be hardened subsequently at a raised temperature. In another example, aniline and formaldehyde are condensed in the presence of hydrochloric acid, the mixture setting to a jelly. The product is comminuted and washed with alkali, or is treated with alkali and then comminuted, and is then compressed.

The Specification as open to inspection under Sect. 91 (3) (a) refers to condensation products made from an aromatic amine and an aldehyde. This subject-matter does not appear in the Specification as accepted.

284,732. Carborundum Co., Ltd., (Assignees of *Hartmann, M. L.*). Feb. 4, 1927, [*Convention date*].

Refractory substances.—Refractory articles are made of silicon carbide, substantially free from iron and other easily reducible metals or compounds thereof, and a permanent bond. In an example, crushed silicon carbide grain is freed from iron by magnetic treatment and by acids, and to 90 parts of this is added bonding material comprising 8 parts pure kaolin and 2 parts feldspar. The materials are mixed with water, moulded and fired.

284,908. Berry, Wiggins, & Co., Ltd., and Holmes, H. H. May 16, 1927.

Compositions containing bituminous materials.—In the construction of roads, pavings or foundations, the road metal or graded stone is mixed with dry powdered material which absorbs water from, and therefore increases the viscosity of, a bituminous or tarry liquid which is subsequently added. The dry powdered material, which is preferably applied as a coating to aggregate such as gravel, may consist of chalk, flue dust, or granite or other quarry-bye-product dust, and the bituminous or tarry liquid is preferably in the form of an emulsion containing about 60 per cent of bitumen or tar.

285,055. I. G. Farbenindustrie Akt.-Ges. Feb. 10, 1927, [*Convention date*].

Cements.—In the production of phosphorus, phosphoric acid and cements by heating together raw phosphates, carbon, and material containing silica and alumina, the charge is regulated so as to produce a slag having a composition similar to blast furnace slag, viz.:—12—35 per cent of alumina, 18—38 per cent of silica and 40—55 per cent of lime. The slag obtained has latent hydraulic properties and is suitable for the production of blast furnace slag cement, for example by grinding with Portland cement clinker. This clinker may be produced in the usual way or by adding lime containing material to the slag. The process may be carried out in an electric or a shaft furnace, the carbon in the latter case acting as a source of heat, and phosphoric acid being produced in addition to phosphorus. Examples are given.

285,179. Illemann, R. Nov. 22, 1926.

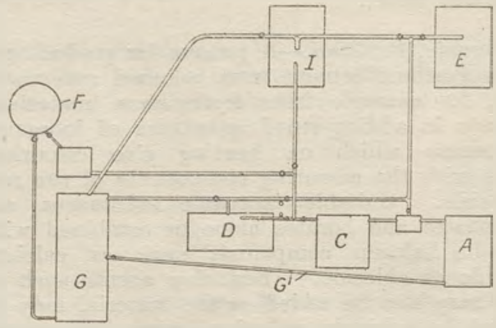
Compostions containing bituminous materials and stone flour. — In coating or lining metal articles, e.g. pipes with bitumen, the required plasticity of the bitumen is obtained by mixing it with a suspension of stone flour in water. 24 lbs. of suspension of stone flour in water is heated to boiling and mixed with 9 lbs. of hot bitumen, pitch, &c. The mixture is allowed to cool and may be used hot or cold. It may be thinned down with water and mixed with fillers, e.g. sand or stone chips or mineral or vegetable fibres.

Reference has been directed by the Comptroller to Specification 262,961.

286,122. Marks, E. C. R., (*Polysius, G.,* [Firm of]). May 6, 1927.

Aluminous cement.—In the manufacture of aluminous cement in the rotary kiln the raw materials are fed to the kiln in the form of lumps, without preliminary grinding.

286,334. Davies, A. R., Hughes, W. K., and Morgan, A. G. Nov. 1, 1926.



Stone, hardening; concretes and mortars.—Relates to processes for the manufacture of artificial stone, bricks, fuel briquettes, &c., from a mixture of lime and gravel, sand, coal &c., wherein the lime is treated with carbon dioxide during slaking and wherein the materials before or during moulding or the moulded articles are subjected to the action of steam heat and are also treated with carbon dioxide. According to the invention, the carbon dioxide is applied in a closed circuit, and is afterwards returned to the generator or to a condenser or collector. As shown, carbon dioxide from a generator A and steam from a boiler E pass to a chamber C which communicates by pipes with a lime slaking chamber D, a mixing chamber F, and an autoclave I for the moulded articles. These chambers D, F, I also communicate with a condenser or collector G which is connected back to the generator by a pipe G^1.

286,336. Lessing, R. Nov. 3, 1926.

Compositions containing bituminous materials.—For treating road metal, the material is coated with coal tar or other liquid containing pitch-like and oily fractions. An oil solvent containing little or no aromatic constituents, such as distillates from petroleum, shale or primary coal tar, is then used to extract the oily portion and precipitate the pitch as a homogeneous coating on the road metal. The oil solution may be removed by draining, filtering or centrifuging assisted by pressure or vacuum and may be distilled to recover the solvent and obtain tar oils which may be distilled for the preparation of the tar fractions, the bituminous residue obtained being added to the mixture. A current of superheated steam may be passed through the mass before pressing to recover remaining traces of the solvent. Extraction of the tar oil is facilitated by the addition of sulphuric acid, an acid solution of iron sulphate or chloride, or the spent liquor from picking steel. Petroleum fractions free from aromatic constituents and boiling at 60—80° C. may be employed as solvent. The hardness of the residual pitch film on the road metal may be adjusted by more or less complete extraction of the oily fraction. Specification 130,362, [*Class* 91, Oils &c.], is referred to.

286,552. Naamlooze Vennootschap Koninklijke Stearine Kaarsenfabriek Gouda. Aug. 2, 1927, [*Convention date*].

Bituminous compositions.—Relates to methods for making asphalt concrete by mixing coarse and fine stone material and a bituminous emulsion, and consists in mixing emulsion with the coarse stone separately and then adding the fine material or a mixture of fine material and emulsion. Preferably, protein or other retarding agent is added to the emulsion to diminish the velocity of coagulation. In a specific example, the emulsion is made by melting 600 kgs. of asphalt with 15 kgs. of resin and then stirring in 80 litres of a water solution of caustic soda; to this emulsion is added 80 litres of water containing 15 kgs. of protein. In making the concrete 100 litres of stone split 5—10 mms. are mixed with 15 litres of emulsion, and 50 litres of fine basalt sand are mixed with 20 litres of emulsion; after coagulation of the emulsion has begun the two mixtures are mixed together.

286,590. Gewerkschaft Sachtleben, and Küppers, J. March 5, 1927, [*Convention date*]. *Addition to* 268,308, [*Class* 51 (ii), Furnaces and kilns for applying &c.]. *Drawings to Specification.*

Refractory substances. — Muffle walls are formed of silicon carbide, chromium silicide, molybdenum carbide, or mixtures of these materials.

286,677. Wagemann, A. March 8, 1927, [*Convention date*].

Refractory substances.—The strength of refractory substances of the kind comprising clay bound quartz, sand, chamotte and like siliceous material is increased by the addition of a small percentage, up to 10 per cent, of artificial silicates containing alumina, for instance slag, dust-destructor clinker, and the like, in a very fine or colloidal state.

286,731. Schieferwerke Ausdauer Akt.-Ges. March 10, 1927, [*Convention date*].

Compositions containing organic condensation products.—The Specification as open to inspection under Sect. 91 (3) (a) claims, but does not describe, the following subject-matter.—The formation of solid artificial materials by cold pressure and subsequent heat hardening of a viscous condensation product, to which fillers may be added, and which is made by heating to boiling a mixture of phenol, *p*-dichlorbenzene, and formaldehyde in the presence of a catalytic salt mixture of sodium and ammonium chlorides and hexamethylene tetramine. This subject-matter does not appear in the Specification as accepted.

286,732. Schieferwerke Ausdauer Akt.-Ges. March 10, 1927, [*Convention date*].

Compositions containing organic condensation products. — A process for forming sheets and articles of insulating material consists in cold pressing at a very high pressure a composition comprising a filling material and a viscous artificial resin obtained, as described in Specification 286,731, from a mixture of phenol, paradichlorobenzene and formaldehyde, in the presence of a mixture of common salt, ammonium chloride, and hexamethylene tetramine, by heating to boiling point, separating from the water formed, freeing from volatile vapours and washing with water. The cold pressed sheets and articles are subsequently hardened by heat. In an example, powdered shale is mixed with one-sixth of its weight of the artificial resin, and the composition is pressed cold in plate moulds at about 500—700 kgs. per sq. cm. pressure. The resulting sheets are fixed in adjustable frames, placed between porous stone slabs and heated for from two to three hours, the temperature being gradually raised to about 80° C.

286,933. Capiau, G., Gauquier, M., and Lahaut, L. June 7, 1927.

Refractory substances. — Cracks in the brickwork of ovens are filled while the oven is hot by supplying dry refractory material under air pressure to the seat of injury where it is set by the heat. For temperatures of from 600° C. to 1200° C. the refractory mixture may be 80 per cent cement (or cement and slag), 1 to 4 per cent dextrin, 2 to 7 per cent litharge, 3 to 8 per cent sodium chloride, and 2 to 5 per cent sodium carbonate. Silica or silicates may be added when glazing is desired.

286,949. Morton, F. July 5, 1927.

Compositions containing bituminous and siliceous &c. materials.—A paving composition consists of a mixture of granite or other hard stone chippings, including slag, of sizes between three-quarters and one-quarter of an inch, and blast furnace or coal tar pitch having a twisting point between 40° and 65° C. The amount of pitch may vary between 20 and 5 per cent of the mixture. If necessary a portion of the pitch may be replaced by bitumen. Specification 255,311 is referred to.

287,036. I. G. Farbenindustrie Akt.-Ges. March 19, 1927, [*Convention date*].

Cements, materials and compositions for. — An aluminous cement and phosphorus are obtained by melting phosphates, under reducing conditions, in an electric or shaft furnace with a slag formed by fusing, under reducing conditions, 70—90 parts of alumina with 30—10 parts of lime. Bauxites of high iron content may be employed in forming the slag, the iron being eliminated in the fusion in the form of a regulus. An example is given.

287,177. Ripper, K. March 18, 1927, [*Convention date*]. *Samples furnished.*

Compositions containing organic condensation products.—Dicyandiamide is condensed with formaldehyde or polymers thereof, in the presence or absence of other substances capable of combining with formaldehyde to give resins, to form hydrophobe products which are converted by cold water into fine powders which can be moulded by heat and/or pressure. Of the other substances capable of combining with formaldehyde, urea, thiourea and phenols are mentioned. Prior to moulding, the powders may be mixed with fillers such as asbestos, cellulose, cotton flock, wood pulp, sawdust, wood flour, cork, flax, wool, silk, leather, or with softening agents, plasticizers or fluxes. The products are useful as insulating material and glass substitutes and for the manufacture of porcelain, trinkets, &c. Examples are given of the preparation of condensation products from (1) dicyandiamide (1 mol.) and aqueous formaldehyde (1 mol.); (2) dicyandiamide (1 mol.), urea (1 mol.), and aqueous formaldehyde (2 mols.); (3) dicyandiamide (1 mol.), thiourea (1 mol.), and aqueous formaldehyde (2 mols.); (4) dicyandiamide (1 mol.), phenol (1 mol.), and aqueous formaldehyde (2 mols.); (5) dicyandiamide (1 mol.), phenol (2 mols.), aqueous formaldehyde (3 mols.); (6) dicyandiamide (1 mol.), cresol (1 mol.), and aqueous formaldehyde (2 hols.). In each case the product is poured into cold water, when a hydrophobe resin separates out and is transformed into a fine powder.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the use of any aldehyde and of derivatives of dicyandiamide. The initial condensation products of formaldehyde with urea, thiourea, phenols &c., such as methylolurea, methylolthiourea, phenol- or cresol-alcohols may also be employed. This subject-matter does not appear in the Specification as accepted.

287,556. Laboratoire de Perfectionnements Thermiques, (Assignees of *Courturand, P. E. J. J.*). March 24; 1927, [*Convention date*].

Refractory substances containing carbon and silicates.—Walls and other parts of furnaces exposed to the injurious action of slag, clinker &c. are protected by a coating having a graphite base mixed with a soluble silicate, e.g. sodium silicate. Proportions are specified.

The Specification as open to inspection under Sect. 91 (3) (a) states that bricks may be coated before building them into the furnace. This subject-matter does not appear in the Specification as accepted.

Reference has been directed by the Comptroller to Specification 3353/06, [*Class* 70, Indiarubber &c.].

287,568. Ripper, K. March 25, 1927, [*Convention date*].

Compositions containing organic condensation products.—Thiourea, alone or together with urea, is heated with an aqueous solution of formaldehyde or a polymer to the stage where a hydrophobe resin separates on cooling a sample, when the reaction mass is brought into contact with cold water and disintegrates into a powder capable of being moulded by heat and/or pressure. Fillers may be incorporated with the powders before or after their formation; materials specified are asbestos, cellulose, cotton, wood, flax, wool and silk. The powders, alone or with fillers, softening and plasticizing agents or fluxes, are useful for the manufacture of substitutes for glass or porcelain, insulating materials, and fancy articles. Specifications 248,477, [*Class* 2 (iii), Dyes &c.]; 258,950; 266,028 and 275,995, [both in *Class* 2 (iii), Dyes &c.], are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) describes also the use of derivatives of thiourea or urea, or the initial condensation products with formaldehyde, e.g. methylolurea and methylolthiourea, and states that aldehydes in general may be used. Sawdust, wood flour, cork and leather are also mentioned as filling materials. This subject-matter does not appear in the Specification as accepted.

287,799. Haddan, R., (*West Process Pavement Co., Inc.*). Oct. 5, 1927.

Compositions containing bituminous and siliceous, calcareous, and like materials. — An asphaltic paving composition which will not set into a coherent mass during storage or transit but requires to be heated and blended before laying, is prepared by heating a mixture of mineral aggregate and a powdered hard asphalt to a temperature below that at which the hard asphalt can blend with a soft or semi-liquid asphalt or asphaltic flux, the latter being separately heated to a temperaure below that at which it will blend with the hard asphalt and then mixed with the former composition. The quantity of soft asphalt added is just sufficient to give the required total proportions of asphalt to aggregate in the final road material. As an example, 60 lbs. of powdered Gilsonite and 1800 lbs. of sand and filler are heated, and 140 lbs. of flux is added. The hard asphalt may be natural or artificial, such as refinery asphalt-residuals which may be sulphonated.

287,943. Auer, L. Sept. 30, 1926.

Asphalts.—The viscosity and other physical properties of " isocolloid " substances containing unsaturated carbon compounds are modified by addition thereto of a small quantity of an electrolyte comprising an organo-metallic compound, a salt of an organic or inorganic acid, or a solid aromatic or lower aliphatic organic acid, which is either added as such in dry form or may be produced in situ, applying heat to the mixture to dissolve the added salt &c. as completely as possible, and either continuing heating at atmospheric, increased, or reduced pressure or under varying conditions of pressure, or subjecting the mixture to increased or reduced pressure in the cold. The reaction mixture may be ground in a mill. The term " isocolloid " is defined to mean a colloidal substance whereof the dispersed phase and the dispersion medium of the colloidal system are both of the same chemical composition but in a different physical state, and is said to include asphalt. In addition to the salt &c. small amounts of acids, of organic substances such as phenols, naphthols, naphthalene, chloroform, acetone, alcohols and their homologues and derivatives, of siccatives, or of sulphur or sulphur compounds such as sulphur chloride, may be added, the sulphur &c. being, if desired, added as a separate step in the treatment. During the treatment, the mixture may be subjected to the action of gases other than air, or to the influence of infra-red, ultra-violet, or X-rays. Examples are given of the appropriate treatment of fatty oils and resins. Specifications 17667/12, [*Class* 70, Indiarubber &c.]; 4896/13, [*Class* 55 (ii), Gas manufacture &c.]; 153,942; 214,679 and 249,916, [both in *Class* 91, Oils &c.], are referred to.

288,192. Lellep, O. April 2, 1927, [*Convention date*]. *Drawings to Specification.*

Cements, Portland, processes for making.—In calcining cement the pulverized raw material is granulated by an addition of water in a manner as to preclude the formation of a thick pasty mass or slurry, e.g. as described in Specification 292,987, [*Class* 87 (ii), Moulding plastic &c. substances], and the granules are sintered to clinker in a rotary kiln after preliminary heating by the waste gases from the kiln.

288,202. Conod, G., and **Lecoultre, F. C. F.** April 4, 1927, [*Convention date*].

Compositions containing calcium carbonate and sulphate and colloidal silica.—Crystalline calcium carbonate powder (30 kg.) is mixed with calcium sulphate or other binding agent (50 kg.) and with colloidal silica solution (5 kg.) to produce an imitation marble or other stone, which may be veined and coloured in known manner. The crystalline $CaCO_3$ may be obtained by baking limestone fragments at 1290° C. in an electric oven under 100 atmospheres pressure and disintegrating the hot mass by immersion in water; or by dissolving $CaCO_3$ in water saturated with CO_2 and re-precipitating by Na_2CO_3. The colloidal silica is obtained by dialysis of a mixture of sodium silicate and HCl solutions.

288,903. Palm, E. C., and Thorsson, H. T. Sept. 28, 1927.

Concretes and mortars, cement. — A cement composition for making building blocks, tiles, statues, &c. comprises a mixture of Portland cement and a pulverized mineral, other than asbestos, containing hydrated silicate of magnesia, such as chlorite and serpentine. Colouring matter, or metal dust or filings which when oxidized give a colour effect, may be added. Small pieces of metal, carborundum &c. may be included in the composition to increase its strength. Suitable proportions are equal parts of cement and mineral.

289,031. Hauser, M. April 28, 1926, [*Convention date*]. *Divided on* 270,300.

Refractory substances containing silicon or ferro-silicon and ceramic materials.—To produce ceramic articles resistant to acids and heat, powdered silicon or ferro-silicon is added to usual ceramic materials. The ferro-silicon may contain 90—95 per cent of silicon. The proportion of silicon or ferro-silicon may be up to 90 per cent of the mixture. When high percentages of silicon or ferro-silicon are used, the ceramic material contains easily fusible compounds such as materials containing borates or boracic acid.

289,415. Auer, L. April 26, 1927, [*Convention date*].

Asphalts. — In the treatment of substances containing unsaturated carbon compounds such as asphalts, with electrolytes to modify their physical properties and produce thermoplastic materials, a solution or colloidal solution of the electrolyte in an organic solvent is employed and the electrolytes consist of organic or inorganic acids, their salts or esters, metallic derivatives of organic compounds, metal oxides or hydroxides or organic bases. The substance treated may be dissolved in an organic solvent or the treatment be effected in the presence of such a solvent. From the product the solvent may be removed as by centrifuging, distilling, or washing, and excess of the electrolyte by washing. A sulphurizing treatment, with for instance sulphur or sulphur chloride, may be effected simultaneously with, or may follow, the electrolyte treatment, and accelerators such as hexamethylenetetramine, aniline, or diphenylguanidine may then be added. The products may be emulsified in an aqueous medium, preferably in presence of an emulsifying-agent such as ammonium linoleate, soaps, sulphonated fatty-acid salts, or compounds of organic bases, and in presence or absence of protective colloids. Varnishes, linoleums, rubbers, and soaps may be prepared from the products, with the addition, if necessary, of filling materials, pigments, or solvents. In an example, asphalt is treated with a solution in benzene of trichloracetic acid. Specifications 14281/10, [*Class* 2 (iii), Dyes &c.]; 153,942; 259,431, 261,406, [both in *Class* 2 (iii), Dyes &c.]; and 287,943 are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) refers also to the use of sulphonated fatty acids, organic bases, albuminous compounds, sulphonated alkylated aromatic hydrocarbons and saponin as emulsifying-agents, and to the employment of the product in the manufacture of candles. This subject-matter does not appear in the Specification as accepted.

289,556. Dehn, F. B., (*Schuster, M. B.*). Jan. 31, 1927.

Asphalts. — Hydrocarbon oils such as black asphalt, crude oil, kerosine, gas oil, lubricating oil &c. are cracked in presence of a colloidal substance such as bentonite, hydrated lime &c. dispersed in the oil. A distillation residue resembling natural asphalt in its content of mineral matter is obtained.

289,560. Withers, J. S., (*Vitrefrax Co.*). Feb. 1, 1927.

Refractory substances.—Mullite, containing 72 per cent or three molecules Al_2O_3 to 28 per cent or two molecules SiO_2, is prepared by the treatment in an electric furnace of a mixture of minerals high in aluminium-silicate content, such as cyanite, andalusite, sillimanite, or pyrophyllite, with an amount of approximately pure alumina necessary to bring the ratio of alumina to silica to the value indicated above. The added alumina may be obtained from bauxite, diaspore or alunite, or may be natural corundum containing fluxes (iron oxide, titania, magnesia lime or alkalies) less than 2 per cent of the total. Silica may be as high as 6 per cent. Where the product is to be used as a refractory lining to resist glasses or enamels of an essentially alkaline silicate character, the porosity may be reduced by the employment of alumina containing potassium oxide and phosphorus pentoxide, such as the residue left as a bye-product in the recovery of potash from alunite. For the manufacture of general refractory ware, such as firebrick for boiler linings, alumina admixed with these oxides is to be avoided. The ingredients are ground to a fineness of at least 40 mesh and roughly briquetted, or agglomerated into small nodules with thin molasses-water. A three-phase furnace is employed, the pot being one-third filled, broken coke piled on the charge, and the arc struck. Additional charge is fed around the arc, the electrodes being lowered quickly in the pool as it forms. The rapid formation of a deep pool is essential, the elimination of iron and ferro-silicon depending on the fluidity.

289,920. Nastukoff, A. M. Jan. 28, 1927.

Bituminous &c. compositions.—Petroleum oils are refined to produce lubricating oils by treating with formaldehyde in presence of strong sulphuric acid to form a hardened condensation product, heating, diluting with water, and treating with steam to remove light volatile hydrocarbons, filtering, neutralizing, and washing the hardened product, and extracting the adsorbed saturated heavy hydrocarbons therefrom by cold solvents. Or illuminating oils are obtained by subjecting the filtered condensation product at atmospheric pressure to a temperature e.g. 350° C. sufficient to crack the adsorbed saturated oil without decomposing the condensation product itself. Or transformer oils may be freed from the unsaturated hydrocarbons forming the solid condensation product and from olefinic hydrocarbons forming liquid condensation products of high boiling point with the formaldehyde by filtering the oil to remove the hardened condensation product and redistilling to separate from the liquid products. The solid condensation product has high dielectric properties. It may be compressed to form hard insulating articles, mixed with mineral oil or pitch and then cast, or as powder added to the insulating materials sold under the registered Trade Marks "Bakelite" and "Carbolite." In an example, 1 litre of crude oil is mixed with 4 litres of 1.86 sulphuric acid and 2 litres of 40 per cent solution of formaldehyde are added gradually with vigorous shaking. The mixture is heated for an hour at 100° C., any light hydrocarbons evolved being collected. The solid condensation product is diluted with water and treated with steam at atmospheric or slightly higher pressure for an hour or more to remove all light saturated hydrocarbons, filtered, washed, neutralized, and dried at 100—105° C. The adsorbed hydrocarbons, including solid paraffin, are then extracted by cold benzene or petroleum ether; tarry, asphaltic and sulphur bodies remain.

290,035. Bury, E., and Walker, F. W. March 3, 1927.

Materials for cements.—A residue which may be ground and used as a hydraulic cement is obtained when a mixture of zinc waste, coke, and lime or limestone is heated for recovery of its zinc and lead contents. A mixture of 10 parts of zinc waste, 2 of refuse coke dust carrying 2 per cent of sulphur, 3 of lime, and 2 of coal may be used, or according to the Provisional Specification, 5 parts of zinc waste, 1 of coke dust, and 10 of limestone.

290,309. White, G. N., Beckett, E. G., Thomas, J., and Scottish Dyes, Ltd. Nov. 10, 1926.

Cements, Portland and Roman, treating after manufacture; concretes and mortars, cement; stone, colouring; cement and concrete surfaces, hardening and preserving.—To prevent lime incrustation on cement and concrete and to improve the setting properties, commercial ammonium carbonate is added in such quantities that the amount available for combination with the lime is equal to at least 5 per cent of the weight of the cement. In the case of cement washes the amount may be from 25 per cent to 50 per cent. In the case of concretes, the ammonium carbonate may be mixed in the dry state with the dry cement, with the aggregate or with both; it may be added to the gauging water; or a saturated solution of ammonium carbonate may be applied to the surface of the concrete after it has set. The cement may be coloured by the use of vat dyestuffs in the form of paste, for instance Caledon jade green, Caledon brilliant purple RR, Caledon red BN, Caledon blue RC, or by mineral colours, such as iron oxide and chrome green. In an example, 100 parts of cement and 300 parts of sand are gauged with 20 parts of water, and 10 parts of a saturated solution of ammonium carbonate are added. In another example a slurry for application to a wet concrete surface comprises two parts of cement and 50 parts of water. As soon as the wash has been applied the whole is sprayed with a saturated solution of ammonium carbonate. Specification 277,389 is referred to.

290,323. Jones, F. W. Vallé-. Jan. 10, 1927.

Compositions containing bituminous emulsions.—An aggregate such as broken stone, slag, or granite is heated and cleansed by means of steam, and is then coated with an emulsion or colloidal mixture of a bituminous substance.

290,327. Arnot, R. Jan. 15, 1927. *Samples furnished.*

Compositions containing resinous materials.—Resinous products are obtained by condensing an aldehyde with at least one organic compound containing an NH_2 group, of which one or both hydrogen atoms may be substituted, and with at least one other organic compound which is either an organic acid or a salt thereof, a phenol, or a naphthol, none of the reagents constituting less than 5 per cent of the total weight of reagents taken. In an example, a heated mixture of colophony and aniline is treated with formaldehyde.

290,331. Schmid, H. Feb. 7. 1927.

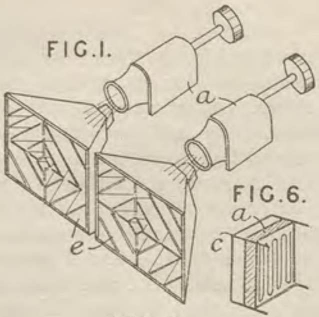


FIG.1. FIG.6.


FIG.8.

Stone, preserving. — Stonework, wood, metal, &c., is preserved by painting or spraying with a wax coating, e.g. beeswax, which is then burnt in by a blow-lamp or electric grid &c., the wax being first heated (100° C.—200° C.) and then quenched in a freezing mixture several times to raise its melting point, mixing the molten wax with a colouring substance, solidifying and grinding the mixture. The blow-lamp *a* has a number of nozzles each with a funnel with diverging lamellae *e* to distribute the heat evenly. Other methods of heating are by concave mirrors to reflect heat from a source of heat, or by electric flat wire grates *a* shown coupled together in treating a statue, Fig. 8. The grates *a* have handles *c* which may act as a paint pot retainer. Oil colour may subsequently be applied over the burnt-in wax and then burnt in also. The wax may also be applied over paints containing lime, casein, or silicate as binding agent. When moist or exposed stonework is to be treated it may be drilled, the holes being filled with perforated tubes of moisture attracting substances or by hot air or hot wires &c., the entrance of the holes being closed by sieves or porous fillings, portions of the stonework adjacent such holes being left uncovered to let moisture escape. Finally, a protecting layer of kieselguhr or other acid proof material may be applied.

290,717. King, G., and **Threlfall, R.** Feb. 16, 1927.

Stone, preserving.—Colloidal solutions of silica for coating or impregnating stone, brick, or other materials are obtained by adding water, not in excess, to a solution of an alkyl silicic acid ester in a solvent capable of carrying water in solution or suspension. Preferably the amount of water used is insufficient to decompose the whole of the ester. Pigments may be added to the solution, preferably in admixture with solvents, e.g. cyclohexanol, which do not interfere with the hydrolysis of the ester. Setting may be retarded by the addition of non-volatile or slowly volatile solvents such as carbon tetrachloride, turpentine, bromnaphthalene, fatty oils, shellac, synthetic resins, essential oils, &c. The solution may be added to pyroxylin lacquers as a stiffening or fireproofing agent. The Specification contains many examples of procedure, of which the following is typical: 315 litres of a mixture of esters obtained by adding 1.3—1.5 volumes of alcohol to 1 volume of silicon tetrachloride are added gradually with stirring to 135 litres of alcohol. The mixture is stirred until homogeneous and a further 250 litres of the mixture of esters is added. Specification 203,042, [*Class* 140, Waterproof &c. fabrics], is referred to.

290,725. Brown, A. C. Feb. 17. 1927.

Compositions containing bituminous and siliceous, calcareous, and like materials.—Relates to methods of making bituminous compositions for roads of the kind in which cold mineral aggregate is first moistened with a liquefier and then coated with heat liquefied bitumen, after which lime and grit are added. According to the invention, the liquefier comprises a weak solution of high penetration bitumen and the bitumen for coating the aggregate may have a penetration of beween 65 and 80. In an example, aggregate of Guernsey granite is moistened with 0.3 per cent by weight of kerosene containing in solution 1 part in 400 of 200 penetration bitumen. After this coating, 5 per cent of bitumen of 75 penetration, comprising a mixture of one part of 200 penetration bitumen and nine parts of 65 penetration bitumen, heated to 240° F., is added. The heated bitumen is agitated before placing it on the aggregate. The road is laid on a suitable foundation in two coatings. The base coat contains aggregate of sizes from 1½ inches to ⅝ to an inch, and is laid to a thickness of 1½ inches. The top coat comprises aggregate of sizes from ⅝ to ⅛ of an inch and is laid to a thickness of half an inch.

290,801. Noack, E. April 19, 1927.

Compositions containing bituminous and organic condensation products.—Gramophone records or other moulded articles are made from phenolic artificial resins, or cellulose ethers or esters, or compositions containing these substances, by grinding to a fine powder pressed blocks of the compound (or previously moulded articles such as used gramophone records), removing all traces of solvent and moisture, adding asphalt as a binder, rolling into sheets or strips by means of heated rollers, and finally moulding under heat and pressure. In one method of carrying out the invention, a mixture of acetyl cellulose, acetone, triphenyl phosphate. sulphanilide, triacetin, ethyl lactate, and a filling material such as heavy spar and lamp black, the proportions of which are specified, is made. After evaporating the solvent, the material is pressed into sheets or blocks, finely ground, and the last traces of the liquid constituents removed preferably in vacuo. A certain percentage of American or other asphalt is then mixed in, without solvent, and the mass, after being rolled into sheets, is pressed to form sound records.

290,886. Fuery, G. T., (*Australian Bituminous Compounds, Ltd.*). Sept. 20, 1927.

Compositions containing bituminous materials.—A composition suitable as a substitute for bitumen in road making and paving compositions, electric insulating materials, damp courses for buildings &c., comprises oil shale and tar. Suitable proportions are oil shale 2 parts and tar 3 parts. The composition may be mixed with filling materials such as ironstone, hæmatite, carborundum, coal, lignite, coke, slag, oil shale residues, shale coke, infusorial earth, magnesite, limestone, lime, asbestos, cement, pumice stone, firestone, fireclay, metal filings, chopped rubber, residual oil bitumen, ground glass, silicate of soda, silicate of lime, potash, sawdust, cork, broken stone, sand, gravel, bauxite and baryta.

290,890. Marks, E. C. R., (*International Cement Corporation*). Sept. 26, 1927.

Portland cement, processes for making. — A cement rich in combined lime is made by adding lime to normal cement clinker, preferably ground, and subjecting the mixture to one or more burning operations, the resulting clinker being then ground. Not more lime is added than is sufficient to saturate the silica, alumina and iron.

291,276. Raschig, F., (*trading as* Raschig, Dr. F.). Oct. 20, 1927. *No Patent granted (Sealing fee not paid).*

Compositions containing bituminous materials and clay.—A road-making composition consists of clay, water and a bituminous substance united to form a hard mass which is emulsifiable with water. In an example, a composition comprises 200 kg. of fat clay, 200 kg. of water and 600 kg. of coal tar pitch. The clay and water are mixed together and heated to 40°—50° C., and the molten pitch is added with agitation. The resulting composition turns to a hard solid material on cooling. In another example, petroleum pitch is the bituminous substance, and filling material such as sharp sand is added.

291,524. Curtis, T. S. March 3, 1927.

Refractory substances.—A ceramic body is composed of fibrous mullite crystals and a binder, the crystals being the product of firing a natural alumina silica bearing substance such as kyanite supplemented with additional alumina in splintery form. In the preferred method, kyanite of the fibrous variety is ground by known processes to a powder in which the maximum of long fibres is developed, the natural mineral being purified and concentrated up to a 90 to 95 per cent kyanite content. To this is added artificial corundum preferably obtained as a by-product when alunite is roasted in the manufacture of potassium sulphate, which by-product contains approximately 88 per cent of alumina, 7 per cent silica and 4 per cent potash. Magnesium oxide is added to this by-product until the total alkaline earth content is equal to one-half of the total alkali metal content, after which the mixture is melted in an electric furnace and allowed to cool slowly. The ingots thus produced are sorted, crushed and ground, passed over a magnetic separator and then re-ground in a pebble mill. Finally weighed quantities of the kyanite and corundum products are mixed and re-ground with water in a pebble mill, after delivery from which the powdered mixture is ready for use as a material for producing pottery by any of the well-known processes.

291,784. Barber Asphalt Co., (Assignees of *McRae, F. W.*). June 10, 1927, [*Convention date*].

Cement and concrete surfaces, hardening and preserving.—Concrete or other cementitious material, after being laid, is left until the surface water has dried off, and is then sprayed or otherwise surfaced with an adherent coating of waterproofing material in the form of a paint to prevent the evaporation of water. A suitable waterproof material is a solution in petroleum distillate of a mixture of asphalt and Gilsonite from which the light oils have been evaporated by heating. In the case of a concrete pavement, this material acts as anti-glare coating.

291,858. Anderson & Son, Ltd., D., and **Child, R. O.** Aug. 16, 1927.

Asphalts, preparation of. — Bitumen, bituminous preparations &c. are rendered suitable for use as electric insulating purposes, by treating them with a colloid such as casein, glue, starch &c. in a partially coagulated condition and then subjecting the mixture to centrifugal action to remove suspended matter. Where necessary, heat may be applied to the material, the mixture or to the centrifugal separator. Solvents, such as naphtha or carbon disulphide, may also be employed to reduce the material or the mixture under treatment to a viscosity suitable for centrifugal treatment. Casein may be partially coagulated by sulphonated oil or other slightly acid agent.

291,960. Pardoe, H., Pardoe, T., and **Hill, H.** June 14, 1927.

Stone, artificial.—Bricks, tiles, &c. are made from pulverized slate or shale waste mixed with from $\frac{1}{2}$ to 3 per cent of ferric oxide ore or of a siliceous iron oxide ore. The materials are mixed with sufficient water to cause them to bind when pressed and the composition is then moulded and fired at about 1000° C. The Provisional Specification also states that glass makers' waste, sand or slag may be used in combination with iron ore.

291,988. Marks, E. C. R., *(International Precipitation Co.).* Aug. 15, 1927.

Cements, Portland; concretes, cement.—Portland or other hydraulic cements are rendered waterproof by adding to them during the grinding or by mixing therewith in a finely divided state after the grinding a naturally occurring earthy material, such as certain shales or clays or diatomaceous earth, containing at least 5 per cent of oil-soluble bituminous or oily material, this percentage, if initially below the desired value, being increased by adding during the grinding or mixing additional oily or bituminous matter such as hydrocarbon oils, tar, or asphalt. In selecting the shale or similar material a large proportion of the hydrocarbon and bituminous content thereof should be in oil-soluble form, while the ultimate waterproofing material or mixture, which is added in the proportion of 1 part to 10—20 parts of cement, should contain 10—50 per cent of oil-soluble oily or bituminous matter. The selected material may contain a proportion of amorphous silica, while other diluents or hygroscopic materials such as the chlorides fluorides, sulphates, silicates, or fluosilicates of magnesium, calcium or zinc may be added.

292,334. Wirth, J. K. May 26, 1927.

Phenol-aldehyde compositions. — Acid-proof structures are constructed with the aid of phenolaldehyde resin mixtures which are hardened by treatment with acid in the cold or with moderate heat. The mixtures may be used either for cementing or jointing acid-proof slabs, or for coating the surface of the apparatus, or the apparatus may be constructed entirely of the mixture with or without a metal or other reinforcement. An uncondensed mixture of phenolaldehyde may be used instead of the resin itself. Inert materials such as quartz, asbestos, kieselguhr, talc may be mixed with the resin, or fibres may be impregnated with it. The hardening may be effected by means of an acid salt or in some cases by means of acid which has already permeated the structure to be lined. When the composition is used for lining apparatus the latter is first coated with an acid-proof covering, e.g. of rubber. According to a typical example, 30 parts of liquid phenolaldehyde resin and 17 parts of hardened resin are mixed with 6 parts of 15 per cent aqueous hydrochloric acid, the surplus water is poured off and the resulting mixture, which remains soft for 1—2 hours, is used as a cement. It sets hard in 24 hours.

292,492. Gensbaur, M. June 20, 1927, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

Cements, Portland and Roman, processes for making.—Raw cement materials are ground or mixed with fuel and pressed into lumps which are fed into a rotary kiln.

292,529. Deutsche Gasgluhlicht - Auer-Ges. June 21, 1927, [*Convention date*].

Refractory substances containing compounds of beryllium, thorium, and zirconium. — In the manufacture of refractory substances from highly-refractory oxides such as those of zirconium, thorium, beryllium, &c., the oxides are rendered plastic for moulding or casting by the addition of up to 5 per cent of the oxide of magnesium, together with a small quantity of a solution of a salt of the oxides to be rendered plastic or of the added oxide, the quantity of the salt solution being about 10 per cent of the chemical equivalent of the added oxide. Part of the salt solution may be replaced by free acid. Specification 245,101 is referred to.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the use of alumina in place of or in addition to magnesia. This subject-matter does not appear in the Specification as accepted.

292,636. Petroff, G. Feb. 18, 1927.

Compositions containing phenol-aldehyde condensation products. — Articles and masses obtained from phenol-aldehyde condensation products (alone or mixed with fillers) in the infusible and insoluble state are coloured and/or protected against atmospheric influences and the action of light by treating them with solutions of colouring agents and/or of phenolic substances in alcohols, aldehydes, lower ketones, volatile organic acids, or mixtures thereof. Suitable phenolic substances are hydroquinone, pyrogallol, gallic acid, tannin, and aminophenols. It is preferred to include in the treating solution a stable resin, such as shellac, or a cellulose ether, and when colouring is effected with a water-soluble colouring matter it is preferred also to fix the colour by subsequent boiling in aqueous solutions of suitable fixing agents, such as bichromates, alum, ferric or copper salts, Glauber's salt, or tannin. In one example, an article made from a phenol-aldehyde condensation product is kept at ordinary temperature for 20 hours in an alcoholic solution of Diamond Green B, and in another example, a hot alcoholic solution of the same dyestuff and shellac is used. In a further example, the article is boiled in an alcoholic solution of Fast Brown Ont. and hydroquinone.

292,637. Petroff, G. Feb. 18, 1927. *Addition to* 292,636.

Compositions containing phenol-aldehyde condensation products.—The process of the parent Specification for colouring articles and masses, obtained from phenol-aldehyde condensation products, with solutions of colouring agents in certain organic solvents is modified in that aqueous solutions of organic colouring matters, with or without organic solvents, are used, the articles &c. being pretreated, or treated at the same time, with aqueous solutions of phenol (or its homologues), of sulphonic acids, or of sulphonated oils, with or without organic solvents. Suitable sulphonic acids are those of high molecular weight, such as octohydroanthracene sulphonic acid and isopropylnaphthalene sulphonic acid. The article may be treated subsequently with a fixing agent such as bichromate, alum, aluminium acetate, copper or iron sulphate, or tannin, and an additional fixing with formaldehyde may be effected also. In one example, a sheet of phenol-aldehyde condensation product is boiled in a dilute aqueous solution of phenol and sulphonated castor oil, and then in a dilute acetic acid solution of malachite green, the colour being fixed by further treatment with dilute bichromate solution. In another example, the treatment comprises heating in an aqueous solution containing malachite green, acetic acid, and phenol, followed by fixing with bichromate solution, with or without a further treatment with formaldehyde solution.

292,871. Hines, J. Jan. 20, 1928.

Compositions containing bituminous and siliceous, calcareous, and like materials.—Tar macadam in which the tar has been strengthened by an admixture of bitumen is treated with a colloidal emulsion of bitumen in water or other suitable liquid, to prevent premature hardening. In an example, a tar macadam in which approximately 20 per cent of the tar has been replaced by bitumen is sprayed with from 1 to 2 per cent of the weight of the aggregate with a bitumen emulsion, the bitumen content of which is about 50 per cent. The emulsion may be used for reconditioning a tar and bitumen macadam which has already set. In this case holes are drilled in the mass and these are filled with the emulsion. A quantity equal to 30 per cent of the original binder is usually sufficient.

292,912. Scovill Manufacturing Co., (Assignees of *Belfit, R. W.*). June 25, 1927, [*Convention date*].

Compositions containing organic condensation products.—The invention relates to compositions of matter comprising a condensation product of a compound having a plurality of nitrogen atoms bonded to a carbon atom, at least one of which is an amino-nitrogen, and a hydroxy-aromatic acid, or a derivative containing a hydroxy aromatic group. Suitable nitrogen-containing compounds are urea, thio-urea, or their derivatives, such as benzoyl- or acetyl-carbamid, cyanamid, guanidine, or their active derivatives &c., and suitable hydroxy-aromatic acids or derivatives include the following substances:—salicyclic acid, acetyl salicyclic acid, salicylamide, the salicylates of ammonium, strontium, or magnesium, gallic acid, hydro-naphthoic acids, and hydroxy-benzoic acids. Such additions preferably comprise at least 15 per cent of the nitrogen body. The compositions, produced in the form of solutions, provide improved lacquers. Thus urea may be condensed with formaldehyde or its polymers in aqueous solution, and adding thereto the resistivity agent such as salicyclic acid dissolved in an organic solvent mixture comprising a low boiling solvent such as ethyl alcohol, a medium boiling solvent such as butyl alcohol, and a high boiling solvent such as ethyl lactate. The solvents may be added to the urea and formaldehyde condensation product solution and the hydroxy-aromatic-acid &c. then added, or the acid may be present before condensation, and the solvents added afterwards. Other organic solvents such as normal- or iso-propyl alcohol, acetone, ethylene glycol monoethyl ether, isobutyl alcohol, benzene, butyl acetate, alcohol, &c. Plasticizers such as castor oil, oleic acid, mastic, natural resins &c. may be incorporated in the lacquers which are hardened after application by heat. The lacquers may be compounded with cellulose lacquers such as pyroxylin lacquers, and natural resins &c. such as kauri, copal, sandarac, guaiac, dammar, camphor, elemis, rosin, ester gum &c. dissolved in a suitable solvent may be added. Pigments, organic colours, fillers, and waxes may be added. The compositions may be used as plastics by admixture with suitable fillers such as wood pulp, asbestos, cotton, &c., and moulding in a heated press. The solvents may be largely evaporated before moulding, or they may be separated from the condensation products, the salicylic acid or its equivalent, fillers and pigments being added to the dried product. The materials comprising cellulose derivatives, resins, and the other additive substances may also be used for plastics. A potentially reactive phenolic condensation product may be mixed with the urea-formaldehyde-salicylic acid product and the mixture hardened under heat and pressure. Examples with proportions are given. The lacquers may be used for impregnating fibrous materials, cloth, paper, &c., and these may be consolidated into a laminated product, and the plastics may be rolled into plates &c., sawed, turned, &c.

The Specification as open to inspection under Sect. 91 (3) (a) describes the use of benzoic, phthalic and anthranilic acids, and aliphatic dibasic acids, such as succinic and oxalic acids as suitable additions in place of the hydroxy-aromatic acid or derivatives referred to above, and also the use of petroleum, coal tar hydrocarbons, terpenes and hydrocarbons chlorides as solvents. This subject-matter does not appear in the Specification as accepted.

292,925. Tetzner, A. June 24, 1927, [*Convention date*].

Concretes, cement.—Artificial stone is made by grinding clay and sand (6 parts each) to a meal-like mass and adding cement (1 part) and water if necessary to obtain a moist mass.

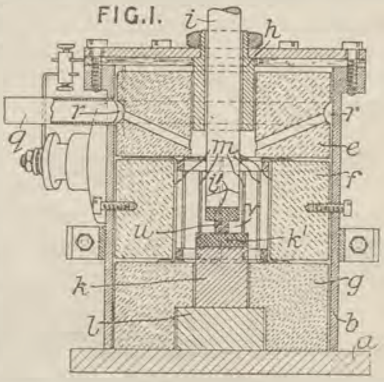
292,958. Deutsche Gold-und Silber-Scheideanstalt vorm. Roessler. June 27, 1927, [*Convention date*].

Refractory substances containing magnesia.—Refractory articles are manufactured from magnesia obtained by the action of air or steam on magnesium chloride, which occurs as a bye-product in the treatment of final potash lyes for example. Highly plastic masses are produced by simply soaking such magnesia with suitable liquids such as water or solutions of salts or acids, preferably with an addition of magnesium chloride or zirconium chloride. The masses are then fired in the usual way.

292,997. General Electric Co., Ltd., (Assignees of *Patent-Treuhand-Ges, für Elektrische Glühlampen*). June 29, 1927, [*Convention date*].

Refractory substances.—Solid bodies of high density are obtained from materials which do not yield such bodies by casting owing either to the refractory character of the material or the low density of the casting, by first sintering pulverized raw material, preferably compressed, to form a porous body and then subjecting such body to a high pressure between members which offer little resistance to lateral expansion, the body being heated during or immediately before compression to a temperature above a red heat but below the temperature at which a previously-compressed body attains a density not less than 85 per cent of that obtained by fusion. Heat treatment to equalize internal strain may be applied to the products. The following examples are given:—(1) Medium grain tungsten powder is subjected to a pressure of about 1,000 kg./cm.^{2} and sintered at a temperature of not more than 2,400° C.; the sintered body is subjected to a pressure of about 15,000 kg./cm.^{2} between jaws in an atmosphere of reducing or inert gas at a temperature of 1,300° C.; (2) calcium fluoride is pressed at 800 kg.-/cm.^{2} and sintered at 900° C., the resulting mass being compressed at a temperature of 1,000° C. and a pressure of 1,500 gk./cm.^{2}. A press for carrying out the process comprises a furnace *b* lined with annular blocks *e*, *f*, *g* of zirconium oxide and fitted with tungsten plungers *i*, *k* surrounded by a heating-coil *m*. The plungers *i*, *k* are furnished with jaw portions i^1, k^1 of a hard metal alloy containing more than 50 per cent of tungsten carbide, as described in Specification 213,524, [*Class* 1 (ii), Inorganic compounds, other than &c.]. The plunger *i* passes through a bush *h*. A base *a* supports the furnace *b* and also the plunger *k* through a block *l*. Reducing or inert gas is passed into the furnace through a tube *q* and passages *r*. To prevent welding of the body *u* to the jaws i^1, k^1 they are covered by protective layers of paper &c. *v*.

FIG.1.



293,035. Pontoppidan, C. June 30, 1927, [*Convention date*].

Cements, Portland and Roman, materials and compositions for.—An hydraulic cement clinker is composed to have an hydraulic modulus, i.e. ratio of basic to acidic materials, of not less than 2.2 and a silica modulus, i.e. ratio of silica to alumina and ferric oxide, of less than 3.0. The raw materials are ground to a high degree of fineness, such that 98—99 per cent passes a 200 mesh sieve. The clinker is ground to any desired fineness, preferably, for rapid hardening, to a high degree of fineness. The resulting cement may be mixed with other materials such as impure gypsum, forms of silicic acid, puzzolano, trass, blast furnace or other slag, limestone, clay, and lime.

293,135. Reynard, O., and Tapping, F. F. April 4, 1927.

Compositions containing bituminous materials.—A fuel binder is made from sulphite cellulose waste liquor and bituminous material such as coal tar pitch, asphaltic pitch or natural bitumen by neutralizing the concentrated liquor with caustic soda or other alkali and forming a paste with very finely divided coal, peat, lignite or the like, the paste being incorporated under pressure at a temperature above 100° C. with the molten pitch or bitumen. Alternatively the liquor may be emulsified wih crude asphaltic petroleum, heavy fuel oil, or tar oils and the emulsion incorporated in the bitumen. The pitch or asphaltic residue may be fluxed with tar oil, creosote, naphthalene or anthracene oil or with crude fuel oil respectively and a combined asphalt-pitch binder may be prepared by incorporating the two with an emulsion containing both petroleum and aromatic constituents. Thus sulphite liquor may be emulsified with its own weight of heavy fuel oil and the emulsion used to emulsify half its weight of gasworks tar oil. The resulting emulsion is incorporated under heat and pressure with twice its weight of coal tar pitch and further blended with molten bitumen in any proportion. Specification 293,136, [*Class* 50, Fuel, Manufacture of], is referred to.

293,578. Kelly, T. D. July 29, 1927.

Compositions containing oils &c.—Coal, lignite, shale, peat, or like carbonaceous material is heated at 70°—300° C. with an alkaline solution of sodium, potassium, or ammonium oleate, and aluminium sulphate is added in order to solidify the oleate. The solid material is separated and mixed with solidified, oxidized, or polymerized oils or the like for making building blocks, tiles, tyres, footwear or other resilient material.

293,830. Berger, O. H. July 13, 1927, [*Convention date*]. *Addition to* 257,114.

Bituminous compositions. — The " cold-lay " paving composition of the parent Specification, comprising mineral aggregate, hard asphalt and a fluxing oil containing a considerable percentage of light volatiles, is modified by adding water or fresh oil, i.e. oil conaining a large percentage of light oil, to the mixed composition and mixing until a light brown colour is obtained. The amount of water or oil necessary is about 3 to 5 per cent.

293,872. Kappeler, H. July 14, 1927, [*Convention date*]. *Samples furnished.*

Compositions containing organic condensation products. — Black compositions resembling ebonite are produced by condensing furfurol with urea. The furfurol may be mixed with other aldehydes and the urea with other amino compounds; furfuramide or derivatives and condensation products of urea may also be used. Colouring matters, filling materials and softening agents may be added, e.g. mineral pigments, organic dyestuffs, sawdust, cork powder, leather powder, heavy spar, asbestos, glycerine, camphor, naphthalene, ketones, phenols, amines or their condensation products with, for instance, formaldehyde. The compositions may be after-treated with an impregnating agent such as linseed oil or furfurol.

294,111. Goffart, E. July 16, 1927, [*Convention date*]. *No Patent granted (Sealing fee not paid).*

Cements, Portland and Roman; concretes and mortars, cement.—A slow setting cement having high initial strength is formed by increasing the alumina content of Portland cement and adding a protective colloid such as albumen, casein, gelatine, gum, algae or starch. The alumina content may be increased by adding bauxite to the raw materials or by adding calcic aluminate to the fired materials during or after grinding. The colloid may be added dry during or after grinding, or may be added to the gauging water. In an example, a cement comprises 1000 parts of Portland cement, 200 parts of calcic aluminate and 4 to 8 parts of casein. These are mixed in the dry state and gauged with water.

294,175. Giller, H. L. T., (Assignee of *Ohrt, P.*). July 19, 1927, [*Convention date*].

Slags, treatment of.—Relates to processes in which molten slags are converted into porous masses by being poured into water, and consists in distributing the molten slag into separate containers, the water in which is evaporated by the slag. The separate containers may be on a moving wheel or endless band, or may be fixed. As shown, a number of containers *a* are arranged on the periphery of a wheel mounted on an horizontal axis *c*. The containers move in succession under a water supply pipe *d*, and a slag trough *e* so that each container receives first a predetermined quantity of water and then the molten slag which, by the steam generated, is converted into a highly porous mass.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also treatment of the slag with a stream of air, granulation of slag in the separate containers, and a construction of container to prevent water from dripping on to the discharged material. If granulation is to be obtained, the water is supplied to the containers simultaneously with or after the slag. To prevent any water which remains in the containers from falling on to the discharged material, the containers may be provided at the dipping edge with a lateral outlet spout *h*, Fig. 4 (*Cancelled*), for water. This subject-matter does not appear in the Specification as accepted.

FIG. 4. (*Cancelled*)

FIG. 1.

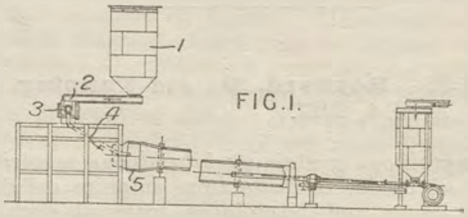
294,179. Soc. Anon. des Manufactures des Glaces et Produits Chimiques de St.-Gobain, Chauny, et Cirey. July 19, 1927, [*Convention date*].

Refractory substances containing bauxite.—In the manufacture of refractory products from bauxite, the alumina is caused to crystallize by the addition of fluorides or fluosilicates preferably of alkalis or alkaline earths which act as catalysts. Raw bauxite intimately mixed with 0.5 to 2 per cent of fluoride or fluosilicate is calcined and ground, and then mixed in a moistened state with raw materials such as bauxite or refractory clay and an equivalent quantity of fluoride or fluosilicate. The whole is then moulded and burnt to give the finished product.

294,194. Gensbaur, M. July 20, 1927, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*]. *Addition to* 292,492.

Cements, Portland and Roman, processes and apparatus for making. — Raw cement powder, either alone or mixed with fuel, is moulded into pieces, bricks or cords and is burnt in a rotary kiln. The kiln preferably has an annular enlargement at the inlet, this enlargement forming a burning pocket in which the material is temporarily retained. As shown, raw cement powder, with or without fuel and moistened or mixed with a binding medium, is fed from a bunker 1 through a conveyer 2 to a press 3. This press discharges the moulded material into a tube 4 which passes to the enlarged inlet 5 of the kiln. If the material is in cord form, it breaks off, or is cut off, when it projects a certain distance from the end of the tube. The process is also applicable for the roasting, burning, agglomerating, fritting &c. of ores and mixtures.

FIG. 1.



294,256. International General Electric Co., (Assignees of *Allgemeine Elektricitäts-Ges.*). July 21, 1927, [*Convention date*].

Compositions containing mica or asbestos and a glassy flux.—The insulating body of a plug coupling for heating-apparatus is made of a mixture of glass-forming substance and finely divided mica or asbestos, the material being that described in Specification 152,780.

According to the Specification as open to inspection under Sect. 91 (3) (a) the composition employed is that known under the designation "Micalex." This statement does not appear in the Specification as accepted.

294,474. I. G. Farbenindustrie Akt.-Ges. July 23, 1927, [*Convention date*].

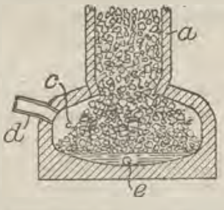
Compositions containing polymerized vinyl compounds.—Masses resembling rubber are obtained by polymerizing vinyl compounds such as vinyl esters of organic acids or vinyl ethers and incorporating nitrogenous organic compounds which are solid at room temperature such as proteids or their degradation products such as peptones, peptides, diketo-piperazines, and amino acids, and other nitrogenous compounds preferably of high molecular weight, or aromatic hydrocarbons which are solid at room temperature such as naphthalene. Mixtures of both may also be used. The polymerization is effected by heating, chemically active radiation or other known means and in the presence or absence of accelerators. It is stated that benzoyl peroxide and organic acid anhydrides in conjunction with oxygen or agents yielding oxygen have already been used as accelerators of the polymerization of vinyl compounds. The products may be vulcanized in the usual way with or without accelerators, and fillers and plastifiers may be added. In the examples, vinyl acetate is emulsified with a casein solution and treated with radiation from a mercury vapour lamp; albumen is suspended in vinyl acetate and heated with a small quantity of benzoyl peroxide, with shaking or stirring, an elastic film or compact mass being obtained, or the reaction mixture may be poured in a viscous state upon a horizontal plate and the polymerization completed by radiation; glycocoll is suspended in vinyl acetate and benzoyl peroxide, and treated as in the preceding example; naphthalene is dissolved in vinyl acetate and benzoyl peroxide and treated as in the preceding example; and naphthalene is added to a solution of polymerized vinyl acetate in benzene and the solvent is distilled off.

The Specification as open to inspection under Sect. 91 (3) (a) states that vinyl esters of inorganic acids may be used as starting materials. This subject-matter does not appear in the Specification as accepted.

294,552. I. G. Farbenindustrie Akt.-Ges. July 25, 1927, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

Refractory substances.—Ceramic bodies of high thermal conductivity for lining vessels are made with a high proportion of silicon or silicon alloy such as ferro-silicon. In examples, (a) 95 parts of finely ground silicon is mixed with 5 parts of milk of lime and burnt, (b) a mixture of 50 parts of ferrous silicon, 40 parts of a clayey mass, 5 parts of elspar and 5 parts of crylolite is burnt in known manner. By a proper choice of the binding and fluxing materials the product is obtained acid-proof, and by burning above 1200° C. it is rendered alkali-proof.

294,838. Aktieselskapet Norsk Staal Elektrisk-Gas-Reduktion, and Edwin, E. Dec. 20, 1927.



Aluminous cement. — In a process of obtaining combustible gases by the passage of gases heated in an electric arc through carbonaceous material such as coke, the molten slag obtained may be used as "cement fondu" if bauxite, aluminium silicates, lime or limestone are added to the charge. The hot gases are fed through a pipe *d* against the surface *c* of the coke which descends from shaft *a* and the slag is tapped off through an outlet *e*.

295,267. British Mannesmann Tube Co., Ltd., and **Weiser, R. F.** April 5, 1927.

Bituminous compositions.—Hollow bodies such as pipes and tubes are lined centrifugally with a hot composition comprising natural asphalt or bitumen, including its normal mineral content, and a fluxing oil. A suitable composition comprises Trinidad native bitumen having a siliceous mineral content of 40 per cent mixed with 20 per cent of asphaltic oil.

295,292. Norton Co., (Assignees of *Saunders, L. E., Milligan, L. H., and Beecher, M. F.*). Aug. 8, 1927, [*Convention date*].

Artificial stone.—Grinding-wheels &c. are made from abrasive grains (crystalline alumina or silicon carbide) and a vitrified ceramic bond having the same coefficient of expansion as the grains at temperatures below the annealing range. A bond mixture suitable for alumina grains consists of oxides of silicon (55.0), aluminium (11.4), iron (4.3), magnesium (2.8), calcium (5.9), sodium (6.0), potassium (2.6), titanium (0.7), and boron (11.3). This differs from a known bond mixture, which is quoted, principally in the presence of boron oxide, in the greater proportion of sodium oxide, and in the less proportion of aluminium oxide. 1 lb. of grains and 1 oz. of this bond mixture are wetted, shaped, fired to about 1125° C. (which temperature is high enough to vitrify the bond, but not high enough to take much slag &c. out of the grains into the bond, or to cause swelling by evolution of gas, e.g. due to decomposition of ferric oxide), cooled rapidly to 800° C. (to prevent formation of crystals of feldspar &c.), and then annealed by cooling slowly to below the temperature (about 600° C.) at which the bond is solid.

295,335. Bakelite Ges. Aug. 9, 1927, [*Convention date*].

Compositions containing organic condensation products.—Lacquers and varnishes are prepared by dissolving resins in the B state (resitols) obtained from phenols and aliphatic aldehydes, at normal, reduced or increased pressure, at normal or raised temperature, in the following solvents:—cyclic ketones such as cyclo-hexanone, homologues of cyclic ketones, cyclic alcohols such as cyclo hexanol and their esters, homologues of cyclic alcohols such as methylcyclohexanol, furfurol, hydrogenated phenols and naphthalenes (except tetrahydronaphthalene), phenol esters, cyclohexanol acetate and mixtures of cyclohexanol acetate, phenol esters and hydrogenated phenols; or furfural, cyclohexanol or methyl-cyclohexanol with additions of linseed oil, poppy-seed oil, wood oil, stand oil, &c. Nonsolvent liquids such as bromobenzene, benzene hydrocarbons, chlorinated hydrocarbons, petrols, and tetrahydronaphthalene may be added to any of the solvents. Catalysts such as ammonia, organic bases, hexamethylene tetramine, substituted phenol such as nitro-phenols, nitro-cresols, phenylamino-cresol, picric acid, styphnic acid, picamide, trinitro-phenetol, picramic and isopicramic acids, in amounts of 0.3-5 per cent may be included in the lacquers. Colours and fillers such as kieselguhr, graphite, ultramarine, soot, pitch, sand, bronze powder, minium ochre, metal resinates and plasticizers such as cellulose esters, acetyl cellulose, chlorhydrins, &c. may be added to the lacquers. Fireproofing media such as ammonium carbonate or sulphate or magnesium chloride or sulphate may also be added to the lacquers. Various methods of obtaining B resin are described, and Specification 1921/08, [*Class* 95, Paints], is referred to in this connection. Finely ground C resin may be added to A resin and the latter converted to B resin whereby lacquers containing finely divided C resin are obtained. The lacquers are applied and the solvent evaporated by passing air or neutral gas at ordinary or raised temperatures over it. If it is desired to harden the lacquer, further heating optionally under pressure, is effected. The solutions may be used for impregnating under vacuum and pressure, for cements and with the addition of organic or inorganic fillers, for press mixtures, grinding discs &c.

The Specification as open to inspection under Sect. 91 (3) (a) describes also dissolving phenol-aldehyde B resins in any suitable solvents and states that solvents which do not dissolve B resins, such as benzene and alcohol may be used, if solution is effected under heat and pressure. This subject-matter does not appear in the Specification as accepted.

295,545. Glover, M. L. Jan. 17, 1928.

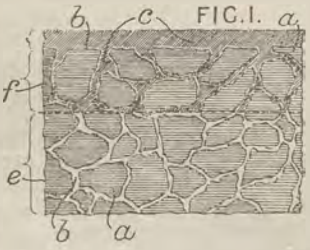


FIG. I.

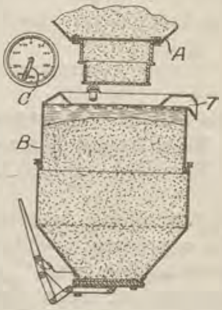
Concretes, cement.—A concrete mass for road or floor surfaces, including floors of reservoirs, foundations, roofs, &c., comprises an upper layer consisting of aggregate of various sizes and cement proportioned to form interstices which are filled partly with stone chippings, gravel or sand and partly with bitumen, tar or the like applied as an emulsion, and a lower layer of dense concrete some of the aggregate of which interlocks with the aggregate of the top layer. In an example the upper layer of a concrete road comprises 20 parts of broken stone of sizes from 1½ inches to ⅜ of an inch, 3 parts of sand, 1½ parts of cement and sufficient water; this is laid on a bed of unset dense concrete and is compressed by rolling until the air spaces are 20 per cent of the volume of the top layer; fine chippings, &c. are then brushed into the interstices and emulsified tar or bitumen is applied by spraying or grouting to fill the interstices and form a surface layer. In a modification the amount of cement mixed with the aggregate is such that the greater part of the cement settles to form a dense lower layer, the upper layer having interstices, which are filled with chippings &c. and bitumen &c. This is illustrated in Fig. 1 in which the lower layer *e* comprises stone *a*, and cement mortar *b* only, while the upper layer *f* comprises stone *a* mortar *b* and interstices filled with chippings and bituminous material *c*. Before applying the chippings and bitumen &c., sand may be brushed into the interstices to form a layer free from bitumen or tar.

295,687. Barrett Co., (Assignees of *Miller, S. P.*). Aug. 17, 1927, [*Convention date*]. *Drawings to Specification.*

Bituminous compositions.—A composite pitch composition is obtained by subjecting tar to distillation by direct contact with hot distillation gases to produce a high melting point hard pitch residue which while still hot is blended with tar to form a homogeneous mixture suitable for use as a liquid fuel, a creosoting composition, or a roofing composition.

295,894. Johnson, C. S. Jan. 9, 1928.

FIG. 3.



Concretes, cement. — A process for proportioning water and aggregate for concrete consists in combining aggregate having a variable moisture content with water until the sum of their weights at a given combined volume equals a predetermined amount. Apparatus shown for carrying out the process comprises a telescopic hopper B the volume of which can be adjusted connected to a weighing device having a dial C. In an example, for making a concrete containing 70 lbs. of water and 200 lbs. of dry sand having a specific gravity of 2.5, the volume of the hopper is adjusted until it is equal to 150 lbs. of water, the actual volume of the sand being equal to that of 80 lbs. of water; 70 lbs. of water is then introduced into the hopper and sand having an unknown water content is added from a bin A until the total weight is 270 lbs. The water in the sand displaces an equal amount of the water originally in the hopper, this surplus passing out through an overflow spout 7.

295,956. Edge, A. March 15, 1927.

Stone, colouring. — Stone chippings for paving hard tennis courts are coloured by heating the chippings and stone dust, and then impregnating them with a pigment mixture prepared by adding half a gallon of white spirit or turpentine substitute to each pound of a paste composed of linseed oil 144 parts by weight, dry colour preferably green 112 parts, and a corresponding aniline dye 1 part. Red pigment and red dye may be used. The heated stone is stirred in the pigment mixture, left for several days for the colour to penetrate, and is then dried.

296,361. I. G. Farbenindustrie Akt.-Ges. Feb. 28, 1927. *Divided on and addition to* 266,752.

Compositions containing organic condensation products.—Condensation products prepared from urea, thiourea, or their derivatives and formaldehyde may be admixed, not only with plasticizers, natural or artificial resins, and cellulose esters as in the case of the process of the parent Specification, but also with phenols, colophony, and protein-containing materials such as casein and yeast. Specifications 261,029 and 262,148, [both in *Class* 2 (iii), Dyes &c.], are referred to.

296,626. Morton, F. Jan. 28, 1928.

Bituminous compositions.—A coloured bituminous composition comprises coal tar pitch or blast furnace pitch having a twisting point between 40° and 65° C., an aggregate of small chippings of granite or other hard stone and a filler in the form of powder or sand constituting or containing a colouring material. Pure bitumen may be added to bring an inferior pitch to the required standard. Suitable proportions are 60 parts by weight of stone chips passing $\frac{1}{4}$ inch mesh, 10 parts of pitch and 30 parts of filler. The pitch is melted and added to the other materials which are also heated. Examples of fillers are red oxide of iron to produce a reddish shade and white limestone dust to produce a light grey shade. The composition is used for making tiles, slabs, blocks &c. and for floor and road surfaces.

297,416. I. G. Farbenindustrie Akt.-Ges. Sept. 21, 1927, [*Convention date*].

Cements.—The process described in Specification 285,055 for producing phosphorus, phosphoric acid and a slag having latent hydraulic properties is modified by forming the charge of a mixture of crude aluminium phosphate and crude calcium phosphate in such proportions that without further addition of mineral substances, a slag having a composition similar to blast furnace slag is obtained.

297,433. Ripper, K. Sept. 21, 1927, [*Convention date*].

Compositions containing organic condensation products. — Compositions which can be moulded by heat and/or pressure are obtained by reacting formaldehyde with protein such as casein and with urea or thiourea, or their derivatives. For example, casein may be added to a urea-formaldehyde condensation mixture, or urea or its derivatives, particularly thiourea, may be mixed with a casein paste which is then shaped and treated with formaldehyde, or a casein paste may be treated simultaneously with thiourea &c. and with a solid polymer of formaldehyde, the mixture being shaped by pressure, with or without heat. The reactions may be accelerated by the use of known catalysts and the compositions may include fibrous or other fillers, dyes, &c. Specifications 412/09, [*Class* 2 (iii), Dyes &c.]; 246,126, and 281,993 are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) describes the use of dicyandiamide instead of urea etc. It states also that the protein may be added to a urea-formaldehyde condensation product still containing free formaldehyde. This subject-matter does not appear in the Specification as accepted.

297,750. Schneble, K. Sept. 26, 1927, [*Convention date*].

Compositions containing cork, pumicestone, and kieselguhr. — A composition for covering floors consists of a mixture of paper fibres, granulated cork, pumicestone, kieselguhr, Portland cement, and water. The cork and pumice stone are preferably in equal proportions, about 40 parts of each to 20 parts of kieselguhr, with enough cement and water to bind and form a paste. For covering concrete floors, dry or wet cement is sprayed thereon, and the plastic mixture is laid and smoothed, and while still wet may be faced with the plastic material containing colour. For wood floors, the surface is first waterproofed with glue or other known material; dried, and again waterproofed; before the second waterproofing is dry, the cementitious plastic material is applied in a thin layer which, while wet, may be faced with one or two layers of sand and cement or other hardening medium. Colouring material may be added.

298,034. Simon, O., and **Küller, M.** Feb. 29, 1928.

Concretes and mortars, lime, magnesia, and cement; compositions containing plaster; cements, Portland and Roman, treating after manufacture.—A water-proofing paste for adding to mortars and plasters, or to the ingredients thereof, is made by acting on limestone, marly limestone, marly clay, a mixture of white limestone and white clay, or other lime-containing material with hydrochloric acid and then incorporating paraffin oil, or other light-coloured oil or fat with the product in the presence of heat. In an example, 100 parts of marly clay are treated with 12.5 parts of crude hydrochloric acid, and 15 parts of paraffin oil is added, the mixture being maintained hot until a stiff paste is formed. The oil or fat may be dissolved in organic solvents. The paste may be mixed with Portland cement, Keene's cement, magnesia cement or the like or to mortar already formed, or it may be added to the burnt ingredients during the grinding.

298,085. Groves, W. W., (*I. G. Farbenindustrie Akt.-Ges.*). Oct. 1, 1928. [*A Specification was laid open to inspection under Sect. 91 of the Acts, Oct. 1, 1928*].

Compositions containing synthetic resins. — Phenolformaldehyde condensation products containing carboxylic groups are produced by reacting a phenolformaldehyde resin with a halogen fatty acid or its salt or by reacting a phenoxyfatty acid with formaldehyde or a substance yielding formaldehyde. Hardened masses are produced by heating an ammonium or amine salt of the resin acid with or without a polyhydric alcohol. A filling-material such as paper-pulp, asbestos, sawdust, wood-pulp, infusorial earth, or powdered horn may be mixed with the aqueous solution of the ammonium or amine salt of the resin carboxylic acid, the mixture being pressed in a mould and hardened by heat, the products being suitable for electric insulation and for stiffening for hats and caps; or paper web may be impregnated with the aqueous solution, a number of such webs being superposed and formed into a mass by heating. The polyvalent alcohols mentioned are glycerine, glycol, mannitol, pentaerythritol, polyvinyl alcohol (made by saponification of polyvinyl acetate) and soluble carbohydrates. In the examples cresol-formaldehyde resin is dissolved in caustic soda and chloracetic acid is added, the reaction product being precipitated by hydrochloric acid, washed, and dissolved in ammonia solution; it may be used for impregnating paper pulp or animal or vegetable tissues or for preparing lacquers. A similar product may be obtained by using aqueous pyridine instead of ammonia. The condensation product of cresoxyacetic acid and paraformaldehyde in presence of hydrochloric acid is dissolved in aqueous methylamine. The condensation product of commercial tricresol and formaldehyde in presence of an alkali is mixed, additional alkali and sodium chloracetate is added; the product is precipitated by hydrochloric acid and dissolved in ammonia solution. The phenol-formaldehyde resin known as "Bakelite A" is reacted with chloracetic acid and the product dissolved in ammonia solution; glycerine is added and the mixture is kneaded with paper pulp to a pasty mass, from which a part of the solution is removed by pressing, after which the mass is moulded and heated.

The Specification as open to inspection under Sect. 91 (3) (a) states that the resin-carboxylic acid may be hardened by heating with a polyhydric alcohol to above 100° C. This subject-matter does not appear in the Specification as accepted.

298,141. Odling, M., and **Street, A. A.** May 4, 1927.

Slags, treatment of; plaster compositions. — Blast furnace slags, or natural slags of similar character, are crushed or granulated and heated with relatively concentrated sulphuric acid, with or without the addition of oxidizing agents such as nitrates or peroxides. On lixiviation, a residue consisting essentially of silica and calcium sulphate is obtained,which may be calcined at a low temperature to produce a hard wall plaster.

298,159. Musag Ges. für den Bau von Müll- und Schlacken-Verwertungsanlagen Akt.-Ges., and **Grote, A.** Oct. 4, 1927, [*Convention date*]. *Drawings to Specification.*

Bituminous compositions. — Paving and like blocks are made by moulding, under heat and pressure a mixture of hard sintered refuse-slag and bituminous material. The slag is in grains of sizes up to 6 mm. These grains are sifted out to sizes of 0—2, 2—4 and 4—6 mm. and are mixed in such proportions that voids are reduced to a minimum. The aggregate is then heated to about 180° C., hot bituminous material is incorporated therewith, and the composition is moulded into blocks at a pressure of from 200 to 300 kilograms per sq. cm.

298,290. Macdonald, J., (Representative of *Macdonald, D.*)., and **Macdonald, R. F.** July 15, 1927.

Stone, artificial; stone, colouring.—A granular siliceous material for floors, pavings, roads, tennis courts and the like is made by mixing silica or other siliceous material with oxides of various elements, in the dry state, fusing the mixture to form a brick-like mass and grinding to a suitable size. The ground material is laid on a suitable foundation, watered and rolled. A suitable mixture comprises 25 parts of silica, 3 parts of iron oxide, 15 parts of alumina, 35 parts of calcium oxide, 12 parts of magnesium oxide and 10 parts of colouring matter. The composition may be varied by using dolomite or other natural rocks and omitting some of the oxides, but the percentage of calcium must not be sufficient to cause the material to set like a cement when mixed with water. Additional colouring matter may be added by coating the outside of the ground particles with a coloured glaze-like composition which is hardened by firing. Specifications 388/04, 14865/14, 162,318, and 244,756 are referred to.

298,631. Wolff & Co., and **Weingand, R.** Oct. 14, 1927, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

Compositions containing organic condensation products.—Film or foils are made from a mixture of a plasticizing agent with a condensation product of an aldehyde and urea or its derivatives, the mixture being applied while liquid to a suitable base, caused to solidify, and removed. Glycerine and glycol are mentioned as suitable plasticizing agents.

298,637. Soc. d'Etudes Chimiques pour l'Industrie. Oct. 13, 1927, [*Convention date*].

Cements, Portland and Roman.—The reducing impurities in fused aluminous cements prepared from slags produced in the manufacture of phosphorous or phosphoric acid from mineral phosphates are eliminated by treating the melted mass with oxidizing agents, which may be gaseous as air, oxygen or carbon dioxide, or solid as manganese dioxide or iron oxide. In an example, the raw materials bauxite, calcium phosphate and coal are fused in an electric or thermic kiln and a current of oxygen or air is caused to pass through the melted mass for a time, varying from several minutes to several hours.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the application of the same oxidizing process to fused cements obtained from usual materials such as bauxite. This subject-matter does not appear in the Specification as accepted.

298,680. British Dyestuffs Corporation, Ltd., and **Walker, E. E.** July 15, 1927.

Compositions containing organic condensation products.—In a process of forming condensation products by condensing a phenol first with an aliphatic ketone and then with an aliphatic aldehyde, the second or both reactions being effected in an alkaline medium, the alkali is neutralized with acid after the second condensation, until the aqueous layer after agitation with the oily layer shows a pH value of 5—7 inclusive, and the oil is separated and crystallized. An example is given of a moulding powder obtained by impregnating wood meal with an alcohol solution of the product obtained by condensing phenol, acetone and formaldehyde, the pH value being adjusted to 6. Pigments may be added. Specification 261,522, [*Class* 2 (iii), Dyes &c.], is referred to.

298,793. Marks, E. C. R., (*Stabilimenti Chimici Industriali*). Nov. 15, 1927.

Compositions containing organic condensation products.—Cellulose, wood-pulp or cotton waste is treated with sulphuric and nitric acids, washed, dried, soaked in phenol and then treated with formaldehyde and optionally a neutralizing agent such as sodium carbonate. The product is drained and dried and paradichlorobenzene is added. The product is roughly shaped at 60° C. and then moulded under pressure at 160° C.

298,812. Morton, F. Dec. 20, 1927.

Bituminous compositions.—Pitch is mixed with a pure bitumen and applied to a relatively large proportion of mineral aggregate, such as broken granite or slag, to form a road making composition. A filler such as sand or stone dust may be added. In an example the pitch has a twisting point between 40° and 65° C. and from 5 to 25 per cent of pure bitumen is mixed with it while both are hot. The aggregate forms from 80 to 90 per cent of the composition.

298,943. I. G. Farbenindustrie Akt.-Ges. Oct. 17, 1927, [*Convention date*].

Cements, Portland, treating after manufacture.—Calcium sulphide, in amounts not exceeding 5 per cent, is added to Portland cement during the grinding, to improve its hydraulic properties.

299,065. British Celanese, Ltd., (Assignees of *Moss, W. H.*). Oct. 21, 1927, [*Convention date*].

Compositions containing artificial resins.—Phenol-ketone-aldehyde resins, produced by condensing one molecule of a phenol-ketone condensation product with less than two molecules of an aldehyde, melting for instance at 140—150° C., are suitable for plastic compositions. Specification 299,781, [*Class* 95, Paints &c.], is referred to.

299,066. British Celanese, Ltd., (Assignees of *Moss, W. H.*). Oct. 21, 1927, [*Convention date*].

Compositions containing artificial resins.—Phenol-ketone resins are produced by condensing a ketone with a phenol-ketone such as diphenylolpropane which is made by condensing excess of a monohydric phenol with acetone in presence of a strong acid catalyst. The diphenylol propane may be condensed with acetone, or the resin may be formed direct by condensing phenol with an equimolecular proportion of acetone in presence of a strong acid. The resin is washed, and dried by distillation at ordinary or reduced pressure. Examples describe the production of the resin in each of the ways mentioned above, using hydrochloric acid as catalyst; the acetone may be replaced by other ketones such as methyl-ethyl and di-ethyl ketones and the phenol by other monohydric phenols such as cresol. The resin is fusible and non-reactive and soluble in benzene, alcohol, and acetone and in the usual solvents for cellulose-ester lacquers. The synthetic resin may be used in making plastic compositions.

The Specification as open to inspection under Sect. 91 (3) (a) is not limited to monohydric phenols.

299,067. British Celanese, Ltd., (Assignees of *Moss, W. H.*). Oct. 21, 1927, [*Convention date*]. *Addition to* 299,066.

Compositions containing artificial resins.—Phenol-ketone-aldehyde resins are produced by condensing a phenol-ketone resin prepared as described in the parent case with an aldehyde. The phenol-ketone resin, such as diphenylolpropane-acetone resin, may be heated with formaldehyde in presence of an acid. The diphenylol-propane-acetone resin may be made by condensing phenol-acetone (diphenylol propane) with acetone in presence of an acid, or by condensing equimolecular proportions of phenol and acetone. The proportion of formaldehyde is preferably one molecule for each molecule of diphenylol-propane used in the production of the phenol-acetone resin. The acid catalysts mentioned are hydrochloric and phosphoric acids. The condensation product is washed with water and impurities are removed by distillation in steam. The resin is fusible and non-reactive, and is soluble in alcohol, acetone, and benzene and in the usual solvents of cellulose ester lacquers. It may be used for plastic compositions.

Th Specification as open to inspection under Sect. 91 (3) (a) is not limited as to the ketone phenol resin employed.

299,208. Stein, R. Aug. 8, 1927. *Divided application.*

Bituminous compositions.—A bituminous composition for supports exposed to heavy pressures and shocks, such as supports for railway, tramway or like rails and sleepers, and heavy machinery and beds, comprises Epure, goudron and pitch. Asbestos fibre may also be added. Epure is defined as Trinidad asphalt freed from earthy impurities and goudron as a distillation product, obtained from Trinidad asphalt, having a melting-point between 95° and 100° C. and great toughness. Suitable proportions are one part of Epure, two parts of goudron, two parts of coal-tar pitch and one part of asbestos-fibre. The mass may be combined with one or several layers of thin wire preferably wound in the form of helices which may intermesh.

299,381. Marks, E. C. R., (*Batterien- und Elemente-Fabrik System Zeiler Akt.-Ges.*). July 22, 1927.

Compositions containing bituminous, resinous, and wax-like materials.—An insulating and sealing composition for electric batteries is made by mixing a saponifiable substance such as wax or resin with a basic substance in insufficient quantity to produce complete saponification, unsaponifiable substances such as paraffin or pitch being also added. After saponification water is removed by heating and fillers added. In an example, wax, resin and pitch are heated together in a vessel and a quantity of soda lye added to produce incomplete saponification. The mixture is boiled to remove water and fillers such as heavy or light spar added while the mass is still liquid.

299,408. Hilbrenner, J. L. A. July 26, 1927. *No Patent granted (Sealing fee not paid).*

Refractory substances. — A composition for making porcelain-like insulating material for use in sparking-plugs, heating and lighting elements &c., comprises fat clay, kaolin, zirconium oxide and aluminium oxide. As a flux, zinc oxide, or a frit composed of magnesium oxide, zinc oxide, and aluminium oxide ground together in a wet state and heated quickly to sintering, may be added.

299,427. Metherell, A., (Assignee of *Barnhart, E.*). Oct. 26, 1927, [*Convention date*].

Concretes and mortars, cement. — A cement concrete having a glazed surface and glaze forming matter distributed through the mass is formed by adding magnesium chloride, calcium chloride, aluminium sulphate and sodium potassium silicate to the gauging water. The aluminium sulphate may be replaced by an alum preferably with the addition of magnesium sulphate.

299,543. Hahn, M., and **Eisenberg, K. B.** Aug. 9, 1927.

Compositions containing oils. — A composition for application to buildings &c. to damp sound and other vibrations consists of a non-drying oil such as mineral oil, and a dust-like filling material. In an example, 25 parts of oil are worked up with 65 parts of clay or loam or a mixture of these, and 10 parts of alumina. The composition may also be employed as a base for machinery to damp vibration, and also to screen electrical instruments from electric fields.

299,752. British Thomson-Houston Co., Ltd., Sporborg, H. N., Young, A. P., and **Ward, A. T.** July 27, 1927.

Compositions containing artificial resins. — A composition for use in making sound-records consists of a synthetic resin made from phthalic anhydride and glycerine, together with a filler, such as wood flour or chalk. A colouring medium may be added.

300,196. Schmitz, W. H. Nov. 8, 1927, [*Convention date*].

Bituminous compositions.—A bitumen-coated mineral aggregate for road making is prepared by first wetting the aggregate with an alkali solution and then applying bituminous emulsion.

300,464. Jackson, L. Mellersh-, (*Barber Asphalt Co.*). April 23, 1928.

Cement and concrete, hardening and preserving.—Concrete after it is laid is sprayed with a water-external-phase, bituminous emulsion, such as that known as cold-repair cement, so that when the water has evaporated an impervious adherent film is formed which prevents the evaporation of water from the concrete during the setting period.

300,654. Harvel Corporation, (Assignees of *Harvey, M. T.*). Nov. 17, 1927, [*Convention date*].

Compositions containing cashew-nut products.—Various products such as insulating materials, moulding compositions, resin-like materials, &c. are made from cashew-nut shell liquid. To produce a resin-like product the liquid is heated alone to a temperature above 395° F. After the liquid has reached 395° F. oils such as linseed, chinawood, japan wood, fish oil, &c. may be incorporated, preferably as or after the liquid cools. Other materials such as pitch, particularly animal pitch, gums, ester gums, waxes, rosin, cumarone, copal, may also be added in like manner. Accelerated drying properties may be obtained by the like incorporation of driers such as litharge, manganese dioxide and hydrochloric acid, manganese resinate, copper oleate or carbonate, copper ammonium hydroxide or other copper compounds. Varnishes are obtained by the similar addition of a solvent such as gasoline, kerosine, or the material sold under the registered Trade Mark " Varnoline." The heating may, if desired, be effected under pressure or with the simultaneous injection of air into the liquid. The products may be dried into sheets or mixed with sulphur &c. to obtain a cured material or to make moulded products. Specifications 259,959, 262,134, [*Class* 91, Oils &c.], 272,509, 272,510, and 275,574, [all in *Class* 95 Paints &c.], are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) describes also heating the liquid (1) alone in general, (2) in the presence of metals or metal compounds such as copper, lead, manganese, lead oxide, copper carbonate or oleate, cuprous ammonium carbonate &c., or treating the liquid with aldehydes such as formaldehyde or furfuraldehyde. The additional materials may be added prior to or at any stage of the treatments. This subject-matter does not appear in the Specification as accepted.

301,133. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). Sept. 6, 1927.

Compositions containing artificial resins.—Artificial celluloid-like masses may be obtained from lacquers obtained in the following manner. The lacquers comprise urea-formaldehyde condensation products, obtainable for example in accordance with Specifications 260,253, [*Class* 95, Paints &c.], or 261,029, associated with nitrocellulose in suitable solvents, and with the addition of vegetable oils, such as poppy-seed oil, linseed oil, soya bean or perilla oil, sunflower, olive or pea-nut oil, and in particular castor oil, and/or animal oils, especially fish oils, such as cod, shark oil and the like, which have been previously treated with oxidizing gases at an elevated temperature, such as 170—180° C. This oxidation must not be carried so far as to produce jellies or other solid bodies. The odour of the products obtained by this oxidation may be removed by catalytic hydrogenation, either before or after the treatment, so as to retain the oils in a liquid form. The nitro-cellulose may also be partially replaced by natural resins or gums, such as copals, or artificial resins. Specification 287,116, [*Class* 95, Paints &c.], also is referred to.

301,241. Ekelund, S. C. G. Jan. 30, 1928. *Drawings to Specification.*

Portland cements.—In a slagging gas producer, the slag may be of use in cement making if it contains silicic acid, aluminium oxide or chalk, and may have titanic acid added for this purpose.

301,509. Chemische Fabrik Grünau, Landshoff, & Meyer Akt.-Ges., (Assignees of *Hinrichsen, C.*). Dec. 1, 1927, [*Convention date*].

Cements, Portland and Roman; concretes and mortars, cement.—A mixture of calcium chloride and hydrochloric acid and, or a chloride which is readily decomposed by hydrolysis, is added to hydraulic cements, or to the gauging water, to accelerate the setting and hardening and to render them water and oil proof. Examples of suitable decomposable chlorides are the chlorides of titanium, tin, iron, and antimony. Aluminium chloride may also be an ingredient of the mixture.

301,544. Colas Products, Ltd., Whiting, W. S., and **Terry, A. G.,** (*Hammond, T. G. D.*). Sept. 2, 1927.

Bituminous compositions. — Mineral or other aggregate is coated with bitumen by applying a bituminous emulsion in the presence of a small quantity of an alkali salt, not including ammonium salts, which is a strong electrolyte, for example sodium chloride or sodium sulphate, for the purpose of ensuring effective distribution of the emulsion as a coating before the emulsion breaks. The salt may be applied dry or as a solution either to the aggregate or to the mixture of aggregate and emulsion. Suitable proportions of salt to emulsion are 5 per cent for sodium chlorine and 2.7 per cent for sodium sulphate. A filler such as soft limestone may be added to the bituminous mixture to absorb the water set free from the emulsion. In addition to broken stone, gravel, sand, clinker and the like, substances such as sawdust, cork dust, and asbestos may be coated with bitumen by this method. Specifications 202,021, 202,230, [both in *Class* 140, Waterproof &c. fabrics], 202,235, 229,361. 230,177, 233,430, 233,784, 236,641, 238,967, 239,120, 243,398, 246,907, 248,859, 252,260, 254,004, and 268,411, [all in *Class* 81 (i), Disinfecting &c.], are referred to.

301,547. Knudsen, G., Goldschmidt, V. M., and **Knudsen, R.** Sept. 3, 1927. *Addition to* 260,298.

Refractory substances; stone, artificial.—Building material resistant to high temperatures and chemical action is made by submitting powdered or granular olivine rock to treatment in which a recrystallization takes place to cement the grains together. The powdered or granular mass is heated to a temperature below the melting point, preferably in the presence of small quantities of substances assisting the recrystallization such as silicates, borates, chlorides, nitrates and phosphates of alkaline metals, nitrates, borates, chlorides and phosphates of tin, manganese, iron and alkaline earths, and silicates, phosphates and borates of tri- and tetravalent metals. Crystallization-assisting agents may also be formed in the mass by the use of acids. Small quantities of binders or of substances adapted to increase the plasticity may also be added, for instance substances adapted to form synthetic magnesium orthosilicate such as serpentine, talc or enstatite mixed with magnesium oxide &c. In an example, granular olivine is mixed with 2—5 per cent of sodium silicate solution and the mass after moulding is heated for ten hours to a temperature of about 1000° C. In another example, granular olivine is treated with dilute acid to form small quantities of magnesium nitrate and the mass is heated for twenty hours to 600° C. and for one hour to 1000° C. Olivine containing considerable quantities of hydrated magnesium silicates such as talc or serpentine may be used, in which case substances rich in magnesium such as magnesium oxide are preferably added. Aluminium compounds such as clay, kaolin, and bauxite, iron compounds and compounds of tri- and tetravalent elements of high atomic weight such as titanium, chromium, manganese, vanadium, zirconium, yttrium, lanthanium, and cerium may be added. Specifications 283,791 and 284,576 are referred to.

301,696. I. G. Farbenindustrie Akt.-Ges. Nov. 6, 1926. *Divided on and Addition to 261,029, under which a Specification was laid open to inspection under Sect. 91 of the Acts, Nov. 8, 1926.*

Compositions containing artificial resins.—In the process of the parent Specification the dimethylolurea comprising the starting material is replaced by the products of higher molecular weight obtained therefrom by cautious treatment with an alkaline agent. As in the parent process, filling materials such as other resins, plasticizers, talcum, diatomaceous earth and plaster of Paris may be added. Specification 266,752 also is referred to.

301,720. Lander, C., Sinnatt, F. S., King, J. G., and **Crawford, A.** Aug. 4, 1927.

Compositions containing bituminous &c. materials.—Coal, lignite, or other carbonaceous material such as sawdust is subjected to the action of hydrogen or hydrogen containing gases under pressure and at such a temperature that the material is modified and converted into a mass which is plastic or fluid at high temperature and which solidifies on cooling to a mass that is not easily fusible, but such treatment does not result in the conversion of the material into a product oily at normal temperatures. The thermoplastic masses may be used in place of asphaltic or bituminous materials.

301,891. Schmitz, W. H. Dec. 8, 1927, [*Convention date*].

Bituminous compositions. — A road-making composition comprising stone aggregate coated with bitumen is prepared by first coating the stone with mineral, vegetable, animal or other oil and then adding bitumen emulsion. In an example, 300 kgs. of broken stone, 200 kgs. of coarse split stone, 200 kgs. of fine split stone and 50 to 100 kgs. of sand are placed in a mixing-drum and 9 kgs. of soil is added; when the oil is thoroughly distributed, 40 to 80 kgs. of bitumen emulsion is added.

302,087. Haglund, T. R. Feb. 18, 1928.

Refractory substances. — In the reduction of oxides or ores in an electric furnace for the production of iron and other metals and alloys, the charge is so constituted by selection, preparation, or addition of slag-forming materials such as magnesite and bauxite thereto that together with the metal or alloy a highly-refractory slag is obtained which contains less than 15 per cent of silicic acid and otherwise consists mainly of magnesia and alumina. The slag may contain over 15 and 20 per cent respectively of magnesia and alumina, up to 35 per cent of chromium oxide, and not more than 20 per cent of silica and iron oxide. Up to one-fourth of the magnesia may be replaced by lime. The slags may be cast, or may be mixed with binders which may be colloidal.

302,612. Lloyd, A., and **Bakelite, Ltd.** Aug. 15, 1927. *Drawings to Specification.*

Compositions containing artificial resins.—Mica is bonded by a condensation product of phenol or its homologues, urea or derivatives, and aldehyde, with or without usual plasticizers. Suitable proportions are 100 parts by weight of phenol, 60 parts of urea, and 250 parts of 40 per cent formaldehyde.

302,710. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). Sept. 17, 1927.

Compositions containing sulphurized fatty pitches. — Adhesive and impregnating compositions are obtained by heating stearin pitch or like fatty pitches such as cotton oil or wool fat pitches or residues obtainable by distilling animal or vegetable oils or fats or crude glycerol with animal or vegetable oils, and sulphur or substances giving off sulphur, and adding before, after, or during the sulphurizing treatment substances containing sulphur-bearing compounds obtained by extracting tar with suitable solvents. The animal or vegetable oils may be previously oxidized and/or polymerized, and the following materials may be added to the compositions: Natural or artificial asphalts, tars, other kinds of pitch, resins such as colophony, copals, phenol-formaldehyde resins or other artificial resins, and fillers such as talc, kieselguhr, lithopone, asbestos, sawdust, &c. Sulphurous chloride may be used as the sulphurizing agent, and the tar products may be obtained by extracting brown or mineral coal-tar with alcohols, ketones, &c.

302,808. Cobb, G. Dec. 28, 1927.

Bituminous compositions.—A bituminous composition for forming a single-layer pavement or road surface comprises a graded mineral aggregate and $3\frac{1}{2}$ to 5 per cent of bitumen, tar or the like. The mineral aggregate consists of crushed rock of which 10 to 40 per cent passes a $\frac{3}{4}$ inch screen, 5 to 20 per cent passes a 10 mesh screen 35 per cent passes a $\frac{1}{2}$ inch screen and is retained on a $\frac{1}{4}$ inch screen, 15 to 35 per cent passes a $\frac{1}{4}$ inch screen and is retained on a 10 mesh screen, 5 to 20 per cent passes a 10 mesh screen and is retained on a 200 mesh screen and not over 5 per cent passes a 200 mesh screen.

303,386. Compagnie Nationale de Matieres Colorantes et Manufactures de Produits Chimiques du Nord Reunies Etablissements Kuhlmann, (Assignees of *Compagnie Francaise pour l'Exploitation des Procédés Thomson-Houston*). Dec. 31, 1927, [*Convention date*].

Compositions containing artificial resins.—Synthetic resins are produced by heating together excess of polyhydric alcohol such as glycerine, glycol, or glucose with a polybasic aromatic acid or anhydride such as phthalic anhydride and a natural resin or gum such as colophony, manilla, dammar, or Congo. The examples describe the production of resins from phthalic anhydride, glycerine, and colophony, dammar, or manilla. The products are soluble in esters such as ethyl, butyl, amyl and benzyl acetates and ethyl, butyl and amyl phthalates, and are suitable for use alone or with cellulose nitrate or acetate, synthetic resins, &c. in the production of varnishes and moulded objects. Specifications 24254/12 and 306,924, [*Class* 70, Indiarubber &c.], are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) is not limited to excess of polyhydric alcohol.

303,388. Compagnie Nationale de Matieres Colorantes et Manufactures de Produits Chimiques du Nord Reunies Etablissements Kuhlmann, (Assignees of *Compagnie Francaise pour l'Exploitation des Procédés Thomson-Houston*). Dec. 31, 1927, [*Convention date*].

Compositions containing artificial resins.—Synthetic resins are obtained by reacting a condensation product of an aliphatic polyhydric alcohol such as glycerine and a polybasic acid or anhydride such as phthalic anhydride with a glycerine ester of a natural resin, or by reacting one of these compounds with the ingredients of the other. The condensation products may be further condensed with a siccative oil such as linseed oil. In the examples, (1) a glycerine phthalate resin and a colophony ester are fused together and heated to 200—290° C. in 8 hours, the product being soluble in esters and in their mixtures with alcohol and hydrocarbons; (2) glycerine at 100° C. is added gradually to phthalic anhydride and the mixture gradually heated to 170—180° C. in 6 hours; finely-ground colophony and glycerine are added and the temperature is raised to 260° C. in 4 hours; (3) glycerine is added to melted colophony at 110—120° C. and the mixture is heated to 270—280° C.; the temperature is allowed to fall to 200° C. and more glycerine is added, then the temperature is reduced to 110—120° C. and phthalic anhydride is added, after which the mixture is heated to 260° C. in 6 hours; (4) phthalic anhydride is introduced into glycerine at 180° C. and the temperature is raised to 170—180° C. in 6 hours; manilla gum and glycerine are slowly added and the mass is heated to 260° C. in 4 hours; (5) finely-ground Congo gum is introduced into melted colophony at 250° C. and glycerine is added to produce an ester; glycerine is added to phthalic anhydride at 110° C. and the temperature is raised to 170—180° C. in 6 hours; the resin ester is then added slowly, and the temperature is maintained and then raised to 260° C. in 4 hours. Other resins such as dammar may be used similarly. The products may be used alone or together with cellulose nitrate or acetate, natural resins, &c. for the production of varnishes, lacquers, and paints, or they may be used alone or together with cellulose nitrate or acetate, synthetic resins, and filling materials for the production of moulded articles. The products may also be condensed with linseed oil by heating in an autoclave to form more or less viscous products which are soluble in the products of distillation of coal, tar, and petroleum and in mixtures of such solvents such as benzene, toluene, xylene, naphtha, petroleum, and coal-tar oil. Specifications 24254/12, 303,386, 303,387, [*Class* 2 (iii), Dyes &c.], and 308,671 are referred to.

The Specification as open to inspection under Sect. 31 (3) (a) includes a modification in which a resin ester in course of formation is reacted with a polybasic acid or anhydride with or without a polyhydric alcohol. This subject-matter does not appear in the Specification as accepted.

303,400. Cresson, L. P. F. F. Sept. 2, 1927.

Concretes and cement. — Relates to rubber-faced surfacing material for floors, walls, table tops, &c. of the kind comprising a base of cement or concrete and a facing of rubber which has been vulcanized in situ. According to the invention, an excess of sulphur above that required to form hard rubber at the interface is provided either in the base or the rubber, so that a polysulphide is formed which permeates the interfacial surfaces and firmly unites the rubber to the cement. The cement base may contain fillers such as mineralized fibre, cocoanut fibre, sisal, jute fibre, cotton fluff, wood flour and asbestos or may be formed of successive layers of felt or woven fabric impregnated with cement. The rubber face may be hard rubber throughout or may be in layers of hard rubber at the interface and soft rubber on the exterior. In an example, the cement base is composed of equal weights of cement and cocoanut fibre.

303,406. Watson, G. Oct. 1, 1927.

Concretes. — Concrete and other mouldable material for buildings, foundations, roads, and building blocks is mixed with metal strips or shreds obtained by cutting up old tins and canisters which may first be flattened.

303,417. Vacuum-Schmelze Ges., and **Rohn, W.,** (Assignees of *Hirsch, Kuper, und Messingwerke Akt.-Ges.*). Jan. 2, 1928, [*Convention date*]. *Addition to 226,801.*

Refractory substances containing silica. — In the process described in the parent Specification for the production and repair of hearths of metallurgical &c. furnaces, a quartzite is used consisting of small grains of quartz cemented together by a siliceous binding-material.

303,639. Knibbs, N. V. S. Dec. 16, 1927.

Cements, Portland and Roman.—A cement of the high alumina type is produced by subjecting a mixture of lime and bauxite or other highly aluminous material to the action of steam, preferably under pressure, to secure reaction between the raw materials, and then subjecting the resultant product to a higher temperature which is normally however below the melting-point. The proportions may vary from one to two parts of lime to three parts of bauxite. The bauxite is ground and mixed with either quick or hydrated lime. The steam treatment when carried out at a pressure of 100 lbs. per square inch may be completed in one hour. The heat treatment may be at a temperature between 1000° and 1400° C. With bauxite containing 50 per cent alumina and 20 per cent iron oxide, four hours heating at 1100° to 1150° C. is sufficient, or two hours at 1150° to 1200° C.

303,889. Schilling, L. C. Jan. 13, 1928, [*Convention date*].

Compositions containing plaster and bituminous, oily, fatty, and resinous substances.—The invention comprised in the Specification as open to inspection under Sect. 91 (3) (a) relates to processes for making building and like compositions in which a colloidal solution, emulsion or suspension of bituminous, resinous, oily or fatty substances, or mixtures of these, is added to calcined gypsum or other material which hardens by absorbing water. According to the invention, the quantities of the calcined gypsum &c. and the concentration of the emulsion &c. are chosen so that in the mixture a quantity of water is present which approximately corresponds to the quantity of water to be bound in the form of water of crystallization in the hardened product. This subject-matter does not appear in the Specification as accepted.

303,938. Nittinger, C. Oct. 24, 1927.

Surface-filling compositions having a metallic lustre comprise a binding-means such as oil varnish and ground coal slag. Coal slag is defined as the mineral residue produced by the combustion of coal as distinct from the vegetable residue usually termed ashes. The compositions may also include zinc powder obtained by grinding zinc produced by electrolytic deposition and mixed colours.

304,114. Naamlooze Vennootschap Koninklijke Stearine Kaarsenfabriek Gouda. Jan. 14, 1928, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

Bituminous compositions.—A process for coating mineral aggregate or the like with bitumen, to form a paving composition, consists in first applying linseed oil, petroleum, a petroleum residual, or similar fatty or mineral oil, resin oil, oily acid or similar fatty acid or a solvent such as alcohol or xylol and then applying a bituminous emulsion. In an example, 1000 litres of broken stones of 2—4 cm. are mixed with 15 litres of a mixture of 40 parts of petroleum and 60 parts of fuel oil and then with 80 litres of a bituminous emulsion containing 60 per cent of bitumen.

304,226. Johnson, J. Y., (*Amiesite Asphalt Co. of America*). Oct. 14, 1927. *Right to Patent relinquished.*

Bituminous compositions. — A process for making a road composition consists in coating mineral aggregate with a bitumen-liquifier, such as kerosene, naphtha, or gasolene containing a partly-neutralized oil-soluble organic acid and adding a normally-solid bituminous binder in the hot state and lime to the cold aggregate. In an example, from 5 oz. to 1 lb. of oleic acid or sulphonated oil partly neutralized with ammonia is added to 1½ gallons of kerosene or naphtha and the solution is applied to 1900 lb. of stone, which may be crushed limestone not thoroughly dry. With this cold aggregate 80 to 120 lb. of melted asphalt, such as Mexican oil asphalt, is incorporated and 6 to 10 lb. of hydrated lime is added and thoroughly distributed. The oleic acid or sulphonated oil may be added to the aggregate separately. When aggregate which is difficult to coat, such as flint, chert, silica rocks or pebbles, is used, free fatty acid and paraffin wax, or candle tar or pitch which is a distillation residue from the manufacture of fatty acids in candle making, may be added to the bituminous binder. Sandy fines may be added to help seal the surface but not enough to fill the voids. Specification 280,011 is referred to.

304,492. Bronn, J. Y. Feb. 10, 1928.

Refractory substances containing chromite utilize the aluminous cement known as "fused cement" as the binder.

304,694. Naamlooze Vennootschap Electrochemische Industrie. June 24, 1928, [*Convention date*].

Refractory substances. — Retorts for treating corrosive mixtures such as oxygenic salts with carbon or halogens are made of or lined with one or more insoluble halides, such as calcium fluoride and silver chloride.

304,729. Metallges. Akt.-Ges. Jan. 25, 1928, [*Convention date*].

Refractory substances.—A porous heat-insulating refractory material is formed of magnesium ortho-silicate, either synthetically produced or a natural product such as olivine, peredotite or dunnite, by agglomerating grains of suitable size with or without a binding agent. Chemical compounds having a cementing action may be used. The porosity of the product may be increased by adding to the granular raw materials substances which generate gases or when water is added, such as magnesium carbonate, magnesium nitrate, and aluminium nitrate. The magnesium ortho-silicate may be formed upon serpentine or other magnesium hydro-silicates by heating with magnesium oxide, magnesite &c.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the addition of substances which are eliminated by heat to form pores, such as sawdust, peat powder, cork waste, coal, maize grains and rice husks, and also specifies metals such as aluminium and calcium, and carbide as substances for generating gases when water is added. This subject-matter does not appear in the Specification as accepted.

Reference has been directed by the Comptroller to Specifications 260,298, 283,791, 284,576, 301,547, *and* 307,391.

305,170. Soc. pour l'Exploitation des Procédés Petrus, (Assignees of *Perrin, L., and Tuscher, B.*). Jan. 28, 1929. [*A Specification was laid open to inspection under Sect.* 91 *of the Acts, Feb.* 2, *1929*].

Cements, Portland and Roman. — Cement is made by intimately mixing finely ground Pozzolana, for instance blast furnace slag (60 to 80 per cent), Portland cement (5 to 27 per cent), and lime (2 to 22 per cent). The composition of the Pozzolana may be corrected by addition e.g. of sodium carbonate, potassium sulphate, or barium chloride, and the setting of the cement may be adjusted by addition of plaster (1 to 10 per cent). The lime may be obtained in the necessary fineness by slaking and drying.

Reference has been directed by the Comptroller to Specifications 8153/85, 9210/95, 21141/97, 212,419, 235,006, *and* 258,073.

305,211. Bakelite Ges. Feb. 3, 1928, [*Convention date*].

Compositions containing artificial resins.—Shaped articles are produced by mixing urea or a derivative thereof, solid polymerized formaldehyde, and suitable fillers without heating, for instance in a ball mill, and hot pressing; or the mixture may be pressed cold and then heated to 100—120° C. Various additions may be made such as natural and artificial resins (whether capable or incapable of hardening) substances which bind any uncombined aldehyde, such as phenol, *p*-toluene, sulphonamide, and amines, substances which bind the water produced in the condensation, such as gypsum and cements, fire resisting substances, and dyes. An example of a suitable mixture is urea, paraformaldehyde, *p*-toluene sulphonamide, burnt gypsum, lithopone, and paper fibre. Specification 281,993 is referred to.

The Specification as open to inspection under Sect. 91 (3) (a) states that when fibrous fillers are used it is preferred to mix the materials in a kneading-machine or on rollers at 67—70° C., the mass on cooling being ground and hot-pressed, an example of a mass treated in this manner being urea, paraformaldehyde, lithopone, paper-pulp, and phenol-formaldehyde resin. This subject-matter does not appear in the Specification as accepted.

305,237. Bakelite Ges. Feb. 3, 1928, [*Convention date*].

Compositions containing phenol - aldehyde resins. — Phenol aldehyde resins, which may contain the usual organic or inorganic fillers and may be mixed with other natural or artificial resins such as colophony, copal, coumarone resin, or "Novolak," with dyes, fire-resisting materials, &c., are hardened and deodorized by incorporating such compounds of alkali, alkali-earth, or heavy metals as combine with the free phenol and uncombined by-products. The metal compounds mentioned are calcium, magnesium, iron, and zinc oxides, hydroxides, or salts with volatile or non-volatile acids such as fatty, oleic, and resin acids, calcium stearate and zinc oleate being mentioned. The phenol-aldehyde initial condensation product may be mixed in the solid, liquid, or dissolved form with the metal compound, the other additional materials when employed being added at any stage. The metal compound may be added as a solution or emulsion, and is thoroughly dispersed in the resin, the quantity added being for instance 0.5 to 10 per cent. The mixture is finally worked up in the usual manner, the thermal and electrical properties being improved. A slight excess only of the metal compound may be employed, calculated by the fraction of bromine-combining constituents found by the bromometric method of Koppeschaar.

305,591. Soc. Lumifer. Feb. 7, 1928, [*Convention date*].

Compositions containing plaster, glue, and lead oxide. — Materials having the appearance of forged iron, silver, or bronze, or any other worked metal are produced by applying to a support of wood, metal, &c. a coating composition consisting of 500 grams of plaster of Paris, 800 grams of liquid skin glue, from 25 to 75 grams of desiccated sinew glue, and 250 grams of lead oxide, the coating being worked before it is dry, to imitate the relief of forged or hammered iron &c. Any desired finish is given to the worked coating, according to the metal to be imitated. The composition may be applied by means of a brush, by immersion in a bath, or by spraying.

305,965. Imperial Chemical Industries, Ltd., Hill, R., and **Walker, E. E.** Nov. 11, 1927. *Samples furnished.*

Compositions containing artificial resins.—Artificial resins are obtained by preparing two resins of the glyptal type, e.g. a glycerol-phthalic anhydride resin and a glycol-phthalic anhydride resin, and melting them together. The products are particularly suitable for lacquers, but they may be hardened by prolonged heating at 80—100° C. followed by heating at a higher temperature, and may be used also, admixed with fillers, as moulding powders. In an example, resins are prepared from phthalic anhydride and ethylene glycol and from phthalic anhydride and glycerol, and equal parts of these resins are heated and stirred together at 210° C.

Reference has been directed by the Comptroller to Specification 299,424.

306,038. Genairon, A. Feb. 14, 1928, [*Convention date*].

Concretes and mortars, lime and cement.—A mortar comprises lime or cement, with or without sand, and blood serum as distinct from blood itself.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the use of similar natural or artificial products instead of the blood serum. This subject-matter does not appear in the Specification as accepted.

306,216. Frink, R. L. Aug. 29, 1927. *Drawings to Specification.*

Refractory substances containing aluminium silicates, silica, boron compounds, and oxychloride cements; porous compositions.—In the manufacture of a refractory composition by the union of a refractory body material such as sillimanite, bauxite, and alusite or the like with bonding materials such as silica, there are added oxides and chlorides of the alkaline or rare earths, e.g. zirconium, cerium and thorium, so as to obtain in the cold state a cementing action in the mixture prior to the firing or heating action, under which the bonding materials are fused and unite with the refractory body material. The bonding materials preferably comprise in addition boron compounds, a suitable mixture being obtained by mixing 50 parts by weight of calcined silica, quartzite &c., 30 parts of boric acid, 20 parts of magnesium oxide, and 5 parts of magnesium chloride, the magnesium chloride being dissolved in the water used to wet the mass and added to the other constituents, which are in powdered form. In making the composition 10 parts of the bonding mixture are mixed with about 90 parts of sillimanite &c., which preferably comprises a mixture of particles graded as to size. Prior to heating the final mixture, it may be moulded to the required shape, or, in the case of constructing or repairing furnace or tank walls, the mixture may be applied in situ and allowed to set, and the heating or firing effected subsequently. In another example the bonding mixture comprises 40 parts by weight of ignited silica, 20 parts of anhydrous boric acid, 15 parts of magnesium oxide, 15 parts of zirconium oxide, 2 parts of sodium biborate, and 8 parts of magnesium chloride. A degree of porosity may be imparted to the composition by adding thereto, previous to the firing, a proportion of fugitive particles, such as sawdust, wax, resin, or naphthalene, which are destroyed during the firing. In building up a furnace wall, for example, layers may be employed having varying degrees of porosity, or the porosity may vary progressively throughout the material. A finished surface may be given to the material, particularly when in shaped pieces or units, by subjecting it for a relatively shorter time to a temperature higher than that at which the firing was effected.

306,256. Banks, R. F. Jan. 21, 1928.

Concretes and mortars. — A composition for plastering on walls, ironwork, roofing, fencing, &c. comprises cement, sodium silicate, barium chloride and water, with or without acid potassium oxalate (salts of sorrel). Preferred proportions are given.

306,444. Billner, K. P., (Assignee of *Broander, N. E.*). Feb. 20, 1928, [*Convention date*].

Cements, Portland and Roman. — Porous concrete is made by injecting or generating gases in a plastic mixture of puzzolanic material ground to cement fineness, lime, hydraulic cement, and water, with or without an aggregate. Suitable puzzuolanic materials are blast furnace slag, lava and trass. Suitable aggregates are granulated slag, cinders, sand and crushed stone. When Portland cement is used a certain amount of lime and gypsum may be added. The mass is aerated preferably by mixing aluminium powder with the composition but other methods employing frothing flotation agents, soap solutions, yeast, &c., may be used. An example of suitable proportions for the active ingredients is 20 parts of Portland cement, 70 parts of pulverized blast furnace slag, 5 parts of lime and 5 parts of gypsum. When slag exceptionally rich in lime or lime and magnesia is used, the active ingredients may consist entirely of lime and slag.

Reference has been directed by the Comptroller to Specifications 212,419, 235,006, *and* 258,073.

306,615. Usines de la Basse-Meuse, Soc. Anon., and **Ruppel, O.** Nov. 28, 1927.

Cement and concrete, hardening.—A composition to be applied to cement, concrete, or other surfaces to produce a glazed effect consists of a mixture of Portland and slag cements, an organic acid, and colouring matter. Suitable proportions are 1—3 parts Portland cement, 1 part slag cement, 10—15 per cent colouring matter, and 0.1—0.5 per cent of an organic acid of the formula $CH_3(CH_2)_xCooH$, where x has any value between 3 and 60. Water is added to make a paste which is applied to the surface by a spraying pistol by casting, or other known method. Hardening is accelerated by exposure to a moist atmosphere containing an excess of carbon dioxide for 2—3 weeks. The hardening time may be shortened by immersing the tiles after two or three days in a bath consisting of 100 parts of water, 8—10 parts of sodium carbonate, and 1 or 2 parts of a soluble silicate.

307,132. Maguire, W. Dec. 16, 1927.

Figured and ornamented artificial stone.—Moulded articles of cement or the like having the appearance of aged or weathered stone are formed by embedding soluble material, such as crystals of magnesium sulphate, in the surface during the moulding, this material being afterwards dissolved out leaving a pitted surface. The interior of the mould may be smeared with thick oil to hold the crystals or other soluble matter in position. The pitted article may be afterwards coloured grey or other suitable colour and burnished with a wire brush to expose the high lights.

307,391. Knudsen, G., Goldschmidt, V. M., and **Knudsen, R.** Sept. 3, 1927. *Divided on* 301,547, *and addition to* 260,298.

Refractory substances; stone, artificial.—The process for the manufacture of refractory building material &c. consisting substantially of magnesium orthosilicate described in the parent Specification is modified by substituting for or adding to the talc, other magnesium hydrosilicates, such as serpentine, or substances containing such. These hydrosilicates or the equivalent are heated with magnesia or other substances of high magnesia content or capable of forming the same, with or without suitable reaction accelerators, to temperatures below the melting point of magnesium orthosilicate. The serpentine or the like may be first dehydrated, preferably at low temperatures. Other substances, binding agents and filling materials may be added such as granulated olevine, clay, kaolin, bauxite, and other aluminium compounds, iron ores, oxides, or other compounds such as magnetite and compounds of trivalent or tetravalent elements of high atomic weight such as titanium, chromium, manganese, vanadium, zirconium, yttrium, lanthanium, and cerium. The composition before being heated may be moulded under high pressure, rammed, cast, or applied by spraying or painting. In an example a composition comprising 100 parts of serpentine and 90 parts of impure magnesite is heated for several hours at 1300° C.

307,448. Hadfield, G. H., and **Sand & Shingle, Ltd.** Dec. 8, 1927.

Stone, colouring; compositions containing oily materials. — Coloured sand and the like is prepared by mixing colouring matter, sand, or other finely divided base, and a proportion of cement sufficient to bind the colouring matter to the particles of the base but insufficient to produce a stable solid body as a finished product. The mixture is allowed to set and is then broken by slight pressure into particles of approximately the same size as those of the original base. In making a tennis court, the cement mixture may be laid on a suitable foundation, allowed to set and then broken down by rolling. To form a composition specially suitable for hard tennis courts, the coloured sand is incorporated with from 3 per cent to 6 per cent of an oil, grease, varnish, or other oily binder. For colouring matter, various earth or mineral colours, aniline dyes and other organic colours may be used provided they are fast to the action of cement. Examples of colouring matter giving a green colour are glauconite, copper sulphate mixed with the gauging water, and a mixture of lake green B and monolite yellow G.

307,465. Winkler, K. March 8, 1928, [*Convention date*].

Bituminous compositions. — To pitches, tars, bitumens, artificial or natural asphalts is added 5 per cent or more drying oils such as linseed oil or wood oil or mixtures thereof, which have been thickened before addition by boiling with 2 to 5 per cent metal oxides such as iron oxide, chromic oxide, lead oxide, manganese oxides, with or without borate, &c., which may be partly replaced by sulphur, sulphur chloride or a mixture of both with or without camphor or phenol or both. 7 to over 15 per cent mineral or organic fibrous material such as asbestos or cellulose may be added. Fillers such as sand, lime, dolomite lime, cement, gypsum, magnesite, slag, clay, alumina, kieselguhr and silicas, coke dust, sulphur, particularly titanium compounds, and similar substances of mineral and organic nature may be added.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the addition to the original asphaltic material of metal oxides, of metalloid compounds, of untreated drying oils, or of fibrous material. This subject-matter does not appear in the Specification as accepted.

307,466. Winkler, K. March 8, 1928, [*Convention date*]. *Addition to* 307,465.

Bituminous compositions containing rubber.—Rubber latex or rubber alone or in solution or fused with small amounts of asphalts, bitumens, tars, resins, resin oils, &c., is used as a partial substituent for the drying oils added to asphalt &c. as described in the parent Specification.

307,580. Lean, C., (*Verein für Chemische und Metallurgische Produktion*). Jan. 16, 1928.

Refractory substances.—A refractory composition for lining furnaces &c. consists of a mixture of fused refractory material, refractory plastic clay or bauxite, and readily fusible salts soluble in water. The salts may be wholly or partly replaced by a cement which acts hydraulically. Suitable fused refractory materials are alumina, zirconia, zirconium silicate, thoria, and ceric oxide, and the salts may be sulphates, phosphates, chlorides, fluorides, or borates. In an example, a composition comprises 100 parts of ceric oxide, 20 parts of white bauxite and 0.5 part of potassium sulphate. These are made into a paste with water and applied to the furnace lining or to finished or half-finished ceramic products by pouring, brushing, spraying, &c.

307,751. Lefebvre, C. G. J., and **Berger, E. E. F.** March 12, 1928, [*Convention date*].

Bituminous compositions. — A tarry binder adapted to be applied to roads as a dressing or mixed with stones to form tar macadam has incorporated with it a mineral filler, consisting of an impalpable stone powder passing a 300 screen, the filler amounting to at least 60 per cent by weight of the tar mixture. Non-porous natural or artificial stone is used as the filler, for example crushed or ground quartz sand, quartzites, porphyries, diorites, hard or marmorean limestones, clinkers, &c. Porous or conchiferous limestones, lime, chalks, slags, slates, and clays are not suitable. In an example 80 per cent of filler is added to a binder consisting of 100 parts of tar, 40 parts of coal pitch and 10 parts of petroleum bitumen. Larger grained sand may also be added to the binder. Specification 216,911 is referred to.

307,970. Christensen, K. Dec. 16, 1927.

Cements, treating after manufacture. — Dry pulverized cement is packed by compression in a suitable mould so as to form a block or briquette, which may be enclosed in a paper wrapper.

308,048. Imperial Chemical Industries, Ltd., Strafford, N., and **Walker, E. E.** Feb. 15, 1928.

Compositions containing artificial resins.— Resinous compositions suitable for the manufacture of moulding powders and laminated articles, are prepared by incorporating a thermo-hardening resin of the phenol-aldehyde type from which free phenols and condensation products of low molecular weight have been removed, for example by the method of Specification 296,514, [*Class* 2 (iii), Dyes &c.], with a resin of the glycerol-phthalic-anhydride type containing a fatty acid, such as stearic or oleic acid or the acids of linseed oil or China wood oil, or containing an oil such as linseed oil or castor oil. The phenol-aldehyde resin is preferably prepared from phenol, or cresols containing a high proportion of *m*-cresol, and formaldehyde or its equivalent, such as hexamethylenetetramine, but furfural may replace formaldehyde.

308,207. Clinton Motors Corporation, (Assignees of *Hoffmann, F. A.*). March 19,1928, [*Convention date*].

FIG.2.

Concretes and mortars, cement. — Concrete and the like after being mixed by usual agitation methods is conditioned by being maintained in slow circulatory movement such that the exposed surface is not broken. This slow movement prevents gravitational separation and removes air bubbles. Suitable apparatus for carrying out the treatment comprises a cylindrical or tapered drum 6 having smooth interior walls and mounted on an horizontal axis. The drum is filled to more than half of its capacity with the concrete and is slowly rotated.

308,315. International General Electric Co., Inc., (Assignees of *Allgemeine Elektricitäts-Ges.*). March 21, 1928, [*Convention date*].

Compositions containing oils, artificial resins, &c.—An insulating material is made by coating particles of a substance with a thin layer of a material having a lower conductivity, and uniting the particles into a coherent mass. Metals may be sprayed into an oxidizing or carbonating atmosphere to form a film of oxide or carbonate, or drying oils may be sprayed, or powdered, dried or polymerized oils may be heated in air or oxygen to form a film of oxidized oil. Particles may also be coated with a lacquer of natural or artificial resin or the like. The particles may be compacted by pressure or in the case of metals, by spraying at high temperature and pressure. Where air gaps in the mass are a disadvantage, these may be removed by consolidating at high pressure, this being assisted by grading the particles, or by soaking in a liquid insulating material such as a solution of " bakelite." Specifications 269,510, 269,511, *and* 277,289 [all in *Class* 36, Electricity, Conducting &c.], are referred to.

308,560. Worldecho, Ltd. March 23, 1928, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

Compositions containing artificial resins. — A solution for coating or impregnating paper or other fibrous sheets or for use as a binder in the manufacture of plastic compositions containing for example sand, asbestos, heavy spar, ashes, sawdust, or cotton fibres is made by mixing an alcoholic solution of β-naphthol "or diamine," with phenol or resorcinol, formaldehyde, resins such as shellac, colophony and sandarac, the proportions of which affect the hardness and flexibility of the product, and kerosene or benzene, warming to 50° C. and adding sodium sulphite. The mixture is then warmed if necessary to 80°—85° C. and quickly cooled to 30°—20° C. This solution may be mixed with water, milk of lime solution or aqueous solutions of colouring substances. The compositions are moulded in a press at 180°—200° C. Paper to be coated or impregnated is moistened before being pressed.

308,627. Mountsorrel Tarred Macadam Co., Ltd., and **Rickaby, F.** Oct. 25, 1927.

Bituminous compositions.—A method of coating mineral aggregate with bitumen to form a cold lay composition for pavings, blocks, tiles, slabs, &c. consists in first applying a harder bituminous material than that required in the finished product and then a softening oil or the like. The softener may be oil derived originally from the bitumen itself, a bituminous oil containing dissolved bitumen, a thick crude petroleum oil or a liquid tar. In an example, 90.2 parts of graded broken granite are mixed with 6.8 parts of hot bitumen having at 77° F. a penetration of 7, and then 3 parts of asphaltic flux oil or asphaltic fuel oil are incorporated. Specification 287,799 is referred to.

308,671. British Thomson-Houston Co., Ltd., Warren, H. W. H., Newbound, R., and **Ward, A. T.** Dec. 23, 1927.

Resinous compositions.—A resin of the polyhydric alcohol polybasic acid type is heated with a natural or artificial resin for some hours to produce a clear transparent resinous product which will readily dissolve under short heat treatment in fatty oils. The solution may be thinned, to form a varnish of the desired consistency, by acetone, petroleum distillates, coal tar fractions, turpentine, benzol, &c. In an example one pound of glyceryl phthalate resin and two pounds of colophony are heated to about 220° C. for about six hours. The product may be dissolved in two and a half pounds of linseed oil by heating to 320° C. for two minutes. After cooling, the solution may be thinned by benzol or turpentine. In another example one pound of glyceryl phthalate oleate resin and one and a half pounds of fused Kauri gum are heated in a digester for about five hours at a temperature of 240° C. and pressure of 65 lb. per square inch. The product is dissolved in china wood oil at a temperature of 310° C. and after cooling, the solution may be thinned by benzene or other thinner. Specifications 253,519 and 273,290 are referred to.

308,701. Littlebury, W. O., and **Imperial Chemical Industries, Ltd.** Nov. 24, 1927.

Compositions containing hydrocarbon substitution products.—In the manufacture of electric blasting fuzes and detonators, there is employed a fusible non-inflammable composition made by mixing tetrachlornaphthalene and a bitumen or asphalt of high melting point. For example, a mixture which pours readily at about 130° C., and sets rapidly, is prepared by mixing about 90 parts by weight of tetrachlornaphthalene with 10 parts of a blown petroleum bitumen melting at about 110° C. Specification 272,082, [*Class* 9 (i), Ammunition &c.], is referred to.

309,069. Balthasar, K., Krause, R., Zingl, A., Derflinger, K., and **Ortis, J.** April 4, 1928, [*Convention date*].

Portland cement containing from 5 to 15 per cent magnesia, is prepared by heating, after sintering, raw materials rich in magnesia such as blast furnace slag to a temperature exceeding 1450° C., for at least 20 minutes. The free lime displaces magnesia in combination.

309,070. Chemische Fabriken Dr. K. Albert Ges. April 4, 1928, [*Convention date*].

Bituminous compositions. — A road making material is made by mixing a water insoluble binding medium with a stone constituent such as fragments or gravel in the presence of a watery medium which acts as an emulsifying or dispersion agent to the binding medium. Binding mediums suggested are prepared tar (tar pitch in anthracite oil), a mixture of tar and bitumen or bitumen alone; sulphite cellulose waste liquor is a suitable emulsifying agent. The binding medium and emulsifying agent may be mixed first but not emulsified and then added to the stone constituent and dispersion completed.

309,298. Gordon, K., and Imperial Chemical Industries, Ltd. March 31, 1928.

Cements, Portland and Roman, materials and compositions for. — In a process for the joint manufacture of sulphuric acid and cement from calcium sulphate, carbonaceous materials, and siliceous materials, the air for the combustion of fuel in the cement kiln, and that for the subsequent oxidation of sulphur dioxide, are admitted separately. Air slightly in excess of that required to burn the fuel is passed into the kiln and the resulting gases after removal of dust, enter the Glover tower at 250—300° C., and are mixed with an additional quantity of air before being passed to the lead chambers.

309,384. Marks, E. C. R., (*Alox Chemical Corporation*). Oct. 6, 1927. *Drawings to Specification.*

Compositions containing fats, oils, and waxes. —Hydroxy-carboxylic acids insoluble in petroleum and in water, and resembling shellac, are obtained together with formic acid light and heavy ketones and aldehyde and water-insoluble carboxylic acids soluble in petroleum by oxidizing with air or gases containing free oxygen petroleum hydrocarbons at 130—160° C. and 150—300 lbs. pressure until 20—40 per cent of petroleum-insoluble acid is produced, the latter being then separated and treated to remove readily-volatilizable compounds. Distillates from Pennsylvania oil of 40—36° Bé., or other fractions such as those of 33—18° Bé., may be used as initial material. The oxidation is effected in presence of a catalyst such as a manganese, copper or iron compound (manganese oleate being mentioned) or an unsaponifiable product from the oxidation. The hydroxy-acids insoluble in petroleum are washed with water, and subjected to vacuum-distillation at 10—20 mm. pressure preferably with admission of air or steam, the temperature being 140—275° C. The residue in the still resembles shellac and is an acid or anyhdride forming soaps with alkalies. It is insoluble in fatty and mineral oils and soluble in carbon tetrachloride. It varies (according to the extent of the distillation) from a hard brittle solid to a tacky material, the latter alone being soluble in alcohol and in benzene. It is of high dielectric capacity, paper impregnated with an alcoholic solution giving a greater dielectric capacity than one impregnated with a shellac solution of the same strength. It is adapted for use for all insulation purposes for which shellac is used, and may be mixed with wood-flour, asbestos, mica, wood pulp, &c. in the same manner for the production under high temperature and pressure, of moulded insulation, artificial lumber, and moulded products generally. In an example, 10 parts of the brittle product mixed with 90 parts of wood-flour moulded under high temperature and pressure gives a product similar to hard wood. In other examples, 75, 65 parts of asbestos, 85—70 parts of mica or 50 parts of mica are used. In all these cases the brittle product may be used in the form of its calcium salt, which is readily ground. The product may also be added to paper pulp to give a hard paper of high dielectric character and the soft form may be used to make sticky insulating tape. Instead of treating by distillation, the hydroxy-acids may be converted into the shellac-like product by exposure in thin films to a current of air. Specifications 287,514, [*Class* 91, Oils &c.], and 309,382, [*Class* 2 (iii), Dyes &c.], are referred to.

309,421. Carpmael, A., (*I. G. Farbenindustrie Akt.-Ges.*). Jan. 4, 1928. *Right to Patent relinquished.*

Compositions containing chlorinated hydrocarbons.—A small proportion, say 5—20 per cent, of a fat, wax, pitch, resin, artificial or natural rubber, and/or a substance having an alkaline reaction, such as sodium phosphate, calcium oxide, magnesium oxide, pyridine, tetrahydroquinaldine, and urea, is added to wax-like chlorinated hydrocarbons, to minimize the risk of injury to the skin of operatives when using these substances as impregnating media, mouldable compositions &c. for fireproofing. Several examples are given, of which the following is typical: 100 parts of tetrachlornaphthalene are melted, and 13 parts of wax and 2 parts of gutta-percha are added. The whole is heated for four hours.

309,441. Artifex Chemische Fabrik Ges. April 10, 1928, [*Convention date*].

Compositions containing oils.—A grinding composition particularly suitable for rubbing down varnished surfaces, consists of a mixture of caoutchouc substitute, grinding powder such as emery, silicon carbide, flintstone, &c., and a liquid which is unaffected by sulphur chloride or sulphur, such as mineral oil, hydrocarbons and their tetrachlorides or other substitution products, or hydrogenated naphthalenes such as tetrahydronaphthalene. The caoutchouc substitute may consist of fatty oil such as rape-seed oil, linseed oils, &c., and sulphur chloride or sulphur. In one example, 110 grs. of sulphur chloride is gradually added to a mixture of 800 grs. of rape-seed oil, 260 grs. of mineral oil and 4200 grs. of emery, the mixture being poured while still liquid into suitable moulds. In use the resulting product is readily friable so that the grinding surface is continually renewed and clogging is avoided.

309,487. Kunstharzfabrik Dr. F. Pollak Ges. April 11, 1928, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

Compositions containing artificial resins.—Resinous products suitable for the manufacture of films and moulded articles are prepared by mixing condensation products of the urea-formaldehyde type with colloidal or semi-colloidal substances, particularly such as are obtained by the polymerization of unsaturated organic compounds such as unsaturated hydrocarbons, vinyl esters, acrolein, and itaconic acid. Preferably, an intermediate condensation product of the urea-formaldehyde type is mixed in solution with the colloidal substance, or with the initial material from which it is produced, the solution being then evaporated and the intermediate product hardened, if desired. In one example, a solution of a condensation product of urea, thiourea, and formaldehyde in benzyl alcohol and methyl glycol is mixed with a solution of polymerized vinyl acetate in methyl glycol. In another example, dioxane and water are used in place of part of the methyl glycol.

309,604. I. G. Farbenindustrie Akt.-Ges. April 13, 1928, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

Cements, Portland.—Phosphoric acid and cement are formed by treating calcium phosphate with sulphuric acid to obtain phosphoric acid and gypsum, working up the gypsum in known manner with materials containing carbon and alumina to yield cement and sulphuric acid and using the sulphuric acid for the treatment of fresh quantities of phosphate.

309,634. Johnson, J. Y., (*Amiesite Asphalt Co. of America*). Oct. 14, 1927. *Divided on* 310,294, [*Class* 107, Roads &c.]. *Right to Patent relinquished.*

Bituminous compositions.—In the manufacture of bitumen-coated stone aggregate for road making, the aggregate is first wetted with a bitumen liquifier, such as kerosene or naphtha, containing a partly neutralized fatty acid, such as oleic acid, and then with molten bitumen. In an example, 5 to 16 oz. of oleic acid partly neutralized with ammonia is dissolved in kerosene, naphtha or other light mineral oil, and the solution is applied to 1,900 lb. of stone. To the treated stone 80 to 120 lb. of molten bitumen at about 212° F. is added, and then 6 to 10 lb. of hydrated lime. The lime acts on the oleic acid to form calcium oleate. Other alkaline earth oxides may be used instead of lime. Specifications 280,011, 304,226; and 310,294, [*Class* 107, Roads, &c.], are referred to.

309,661. Harris, G. J., and **Imperial Chemical Industries, Ltd.** Feb. 6, 1928.

Cement, Portland, materials for.—A process for the joint production of cement and sulphuric acid consists in introducing a mixture of sand, clay and calcium sulphate into a kiln in the form of a dry powder. The powder may be blown into a combustion chamber through nozzles suitably situated with reference to the fuel burners, for instance combined inlets for the powder and pulverized fuel may be in the form of two or more concentric nozzles, or separate nozzles may be so arranged that the two jets impinge in the centre of the chamber. The hot gases laden with cement dust and containing sulphur dioxide are passed into a second chamber in the form of a vortex separator, or the combustion chamber may constitute a vortex separator. The gases may be further purified by a second vortex separator or by an electrical separator.

309,755. Friedrich, K., and **Friedrich, C.** May 7, 1928.

Statuary; concretes, cement.—Articles such as tiles and statues formed of porous materials are coated with a glazing-liquid which consists of water and finely ground cement and contains small quantities of substances for rendering the colloidal condition of the liquid more permanent, and while such coating is still plastic a thin covering of a solution of nitro-cellulose or ether-cellulose is applied. The articles may be formed of pumice-stone, slags chilled in water, or burnt porous clay, and a preferred composition consists of Portland cement, sand, and granulated furnace slag. The first coating comprises water, finely ground cement, and metallic soaps, such as zinc soaps.

309,877. Webb, V. W., and **Bacchini, M.** Nov. 17, 1927.

Concretes; compositions containing plaster, sawdust, and marble dust.—A block or mould for hats or other articles is formed from a composition of Portland cement, marble dust, plaster of Paris, and sawdust. Preferably 40 per cent by weight of Portland cement, 10 per cent marble dust, 50 per cent plaster of Paris are mixed with water to the consistency of cream. For each pound of the dry mixture from one to four ounces of sawdust is added, the composition is shaped to the desired form and dried at a temperature of about 70° C., or heated in an oven to about 120° C. The block or mould may be reinforced with wire or wire netting.

310,841. Carborundum Co., Ltd., (Assignees of *Walker, P. H., and Kenyon, S. S.*). May 1, 1928, [*Convention date*].

Abrasive and refractory articles are rendered less permeable and more durable by impregnating the bonding material with an inorganic material in solution which may react with an ingredient of the bonded article on firing and then subjecting to heat treatment. The article may be impregnated with aluminium hydroxide and/or calcium hydroxide—preferably by impregnating with a solution of the chlorides and treating with ammonia solution or gas—or with aluminium sulphate, and heated to deposit the corresponding oxides. In an example the impregnating solution is a saturated solution of aluminium chloride, 10 parts, and calcium chloride, 1 part. Other impregnating materials such as solutions of alkali silicates or other salts or clay suspensions may be used. Specification 207,677 is referred to.

The Specification as open to inspection under Sect. 91 (3) (a) refers to silicon carbide refractories as suitable for this treatment. This substance is not specifically referred to in the Specification as accepted.

310,875. Metherell, A., (Assignee of *Barnhart, G. E.*, and *Pfaff, H. E.*). May 2. 1928, [*Convention date*].

Concretes and mortars, cement.—A waterproofing and glaze-forming composition for adding to the gauging water of cement mortars and concretes comprises a mixture of metallic sulphates or other salts. The preferred mixture comprises equal volumes of aluminium, magnesium, sodium and potassium sulphates. Various changes may be made in this mixture, for instance some of the sulphates may be omitted or replaced by the sulphates of other metals, such as zinc or iron, or by other salts such as potassium or magnesium chloride or sodium silicate. Calcium chloride is not used. Examples of these modified mixtures are (a) two parts of sodium sulphate, two parts of zinc sulphate, four parts of potassium chloride and one part of magnesium chloride, and (b) equal parts of sodium silicate, aluminium sulphate, potassium chloride and magnesium sulphate. In making up the solution to be used as the gauging water, thirty volumes of water are used to each volume of chemical.

310,922. Naamlooze Vennootschap Mijnbouw en Cultuurmaatschappij Boeton. May 3, 1928, [*Convention date*].

Bituminous compositions.—Relates to processes for covering roads and tiles and for manufacturing tiles, plates, blocks, &c., by rolling or moulding under pressure a plastic mass containing bitumen and a filler, and consists in increasing the adhesiveness of the bitumen by the addition of low boiling solvents and then temporarily decreasing the adhesiveness of the mass, to prevent sticking to the mould or roller, by distributing water throughout it, and in expelling the water by the application of pressure in the subsequent treatment. The mass may be heated to a temperature not exceeding 100° C. prior to the application of pressure. The bituminous mass may be a natural asphalt, such as boeton asphalt limestone or asphalt limestone of Val de Travers, or an artificial mixture of bitumen and filler. Examples of solvents are benzene, petrol, and carbon disulphide. The mass may be applied to moist underlayers for instance of concrete. Examples of suitable proportions are (1) 1,000 kgs. of boeton asphalt limestone having a 30 per cent bitumen content, 3,000 kgs. of gravel, 40 kgs. of flux, 80 litres of carbon disulphide and 120 litres of water; (2) 1,000 kgs. of ground boeton asphalt limestone with a 30 per cent bitumen content, 3,000 kgs. of gravel, 50 kgs. of flux, 100 litres of carbon disulphide and 120 litres of water. Specification 310,923 is referred to.

310,923. Naamlooze Vennootschap Mijnbouw en Cultuurmaatschappij Boeton. May 3, 1928, [*Convention date*].

Bituminous compositions.—Plastic bituminous masses suitable for roads, tiles, blocks, &c., are made by treating natural or artificial mixtures of bitumen and a filling material with low boiling solvents for bitumen, and subsequently or simultaneously (as an emulsion with the solvent) adding a small quantity of water. The solvents may be benzene, carbon disulphide, carbon tetrachloride or petroleum ether. Examples of natural mixtures are boeton asphalt limestone and asphalt limestone of Val de Travers. The compositions are specially suitable for applying to moist underlayers such as moist tiles or road surfaces. Examples of proportions are (1) 1,000 kgs of asphalt limestone, 3,000 kgs. of sand, 100 litres of gasoline, followed by 100 litres of water; (2) 1,000 ekgs. of asphalt limestone, mixed with an emulsion of 50 litres of water and 50 litres of gasoline. Specification 310,922 is referred to.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the addition of volatile solvents by themselves to the bitumen filler composition. This subject-matter does not appear in the Specification as accepted.

312,216. Ellis, G. B., (*Chemische Fabrik Grünau Landshoff & Meyer Akt.-Ges.*). Feb. 22, 1928.

Ornamental artificial stone; concrete, hardening.—Ornamental surfaces are produced on concrete blocks or structures by subjecting the surfaces during manufacture to the products of decomposition of the alkaline hydrolysis of albuminous substances, including albuminoids, thus delaying the setting of the surface layer so that it can be washed away to reveal the structure of the filling-pieces. For example, the moulds may be coated with a solution of the alkaline salts of lysalbic or protalbic acids. The washing-water is stated to penetrate the main structure during the washing-off process and cause a gradual final hardening of the exposed decorated surface.

312,343. Toledo Scale Manufacturing Co., (Assignees of *Howald, A. M.*). May 26, 1928, [*Convention date*].

Compositions containing artificial resins.—A fusible alkaline condensation product of urea, thiourea, guanidine, &c., and an aldehyde is mixed with a substance capable of rendering the mass neutral or acid on heating, and the mass is moulded under pressure and heat to obtain an insoluble, infusible article. In an example, urea and formaldehyde are mixed with ammonia, and a small quantity of soda or lime, and boiled to a syrup. A small amount of β brom hydrocinnamic acid, or isodibrom-succinic anhydride is added, and the mass is dried at low temperature, powdered and hot moulded. Other acidifying substances specified are dry mildly acid salts. Organic bases may be employed as the alkaline agent. The mass may be mixed with fillers, phenol aldehydes, &c.

The Specification as open to inspection under Sect. 91 (3) (a) describes also the use of salt such as ammonium nitrate or chloride, which is inactive when dry and cold. This subject-matter does not appear in the Specification as accepted.

312,372. Armstrong, J. J. V., (*Plausen, G.*). Nov. 18, 1927.

Bituminous compositions.—Tar is hardened by dispersing therein substantial quantities of hard pitch, bitumen, or natural resin by the aid of a synthetic resin as dispersator. Preferably sulphur is added and the mass vulcanized. The synthetic resins, for instance phenol aldehyde resins and cumarone resins, may be added as such or may be formed within the mass, for instance by the action of aldehydes on phenol contained in the tar or in the case of cumarone resins by the action of known condensing agents on solvent naphtha. The resulting products may be used for road making. Natural resins mentioned are acaroid, copal, and dammar. Rubber solution, oxidized oils or vulcanized oils, may be added. In examples—(1) 100 parts of coal tar are melted with 5 to 50 parts of phenol aldehyde resin in the A or B state, and pitch is added; further additions of from 5 to 3 per cent of oils, factis or rubber solution may be made; (2) 200 parts of crude tar, 10—20 parts of solvent naphtha and 2—3 per cent of concentrated sulphuric acid are heated to 30—60° C. until cumarone resin formation is complete; the residual acid is neutralized by calcium hydroxide and 500—600 parts of hard pitch are added and thoroughly incorporated in a colloid mill; the injurious ingredients such as phenols and cresols may be combined with aldehydes and sulphur and lime or powdered brown coal may be added.

312,467. Gough, F. W. May 4, 1928.

Compositions containing bituminous, resinous, or oily materials.—A waterproof composition is made by adding an emulsion of a bituminous substance to a suspension of solid mineral matter in the presence of a de-emulsifying agent so that the bituminous emulsion breaks and deposits the bituminous substance on to the mineral particles and the whole thickens into a plastic mass. The bituminous substance may be natural or artificial bitumen, pitch, bituminous oils, resins and analogous substances. Suitable minerals are clay, slate, limestone, felspar and asbestos, and de-emulsifying agents are acetic acid, propionic acid, aluminium chloride, ferric chloride and acid salts. The bituminous substance may be emulsified in soap and water and before the emulsification a sulphonic product of an aromatic hydrocarbon or a hydrogenation product of phenol or its homologues may be added. In an example clay is dispersed in water heated to 200° F. and acetic acid is added. Into this mixture is stirred a bituminous emulsion prepared by running molten pitch or the like, a quantity of a sulphonic product of an aromatic hydrocarbon and soap and water through a colloid machine. A quantity of fibrous material such as asbestos may finally be incorporated. A part of the de-emulsifying agent may be added to the clay liquor and the rest added when the bituminous emulsion is being poured in. The composition may be used for roofing, covering walls, &c., and making footpaths, blocks, slabs, &c.

312,636. Selden Co., (Assignees of *Jaeger, A. O.*). May 29, 1928, [*Convention date*].

Compositions containing natural or artificial resins.—One or more compounds of the phthalide type are used as plasticizers, with or without fillers, solvents or other plasticizing ingredients, in compositions containing resins such as phenol aldehyde, aldehyde urea, polybasic acid polyhydric alcohol, such as glycerol phthalate, phenolketone, or sulphur resins, or polymerization or condensation products of cumarone and indene, of styrol or itaconic acid and in casein plastics. As examples of plasticizers are phthalide, hydrogenated phthalides, alkylidene phthalides or hydrogenated phthalides, mono-or dialkylphthalides, or hydrogenated phthalides, mono-or diarylphthalides, or hydrogenated phthalides, or mixtures of two or more phthalide substances. Examples of proportions are given, one showing the preparation of a moulding composition from shellac.

312,700. Jack, J. A. March 6, 1928.

Refractory substances.—Relates to processes for refining iron, steel and other metals, especially for the removal of sulphur and silicon, by treating the molten metal with oxides, hydroxides or carbonates of the alkalies or alkaline earths, and consists in lining the ladle or other container in which the alkaline treatment is effected with a refractory material of high silica content, such as ganister clay, with which carbon has been incorporated. The percentage of carbon may be from 5 to 25. In an example, 90 parts of ganister clay and 10 parts of powdered graphite are mixed to a paste with water and moulded or otherwise shaped.

312,741. Kleiber, E., and **Gilardi, P.** March 26, 1928.

Resinous compositions.—An elastic mass capable of being vulcanized and used as a rubber substitute is obtained by treating petroleum with nitric acid or with sodium peroxide in the presence of soda lime or sodium acetate or with other oxidizing agent and distilling the neutralized liquid so obtained repeatedly over colophony, treating the distillate with a dilute alkali under pressure causing separation into three layers, and treating one or both of the upper layers with a rubber promoter, e.g., by adding glacial acetic acid and formaldehyde and raw rubber. From a syrup like mass so obtained an elastic mass capable of being vulcanized is obtained by the addition of acetone or alcohol. The residue obtained after the distillation over colophony is a hard resin which may be used as a substitute for copal for varnish.

312,769. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). April 26, 1928.

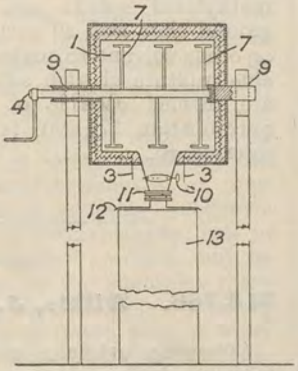
Cements, Portland and Roman, materials for.—Flue dust, combustion residues, coal particles, &c., carried over by industrial gases, such as produced according to the process of Specifications 214,544 and 279,316, [both in *Class* 55 (i), Coking &c.], are utilized, after deposition of sulphur thereon by oxidation of sulphur compounds in the gases, in the manufacture of cement by being heated to sintering together with aluminium silicate and silicic acid with or without an addition of carbon.

312,905. Kunstharzfabrik Dr. F. Pollak Ges. June 1, 1928, [*Convention date*].

Compositions containing artificial resins.—In making phenol-formaldehyde condensation products according to the process set out in Specification 267,901 or Specification 290,963, phenols, urea, or derivatives of urea such as thiourea or guanidine are added towards the end of the condensation for the purpose of binding free formaldehyde. When phenols are employed, the amount of the addition is preferably such that the final product contains formaldehyde and phenol in the molecular proportion of five to two. The initial solution containing phenol and formaldehyde is preferably of low viscosity. Examples are given in which urea and phenol are employed as additions in accordance with the invention, caustic potash being used as the condensing agent, and neutralization being effected with lactic acid and phthalic acid or phthalic anhydride dissolved in glycerine, and with chloracetic acid. In one example, glucose is added to the condensation product for the purpose of increasing the breaking strength.

The Specification as open to inspection under Sect 91 (3) (a) comprises also the addition to phenol-formaldehyde condensation products in which the last phase of condensation is carried out in alkaline solution with a proportion of more than one molecule of formaldehyde to each molecule of phenol, of mono- or polysaccharoses or derivatives thereof, for example glucose, fructose, sucrose, lactose, soluble starch, or cellulose. It also includes the addition to such condensation products of homologues, substituents, and salts of phenols and of urea, and mentions methylurea, acetylurea, and diphenylurea as urea derivatives. It further includes the application to condensation products from homologues of phenol, and aldehydes, or polymers thereof, other than formaldehyde. This subject-matter does not appear in the Specification as accepted.

312,940. Roessler & Hasslacher Chemical Co., (Assignees of *Gilbert, H. N.*). June 1, 1928, [*Convention date*].



Plastic compositions containing carbon.—In the manufacture of carbon electrodes from compositions comprising a mixture of graphite and a binding agent such as pitch, as described in Specification 251,982, the mixture, before being heated under pressure to carbonize the binder, is heated to a temperature sufficient to volatilize a portion of the binder or a hydrocarbon such as benzene, xylene or the like added to the mixture, in order to drive off any air or non-condensable occluded gas. Precautions are taken to prevent further occlusion prior to pressing. The absence of air, &c., from the mixture enables the subsequent heating process to be effected at considerably lower pressures. To avoid undesired decomposition of the binder due to excessive or prolonged heating of the mixture during this preliminary treatment, the mixture is stirred either in a separate heating vessel or in the mould itself, or the heating may be effected by a number of electrical heaters distributed in the mixture. The mixture may also be heated by arranging it as a resistance in a suitable electric circuit. The mixture may comprise 80 parts of powdered graphite and 20 parts of hard pitch. In the apparatus shown the preliminary treatment is effected in a heat-insulated container 1 separate from the mould 13 and mounted on trunnions 9 for charging and discharging through a flanged opening 11 provided with a butterfly valve 10. The container is heated electrically by heaters 3 and the mixture is stirred by paddles 7 carried by a rotatable shaft 4. During the mixing, the container is turned so that its flange 11 faces upwardly and is connected to a liquid or mechanical seal (not shown) to permit egress of air and vapours, but to prevent ingress of air. When the occluded air has been driven off, the container is rotated so that the flange 11 may be connected with the cover 12 of the mould 13, and the contents are discharged through the valve 10. The mould may be partially exhausted or may contain vaporized benzol to avoid undue exposure of the mixture to air. The binder may comprise commercial coal-tar pitch heated in an open vessel to a temperature 350° C. until the melting point of the pitch is between 160° C. and 210°., or untreated commercial pitch may be used and the preliminary heating of the mixture carried on until the mixture acquires the desired properties. The compressed mixture may be removed from the mould before carbonization of the binder by cooling the mould below the softening point of the pitch, the moulded electrodes being subsequently subjected to baking. The electrodes may be completely graphitized.

313,133. British Celanese, Ltd., (Assignees of *Moss, W. H., and White, B. B.*). June 7, 1928, [*Convention date*].

Compositions containing artificial resins and cellulose ethers.—Plastic compositions containing benzyl or other aralkyl ethers of cellulose and synthetic resins are obtained by dissolving these bodies in a suitable solvent, and adding plastifiers, other resins (natural and synthetic) and/or effect materials. Suitable solvents include acetone, methyl ethyl ketone, acetone oil, cyclohexanone, cyclohexanol, tetra-hydronaphthalene, benzene, toluene, xylene, ethyl propionate, acetate, lactate and butyrate, butyl propionate, mono butyl ether of ethylene-glycol butyl acetate, amyl acetate, ethylene dichloride, methylene dichloride, tetrachlorethane, pentachlorethane, perchlorethylene, trichlorethylene, benzyl alcohol, glycol diacetate, mono ethyl ether of ethylene glycol, and mono methyl ethyl of ethylene glycol, alone or admixed. Mixtures of the above with alcohols, such as methyl, ethyl, propyl or butyl alcohols are also suitable, although the benzyl ethers of cellulose are insoluble in alcohols alone. Suitable plastifiers include camphor, tri-phenyl phosphate, tricresyl phosphate, triacetin, the mixed isomeric monomethyl xylene sulphonamides, para toluene sulphonanilide, ethyl para toluene sulphonamide, toluene sulphonamide, diphenyl propane, diphenylol butane and similar substituted phenols, diethyl phthalate, dibutyl phthalate, diamyl phthalate, ethyl abietate, dibutyl tartrate, naphthalene, chlornaphthalene, waxes such as paraffins, ceresin, japan wax, beeswax, and oils, such as castor oil, olive oil, linseed oil and tung oil. Suitable resins include natural gums as rosin, acaroids, manilla, kauri, congo, pontionak and dammar; semi-synthetic resins as glycerol ester of rosin and esterified copals; and synthetic resins as cumar, soluble phenol formaldehyde, phenol furfural, furfural acetone, phthalic-anhydride-glycerol, zinc butyl phthalate, and polymerized lactic acid resins. The term "phenol" includes phenol and its homologues, polyphenols, naphthols and derivatives containing a free hydroxy group, and also compounds having a free hydroxy group, such as diphenylol propane, &c. Dyes, pigments, metallic powders, &c., may be added to produce colour, protective or decorative effects. Other cellulose ethers, e.g. methyl or ethyl cellulose, may be added to the composition containing benzyl ethers of cellulose. The plastifiers and resins may be added to the cellulose esters before or after solution, or they may be dissolved in a suitable solvent and added to the cellulose ether solution. Specification 164,375, [*Class* 2 (ii), Cellulose, &c.], is referred to.

In the Specification as open to inspection under Sect. 91 (3) (a) the presence of a synthetic resin in the composition may be optional, and compositions containing other ethers of cellulose, e.g. methyl or ethyl cellulose are described. This subject-matter does not appear in the Specification as accepted.

313,433. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, (*formerly* Bataafsche Petroleum Maatschappij). June 11, 1928. [*Convention date*]. *Grant of Patent opposed.*

Asphalts.—Light coloured asphalt-like products are manufactured from petroleum residues, asphalts and similar substances containing asphaltenes, by removing the asphaltenes by (1) treating the asphalt, &c., with a precipitating agent such as gasoline, pentane and other light hydrocarbons poor in aromatic constituents in the presence or absence of a diluting agent such as benzine or kerosene, or (2) treating the asphalt, &c., in the presence or absence of a diluting agent; with a chemical reagent such as sulphuric acid, anhydrous ferric chloride, anhydrous stannic chloride, boron fluoride, or aluminium chloride, which converts the asphaltenes into insoluble compounds, or (3) treating the asphalt, &c. with a decolorizing powder, such as bleaching earths or carbon, in the presence or absence of a diluting agent. Two or three of these treatments may be applied in any order. Other dark coloured compounds may be removed by the treatment in addition to the asphaltenes proper. In an example, a Java asphalt is heated and diluted with 200 per cent. of benzine; 2 per cent. of sulphuric acid is added; the mass is allowed to settle and the acid tar and the enveloping substances removed; 3 per cent of bleaching earth (Terrana) is stirred in, and the mass filtered; finally the benzine is distilled off and the resulting light coloured asphalt is steam distilled to the required degree of penetration.

313,569. I. G. Farbenindustrie Akt.-Ges. June 14, 1928, [*Convention date*].

Compositions containing artificial resins.—Polymerized vinyl halides are combined with resins, oils, cellulose derivatives or filling materials of any kind. In examples, (1) Vinyl chloride and ethyl chloride are mixed with intensive cooling and afterwards heated in an autoclave, giving a transparent vitreous mass which by heating may be converted to solid incombustible insulating substances. (2) Vinyl chloride is mixed with vinyl acetate and treated as in (1) giving a transparent product which when dissolved in a mixture of cyclohexanone and benzene gives a lacquer which may be used alone, but it may also be combined with a cellulose derivative, a resin, caoutchouc, or the like.

313,578. Consortium für Elektrochemische Industrie Ges., and Dörr, O., (Assignees of *Dörr & Hofman*). June 14, 1928, [*Convention date*].

Compositions containing vinyl esters and fillers are made by incorporating into an alcohol soluble vinyl ester solution which can be sprayed, fillers such as ground slate, corkmeal, leather dust, woodmeals or mixtures thereof. In an example 20 parts of a 50 per cent vinyl ester solution in methylated spirits are mixed with 40 parts of ground slate and 40 parts of alcohol, acetic ether or other solvent to make a quickly drying sprayable mixture of high adhesive power. Mixtures are formed capable of being filed or worked. Specification 271,090, [*Class* 95, Paints &c.], is referred to.

313,766. Bilbie, J. P. June 28, 1928.

Colouring artificial stone. — Sand and lime bricks and tiles are provided with glazed and colour effects upon certain sides by the applications of dry oxide colours and then a coating of transparent cellulose varnish. The sides are first prepared by a material, such as lime, which fills the pores and makes a ground for the application of the colours. Any desired number of colours may be applied in order to produce the desired effect and the cellulose varnish may be applied by spraying. White effects in an umbrated pattern may be produced by applying the cellulose coating direct to the prepared surface. According to the Provisional Specification a coating of sodium silicate is applied to the colour layer prior to the application of the cellulose coating.

313,824. Hopkirk, F. C., and **Tennant & Co., Ltd., C.** Sept. 29, 1928.

Compositions containing tar, tar oil, and bitumen.—As a binding agent in road construction, 61 per cent tar is mixed with 5 per cent light coal tar oil containing a minimum of 5 per cent naphthalene and less than 1 per cent water, and 34 per cent bitumen, preferably steam refined from heavy Mexican crude. The bitumen is heated to between 100° F. and 200° F. and incorporating temperature not exceeding 300° F. to the mixture of tar and tar oil prepared by heating the tar to between 100° F. and 200° F. and incorporating the oil. The mixture is applied hot by heating to between 240° F. and 280° F.

314,358. British Cyanides Co., Ltd., and **Rossiter, E. C.** Dec. 23, 1927. *Samples furnished.*

Compositions containing artificial resins.—Resinous products capable of being hardened by heat are prepared by the interaction of dicyandiamide and formaldehyde. The reaction is preferably conducted under comparatively mild conditions so that the primary condensation product remains in solution. The products may be treated with, or prepared in the presence of, acidic substances (this term including organic hydroxy compounds such as phenols, and casein and like substances), whereby there may be obtained, according to circumstances, resinous, gummy, waxy or oily products. Any of the products obtainable as described above may be used to modify the properties of resins prepared from formaldehyde and urea and/or thiourea, or from formaldehyde and a phenol or other substance capable of condensing with formaldehyde, and to this end the previously prepared products may be mixed together. According to the examples there are obtained (2) and (3) moulding powders by impregnating a filler such as paper pulp or wood meal with solutions of dicyandiamide-formaldehyde condensation products; (4) and (5) moulding powders from wood meal and solutions of products prepared by treating mixtures of urea and dicyandiamide with formaldehyde; (6) a moulding powder from wood meal and a product prepared by heating a mixture of urea and dicyandiamide with formaldehyde and then heating with butyric acid; (7) a moulding powder from a filler and a solution obtained by condensing urea with formaldehyde in the presence of the product of example (11); (9) a resin by heating dicyandiamide with formaldehyde and then heating with formic acid; the product swells in water and is miscible with gelatin; (11) a resin, not hardened by heat, by heating a mixture of dicyandiamide, formaldehyde, and butyric acid; the properties of mixtures of this resin with urea-formaldehyde and like resins or with resins prepared as in (12), with or without plasticisers such as triphenyl phosphate, are described: (12) a resin by heating a mixture of dicyandiamide, formaldehyde, and linoleic acid.

314,399. Groves, W. W., (*Consortium für Elektrochemische Industrie Ges.*). June 26, 1929. [*A Specification was laid open to inspection under Sect. 91 of the Acts, June 27, 1929*].

Compositions containing artificial resins.—Aldehyde resins are fused with polymerised vinyl compounds, such as polyvinyl esters, acrylic esters, and itaconic acid esters, in particular the vinyl alcohol polyesters tautomeric with acetic aldehyde. The compositions may be used as substitutes for shellac and with fillers particularly in the manufacture of gramophone records. In an example, 90 parts by weight of an artificial resin made as described in Specification 201,916 and 20 per cent castor oil are melted together with 10 parts polyvinyl acetate freely soluble in alcohol. The product takes up large quantities of filling materials. Reference is made to Specifications 182,459, 184,442, and 185,107, [all in *Class* 2 (iii), Dyes, &c.], and 201,916.

314,440. Rohm & Haas Akt.-Ges., (Assignees of *Blumfeld, A. E.*). June 27, 1928, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

Bituminous compositions. — Water-insoluble condensation products are obtained by the action of sulphur compounds on glycerine chlorhydrins. In an example, epichlorhydrin is treated with sodium sulphide in the presence of water. The product, a yellow oil soluble in alcohol, may be converted by heat at ordinary, reduced, or increased pressure, into a brown substance which is insoluble in most solvents, and the elastic properties of which may vary, according to the nature of the heat treatment, from those of a lightly vulcanized rubber to those of a hard vulcanite. The above products are capable of hardening in the presence of either reactive or non-reactive resins. The treatment of epichlorhydrin with sodium sulphide may also be carried out in the absence of water, in which case in addition to the yellow oil, solid white products are obtained, which are insoluble or difficultly soluble in alcohol, and which may be used as substitutes for factis. Products prepared from glycerine chlorhydrins and sulphur compounds as above may be used in the manufacture of phenol-aldehyde resins as additions for removing brittleness.

314,561. Travis, S., and **Callow Rock Lime Co., Ltd.** March 27, 1928. *Drawings to Specification.*

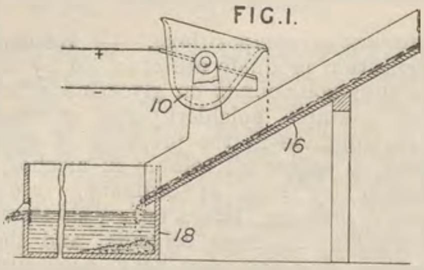
Cements, Portland.—Dust evolved from cement kilns is treated with a sludge formed from such dust and water to bring the dust into suspension, and the sludge used also for mixing the raw materials for the cement manufacture, which may then be fed into the kiln in a wet state as a slurry. The sludge is preferably passed in closed circuit from slurry tanks into contact with the dust and back to the slurry tanks.

315,126. Jacobs, A. N. P. Aug. 14, 1928.

Stone, colouring.—Articles made of magnesia cement are coloured by dipping first in a solution of potassium permanganate, ammonium chromate or other oxidizing agent, and then in a solution of cobalt chloride or nitrate. Portions of the surface to be left uncoloured may be protected by a coating of oleaginous material such as printers' ink.

315,196. A. C. Spark Plug Co., (Assignees of *McDougal, T. G.*). July 7, 1928, [*Convention date*].

FIG.1.



Refractory substances. — Aluminium silicate for use as an ingredient in ceramic material is produced in the form of very minute unstable crystals by rapid cooling of the fused mass. As shown in Fig. 1, mullite, andalusite or sillimanite is melted in a crucible 10, with a small proportion of a suitable flux such as magnesia, and is poured in a fine stream or drop by drop into a stream of water flowing down a trough 16 into a tank 18. In a modification, the stream of molten material is broken up by a water jet under high pressure. Specification 315,197 is referred to.

315,197. A. C. Spark Plug Co., (Assignees of *McDougal, T. G.*). July 7, 1928, [*Convention date*].

Refractory substances.—Ceramic material for the manufacture of sparking plugs, electric insulators, and the like, comprises approximately 50 per cent of plastic clays, 5 per cent of suitable flux such as magnesia, and the remainder of refractory such as mullite prepared as described in Specification 315,196 in the form of very minute unstable crystals. It is stated that when the moulded product is fired in the usual manner, a marked crystalline growth takes place which increases the mechanical strength, the electrical insulating quality and the resistance to heat.

315,265. International General Electric Co., Inc., (Assignees of *Allgemeine Elektricitats-Ges.*). July 10, 1928, [*Convention date*].

Refractory substances.—A heat-resisting insulating material is made by the homogeneous distribution of kaolin; talc or heavy spar in a glassy flux with or without mica and/or asbestos. Specification 152,780 is referred to.

The Specification as open to inspection under Sect. 91 (3) (a) states that gum may be added. This subject-matter does not appear in the Specification as accepted.

Reference has been directed by the Comptroller to Specifications 25853/03, 138,799 *and* 152,780.

315,620. Oesterreichisch Amerikanische Magnesit Akt.-Ges., and **Erdmann, K.** Aug. 16, 1928, [*Convention date*].

FIG.1.

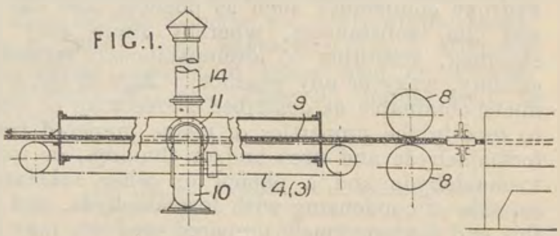
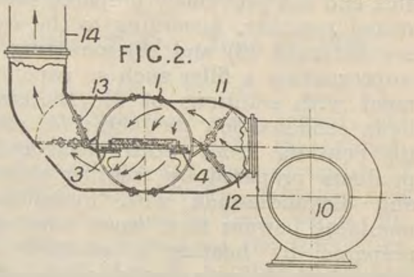


FIG.2.



Stone, hardening. — Articles moulded from a composition of fibrous material and Sorel cement, are dried by passing a heated gaseous medium, preferably containing carbon dioxide, through the article alternately in different directions. The process is particularly applicable to drying the "hank" formed by a continuous moulding process such as that described in Specification 258,731, [*Class* 87 (ii), Moulding plastic &c. substances]. A rectangular "hank" 9, Fig 1, sufficiently hardened to bear handling is fed from the moulding machine by rolls 8 to a drying chamber 1, through which it is conveyed by chains, &c. 3, 4 supporting it at the edges, and so arranged that the hank divides the chamber 1 into two longitudinal compartments. The chamber 1 is supplied with heated drying medium by a pump 10, Fig. 2, conduit 11, and exhaust 14. In the conduit 11 and exhaust 14 are placed manually or automatically operated valves 12, 13. In the position shown, heated gas passes into the upper compartment of the chamber 1, through the hank 9, and discharges from the lower compartment. On moving the valves into the dotted position, the hot gas passes upwards through the hank.

315,799. Ter Smitte, J., Ter Smitte, J. C., and **Ter Smitte, J. P.** July 18, 1928, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

Figured artificial stone.—A mould is coated with colouring matter, which may be fluid or in powder and uniform or variegated, the stone-forming composition is deposited thereon in a pappy state, a portion at a time, and after each portion has been deposited the mould is inclined or jogged to run the colour. The portions of stone-forming composition may themselves be variously coloured.

315,807. British Celanese, Ltd., (Assignees of *Dreyfus, C.*). July 18, 1928, [*Convention date*].

Compositions containing artificial resins and cellulose derivatives.—Coating and plastic compositions comprise a synthetic resin formed by condensing benzene sulphonamide with an aldehyde, and a cellulose derivative. The resins are preferably made without the aid of catalysts, but acid or alkaline catalysts may be employed. Examples of the aldehydes which may be used are formaldehyde, paraformaldehyde and acetaldehyde. As cellulose derivatives, cellulose acetate is preferred, but other derivatives such as the nitrate, formate, propionate, butyrate, or ethers such as methyl, ethyl or benzyl cellulose may be used. The compositions may also comprise natural or artificial resins, plasticizers, softeners, medium and/or high boiling solvents, pigments, dyes, &c. Among the resins suitable for use are manilla, acaroids, pontianak, kauri, dammar, rosin, shellac, ester-gum, phenol-aldehyde resins, &c. As plasticizers or softeners, diethyl phthalate, triphenyl or tricresyl phosphates, amides such as monomethyl or ethyl benzene or toluene sulphonamides, triacetin, diphenylol propane, thiocarbanilide, &c. may be used. High, medium and low-boiling solvents specified are ethyl acetate and lactate, tetrachlorethane, benzyl and diacetone alcohols, acetone, benzene, alcohol, and ethylene dichloride. Fire-retardants, for example, organic bromine compounds such as brominated tricresyl phosphate may be added. An example of the preparation of a benzene sulphonamide-aldehyde resin is given.

315,808. British Celanese, Ltd., (Assignees of *Dreyfus, C.*). July 18, 1928, [*Convention date*].

Compositions containing artificial resins and cellulose derivatives.—Coating and plastic compositions comprise a synthetic resin formed by condensing xylene sulphonamide with an aldehyde, and a cellulose derivative. In making the resin sulphonamides of the homologues of the xylenes, such as diethyl benzene or cymene may be used, and as aldehydes, formaldehyde, paraformaldehyde, acetaldehyde, &c. are suitable. The resins are preferably made without the aid of catalysts, but acidic or alkaline catalysts may be employed. As cellulose derivatives, cellulose acetate is preferred, but other derivatives such as the nitrate, formate, propionate, butyrate, or ethers such as methyl, ethyl or benzyl cellulose may be used. The compositions may also comprise natural or artificial resins, plasticizers, softeners, medium and/or high boiling solvents, pigments, dyes, &c. Among the resins suitable for use are manilla, acaroids, pontianak, kauri, dammar, rosin, shellac, ester-gum, phenol-aldehyde resins, &c. As plasticizers or softeners, diethyl phthalate, tricresyl or triphenyl phosphates, amides such as mono-methyl toluene or xylene sulphonamides, triacetin, diphenylol, propane, thiocarbanilide, &c., may be used. High, medium and low-boiling solvents specified are ethyl acetate and lactate, tetrachlorethane, benzyl and diacetone alcohols, acetone, benzene, alcohol and ethylene dichloride. Fire-retardants, for example organic bromine compounds such as brominated tricresyl phosphate may be added. An example of the preparation of a xylene sulphonamide-aldehyde resin is given.

315,835. I. G. Farbenindustrie Akt.-Ges. July 19, 1928, [*Convention date*].

Compositions containing artificial resins.—Artificial resins derived from phenols and capable of being hardened, are kept soft by incorporating in them not more than 10 per cent of a cellulose ether other than an aralkyl ether. The products may be used for the preparation of substitutes for glass, celluloid, &c. In examples (1) 100 parts of phenol-formaldehyde condensation product is dissolved in 100 parts of alcohol and 30 parts of a 10 per cent solution of ethyl cellulose in alcohol and toluene is added. (2) 30 parts of a 10 per cent aqueous solution of methyl cellulose are added to 35 parts of the artificial resin prepared by reacting a fusible phenol aldehyde resin with a halogen fatty acid, dissolved in 65 parts of water. The solutions when applied as lacquers are hardened at 150° C.

The Specification as open to inspection under Sect. 91 (3) (a) describes the use of any proportions of any cellulose ether for keeping soft any artificial resin capable of being hardened. This subject-matter does not appear in the Specification as accepted.

315,846. Bie, P. B. de. July 20, 1928, [*Convention date*].

Compositions containing bituminous, resins, and wax-like materials.—In making a macadam or gravel road, the voids are filled with a mixture of sand or similar fine grained mineral and an aqueous emulsion of solid bituminous material such as bitumen, wax, resin or the like. The road crust contains at most 3 per cent by weight of the bituminous material, a specimen composition being 100 c. ft. of stone, and 40 c. ft. of sand mixture, the latter including five parts by volume of sand, and one part of an emulsion containing 50 per cent of bitumen.

315,856. Hartford-Empire Co., (Assignees of *Willetts, P. G.*). July 21, 1928, [*Convention date*].

Refractory substances.—Firebricks and like refractory articles are composed to have substantially the following chemical analysis: 39.9 to 34.89 per cent of SiO_2, 61.39 to 56.38 per cent of Al_2O_3, 1.11 to 0.89 per cent of Fe_2O_3, 2.72 to 2.65 per cent of TiO_2, 0.28 per cent of CaO, 0.27 to 0.25 per cent of MgO, 0.06 to none of Na_2O and loss on ignition from 0.28 to 0.22 per cent. The bricks, &c. are made of white bauxite, Georgian Klondike white kaolin, and a hard fireclay known as Georgian G^1 clay, or of other clays and bauxites having substantially the same analytical composition and properties. In an example, 128 parts of raw white bauxite, 87 parts of Georgian Klondike white kaolin and 21 parts of Georgian G^1 clay are ground to extreme fineness and mixed in the presence of water; this composition is calcined at 2,850° F. or higher and broken down to pass an 8 mesh screen; 60 parts of this grog are mixed with 40 parts of raw mixture, and the composition is moulded under a pressure of from 1 to 2½ tons per sq. in., dried, and fired at 2,850° F. or higher. The finished material comprises a glassy phase and a crystalline phase having the properties of mullite and present in minute crystals uniformly distributed.

315,870. Varnol Chemical Corporation, (Assignees of *Rosenblum, I.*). July 21, 1928, [*Convention date*].

Bituminous compositions. — Phenol-aldehyde or phenol-ketone condensates are reacted with compounds, such as glyceryl mono- and di-abietates, formed by partially esterifying polyhydric alcohols, such as glycerol or mannitol, with acids of a resinous nature. The products are fusible resins which are substantially neutral, soluble in drying oils, and suitable for use in the manufacture of varnishes. The phenol-aldehyde or phenol-ketone condensate is prepared in known manner, preferably in the presence of a solvent, for example, turpentine, drying or non-drying oils, natural or synthetic resins, resin esters, or mixtures of these solvents, and may be dehydrated at temperatures up to 120° C. Phenols specified are phenol and cresol, and a mixture of phenol and cresol may be employed. Aldehydes and ketones specified are formaldehyde, acetaldehyde, and acetone; mixtures of an aldehyde and a ketone may be employed. The partially esterified compound may be prepared by treating a polyhydric alcohol in known manner with colophony, congo, manila, pontiac, shellac, kauri, copal, or other fossil resin; and it may be dissolved in a suitable solvent, for example, a natural resin, or a resin ester such as glyceryl triabietate, before it is reacted with the phenol-aldehyde or phenol-ketone condensate. The latter reaction is carried out at ordinary, reduced, or increased pressure, if desired in presence of excess of the polyhydric alcohol, and at temperatures of from 250° C. to 300° C. Examples are given.

316,017. Hines, J. T. July 31, 1928.

Bituminous compositions.—A road-making or like composition comprises stone or other mineral aggregate bonded with a mixture of commercial bitumen, Trinidad bitumen or epure containing clay in a colloidal state and a fluxing oil containing sulphur in combination or free. A fine mineral filler may also be added. The sulphur, which serves to harden the bitumen, is preferably dispersed in a colloidal state in the oil and by varying the amount of sulphur the hardness can be controlled. Three methods of making the composition are (1) spraying the clean dry aggregate with the fluxing oil and then incorporating the bitumen mixture and the mineral filler; (2) mixing the fluxing oil, bitumen and epure and applying the mixture to the aggregate; (3) applying the bitumen mixture to the aggregate and the fluxing oil to the mineral filler, and then mixing the two compositions. The oil is preferably applied at a temperature of 110°—185° F. and the bitumen mixture at a temperature of 240°—320° F. The mineral filler is preferably stone of the same quality as the aggregate, but cement, limestone dust or slate dust may be added. Suitable proportions of the oils and bitumens are from 5 to 10 per cent of fluxing oil containing 2—10 per cent of sulphur, from 40 to 60 per cent of commercial bitumen of 200 penetration, and from 40 to 60 per cent of Trinidad epure having a high content of colloidal clay. In surfacing a road, the composition is sprayed to a thickness of one and a half times the thickness of the finished layer and is then consolidated with a heavy roller. The surface is then covered with clean ⅜ inch chippings at the rate of about one ton to 135 sq. yds., and the chippings are rolled to give a non-skid surface. On paths and carriage-ways screened gravel can be used to give a finished surface having the appearance of ordinary gravel.

316,108. Ascroft, P., and **Richards, T. E. G.** Jan. 20, 1928.

Bituminous compositions.—An under layer of coarse granulated asphaltic concrete is rolled and served with a layer of fine grained asphaltic grout over which a wearing surface of fine asphalt mixture is laid, spread and rolled. By this means the grout is forced up into the interstices of the wearing surface and down into the under layer. A final layer of asphaltic grout may be squeegeed into the wearing surface and lightly rolled. The process is carried out under normal atmospheric conditions. The solid constituents employed such as crushed stone, slag or clinker are coated at a temperature of between 70° C. and 135° C. with a bitumen of such a viscosity that a float test at 50° C. gives a result of between 60 and 90 seconds. A filler such as that known under the registered Trade Mark "Inertite" is preferably added to the bitumen.

316,129. Hartford-Empire Co., (Assignees of *Willetts, P. G.*). July 23, 1928, [*Convention date*].

Refractory substances.—A refractory body for use in contact with molten glass is made from a starting mixture containing, by analysis, from 35 to 88 per cent of alumina, from 11 to 63 per cent of silica, not more than 1.5 per cent of iron, magnesium and alkali metal oxides, and sufficient fluxes, e.g. alkaline earth oxides to cause the transformation of the materials, when they are heated to below the fusion point, into mullite or corundum crystals and a glassy matrix. In an example, a body of high silica content is made by intimately mixing 90 parts of washed Georgian Klondike white kaolin and 10 parts of Arkansas clay, both in a fine state of sub-division, burning to form a grog which is broken down to pass a U.S. standard No. 24 screen: 17 parts of this grog is then mixed with 20 parts of a binder formed of 65 parts of the kaolin, 5 parts of the Arkansas clay and 30 parts of finely ground potter's flint; the mixture is moulded at a pressure of 5 tons to the sq. inch and fired at about 2850° F. The final product comprises two phases only, mullite crystals and glass, and has a low porosity. In another example, a body of high alumina content is made of a grog, formed of 96 parts of raw aluminium mono hydrate and 4½ parts of raw Arkansas clay, and a binder of the same composition fired at a temperature of about 3200° F. Other compositions are described. Specification 315,856 is referred to.

316,144. Goldschmidt, S., and **Mayrhofer, R.** July 23, 1928, [*Convention date*].

Compositions containing artificial resins.—Condensation products of phthalic acid anhydride with polyhydric alcohols are added in the liquid or viscous form to aqueous solutions of urea-formaldehyde condensation products. The addition may be made to the urea-formaldehyde product prior to, during or after its formation in acid or alkaline aqueous solution. The polyhydric alcohol may be in excess, so that some remains in the final product. The mixed condensation products are capable of hardening at a substantially higher temperature than the normal and cracking is avoided. According to the examples, glycerine is condensed with phthalic acid anhydride and the hot liquid or viscous product added to boiling aqueous condensation products of urea with polymeric formaldehyde, which in one case contains glycerine; after further boiling, the mass is hardened in moulds at elevated temperature.

The Specification as open to inspection under Sect. 91 (3) (a) contains additional examples of the above process, in one of which glycol is employed in lieu of glycerine. An example is also included, according to which urea, polymeric formaldehyde, glycerine, monoacetin and sodium carbonate solution are boiled together and the product hardened in moulds. This subject-matter does not appear in the Specification as accepted.

316,189. Carborundum Co., Ltd., (Assignees of *Martin, H. C.*). July 24, 1928, [*Convention date*].

Compositions containing abrasive material and artificial resins.—A composition for the manufacture of abrasive articles, comprising abrasive granules and powdered synthetic resin, is mixed at a temperature below about 70° F. to avoid gumming of the resin, which would result in a non-uniform mixture. The mixture is cold pressed and baked. The abrasive material may consist of silica, garnet, silicon carbide, fused alumina, magnesia or aluminium silicate, or glass, and the resin may be a phenol condensation product. The abrasive granules may be first wetted with furfurol and then mixed with the powdered resin, some of which becomes attached to the granules so that the mixture is workable at temperatures below that at which the resin becomes gummy. The mixing may be effected in a room automatically kept below the critical temperature by a thermostat which actuates a refrigerating system if this temperature is exceeded, and as excessive moisture present in the air will condense on the pipes of the refrigerator, the humidity of the atmosphere will also be controlled. The mixing temperature may be as low as 48° F. The temperature of the mixture may also be controlled by water jackets. The mixture may comprise 900 grams of abrasive, 100 grams of resin and 10c .c. of furfurol. Specification 225,436 is referred to.

316,275. Bakelite Corporation, (Assignees of *Chamberlin, C. L.*). July 27, 1928, [*Convention date*].

Compositions containing artificial resins and fibrous material.—A dry composition capable of flowing in the mould is composed of pieces of woven fabric, for instance coutil, impregnated with a phenol aldehyde resin in the reactive state. The size of the pieces of fabric may vary from ⅛ inch to 1½ inches long by ⅛ inch to 1½ inches wide. Colours, or coloured compositions such as wood flour mixes, may be added, but not coarse filling material of the nature of ground cork. In an example, coutil is cut into pieces in a rag cutter to sizes of about 1 to 1½ inches long by 1 to 1½ inches wide. The pieces are placed in a kneading machine and a 50 per cent solution in alcohol of the reactive product of about 100 parts of phenol, 60 parts of formaldehyde and 10 parts of hexamethylenetetramine is added. After mixing for about 20 minutes the material is dried under a partial vacuum at about 70° C. and remains in flake form. For the moulding of articles, a hot mould is charged with the loose material and pressure is applied. Continued heating at about 135° C. hardens the resin. Specification 146,845, [*Class* 70, Indiarubber &c.], is referred to.

316,319. British Thomson-Houston Co., Ltd., (Assignees of *Kienle, R. H.*). July 27, 1928, [*Convention date*].

Compositions containing artificial resins; ester condensation products. — An alkyl resin containing an unsaturated oxidizable fatty acid preferably the acid of a drying oil is incorporated with a drying oil before the completion of the resinification and may be employed as a coating or impregnating composition or for making laminated articles of paper, textiles, mica and the like, or, with fillers such as wood flour, asbestos, cotton, ground minerals, &c. for making moulded articles. The alkyd resin may be made from glycerine and phthalic anhydride, or other polyhydric alcohols such as glycol or mannitol and other polybasic acids such as succinic or malic acid may be employed. In the examples glycerine and phthalic anhydride are heated together, and, at 200° C. further phthalic anhydride and the fatty acid of chinawood, linseed perilla or like oil is added; or all the ingredients may be mixed at one time; in either case the drying oil is added when the resin is in the A stage. When the resin contains more than 45 per cent of oxidizable fatty acid it is unimportant what part of the A stage the resin has reached. In another example an unsaturated fatty acids such as the acid of linseed oil is heated with excess of glycerine so as to form an ester, linseed oil is added and finally phthalic anhydride, the heating being continued until a drop on a hot plate (200° C.) loses all fluidity in less than five minutes. Alternatively the oil may be added in two portions, the second being added after the phthalic anhydride. When the resin contains at least 45 per cent of oxidizable fatty acid, it can be incorporated with oil by simply heating, without special precautions. The oil solutions of the resin are soluble in solvents such as acetone, benzene-alcohol, coal-tar oil, acetone oil, butyl acetate, butyl alcohol, ethyl lactate, glycol diacetate, glycol ethers, benzyl acetate, triacetin, diethyl phthalate, and dibutyl phthalate, and, when there is a high fatty-acid content, the oil solutions are also soluble in aliphatic hydrocarbons such as gasolene, petroleum naphtha, &c. Specification 22544/13, and 284,349, [*Class* 95, Paints, &c.] are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) includes the use of a non-drying oil such as cotton seed oil instead of the drying oil. This subject-matter does not appear in the Specification as accepted.

316,325. Imperial Chemical Industries, Ltd., (Assignees of *Lawson, W. E.*). July 27, 1928, [*Convention date*].

Compositions containing artificial resins.— Plastic compositions comprise synthetic resins containing ether groups which are prepared by heating polybasic carboxylic acids or their anhydrides with ether-alcohols containing at least two free hydroxy groups to temperatures of from 175° C. to 250° C., ensuring complete esterification. Specified polybasic acids are phthalic and succinic acids. The ether-alcohols may be monomethylin, monoethylin, other monoalkyl ethers of glycerine, monoaryl ethers of glycerine, or monoalkyl monoaryl, dialkyl, or diaryl ethers of pentaerythritol, mannitol or sorbitol. Compositions containing such resins may include modifiers of the types used in the preparation of glycerine-phthalic anhydride resins, and may also contain cellulose derivatives.

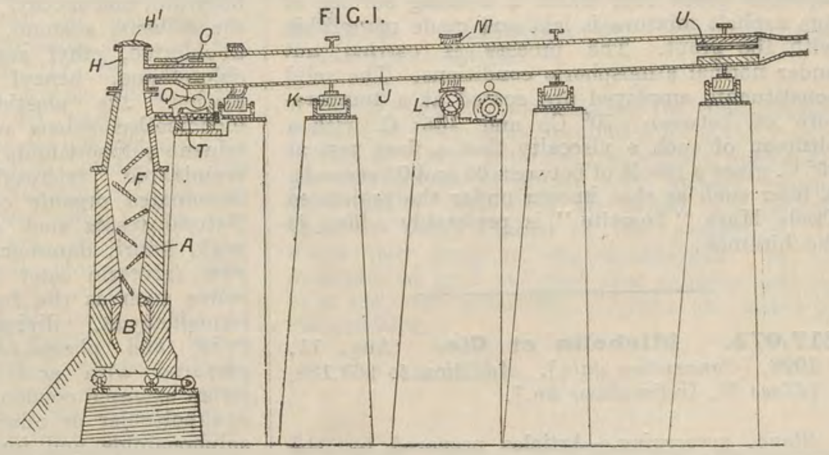
316,700. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges*). May 11, 1928.

Fibrous compositions containing artificial resins. — Vulcanized fibre is impregnated with aqueous solutions of substances which are capable of forming resinous water repellant products, or with solutions of the components of such substances, and the substances are then converted into the solid water repellant state within the fibre. The fibre is impregnated, for example, with solutions or mixtures, or soluble primary condensation products, of phenols and aldehydes, or of urea and aldehydes, ketones and aldehydes, phenols and sulphur or sulphur compounds, phthalic anhydride and polyhydric alcohols, or other substances, and insoluble condensation products formed within the fibre. Catalytic agents may be added. The fibre may be first impregnated with a solution of one component and then with a solution of the other component. In one example, 94 parts of phenol are dissolved in 100 parts of an aqueous 30 per cent solution of formaldehyde with the addition of 1 part of butylamine. Articles of vulcanized fibre immersed in the solution swell and absorb up to 100 per cent of their own weight of solution. They are taken out and kept for one or more days at 95° C., when the condensation product is formed. The heating may be effected under pressure, and the mass may be moulded at the same time. The phenol may be replaced by its homologues or by naphthol, and other aldehydes such as furfural may be substituted for formaldehyde. In a second example, 30 parts of urea are dissolved in 100 parts of water, and the fibre placed in this solution until it ceases to absorb liquid. The fibre is then immersed in a 30 per cent solution of formaldehyde for one or two days. Catalysts may be added. The fibre is then dried and heated to 90°—95° C. for a few hours up to several days. Urea may be replaced by its homologues or by thiourea. In a third example, 50 parts of glycerol and 100 parts of phthalic anhydride are melted and then dissolved in 100 parts of warm water. The fibre is impregnated with the solution, dried, and heated at 100° C. for several hours, for a shorter time at about 140° C. and finally at 160° C. for about half an hour. The glycerol may be replaced by other polyhydric alcohols such as glycol or sorbitol, and the phthalic acid by other dibasic acids such as succinic acid.

316,715. Benham, H. J. May 19, 1928.

Cements, Portland and Roman.—A kiln for the manufacture of cement or lime comprises a shaft A provided with a plurality of baffle plates F and situated above a fusing chamber B fitted with electrodes, and a pulverizer Q communicating with the shaft A and a pre-heating tube J into one end of which the raw material is fed. The waste gases pass up through the shaft and a T shaped casting H into the preheating tube, which is mounted on roller bearings K and rotated through a motor driven worm gear L, M. The casting H is fitted with an inspection door H¹ or a pipe can be attached to lead the waste gases away from the shaft. The raw material passes into the pulverizer through slots O in the tube J and is fed into the shaft by a worm T. The baffle plates F are adjustable. Projecting plates U are fitted at the charging end of the tube J.

FIG.I.



316,866. General Electric Co., Ltd., (Assignees of *Patent-Treuhand-Ges. für Elektrische Glühlampen*). Aug. 4, 1928, [*Convention date*].

Compositions containing artificial resins.—In order to prevent the separation of the caps of electric lamps and discharge tubes when exposed to damp, a small quantity of wood oil, linseed or other greasy drying oil, is incorporated in the cement used for securing the caps to the glass bulbs. The cement consists of a spirit solution of synthetic resins, with or without a filler, and a condensing agent such as hexamethylene tetramine or calcium phenolate, to which 2 or 3 per cent of oil is added. The cement, particularly with a condensing agent, sets at comparatively low temperatures, but even if higher temperatures are used, the Specification states that sufficient oil remains to prevent damp from creeping between the glass and the cement.

316,897. South Metropolitan Gas Co., Pickard, H., and Stanier, H. March 3, 1928. *Drawings to Specification.*

Bituminous compositions.—Substitutes for the tar-bitumen mixtures used in road-making and like operations are obtained by dispersing bituminous coal, peat, or analogous material in coal tar at 250—350° C. so that the product contains no more than 15 per cent of coal, &c., and has a consistency lower than 100 secs. Hutchinson at 122° F. and upwards. In an example, 6 lb. of Durham coal are dispersed at 300° C. in 94 lb. of horizontal retort tar free from water and more volatile oils and of S.G 1.20; or 30 lb. of coal are dispersed in the tar, and then further tar added at 150—200° C. to give a product containing 6 per cent. of coal. The Specification shows how to ascertain readily the proportions, &c., required to obtain a product of a desired consistency at a given temperature by use of the logarithmic graph of the temperature-consistency relationship of the tar used. According to the Provisional Specification the viscosity and elasticity of coal oils, tars, and pitches are modified by dispersing therein the necessary proportions of naturally occurring carbonaceous substances such as peat and coal at 200—350° C. or other high temperature below that causing decomposition of the materials. Specifications 17799/96, 2292/02, [*Class* 55, Gas Manufacture], 131,588 and 268,372, [both in *Class* 91, Oils &c.], are referred to.

317,022. Ascroft, P., and **Richards, H. E. G.** Feb. 9, 1928. *Addition to* 316,108.

Bituminous compositions.—An underlayer of coarse granulated stone is rolled dry and served as in the parent Specification with a layer of asphaltic grout over which a wearing surface of fine asphalt mixture is laid and made monolithic with the grout. The process is carried out under normal atmospheric conditions. The solid constituents employed are coated at a temperature of between 70° C. and 135° C. with a bitumen of such a viscosity that a float test at 25° C. gives a result of between 60 and 90 seconds. A filler such as that known under the registered Trade Mark " Inertite " is preferably added to the bitumen.

317,073. Michelin et Cie. Aug. 11, 1928, [*Convention date*]. *Addition to* 263,138, [*Class* 70, Indiarubber &c.].

Stone, preserving.—Articles prepared by the process of the parent Specification by moulding ground lava bound with sodium silicate are, after moulding, treated with sulphur to make them less porous and consequently less susceptible to frost.

317,449. Harbison-Walker Refractories Co., (Assignees of *Youngman, R. H.*). Aug. 16, 1928, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

Refractory substances.—Serpentine is made suitable for use as a refractory material by being calcined at a temperature high enough, about 2900° C., to drive off its volatile constituents and reduce its porosity below 20 per cent. The calcined clinker is ground and may then be made into bricks by being mixed with lignin liquor and moulded, or by being mixed with water, moulded and fired at a temperature about 100° F. lower than the calcining temperature. The serpentine may be blended with magnesite to modify the refractory qualities of the product.

317,456. British Celanese, Ltd., (Assignees of *Moss, W. H., and White, B. B.*). Aug. 16, 1928, [*Convention date*].

Compositions containing artificial resins and cellulose derivatives.—Resins suitable for use in coating-compositions and plastics containing cellulose derivatives are made by subjecting the condensation product of toluene sulphonamide with formaldehyde or other aldehyde or other compound having a reactive methylene group with or without a small proportion of urea, to the action of heat in the absence of water. The product, together with cellulose derivatives may be made into solutions or plastics containing suitable low, medium or high boiling solvents, plasticizers, natural or synthetic resins, pigments and dyes; the solutions may be used as adhesives for making safety glass by securing sheets of glass to celluloid; the plastics may be made into sheets which may be used for making laminated glass. The cellulose derivatives mentioned are the formate, acetate, propionate and butyrate, and methyl, ethyl and benzyl cellulose; the solvents acetone, alcohol, benzene, ethylene di-chloride, ethyl acetate, ethyl lactate, tetrachlorethane, benzyl alcohol and diacetone alcohol; the plasticizers diphenylol propane monomethyl xylene sulphonamide, *o*- or *m*-ethyl toluene sulphonamide; and fire retarders such as brominated tricresyl phosphate or other brominated organic compounds may be added. Natural resins such as manilla, acaroid, pontianak, kauri, dammar, rosin and shellac; ester gum (glycerin ester of rosin); and synthetic resins such as the fusible and soluble phenol-formaldehyde, diphenylol, propane-formaldehyde, and phenol-furfural resins preferably prepared with acid catalysts, may be used. In an example condensation is effective between equimolecular or other proportions of *p*-toluene sulphonamide and formaldehyde (as solution or as paraformaldehyde) are heated under reflux at 150° C. for 16—20 hours with or without an acid or alkaline catalyst yielding a soft yellow resin. This resin is converted into a harder product according to the invention by distilling to remove the water from the product; it is then heated at 200—260° C. under reflux, some formaldehyde which splits off being returned to the resin. Paraformaldehyde may be added at this stage up to 15—20 per cent of one molecular proportion, the heating being continued; finally the product is distilled at 100—150° C. for 15 minutes to one hour. In another example, the same reagents are heated with the addition of a relatively small quantity of urea, the condensation product being separated from the water and heated at 160° C. without refluxing. Examples of compositions containing the synthetic resin are (1) cellulose acetate 10 parts, the toluene sulphonamide resin 10 parts, acetone 100 parts (coating-composition); (2) cellulose acetate 10 parts, the toluene sulphonamide resin 1—20 parts, acetone 60 parts, alcohol and benzene 25 parts each, diacetone alcohol 20 parts (coating-composition); (3) cellulose acetate 20 parts, the toluene sulphonamide resin 25 parts, acetone 60 parts (adhesive); (4) cellulose acetate 100 parts, the toluene sulphonamide resin 40 parts, triacetin 10 parts (moulding powder or plastic).

317,496. Imray, O. Y., (*I. G. Farbenindustrie Akt.-Ges.*). March 16, 1928.

Bituminous compositions.—Bituminous dispersions of a somewhat coarse nature are prepared by the use as dispersing agents of water-insoluble humic acid or substances containing humic acid, the products being mixed with road-making materials or with materials such as plaster of Paris to form waterproof coverings. The substances defined as " containing humic acid " comprise (1) the aqueous suspension of the raw material, such as Cassel brown, peat or decayed vegetable matter, from which humic acid is extracted; (2) products prepared by oxidizing coal, coal-tar pitch or the like, with nitric acid, chromic acid or the like; (3) oxidation or chlorination products of the substances referred to in (1); (4) calcium, magnesium, aluminium, iron or other insoluble salts of the compounds referred to in (1), (2) and (3). Examples of the invention are as follows:—(1) 100 parts of brown coal, 30 parts of slaked lime and 120 parts of water are ground together and 500 parts of a mixture comprising 150 parts of tar, 350 parts of Mexican bitumen and 250 parts of water are slowly added. The product is mixed with 4000 parts of basalt road metal, 3000 parts of basalt chips and 2000 parts of sand to form a road surfacing composition. (2) 500 parts of Mexican asphalt at 90° C. are added, with 350 parts of cold water to 150 parts of finely ground 3 per cent humic-acid paste. Equal parts of basalt chips and sand are mixed with 12 per cent of the above product and 5 per cent of cement to form a composition which may be applied to and rolled on roads and the like. The cement causes a rapid solidification of the mass. (3) To the mixture as in (2) 5 per cent of crude gas-tar is added. The mixture is thereby rendered quicker setting. (4) 100 parts of coal are digested at ordinary and then at elevated temperature with 100 parts of 50 per cent nitric acid until evolution of red vapour ceases. The mass is then washed with water and the insoluble residue dissolved in caustic soda solution and precipitated with hydrochloric acid. The resulting blackish-brown paste is washed and filtered. 50 parts of the product are mixed with 200 parts of molten tar, containing 60 per cent tar pitch and 40 per cent anthracene oil, and 150 parts of water to form an emulsion which may be mixed with 50 times its weight of basalt chips.

317,527. Tyler, A. H. May 18, 1928.

Bituminous compositions.—A surfacing composition for roads, pavements, &c., comprises granite sand or like refractory material, limestone dust, granulated glass or silica, peat dust or sawdust or the like, and a bituminous binding material. In an example, a composition comprises 20 parts of bitumen, 32 parts of granite sand, 15 parts of Kentish rag dust, 22 parts of granulated glass or silica ($\frac{1}{8}$ inch mesh) and 12 parts of peat. The composition may be moulded into blocks having depressions 3, Fig. 1, on the top surface to prevent slipping and grooves or channels 5, Fig. 2, on the under surface to enable the blocks to be well bedded into cement or other material.

FIG. 1.

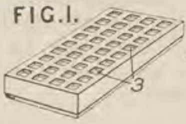
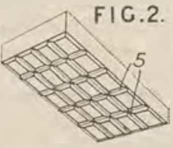


FIG. 2.



317,672. Lefebure, V. Oct. 22, 1928. *Addition to* 236,695.

Plaster.—In a modification of the process claimed in the parent Specification for the manufacture of plaster from natural mineral anhydrite, the components of double salts instead of the double salts themselves are added, the proportions not being limited to the proportions in which they occur in the double salt. In an example, up to 2 per cent zinc sulphate and up to 4 per cent potassium sulphate are added to the anhydrite.

317,763. Soc. of Chemical Industry in Basle. Aug. 21, 1928, [*Convention date*].

Stone, colouring.—Pigments which are fast to light and weather are made by reaction between a sulphonated disazo or polyazo dye which contains the residue of a diazotized 1 : 8-amino-naphthol-sulphonic acid as initial component and a sparingly soluble compound of magnesium or an alkaline earth metal or heavy metal, in which the metal is present in a form capable of reaction. As precipitating agents, oxides, carbonates, silicates, and the like may be used, either natural or artificial, including minerals or stones such as marl, green earth, kaolin, clay, loam, calcium salts of zeolites, levigated chalk, and magnesia usta. The invention may be applied to making stone pavings of fast colour, coloured gravel surfaces, coloured brickwork, and for building purposes generally, the stone material being brushed, sprayed or impregnated with a solution of the dyestuff. In an example, one of the above-mentioned materials is saturated with a solution of one of the dyestuffs of Specification 274,130 or the green dyestuff made by coupling the tertiary condensation product from cyanuric chloride, H-acid, *p*-amino-benzeneazo-salicylic acid and aniline with the diazotized azo dyestuff from H-acid and cresidine, the product is filtered and washed, and a brown, red or green pigment is obtained according to the dyestuff used.

The Specification, as open to inspection under Sect. 91 (3) (a) comprises the use of dyes "sensitive to lime " in general, and is not restricted to the above-mentioned disazo and polyazo dyes. The azo dye *p*-chloranilinesulphonic acid $\rightarrow$ *m*-amino-*p*-cresol $\rightarrow$ β-naphthol is also specified in the example. This subject-matter does not appear in the Specification as accepted.

317,783. Soc. Anon. des Chaux et Ciments de Lafarge et du Teil. Aug. 22, 1928, [*Convention date*].

Cements.—A hydraulic binding medium consists of an intimate mixture of aluminous cement prepared by melting, clinkering, or fritting, and calcium sulphate in the form of natural gypsum, or natural anhydrite, or gypsum calcined at a temperature of at least 200° C. The proportions are preferably such that all the alumina is converted into calcium sulpho-aluminate and the mixture usually contains from 20 to 50 per cent of calcium sulphate. Other proportions of from 5 to 95 per cent of either ingredient may, however, also be used. The calcium sulphate may be added to the raw material of the aluminous cement, the mixture being then heated without melting. The fineness of the sulphate may vary from coarse to exceedingly fine.

317,902. Taylor, W. May 26, 1928. *No Patent granted (Sealing fee not paid).*

Cement compositions.—A composition for surfacing walls, tiles, panels, &c., comprises cement such as Portland cement, calcium chloride, potassium soft soap, china clay or aluminium silicate, with or without ground silica. The fluidity of the composition is adjusted by the addition of water. The cement may be coloured, and instead of soft soap as such, potash, or potash and soda, together with oils or fatty acids may be employed.

317,919. Kolloidchemie Studienges., Carpzow, J. B., March, M., Lenzmann, R., and **Sanders, H.** May 30, 1928.

Cements, Portland and Roman, materials and compositions for; concretes and mortars.—Cements, building, plastering, and coating materials are formed by causing fresh mud containing unsaturated silicon compounds, or the colloidal constituents separated therefrom, to react, preferably in the absence of air, with finely divided metal oxides or other compounds other than chalk or lime. Bacterial nutrients and anaerobic bacteria cultures may be added to the mud to increase its activity. The mud or separated colloids, prior to being mixed with the other compounds may be dried, preferably in the absence of air, at temperatures below 80° C. so as to maintain substantially the colloidal structure and unsaturated state. In examples (1) 100 parts of mud are mixed with 20 parts of aluminium sulphate, allowed to stand for 24 hours, dried and ground. The product may be mixed with cement and mortar for making slabs and as plastering and coating material. (2) 100 parts of mud are mixed with 10 parts of an oxide of chromium, cobalt or titanium, are dried after 24 hours, calcined at 800° C. and powdered. The product can be used for colouring lime sandstone. (3) A cement is formed by mixing 100 parts of mud, 20 parts of powdered bauxite and 10 parts of barium sulphate, storing for some time in absence of air, air drying, calcining at 800° C. and grinding. (4) 100 parts of mud, 20 parts of kaolin and 20 parts of furnace slag are mixed, air dried and pulverized. The power is mixed with an aqueous solution of alkaline silicates or of fluoric compounds for use as a liquid cement or as a mouldable composition. Examples are also given in which magnesium, iron and calcium sulphates, magnesium chloride, pyrolusite, talc, and ferric oxide are combined with the mud.

318,239. Armstrong Cork Co., (Assignees of *Pieper, E. J.*). Aug. 31, 1928, [*Convention date*].

Compositions containing artificial resins.—A flexible mass for use in floor or wall coverings comprises (1) a binder of a modified polyhydric alcohol-polybasic acid resin, i.e. a condensation product obtained by heating a polyhydric alcohol such as glycerine and a polybasic acid such as phthalic acid with one or more fatty acids, for example oleic acid and the acids obtained by hydrolysis of vegetable or animal oils such as linseed, china wood, soya-bean, maize or fish oils, and (2) fillers such as cork, wood flour, whiting, ochre, and iron oxide. Other synthetic resins, such as vinyl compounds, may be added. The binder may be fluid when mixed with the filler, but becomes harder after heating during the calendering process. The material may be rolled or pressed into sheets and cut into tiles, and may be used alone or with a thick backing material such as felt base or linoleum or with a thin backing such as burlap or paper.

The Specification as open to inspection under Sect. 91 (3) (a) describes also the use of synthetic resins such as polymerized vinyl compounds instead of the resins referred to above. This subject-matter does not appear in the Specification as accepted.

318,549. I. G. Farbenindustrie Akt.-Ges. Sept. 5, 1928, [*Convention date*].

Compositions containing artificial resins.—The Specification, as open to inspection under Sect. 91 (3) (a) describes the preparation of homogeneous artificial resins by mixing in solution or by heating together a polymerization product of a vinyl ester with the condensation product of a phenol or a phenol derivative and an aldehyde or an agent yielding an aldehyde. Solutions of the mixtures may be used as lacquers, either alone or mixed with nitrocellulose. Example :—A solution of 80 parts polyvinyl acetate and 30 parts cresol paraldehyde condensation product in 200 parts of alcohol, is mixed with a solution of 50 parts nitrocellulose in 200 parts alcohol, 300 parts toluene, and 350 parts butyl acetate.

The Specification as accepted is limited to the products (lacquers) obtained by mixing solutions and does not describe the use of phenol derivatives.

318,696. Thurston, A. P., (*Fuller Lehigh Co.*). June 27, 1928.

Refractory substances.—To a moderately refractory water-glass cement of high heat conductivity for furnace linings, containing pulverulent metal, metallic oxides, such as iron, copper, carborundum, haematite, copper oxide, &c., glycerine and oil are added to prevent drying before use. In an example, 100 parts carborundum, 40 parts water-glass, 20 parts glycerine and 2 parts castor oil are used.

318,883. Bakelite Ges. Sept. 11, 1928, [*Convention date*].

Compositions containing artificial resins.—The production of resinous condensation products from urea or its derivatives and solid polymerized formaldehyde such as paraformaldehyde is effected in presence of molten, natural or artificial resins (excluding urea resins and phenol formaldehyde resins) such as colophony, copal, and condensation products of mono- and poly-hydric phenols with aldehydes and ketones or glycerin ester of phthalic acid, with the addition if desired of liquid organic compounds of high-boiling point, such as triphenyl phosphate, which render the product flexible. Aldehyde-binding substances, water-binding substances, dyes, and fillers may be added to the reaction mass before, during, or after the condensation. In the examples (1) glycerin ester of phthalic acid is fused and mixed with lithopone, sawdust, urea, and paraformaldehyde, the reaction being carried on until a mass is obtained which is brittle when cold; it is disintegrated and hot-pressed to produce the desired articles; (2) colophony is fused and mixed with fillers, urea, and paraformaldehyde. Specifications 280,520, [*Class* 2 (iii), Dyes &c.], and 305,211 are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) includes the use of other fused organic compounds including phenol, formaldehyde resin, hydrocarbons such as naphthalene and anthracene, nitrated, chlorinated, and hydrogenated hydrocarbons, and amines, and the aldehyde used need not be formaldehyde; additional examples describe the use of phenol-formaldehyde resin, in one case with the addition of triphenyl phosphate. This subject-matter does not appear in the Specification as accepted.

318,959. Bakelite Ges. Sept. 13, 1928, [*Convention date*]. *Addition to* 305,211.

Compositions containing artificial resins.—In the production of resinous condensation products from urea or its derivatives and solid polymerized formaldehyde such as paraformaldehyde as described in the parent Specification, the progress of the condensation may be retarded or accelerated by adding suitable contact agents of acid, neutral, or alkaline character. For retarding the reaction, ammonia, calcium hydroxide, hexamethylene tetramine and alkaline salts such as sodium carbonate are mentioned, and for accelerating the reaction acids or acid salts such as citric, acetic, and hydrochloric acids, and urea nitrate. In an example, urea, paraformaldehyde, lithopone, sawdust, and citric acid are ground together and hot pressed.

The Specification as open to inspection under Sect. 91 (3) (a) is not limited to formaldehyde, and contains other examples in which (2) urea, paraformaldehyde, lithopone, paper pulp and calcium hydroxide are ground together; (3) glycerin ester of phthalic acid is fused and mixed with lithopone, sawdust, urea, paraformaldehyde, and urea nitrate. The products are hot pressed. This subject-matter does not appear in the Specification as accepted.

319,008. Westinghouse Lamp Co., (Assignees of *Driggs, F. H.*). Sept. 15, 1928, [*Convention date*].

Refractory substances used as insulating material in contact with heated metal in thermionic valves are composed of a rare earth oxide mixed with 1—10 per cent of a refractory material of lower melting point not destroying the chemical inertness of the oxide but lowering the temperature at which the mixture unites and solidifies to just below 1600° C. A mixture of 95 per cent of thorium oxide and 5 per cent of artificially prepared, purified magnesium silicate may be ball milled dry, mixed with a binder such as a solution of nitrocellulose in amylacetate, extruded and fired at 1500—1600° C. in a tungsten- or molybdenum-wound, hydrogen furnace. Instead of magnesium silicate, talc or mixtures of compounds of silica with magnesia and alumina may be used. Casein, agar agar and paraffin may be used as binders. Insulators made from zirconia instead of thoria are referred to.

319,251. I. G. Farbenindustrie Akt.-Ges. May 7, 1928. *Addition to* 261,029.

Compositions containing artificial resins.—In the process of the parent Specification, the dimethylolurea comprising the starting material is replaced by dimethylolthiourea or the products of higher molecular weight resulting therefrom by splitting off water or by mixtures of the foregoing with each other or with dimethylolurea or with the products of higher molecular weight resulting therefrom by splitting off water. The condensation is effected in a considerable quantity of the organic solvent, e.g. acetone or monohydric alcohols such as ethyl alcohol, until colloidal compounds are formed in the solution. On evaporation of the solvent, resins and glass-like masses remain. As in the parent process, filling materials such as other resins, plasticizers, talcum, diatomaceous earth and plaster of Paris may be added. Specification 301,696 also is referred to.

Reference has been directed by the Comptroller to Specifications 262,147, [*Class* 2 (iii), Dyes &c.], 266,752 and 296,361.

319,288. Lechler, P. Sept. 19, 1928, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

Concrete, hardening and preserving.—Concrete surfaces are protected against wear and corrosion by applying to the concrete surface or to a wash of cement milk thereon, before the concrete or cement milk has completely set, a water resistant coating, which may be a paint such as a bituminous paint, or an emulsion of a water resistant substance such as asphalt, tar or paraffin, which breaks quickly after application. The paint is preferably applied by a brush or spray while the concrete is still wet. The method can also be applied to the treatment of surfaces of concrete inserts by removing the form plates, between the mould and the concrete, during the setting period, coating them and re-inserting.

319,342. Imai, G. Sept. 21, 1928, [*Convention date*].

Cements, Portland and Roman.—A mixture of calcined rock containing quartz and felspar, and a substance containing large proportions of acidic components such as soluble silica, alumina and iron oxide, is mixed with Portland cement clinker and the whole is intimately mixed and finely ground. Suitable rocks are granite, liparite, quartz porphyrite and diorite, and suitable substances for the second ingredient are weathered tuff, basalt and andesite and artificial substances such as slag. In an example, from 3 to 5 parts of the first ingredient are mixed with from 5 to 3 parts of the second; the mixture is ground at a temperature of about 150 to 200° C. and mixed with about 30—40 per cent of Portland cement clinker; the whole is then reground.

319,371. I. G. Farbenindustrie Akt.-Ges. Sept. 22, 1928, [*Convention date*].

Plastic compositions.—Artificial materials in the form of plastics, threads, films or sheets, layers, coatings, &c., are made by dispersing with water a water-insoluble or sparingly soluble binding agent such as cellulose derivatives, rubber, natural or artificial resins, drying oils, &c., or a mixture thereof, and treating the dispersion after bringing it into a desired form, as by spreading, spraying, kneading, &c., and if desired, after wholly or partially drying it, with an agent capable of dissolving or swelling the binding agent, the treatment being such that the shape is substantially retained. The dispersion may be made with the aid of colloids such as water-soluble starch preparations or cellulose derivatives, glue-like materials, inorganic colloids such as alumina or silicic acid sols, or with wetting-agents. The dispersion may be applied to a textile, or wooden or metallic surface. The solvent or swelling agent may be used in liquid or vapour form, with or without diluents, and may include non-volatile material, e.g. a lacquer containing a solvent may be used. The material may finally be improved by heat or cold, mechanical treatment, raised or reduced pressure, &c. In examples (1) nitrocellulose is kneaded with water and methyl cellulose and a filler such as sawdust, kieselguhr or chalk is added. The product may be applied to wood and allowed to dry, after which it is coated with a slow drying nitrocellulose lacquer. (2) Water-insoluble ethyl cellulose is made into a paste with ultramarine and water with the aid of butylated naphthalene sulphonic acid. After dilution with water and the optional addition of a glue or starch solution, the mass is spread. The dry coating is sprayed with a mixture of benzene and alcohol. (3) Oil varnish is intimately mixed with an aqueous solution of methyl cellulose and cork powder is added. The mixture is rolled upon a base such as fabric or cardboard, and after partially drying is covered with an oil varnish. Additional layers may be added, and the material used as a floor covering. (4) Resin ester is fused, methyl cellulose is added, and the whole agitated with a boiling aqueous solution of resin-soap. Sawdust is added, and the mass formed into shaped bodies such as bars, plates or buttons. After partially drying, the bodies are placed in a mixture of benzene and oil varnish until slightly swollen. They are then dried, turned and polished.

319,612. Westinghouse Lamp Co., (Assignees of *Iredell, C. V.*). Sept. 24, 1928, [*Convention date*].

Refractory substances containing alumina.—Insulators for indirectly-heated thermionic cathodes are composed of fired aluminium oxide preferably containing 2 per cent of material of lower melting point inert to tungsten at high temperatures, such as talc or magnesium silicate. The pure unfused oxide is prefired at 1500 or 1600° C., and, after adding the talc, is ball-milled dry to pass a 200-mesh screen and mixed with binder such as flour paste, glycerine, linseed oil, or a solution of nitro-cellulose in amylacetate to form a plastic mass for extrusion. The flour paste is formed by adding water and then ammonia to flour and heating to thicken the solution. After extrusion of the mass to form tubes with one or more holes and after cutting into lengths, the tubes are air-dried in molybdenum boats, heated to volatilize the binder and fired at 1500—1600° C. in a tungsten or molybdenum wound, hydrogen furnace.

319,648. Bowran & Co., Ltd., R., and **Craggs, J. W.** Aug. 22, 1928.

Bituminous compositions.—A heat non-conducting composition in paste form is made by adding powdered talc, and finely ground asbestos to an emulsion of bitumen in water. The emulsion is prepared by first producing an emulsion of water in bitumen by stirring in a hot water solution of sodium oleate into molten bitumen, and then gently stirring and allowing to cool until coagulation occurs and the emulsion is inverted into a suspension of bitumen in water. In an example, the proportions employed are 50 oz. of bitumen of 120 penetration, 42 oz. of water, 1½ oz. of sodium oleate, 8 oz. of talc and 25 oz. of asbestos. The composition is especially intended for application to the surfaces of cork sheets used for heat insulating, but may also be used for coating other surfaces, such as magnesia coverings of cold storage chambers, as a cement and floor pad beneath linoleum, as a floor covering and as a top dressing for tennis courts, in which case chromium oxide may be added to give a green colour.

319,663. Lefebvre, C. G. J., and **Berger, E. E. F.** Sept. 25, 1928, [*Convention date*].

Compositions containing bituminous materials and mineral fillers.—The incorporation with bituminous emulsions of mineral fillers, such as finely crushed silicious earth or limestone, is facilitated by prior treatment of the emulsion or the filler with stabilizing material comprising an alkali salt of a weak acid in solution, particularly sodium or potassium carbonate, sulphide, silicate, borate or stearate. The final product may be fluid or, by increasing the proportion of filler, may be made of putty-like consistency. A fluid product for example contains 500 kgs. of bitumen, 500 kgs. of water, 600 kgs. of limestone or siliceous earth, and 300 kgs. of anhydrous sodium carbonate. Specifications 196,950; and 239,922, [*Class* 81 (i), Disinfecting &c.], are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) states that the filler may comprise bituminous materials obtained by the crushing of asphaltic rocks or bituminous slates of poor bitumen content. This subject-matter does not appear in the Specification as accepted.

319,673. Bolgar, L. March 23, 1928.

Bituminous compositions.—Crude mineral oils, schist oils, asphalt oils, tars, distillates, petroleum residues, bituminous materials, mixtures and related substances are mixed with oxidizing agents such as acids or acid-containing substances, e.g. acid sludges, heated to over 100° C. and preferably to 120—200° C. and allowed to rest until a precipitate is formed, which is separated from the liquid and heated until the acids are decomposed. The precipitate is heated at about 200—300° C. preferably after the addition of 10—20 per cent of fluxating agent, e.g. Mexican flux oils, anthracene oils, &c., and the resulting bitumen is mixed with filling materials such as sand, stone meal, steatite meal, fibrous substances or mixtures.

Reference has been directed by the Comptroller to Specifications 240,803 *and* 259,442, *both in Class* 91, Oils &c.].

319,718. Bolgar, L. March 23, 1928. *Divided on* 319,673.

Bituminous compositions.—Crude oils, tars, bituminous residues, and the like are mixed with a reagent such as sulphuric acid, waste acids, or substances containing sulphuric acid such as acid sludges and the mixture is heated to over 180° C. Stearin pitch is added before or during the acid treatment and the mixture is further heated, after which filling materials are added and the composition is pressed to form an binder such as a solution of nitrocellulose in amylacetate, extruded and fired at 1500—1600° C. in a tungsten- or molybdenum-wound, hydrogen furnace. Instead of magnesium silicate, talc or mixtures of compounds of silica with magnesia and alumina may be used. Casein, agar agar and paraffin may be used as binders. Insulators made from zirconia instead of thoria are referred to.

319,251. I. G. Farbenindustrie Akt.-Ges. May 7, 1928. *Addition to* 261,029.

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Cements, Portland and Roman.—A mixture of calcined rock containing quartz and felspar, and a substance containing large proportions of acidic components such as soluble silica, alumina and iron oxide, is mixed with Portland cement clinker and the whole is intimately mixed and finely ground. Suitable rocks are granite, liparite, quartz porphyrite and diorite, and suitable substances for the second ingredient are weathered tuff, basalt and andesite and artificial substances such as slag. In an example, from 3 to 5 parts of the first ingredient are mixed with from 5 to 3 parts of the second; the mixture is ground at a temperature of about 150 to 200° C. and mixed with about 30—40 per cent of Portland cement clinker; the whole is then reground.

319,371. I. G. Farbenindustrie Akt.-Ges. Sept. 22, 1928, [*Convention date*].

Plastic compositions.—Artificial materials in the form of plastics, threads, films or sheets, layers, coatings, &c., are made by dispersing with water a water-insoluble or sparingly soluble binding agent such as cellulose derivatives, rubber, natural or artificial resins, drying oils, &c., or a mixture thereof, and treating the dispersion after bringing it into a desired form, as by spreading, spraying, kneading, &c., and if desired, after wholly or partially drying it, with an agent capable of dissolving or swelling the binding agent, the treatment being such that the shape is substantially retained. The dispersion may be made with the aid of colloids such as water-soluble starch preparations or cellulose derivatives, glue-like materials, inorganic colloids such as alumina or silicic acid sols, or with wetting-agents. The dispersion may be applied to a textile, or wooden or metallic surface. The solvent or swelling agent may be used in liquid or vapour form, with or without diluents, and may include non-volatile material, e.g. a lacquer containing a solvent may be used. The material may finally be improved by heat or cold, mechanical treatment, raised or reduced pressure, &c. In examples (1) nitrocellulose is kneaded with water and methyl cellulose and a filler such as sawdust, kieselguhr or chalk is added. The product may be applied to wood and allowed to dry, after which it is coated with a slow drying nitrocellulose lacquer. (2) Water-insoluble ethyl cellulose is made into a paste with ultramarine and water with the aid of butylated naphthalene sulphonic acid. After dilution with water and the optional addition of a glue or starch solution, the mass is spread. The dry coating is sprayed with a mixture of benzene and alcohol. (3) Oil varnish is intimately mixed with an aqueous solution of methyl cellulose and cork powder is added. The mixture is rolled upon a base such as fabric or cardboard, and after partially drying is covered with an oil varnish. Additional layers may be added, and the material used as a floor covering. (4) Resin ester is fused, methyl cellulose is added, and the whole agitated with a boiling aqueous solution of resin-soap. Sawdust is added, and the mass formed into shaped bodies such as bars, plates or buttons. After partially drying, the bodies are placed in a mixture of benzene and oil varnish until slightly swollen. They are then dried, turned and polished.

319,612. Westinghouse Lamp Co., (Assignees of *Iredell, C. V.*). Sept. 24, 1928, [*Convention date*].

Refractory substances containing alumina.—Insulators for indirectly-heated thermionic cathodes are composed of fired aluminium oxide preferably containing 2 per cent of material of lower melting point inert to tungsten at high temperatures, such as talc or magnesium silicate. The pure unfused oxide is prefired at 1500 or 1600° C., and, after adding the talc, is ball-milled dry to pass a 200-mesh screen and mixed with binder such as flour paste, glycerine, linseed oil, or a solution of nitro-cellulose in amylacetate to form a plastic mass for extrusion. The flour paste is formed by adding water and then ammonia to flour and heating to thicken the solution. After extrusion of the mass to form tubes with one or more holes and after cutting into lengths, the tubes are air-dried in molybdenum boats, heated to volatilize the binder and fired at 1500—1600° C. in a tungsten or molybdenum wound, hydrogen furnace.

319,648. Bowran & Co., Ltd., R., and **Craggs, J. W.** Aug. 22, 1928.

Bituminous compositions.—A heat non-conducting composition in paste form is made by adding powdered talc, and finely ground asbestos to an emulsion of bitumen in water. The emulsion is prepared by first producing an emulsion of water in bitumen by stirring in a hot water solution of sodium oleate into molten bitumen, and then gently stirring and allowing to cool until coagulation occurs and the emulsion is inverted into a suspension of bitumen in water. In an example, the proportions employed are 50 oz. of bitumen of 120 penetration, 42 oz. of water, 1½ oz. of sodium oleate, 8 oz. of talc and 25 oz. of asbestos. The composition is especially intended for application to the surfaces of cork sheets used for heat insulating, but may also be used for coating other surfaces, such as magnesia coverings of cold storage chambers, as a cement and floor pad beneath linoleum, as a floor covering and as a top dressing for tennis courts, in which case chromium oxide may be added to give a green colour.

319,663. Lefebvre, C. G. J., and **Berger, E. E. F.** Sept. 25, 1928, [*Convention date*].

Compositions containing bituminous materials and mineral fillers.—The incorporation with bituminous emulsions of mineral fillers, such as finely crushed silicious earth or limestone, is facilitated by prior treatment of the emulsion or the filler with stabilizing material comprising an alkali salt of a weak acid in solution, particularly sodium or potassium carbonate, sulphide, silicate, borate or stearate. The final product may be fluid or, by increasing the proportion of filler, may be made of putty-like consistency. A fluid product for example contains 500 kgs. of bitumen, 500 kgs. of water, 600 kgs. of limestone or siliceous earth, and 300 kgs. of anhydrous sodium carbonate. Specifications 196,950; and 239,922, [*Class* 81 (i), Disinfecting &c.], are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) states that the filler may comprise bituminous materials obtained by the crushing of asphaltic rocks or bituminous slates of poor bitumen content. This subject-matter does not appear in the Specification as accepted.

319,673. Bolgar, L. March 23, 1928.

Bituminous compositions.—Crude mineral oils, schist oils, asphalt oils, tars, distillates, petroleum residues, bituminous materials, mixtures and related substances are mixed with oxidizing agents such as acids or acid-containing substances, e.g. acid sludges, heated to over 100° C. and preferably to 120—200° C. and allowed to rest until a precipitate is formed, which is separated from the liquid and heated until the acids are decomposed. The precipitate is heated at about 200—300° C. preferably after the addition of 10—20 per cent of fluxating agent, e.g. Mexican flux oils, anthracene oils, &c., and the resulting bitumen is mixed with filling materials such as sand, stone meal, steatite meal, fibrous substances or mixtures.

Reference has been directed by the Comptroller to Specifications 240,803 *and* 259,442, *both in Class* 91, Oils &c.].

319,718. Bolgar, L. March 23, 1928. *Divided on* 319,673.

Bituminous compositions.—Crude oils, tars, bituminous residues, and the like are mixed with a reagent such as sulphuric acid, waste acids, or substances containing sulphuric acid such as acid sludges and the mixture is heated to over 180° C. Stearin pitch is added before or during the acid treatment and the mixture is further heated, after which filling materials are added and the composition is pressed to form an ebonite like product. The filling materials comprise sand, stone meal, steatite meal, fibrous substances, asbestos or mixtures of these materials. To prevent foaming during the acid treatment, high temperatures, between 250—260° C. for petroleum residues and 180—220° C. for tar residues may be employed. The quantity of sulphuric acid may amount to 25 per cent by volume for treating petroleum pitch and should not exceed 6 per cent for coal or brown coal pitch. For decreasing brittleness, escape of oils may be prevented by means of a backflow cooler or other oils may be added. The temperature may be raised to over 200° C. to decompose the acid and a fluxating agent added. The acid-treated substance may be treated with bases such as soda lye to raise the melting point. In an example, 6 per cent by volume of sulphuric acid of 50° Beaume is added at 200° C. to a mixture of 1 kg. of coal pitch and 5 dkg. of stearin pitch. The product is heated to 250° C. and 3 kg. of stone meal and 15 dkg. of asbestos are then added, the composition being pressed hot.

319,904. Hewitt (Darlaston), Ltd., and **Hewitt, A.** Sept. 4, 1928.

Bituminous &c. compositions for the treatment of road-making materials, &c., and particularly for the preparation of a top-dressing, are made from suitable proportions of rubber, bituminous oils, resin, and oil shale. In an example, 5 lb. shredded rubber are mixed with 10 gallons bituminous oil and heated to boiling point when 1 lb. of powdered resin is added, the mixture is cooled and 1½ lb. crushed oil shale are added. This fluxing composition is then mixed with a suitable aggregate without heat, with or without the addition of Portland cement and/or calcium chloride, or it may be sprayed on road surfaces.

320,123. Clayton Son & Co., Ltd., and **Sowden, W.** July 7, 1928.

Bituminous compositions.—Metal and other pipes, tubes and other bodies are lined or coated with a bituminous body, containing a proportion of wool fat pitch or fatty acid pitch to act as flux. A suitable carbonaceous filler may also be incorporated. For example, about 10 per cent of wool fat pitch or fatty acid pitch is incorporated with the bituminous body known under the registered Trade Mark " B, mexphalte," and the mixture heated to 170° C. A filler of finely-divided carbonaceous material is then added and thoroughly admixed, the whole being heated to 220—230° C. and applied to the body to be coated in known manner, preferably by the application of centrifugal action.

320,160. Gardiner, J. de B. W. July 23, 1928.

Stone, preserving.—A protective coating for metal, wood, masonry, &c., is produced by first covering the surface with a thin layer of a bituminous emulsion of the type in which a mineral colloid, such as clay, is used as the emulsifying agent, and in then dusting the surface with dry powdered cement. The cement may be Portland cement, magnesite cement, gypsum plaster, lime, &c., and may have sand or aggregate incorporated with it. The cement coating may serve as a base for additional coats of plaster. The process may be used for protecting metal pipes, waterproofing walls of wood or masonry, or for the treatment of paper or cloth for use in roofing.

320,357. Klein, J. July 9, 1928.

Compositions containing bituminous, resinous, fatty, or oily materials.—A process for producing artificial rock asphalt consists in forming an aqueous emulsion of bituminous substances, resins, oils, &c., using naphthenic acid or salts thereof or alkali resinates as the emulsifying agent, adding mineral filling material such as lime flour, removing the excess of the emulsifying agent in soluble form and precipitating the remainder of the emulsifying agent as a metallic salt. In an example, an emulsion of bitumen in water is made, using an excess of a resin soap as emulsifying agent, lime flour is added and an excess of cold water. The mixture is then passed through a centrifugal machine where the excess of water with the resin soap in solution is removed. Calcium chloride is then added to the residue to precipitate the emulsifying agent as a calcium resinate which remains in the finished product. In another example, hexahydro benzoate of sodium is used as the emulsifying agent. Salts of barium, iron, manganese, cobalt, nickel or chromium may be used as the precipitating salt instead of calcium chloride.

320,579. Lichtenstern, R. Jan. 16, 1929.

Compositions containing asphalts, drying oils, metal salts.—Artificial and natural asphalts are heated with Chinese wood oil to a temperature of approximately 300° C. with a condensing agent, preferably a metal chloride, such as aluminium, zinc, copper or ferric chloride, or phosphoric acid. The mass may be poured into moulds while it is still fusible and final hardening carried out by further heating or fillers such as sand, gravel, broken stone, sawdust, cork refuse, talcum, asbestos, or waste rubber may be added before hardening takes place, and the product may be used in floor covering, road building, roof covering. The mass may be spread on pasteboard, &c., or rolled into elastic plates on a textile support, if desired, to give a product similar to linoleum, or may be used to impregnate fibrous material for packing purposes by dipping the material into the mixture during the preparation of the asphalt mass.

320,597. Badder, H. C. April 26, 1929.
Divided application.

Cements, Portland and Roman.—Coloured hydraulic cements are made by fusing a pure base of Portland cement or of aluminous cement, or the like, together with metallic oxides, carbonates or other salts. A small proportion of fluxing material may also be added. The raw materials and colouring matter are very finely ground, for instance to pass a 200 per inch mesh sieve. The fused cement is run into moulds and subsequently ground. Examples of colouring matter are ferrous and ferric oxides, oxides of copper and cobalt, salts of iron, copper, manganese, cobalt and chromium, and earth pigments such as ochre, bole, sepia and brown umber. In some cases a proportion of finely ground metal may be added to overcome the effects of the caustic lime on the colours.

320,886. McRae, F. W. July 19, 1928.

Bituminous compositions.—A waterproof paint which may be used for sealing wet concrete during curing is made by mixing the residue obtained by heating mined Trinidad asphalt to a high temperature to vaporize light oils with the residue obtained by similarly treating gilsonite and, while hot, adding a petroleum distillate of 46 to 52° Beaumé, and allowing the sludge to settle.

321,106. Binks, K. R. Dec. 24, 1928.
Drawings to Specification.

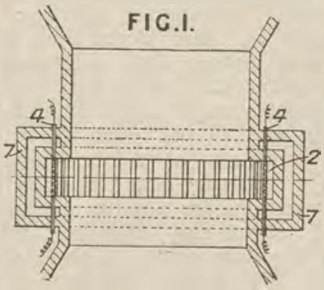
Refractory substances containing chromite.—An auxiliary nozzle for attachment to the main nozzle of a casting ladle is made of finely crushed chromite mixed with a bonding medium which may be china-clay or fireclay. For example, about 19 parts of chromite may be mixed with 1—4 parts of bonding medium in the presence of about 2 per cent of water, and the mixture pressed and fired at about 1450—1500° C.

321,188. Ramage, W. H. Aug. 1, 1928.

Refractory substances containing fireclay and carbon.—Firebricks are made from a mixture of fireclay and sawdust, preferably hard wood sawdust, in substantially equal parts by weight. The mixture is moistened and moulded under pressure, then air dried and fired in a kiln in the usual manner. Preferably a semi-flint clay is employed. Specifications 10036/90, [*Class* 87, Moulding &c.], 5709/91 and 3309/12 are referred to.

321,205. Fawcett, W. July 31, 1928.

FIG.I.



Cements, Portland and Roman, processes and apparatus for making.—The rock materials to be fused or calcined are fed by forced draught through a zone heated solely by electric resistance elements 4 arranged around a stationary heating chamber. Suitable baffles or shields may be fitted to protect the elements and to guide the material. The resistance elements are arranged in the side walls of a recess 2 formed by enlarging the kiln diameter. An outer wall 7 is spaced from the circumferential wall of the recess and the intervening space is filled with asbestos. The heating elements are connected in series or parallel or in sets which may be so connected. A regulating device may be provided for selectively connecting the elements.

321,744. Kopelowicz, B. J., and **Kopelowiczowa, L.** Aug. 23, 1928.

Concretes and mortars, cement.—A concrete mass is made by mixing Portland cement and sawdust which has been boiled in lime water to remove the resins and fats, which are skimmed off. Sand may also be added. In an example, a concrete comprises 96 litres of treated sawdust, 46 litres of fine sand, and 32 litres of Portland cement. In moulding blocks, slabs, and articles such as doors, netting made of long straw is embedded in the plastic mass. Specification 24359/02 is referred to.

321,948. Grimshaw, C. H. June 22, 1928.

Bituminous compositions.—Coloured bituminous compositions are made by mixing cold argilliferous material and colouring matter with a cold preformed aqueous bituminous emulsion. Bentonite may be incorporated with the mixture. In an example, a bituminous oil or other bituminous material is emulsified at about 200° F. with an alkaline solution of soap and is allowed to cool; in another tank a creamy suspension of potters clay in water is formed and bentonite is added until the mixture is thick; white base colouring matter such as paris white, titanium oxide or antimony oxide is incorporated in the clay mixture together with a dye or other colour, e.g. Monolite Fast Scarlet, Monolite Yellow G, Brunswick Green, &c.; the bituminous emulsion is added slowly to the clay mixture with constant stirring; loading materials such as slate flour, lime stone dust, powdered cork, leather dust and asbestos may also be incorporated. For paints, the emulsion is of thick consistency, approximately 75 per cent bitumen and 25 per cent water, and for plastic compositions a thinner emulsion of approximately 60 per cent bitumen is used. Suitable proportions for a pink composition are 125 parts of potters clay, 25 parts of bentonite, 100 parts of titanium oxide, 20 parts of Monolite Fast Scarlet, 260 parts of bituminous emulsion and 80 parts of water. Specifications 11028/03 [*Class* 95, Paints &c.], and 312,467 are referred to.

321,976. Glover, M. L. Aug. 23, 1928.

Concretes.— In the treatment of concrete having voids as described in Specification 295,545, after the concrete has been laid or cast, cement, cement mortar, or mortar is applied to fill the voids to a predetermined level, and, if desired, chippings, sand or gravel introduced before the application of bitumen, or its equivalent, such as rubber as emulsion or hot or melted liquid. The cement or mortar is applied as liquid or as dry powder and brushed in simultaneously with or before the addition of water. The concrete may be laid on a bed of voidless concrete before or after the bed has set or may be precast as blocks or slabs.

322,133. Bünz, R. Feb. 11, 1929.

Compositions containing sulphurized oils.— Linseed oil is treated with sulphur chloride in excess of 35 per cent. and at the same time a mineral substance such as barytes, light spar, brick powder, slate powder, ground quartz, sand, or the like is stirred in. The mixture is poured into moulds to solidify. If emery or silicon carbide is the added mineral, the material may be used for the production of grinding discs; otherwise it is suitable for floor coverings, as artificial stone, etc.

322,158. Bayon, H. P., (*Magnasco, Roggero, & Co*). July 21, 1928.

Compositions containing cellulose materials and organic condensation products.—Cellulose material is modified by treatment with a solution of an oxidizing acid or acids such as an aqueous solution of nitric acid or of a mixture of nitric and sulphuric acids, and the modified material is incorporated with the initial condensation product of a phenol and an aldehyde, to form an amorphous mass which may be stored for an indefinite time. The mass may be subsequently pulverized and moulded into articles under pressure and heat. The initial condensation product may be formed in the mass itself or separately. A dichlorbenzene such as paradichlorbenzene may be introduced into the composition. Examples of suitable cellulose materials are wood pulp, sawdust, shavings, cotton, linter, flock, and rags, paper cuttings, straw and artificial silk waste. In an example, 100 kgs. of wood-pulp cutting is reduced to a fine powder and treated for from 12 to 24 hours with a 5 per cent aqueous solution of equal parts of sulphuric and nitric acids. The soaked powder is strained and washed first in a weak alkaline solution and then in water. The resultant mass is dried and pulverized and steeped for six hours or more in its own weight of phenol. Formaldehyde and carbonate of soda are added and thoroughly mixed. Aqueous liquor is removed and the resulting mass is mixed with an alcoholic solution of paradichlorbenzene. The composition is then dried and milled to a powder. Pigments, ground glass, metal powders and other substances may be added to the moulding powder. Specification 298,793 is referred to.

322,361. Marks, Sir G. C., (*A. C. Spark Plug Co.*). Dec. 17, 1928.

Refractory substances containing artificial corundum, clay, lithium compounds.—A refractory body is made by melting, e.g. in an electric arc, a mixture of alumina, clay and a lithium compound, and cooling rapidly to reduce the size of crystals, the proportion of alumina to silica being preferably greater than that in mullite. An example of proportions is alumina 60 per cent, clay 35 per cent, and lithium oxide 5 per cent. The alumina may be partly replaced by clay or a zirconium compound and other ingredients, such as chromium oxide. The lithium compound may be partly replaced by or used in addition to magnesium oxide, zirconia or beryl. The material thus produced may be ground and used as grog preferably with an equal proportion of clay in the manufacture of a porcelain for insulators, such as sparking plugs, &c.

322,431. King, T. F. Aug. 3, 1928.

Compositions containing bituminous, siliceous, and calcareous materials and alum.—A spraying or binding material in road construction contains about one per cent alum, mixed with chalk and/or powdered limestone, coal tar, or its equivalent in natural bituminous material and hard pitch. An example of proportions by weight is chalk 50 to 75, alum 1, hard pitch 12 to 6, coal tar or equivalent 36 to 18. The composition may be made with the aid of a flux such as creosote or naphtha oils, and may be cast into blocks or associated with an aggregate of soil, with which may be mixed wet or dry clay with or without gravel, or with river mud and/or wet or dry clay. By admixing the binder with a fine powder such as chalk or barium sulphate, a moulding material is obtained.

322,476. Brockbank, C. J. Sept. 3, 1928.

Refractory substances.—Relates to the manufacture of crucibles of the kind consisting of graphite, with or without silicon carbide, and a clay, ceramic or carbonaceous bond, and consists in adding titaniferous material to the composition, or in applying such material to the moulded article, so that the crucible can be fired at vitrification temperatures whereby a crystalline structure and a glazed surface are produced. Suitable titaniferous materials are titanium dioxide, rutile, titanium silicate and titanium aluminate. In an example, a composition comprising from 30 to 60 per cent flaked graphite, 17 per cent finely powdered silicon carbide, 30 to 45 per cent ball clay and 1 to 5 per cent titanium dioxide is moulded into crucible form and fired to a temperature between Seger cones 5 and 10.

322,496. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). Sept. 6, 1928.

Plastic compositions containing condensation products of polyhydroxy alcohols and hydroxycarboxylic acids are prepared by heating, to above 150° C., the liquid acid portion insoluble in petroleum ether, of an oxidation product of paraffin hydrocarbons, waxes, &c., with half or more of the stoichiometrical quantity of organic compounds containing at least two hydroxyl groups in the molecule, e.g. glycerol, if desired in admixture with organic unsaturated or hydroxy carboxylic acids or glycerides thereof, the liquid acid portion being treated before or during the heating with siccatives, e.g. lead oxide or with sulphur, or compounds containing sulphur or the like. The products may be used in the fanufacture of linoleum, or for filling or improving rubber products, lacquers, &c. Specification 321,399, [*Class* 91, Oils &c.], is referred to.

322,752. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). Sept. 10, 1928.

Compositions containing artificial resins.—Artificial cork masses are made by incorporating disintegrated cork or an equivalent material with less than 30 per cent of its weight of an unhardened resinous condensation product of urea, or of a derivative of urea, and formaldehyde or with a mixture of such condensation products, and moulding under pressure at ordinary or elevated temperatures. Softening or plasticizing agents for instance polyhydric alcohols, sugars, or esters or ethers thereof, and acids or acid yielding substances adapted to accelerate the hardening such as formic acid, potassium bisulphate, magnesium chloride, formamide and formic acid esters may be added to the composition and also organic binding agents such as natural, or artificial resins, for instance gum acaroids or phenolformaldehyde resins, gelatin, dextrin, glue and rubber latex. In an example, 100 kilograms of cork meal are mixed with 20 kilograms of a 60 per cent aqueous solution of a condensation product of urea and formaldehyde, formed by condensing urea and formaldehyde in the presence of an acid condensing agent such as sodium tetroxalate and 1 kilogram of glycerol and 0.5 kilogram of formamide are added. The mass is moulded at about 100° to 140° C. under a pressure of about 100 to 200 atmospheres. In another example urea nitrate is used as the condensing agent.

322,780. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). Aug. 8, 1928. *Addition to* 301,133.

Compositions containing natural or artificial resins.—Lacquers, artificial masses, &c., are prepared by replacing the simple varnishes described in the parent Specification by gum varnishes, i.e. solutions of natural or artificial resins obtainable by melting the said resins in drying oils, which may contain drying agents, e.g. metal resinates, napthenates, or oleates and/or suitable diluents, dyestuffs or pigments, an addition of a difficultly volatile plastifier having a boiling point above 150° C. also being made. The condensation products of urea and formaldehyde can be replaced by similar products obtainable from thiourea or mixtures thereof with urea, and formaldehyde, or by those obtainable from dimethylolurea, and the nitrocellulose may be replaced by other esters and ethers of cellulose. Suitable plastifiers include cyclohexyl acetate; the portion of the products of catalytic hydrogenation of the oxides of carbon boiling above 150° C. consisting mainly of higher alcohols, ketones and esters; the di-ethers and di-esters of ethylene glycol; esters of mono-ethers of ethylene glycol; alkyl, aryl or aralkyl esters of phosphoric acid and of aromatic or aliphatic dibasic acids or of aromatic monobasic acids such as oxalic, succinic, adipic, tartaric, phthalic or benzoic acids. The properties of the lacquers, &c. are modified by variation of the composition of the gum varnishes, e.g. for elastic coatings non-drying or slowly drying fatty oils, such as castor oil may be added, part of which may have been previously treated with gaseous oxidizing agents. According to examples, (1) a solution of urea-formaldehyde resin in butyl alcohol is mixed with a solution of nitrocellulose and a gum varnish, obtained by remelting Congo copal in boiled linseed oil at 280°—300° C. and adding Cobalt resinate after cooling to 200° C., in a mixture of butyl acetate, ethyl alcohol and toluene. A plastifier consisting of the oily fraction boiling between 150°—190° C. obtained by catalytic hydrogenation of the oxides is then added. The gum varnish may be prepared from Chinese wood oil, (2) the artificial resin solution described in example 1 is mixed with a solution of nitrocellulose and gum varnish, obtained in a similar manner from Kauri copal and boiled linseed oil, the drier being manganese resinate, in the same solvent mixture. The plastifier may be di-isobutyl phthalic ester, or the phosphoric acid esters of phenols, such as tricresyl phosphate, (3) a solution of nitrocellulose in butyl acetate, cyclohexyl acetate acting as a plasticizer, ethyl alcohol and toluene is treated with a gum varnish consisting of melted Zanzibar copal and boiled linseed oil, with the addition of cobalt resinate. After solution has occurred, a solution in n-butyl alcohol of a urea-formaldehyde resin prepared from dimethylol-urea is added. The above condensation product may be replaced by similar products from a mixture of urea, thiourea and formaldehyde, or thiourea and formaldehyde, or from dimethylol-thiourea, (4) a nitrocellulose solution as in example 3 is incorporated with a mixture of castor oil, which has been blown with air at 140° C., and a gum varnish obtained by melting Benguela copal with China wood oil, cobalt resinate being added. After dissolution, a solution in amyl alcohol of a resin prepared according to Specification 261,029 is added.

322,792. Colas Products, Ltd., Gabriel, L. G., and **Blott, J. F.** Sept. 13, 1928.

Concretes, cement.—Road-making and building materials are prepared by mixing concrete with an emulsion of artificial asphalt, for example Mexican asphalt prepared by the aid of not more than 5 per cent, preferably 2 per cent, of gelatine, glue, or like gelatinizable substance in mineral acid or non-alkaline solution. For example, concrete comprising 4 parts Thames ballast, 2 parts sand and 1 part Portland cement is mixed with 10 per cent of the above emulsions. Specification 322,793 is referred to.

322,793. Colas Products, Ltd., Gabriel, L. G., and **Blott, J. F.** Sept. 13, 1928.

Compositions containing bituminous materials and hydraulic cement.—Bitumen-impregnated concrete for foundations is prepared in a mixer by incorporating an aqueous emulsion of bitumen with a concrete formed of 4 parts of aggregate, 2 parts of sand, and either 1 or 2 parts of rapid-hardening cement. Aqueous emulsions of bitumen such as those described in Specifications 202,201, [*Class* 140, Waterproof &c. fabrics], and 322,792 may be employed.

322,923. Berry, Wiggins, & Co., Ltd., and **Holmes, H. H.** Jan. 9, 1929.

Bituminous compositions.—Dilute metallic salt solutions are incorporated in a mixture of mineral aggregate and bituminous emulsion to promote rapid separation of the bitumen. The salts used are those of aluminium, iron, or calcium. They are added to the mineral aggregate either before or at the same time as the bituminous emulsion, or may be applied to roads laid with the aggregate-bitumen mixture, or to roads sprayed with bituminous emulsion, and in these latter cases alkali salts may be used. The emulsion may be applied either hot or cold.

323,036. Wade, H., (*Bakelite Corporation*). Sept. 13, 1928.

Compositions containing phenols and aldehydes.—Condensation products of phenols, including cresols, with furfural are dehydrated by heating in the presence of an non-reactive resin, whereby the tendency of phenol-furfural resins to gelatinize before complete dehydration is avoided and products having good electrically insulating properties, and suitable for use in the manufacture of moulding mixtures, laminated products, varnishes and impregnating solutions are obtained. The non-reactive resin may be added before the initial condensation of phenol and furfural, or at any intermediate stage thereof. Suitable condensing agents are sodium hydroxide and carbonate, magnesium and calcium oxides and hydroxides, pyridine, and hexa-methylene-tetramine. The added resin is preferably one of the phenol-methylene type, which may however, be wholly or partly replaced by a natural resin such as rosin. The quantity of added resin may be from 10 to 80 per cent of the phenol-furfural resin. The products are reactive resins, which may be hardened in the usual manner with hexamethylenetetramine or other methylene-containing hardening agent. Moulding mixtures are produced therefrom by incorporating the necessary fillers, solvents, colours, and the like before hardening. Specification 253,519 is referred to.

323,047. Ripper, K. Sept. 21, 1927, [*Convention date*]. *Divided on* 297,433.

Compositions containing organic condensation products.—Condensation products which can be moulded by heat and/or pressure are obtained by reacting formaldehyde with dicyandiamide and a protein, particularly casein. For example, casein may be added to a dicyandiamide-formaldehyde condensation mixture, or to a dicyandiamide-formaldehyde condensation product still containing free formaldehyde, and the resulting condensation product may be dried and ground for use as a moulding powder. Alternatively, dicyandiamide may be mixed with a casein paste which is then shaped and treated with formaldehyde, or a casein paste may be treated simultaneously with dicyandiamide and a solid polymer of formaldehyde, the mixture being shaped by pressure, with or without heat. The reactions may be accelerated by the use of acid or alkaline catalysts, and the compositions may include fibrous or other fillers, dyes, &c. Specification 287,177 is referred to.

323,060. Nicholls, F. N. Oct. 6, 1928.

Bituminous compositions.—A bituminous composition is made by heating a mixture of about 20 per cent of bitumen and 75 per cent of gas oil to a temperature of 150° C. and adding and thoroughly incorporating 5 per cent of a liquid glue made by melting glue in half its weight of gas oil. The product can be used as a marine glue substitute and road dressing material and for making damp courses, plastic asbestos compositions, roofing compositions, road expansion joints, &c.

323,107. Marks, Sir G. C., (*Bataafsche Petroleum Maatschappij*). Dec. 17, 1928.

Bituminous compositions.—Asphalt for protecting sea shores, &c. is mixed with a large proportion of sand and gravel mixture or a like filler, and preferably also cement.

Reference has been directed by the Comptroller to Specification 213,659.

323,896. Berry, Wiggins, & Co., Ltd., and **Hohmes, H. H.** Dec. 17, 1928.

Bituminous compositions.—Relates to processes for making bituminous compositions, for roads, foundations, &c., of the kind in which mineral aggregate is coated with an aqueous emulsion of a bituminous or tarry substance, and consists in adding sodium silicate or other water soluble silicate to the composition, the silicate having the property of increasing the viscosity of the emulsion. The silicate may be added to the aggregate or, to the emulsion, or portions of the silicate and emulsion may be added alternately to the aggregate. In an example, half a gallon of a water solution of sodium silicate of specific gravity 1.42 is added to 12 gallons of a bituminous emulsion containing 60 per cent of bitumen, and the mixture is applied to about one ton of stone aggregate.

324,025. Bakelite Corporation, (Assignees of *Turkington, V. H.*) July 7. 1927, [*Convention date*]. *Divided on* 293,453.

Compositions containing organic condensation products.—In the process of making a resinous composition, reaction is effected between a phenol such as phenol or cresol, and a fatty oil in the presence of a non-phenolic acid resin, other than a resin of polybasic acid-polyhydric alcohol type, with or without the addition of alkaline, neutral or acid condensating agents. Most acid natural resins such as rosin, manila and other copals or elemi may be used. Tung oil is preferably used, but may be substituted wholly or in part by other fatty oils such as linseed or rape oil. The product so obtained is heated with an active methylene containing substance such as formaldehyde, whereby a product is obtained which may be dissolved in solvents such as turpentine, toluene, &c. to form varnishes. In an example a mixture of phenol, rosin and tung oil are refluxed from one to ten hours. Formaldehyde and aqueous ammonia are added and boiling under reflux continued for four to eight hours. The water is then removed by boiling, and heating continued at 150° C. until a clear, non-tacky solid is produced on cooling. The product may be dissolved in turpentine, toluene, &c. to form a varnish. The compositions may be applied in a melted condition without solvents. Specification 267,736, [*Class* 95, Paints &c.], is referred to.

324,038. Kin, S. Oct. 15, 1928.

Stone, artificial and imitation; figured and ornamented artificial stone; hardening.—A process for making imitation marble consists in placing a thin layer of a composition of white cement and water, with or without powdered glass or white sand or both, in a mould having a glazed or enamelled surface, adding a backing of cement and sand, consolidating under pressure, stacking in a humid atmosphere, exposing to dry heat at about 100° F. for about 24 hours and finally removing from the mould. Before exposing to dry heat, the article, still in the mould, may be kept in the dark for about 14 days. Marbled designs may be worked into the primary layers with a brush, using Indian ink or the like.

324,199. Meuris, H. Oct. 6, 1928, [*Convention date*].

Cements, Portland, materials for.—In the preparation of sulphuric acid and Portland cement from calcium sulphate, clay, carbon, &c., metallic carbonates, such as siderite or chalk are added to the roast, whereby complete combustion of all the carbon takes place before the clinkering zone is reached, owing to carbon monoxide being formed from the carbon dioxide. In consequence no calcium sulphide is formed by reduction in the clinkering zone. The material is briquetted in the form of small cylinders. The carbon and carbonate may be supplied by choice of a suitable oil shale. Proportions are given.

324,312. Sprenger, A. July 17, 1928.

Refractory substances.—A highly refractory substance is produced by fusing together the oxides of chromium, aluminium, silicon and magnesium, or minerals containing such oxides, in such proportions that the alumina may combine with silica or with silica and magnesia, and the chromium oxide may combine with magnesia to form simple double oxides. Preferably the last double oxide predominates in the product, and uncombined chromium oxide or magnesia may be present. The melting of the mixture is performed in an electric furnace, and the heating and cooling are so conducted that the product contains 50 per cent or more of vitreous constituents. The melt may be tempered during or after cooling. The slag derived from the process of producing ferro-chromium may be employed as a raw material, with additional chromium ore if necessary. The refractory substance may be cast or may be crushed and moulded with binding agents. Specification 302,087 is referred to.

324,631. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). Sept. 24, 1928.

Bituminous compositions.—Products resembling natural waxes and suitable for use in boot and floor polishes and the like are obtained by esterifying together, maybe in presence of a catalyst, e.g. sulphuric or hydrochloric acid, montan wax bleached by oxidation, and a fatty, aromatic or hydroaromatic acid by means of a polyhydric alcohol. Any free acids in the products may be wholly or partially converted into salts, esters, anhydrides, amides, or other -CO- compounds or into mixtures thereof. Solid or liquid hydrocarbons, or oily, fatty, waxy, or resinous substances, containing no free -COOH groups may be added before, during, or after the esterification. The bleached wax may be replaced by a conversion product, still containing free acid, e.g. the products described in Specification 320,854, [*Class* 91, Oils &c.], and the polyhydric alcohol by carboxylic acids, aldehydes, ketones or phenols, containing 2 or more hydroxyl or other e.g. halogen groups capable of esterification under the conditions. For example, (1) 220 kg. of coconut oil fatty acids, 150 kg. of ethylene glycol or 300 kg. of polyglycol, and 1 kg. of 40 per cent sulphuric acid are heated for about 1 hour at 120—130° C., then 1,000 kg. of montan wax bleached according to Specification 308,996, [*Class* 91, Oils &c.], and consisting mainly of free acids, 100 kg. of tallow acids, and 40 kg. of wool grease are added, and the whole heated to 120—130° C. for 3 hours. The flexibility of the soft plastic product may be increased by melting with 25 per cent of its weight of paraffin wax. (2) 20 kg. of coconut oil fatty acids, 5 kg. of naphthenic acids, and 7 kg. of ethylene glycol are stirred for ½ hour at 160° C., 100 kg. of montan bleached as described in Specification 305,552, [*Class* 91, Oils &c.], are then added and the mass maintained for 4 hours at 120—130° C. The free acids in the product are then esterified by heating for another hour with 9 kg. of benzyl alcohol. The Specification also describes the use of benzoic, salicyclic, and wool-grease acids, castor oil, tallow, and glycerol, and of calcium and barium oxides to form salts with the free acids of the products.

324,638. Marks, Sir G. C., (*Plastic, Inc.*). Oct. 26, 1928.

Compositions containing asbestos, silica.—A composition comprising a kelp treated with copper sulphate solution, macerated and ground with fibrous material and subsequently admixed with ammonia is used for covering electric cables or steam pipes, &c., or for moulded articles. The fibrous material may be asbestos, cork, or jute flocks with or without a refractory material such as silica. In an example, 25 lb. kelp are treated with 5 lb. copper sulphate in 100 lb. water, drained, ground up with 25 lb. asbestos fibre and mixed with 10 lb. water and 7½ lb. ammonia solution (26 per cent) more water being added if necessary.

324,652. Harris, L. G. Oct. 26, 1928.

Stone, hardening and preserving.—Articles composed of hydrolysed cellulosic material and Portland, &c., cement, are rendered waterproof and proof against erosion by immersion in a reagent capable of forming a viscous body with cellulose (e.g. an acid solution of zinc chloride) and/or treated superficially with sodium silicate, casein, solutions of waxes, mineral oil or the like.

324,798. Eiger, A. Jan. 22, 1929.

Cements, Portland, processes for making.—In the wet process for the manufacture of cement the slurry is dried by steam at a temperature of about 400° C., and the resulting wet steam is reheated for reuse in the drying process, a surplus being available for other purposes. In the plant shown slurry is heated in a tank 2 to about 100° C. and is sprayed into the upper end of a drying-drum 3, at the lower end of which hot steam is supplied by a pipe 4. The wet steam is drawn off from the chamber 5, part being returned to the drying-drum through the heater 10, while the remainder for use elsewhere is passed to a superheater 12. The waste gases from the burning drum 16 pass over the superheater 12, heater 10 and slurry tank 2.

FIG. 2.

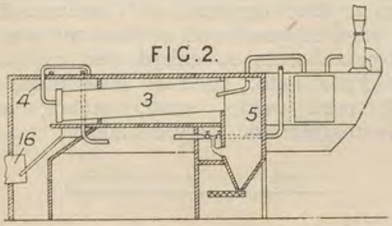
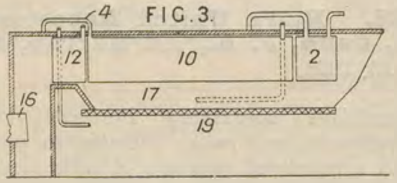


FIG. 3.



324,812. Chevron, A. Feb. 1, 1929.

Stone, artificial.—Artificial stone is made by kneading moistened clay with cement and allowing the mixture to set under pressure. Suggested proportions are 80 per cent of clay and 20 per cent cement.

324,864. Fugmann, G. April 19, 1929.

Stone, colouring.—Esters of cellulose or of organic oxy-acids are added to the metal salt solution used for colouring stone by the known process of impregnating the stone with a metal solution and precipitating the metal in the stone.

325,793. Meyer, E., and **Fichte, E.** Nov. 20, 1928.

Concretes, cement.—Conduits for the discharge of waste gases having a high percentage of steam or other vapours are made of a plastic mass comprising wood shavings, Portland cement, sand and water in approximately the proportions 6 :2 :1 :1. The material may be coated with a weak aqueous solution of aluminium acetate.

325,991. Hamakado, H. Feb. 14, 1929.

Concretes, cement.—A composition to be added to cement compositions in the gauging water for waterproofing purposes is prepared by treating a soluble aluminium salt with sodium carbonate or bicarbonate, washing the precipitated aluminium hydrate several times by decantation, heating the washed precipitate with soluble soap under thorough stirring, boiling with boric acid, and then diluting with water.

326,214. Groves, W. W., (*I. G. Farbenindustrie Akt.-Ges.*). Oct. 1, 1928. [*Divided on and addition to 298,085 under which a Specification was laid open to inspection under Sect. 91 of the Acts, Oct. 1, 1928*].

Compositions containing synthetic resins.—Resins containing carboxylic groups made by reacting a phenol-formaldehyde resin with a halogen-fatty acid or by reacting a phenoxy-fatty acid with formaldehyde, are hardened by heating to above 100° C. with a polyhydric alcohol, with or without a filling material. For example, the resin is dissolved in alcohol, a polyhydric alcohol such as glycerine or pentaerythritol is added, and the whole is evaporated and heated as above described; or the resin may be simply mixed with the polyhydric alcohol and heated. In the examples (1) Bakelite A is reacted with chloracetic acid as described in Example 1 of the parent Specification, the resin carboxylic acid is dissolved in alcohol, and glycerine is added, the mixture being kneeded with paper-pulp; (2) cresol and formaldehyde are condensed in presence of alkali, the reaction mass is treated with more alkali and sodium chloracetate, the resin-carboxylic acid is precipitated with hydrochloric acid, dissolved in alcohol, and polyvinyl alcohol is added, the mixture being evaporated and the residue heated to 150—170° C.

326,279. Carborundum Co., Ltd., (*Carborundum Co.*). Jan. 1, 1929.

Refractory substances containing crystalline alumina.—Refractories, having a crystalline structure, e.g. fused alumina are rendered more resistant to spalling by bonding with another material having an interlocking crystalline structure and which preferably possesses a coefficient of expansion approximately the same as that of the bonded material. Calcium titanium oxide, magnesium titanium oxide and mixtures of magnesium oxide and calcium fluoride or magnesia, lime and silica are given as examples of bonding materials for fused alumina. In an example, refractory pieces consisting of 95 per cent fused alumina bonded with 5 per cent $CaTiO_3$ (perovskite), and burned to 1450° C. lose less than 20 per cent of their weight after alternately heating to 1350° C. and quenching in an air blast twenty times.

326,545. Wade, H., (*Bakelite Corporation*). Dec. 15, 1928.

Compositions containing phenols and aldehydes.—Moulding mixtures are prepared by the addition of methylene-containing hardening agents and fillers to non-reactive phenolic resins obtained by heating a non-reactive phenol-methylene resin with furfural and a basic condensing agent such as lime for a time sufficient to convert the resin into a mass which is brittle when cold, but insufficient to destroy its non-reactive character. The initial resin may be made from phenol, cresol, or mixtures thereof, and formaldehyde, and may have incorporated with it another resin of still lower reactivity, for example, a cresol-formaldehyde or phenol-acetaldehyde resin may be added to an initial resin derived from phenol and formaldehyde; or a retarding agent such as rosin may be added thereto. To lessen the time required for the final hardening a small proportion of a methylene-containing hardening agent may be added to the resin during the furfural treatment stage.

326,560. Carborundum Co., Ltd., (*Carborundum Co.*). Nov. 20, 1928. *Drawings to Specification.*

Refractory substances containing fluorides, silicates, alumina, magnesia.—A composite binder for a refractory material has constituents soluble in each other in varying proportions so that it continuously matures over a temperature range of at least 300° C. for some interval between 1150° C. and 1900° C. Preferably the melting point curve of the binder approximates to a straight line in the temperature range and the refractory material and binder are stable under reducing conditions above 1300° C. and below 1600° C. Refractory materials are for example alumina, silicon carbide, magnesite or magnesia spinel and composite binders according to the invention are mixtures of alumina and fluorspar, of magnesia and calcium fluoride, and of diopside ($Ca\,Mg\,(SiO_3)_2$) and forsterite ($Mg_2\,SiO_4$).

326,612. Marks, Sir G. C., (*Polysius Akt.-Ges., G.*). Jan. 23, 1929.

Cements, Portland and Roman, processes for making.—In a process for the manufacture of cement and sulphuric acid by burning in a rotary furnace a mixture of gypsum, clay, &c., and a reducing agent (for example carbon), the mixture is formed into granules, for example balls of 3—20 mms. diameter, to prevent the premature action of the oxygen of the air on the reducing agent. It is preferable to use more reducing agent than is theoretically needed.

326,625. Josz, E. Feb. 5, 1929.

Compositions containing plaster, sodium borate, and erythro dextrine.—A plaster composition is made by adding 0.6 per cent by weight of powdered erythro dextrine and between 0.5 and 1.2 per cent of powdered sodium metaborate or sodium pentaborate to dehydrated calcium sulphate. Fillers etc., such as wood pulp, fibrous material, cork waste, sand, gravel, cement, colouring matter etc., may be added.

326,825. Bell's United Asbestos Co., Ltd., Cann, J. A., and **Harrap, E. R.** Nov. 16, 1928.

Compositions containing Portland cement, lime, magnesia, and salts.—Relates to processes in which a powdered mixture of salts containing water of crystallization and alkaline earth compounds which set by absorption of water, such as calcareous cements, are moulded under heat and pressure in the substantial absence of added water. According to the invention the salts used are salts, such as the sulphates, chlorides, phosphates and nitrates of iron, zinc, manganese and like heavy metals. Examples of alkaline earth compounds are Portland cement, hydraulic and fat limes, plaster of Paris, magnesia and magnesian and dolomite limes. Additional compounds which react with the salts may also be added. Examples of moulding mixtures are (1) Portland cement or lime and ferrous sulphate; (2) plaster of Paris and zinc sulphate; (3) 60 parts of plaster of Paris, 8 parts of zinc sulphate and 10 parts of zinc oxide, a zinc oxysulphate being formed; (4) lime, zinc sulphate and magnesia in the proportion by weight of 5.6 : 27 : 16. The temperatures used are comparatively low, generally below the melting point of the constituents, for instance the temperature of steam at a pressure of 10 lb. per sq. inch. The pressures may be put up to 10 tons per sq. inch. The moulded bodies may be impregnated with waterproofing substances or such, in small quantities, may be included in the mixtures. Examples of such substances are metal soaps, resins, bitumens, waxes, synthetic resins, oils and fatty acids. Colouring and filling substances for instance mica and asbestos may also be added and marbled or grained effects may be produced. The Provisional Specification also describes mixtures of two salts which react with double decomposition, and mixtures of cements, limes, &c., with hydrated oxides or salts other than those of heavy metals.

326,840. Wade, H., (*Bakelite Corporation*). Dec. 21, 1928.

Compositions containing synthetic resins and cellulose esters.—A moulding mixture for use under standard hot press conditions comprises a fibrous cellulose ester and a potentially reactive phenolic resin, preferably in equal proportions, with or without a plasticizer, colouring materials and fillers. The mixture is preferably made by grinding commercial fibrous cellulose acetate and admixing with the finely ground resin. The resin may be such that heating directly converts it into the infusible state or it may need hardening agents, such as formaldehyde hexamethylenetetramine, etc. As plasticizers the phosphoric acid esters are preferably used.

326,863. Marks, Sir G. C., (*Rol, Lister, et Cie*). Nov. 23, 1928.

Compositions containing bituminous materials.—In a process of cold laying, compositions consisting of an aggregate admixed with bitumen previously softened by the addition of a proportion of bituminous or asphaltic base oil or refined tar are used the matrix having a melting point between 15° C. and 25° C. The invention also consists in the composition when refined tar is used as the softener but not otherwise. In examples 75 per cent of bitumen of 50 penetration and 25 per cent of heavy asphaltic base oil distillate or 58 per cent bitumen of 200 penetration and 42 per cent refined tar are heated together to form the binder.

327,095. White, A. E., (*Ellis-Foster Co.*). Sept. 19, 1928.

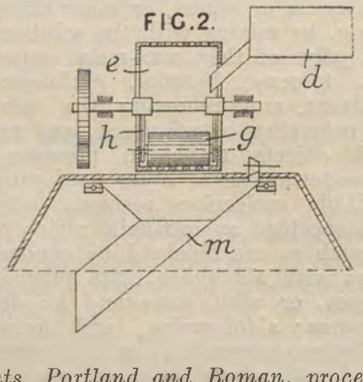
Compositions containing organic condensation products.—In the manufacture of cellulose ester compositions for coating, moulding and like purposes, a synthetic resin, made by heating a natural resin with a polyhydroxy alcohol and an organic acid, is incorporated with a cellulose ester, e.g. cellulose acetate or nitrate, to form a composition in which the amount of resin exceeds the cellulose ester. The natural resin used may be copal, kauri, damma, or mixtures of these, or the resin acids derived therefrom. The polyhydroxy alcohol may be glycerol, glycol or their condensation products, e.g. polyglycerol, or derivatives thereof, e.g. glycol ethers, halohydrins or homologues of ethylene oxide. The organic acid may be a polybasic aliphatic acid, e.g., tartaric acid, or a poly- or mono-basic aromatic acid, e.g. phthalic or benzoic acid, or mixtures of these. The synthetic resins, e.g. rosin phthalic glyceride, or rosin benzoic salicylic glyceride may be rendered light in colour by cooling the reaction product under reduced pressure, or in the presence of an inert gas, e.g. nitrogen. They are mixed with solutions of cellulose esters, e.g. scrap celluloid, dissolved in solvents, e.g., acetone, amyl-ethyl or butyl acetates or alcohols, to which may be added a hydrocarbon diluent, e.g. toluene. Softening agents, e.g. castor oil or triphenyl phosphate, or pigments or dyestuffs may be added. The cellulose ester composition may be mixed with fillers and fibrous materials, e.g. asbestos, mica dust, terra alba or lampblack to form plastic compositions, and used as a rubber substitute. Specification 316,914, [*Class* 95, Paints &c.], is referred to.

327,417. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). Sept. 29, 1928.

Bituminous compositions containing waxes and artificial resins.—Hard wax-like products are obtained by esterifying high molecular condensation products of a resinous nature containing hydroxyl groups but no aromatic or hydroaromatic sulphur compounds, with the high molecular fatty acids of waxes. The wax acids may be esterified after extraction from bleached or oxidized montan-bees-carnauba- or other wax as by glacial acetic acid, or the bleached or oxidized wax or a conversion product thereof still containing free carboxylic acids may be treated. Temperatures of near or above 200° C. are necessary when the ingredients are heated together alone or in presence of naphthalene or other organic solvent boiling above 95° C., but when the process is carried out with aqueous emulsions of the components lower temperatures may be used. Accelerators, e.g. sodium bisulphate, boric acid, or anhydrous zinc chloride may be present. Especially hard products may be obtained by (1) prolonged heating; or (2) converting part of the wax acids, before, during, or after the esterification into metal salts, especially of calcium or other divalent metal; or (3), dispersing the powdered wax-resin ester product in an aqueous solution of formaldehyde and a phenol, and adding ammonia or other agent affecting condensation of the phenol and aldehyde. Stability to temperature and resistance to solvents may be increased by treating the esters with trioxymethylene or other substance yielding formaldehyde on heating. Dyestuffs, kieselguhr, wood meal cork powder, asbestos fibre, natural or artificial resins, asphalts, pitches, gums, rubber, cellulose esters or ethers, or other fillers may be added, e.g. by mixing with the solution, suspension, or jelly of the wax-resin ester in hot benzene, toluene, butanol, cyclohexanone, or other solvent, and removing the solvent; the product may then be powdered, and pressed hot into solid objects, maybe in presence of hexamethylene-tetramine or other hardening accelerator. High molecular resinous condensation products specified are artificial resins or organic glasses such as are obtained by condensation of aldehydes with aldehydes, with phenol and its homologues, or with urea and its derivatives, e.g. thiourea; aldol resins, and formaldehyde, hexamethylene-tetramine, or trioxymethylene, condensed with phenol or cresol are referred to. The intermediate condensation products in the manufacture of artificial resins from aldehydes, so long as they contain hydroxyl groups and in the course of the operation are further polymerized to the resins, may be used. *o-* and *p*-hydroxybenzyl alcohols, and mono-or di-methylol-urea or thiourea are specified. Light coloured products are obtained by operating out of contact with oxygen, e.g. *in vacuo* or in carbon dioxide or nitrogen, and by starting with wax bleached by chromic acid or other oxidizing agent or with the free acids extracted therefrom. In examples, (1) 70 lb. of montan wax bleached by chromic acid as described in Specification 305,552, [*Class* 91, Oils &c.], and 30 lb. of a condensation product of *o* cresol and formaldehyde are melted with vigorous stirring in an atmosphere of carbon dioxide. 1lb. of sodium bisulphate is added, and the whole kept at 240—250° C. for 10 hours. (2) The ester obtained by melting together 70 lb. of bleached montan wax and 30 lb. of *o*-cresol-formaldehyde-resin is heated in a current of carbon dioxide to 250° C. for several hours or to 300° C. for a shorter time. A thermo-plastic product is obtained. It may be powdered and dispersed in a solution of 600 lb. of phenol and 840 lb. of 30 per cent. of formaldehyde to which is then added, drop by drop, 110 lb. of concentrated ammonia. The whole is stirred at 50° C. for 2 hours, the volatiles distilled off, and the homogeneous brown resinous product, with or without fillers, pressed into solid objects at 150—165° C. and several hundred kilograms per sq. cm. (3) A solution of 1.25 lb. of boric acid in a 1 :1 mixture of benzene and hexyl alcohol is added at about 100° C. to a solution in 50 lb. of xylene of 20 lb. of aldol resin and of montan wax prepared as described in Specification 305,552, [*Class* 91, Oils &c.]. The mixture is heated under a reflux condenser to 140—150° C. for about 5 hrs., and then for a further 8 hrs. to almost 200° C. The xylene is then evaporated off. *p*-cymene, 1, 2, 4, 5-tetramethylbenzene, or tetra- or deka-hydronaphthalene may replace the xylene. Specifications 219,368 and 322,496 also are referred to.

327,679. Schwenk, E., [Firm of], and **Hauenschild, A.** Dec. 31, 1928.

FIG.2.



Cements, Portland and Roman, processes and apparatus for making.—In charging apparatus for shaft furnaces for burning cement, lime and the like, of the kind in which the raw pasty material is pressed through a perforated plate so as to issue in the form of ropes which break off or are cut into short lengths, the extrusion is effected by one or more rollers. As shown, the apparatus comprises a rotary drum *e* to which the raw material is supplied from a mixer *d* and from the driving shaft of which the extruding roller *g* is freely suspended by rods *h*. The extruded material is distributed uniformly within the furnace by a rotating shoot *m*. A modified form of press comprises an horizontal plate having perforations, which may be disposed obliquely to the plane of the plate, and two rollers secured by links to a central vertical shaft, the extrusion being effected by rotating the plate and/or the rollers about the central shaft. The broken or cut pieces may, before entering the furnace, be fed to a rotary drum in which they are rolled into balls.

327,713. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). Sept. 29, 1928. *Divided on* 327,417.

Bituminous compositions containing waxes and artificial resins.—Hard wax-like products are obtained by simultaneously producing high molecular condensation products of a resinous nature containing hydroxyl groups but not aromatic or hydro aromatic sulphur compounds, and esterifying such products with the high molecular fatty acids of bleached montan wax or a conversion product thereof still containing free carboxylic acid. The ingredients may be melted together, or be heated mixed with water or with naphthalene or other organic solvent boiling above 95° C. Accelerators, e.g. sodium bisulphate, boric acid, or anhydrous zinc chloride, may be present. Especially hard products may be obtained by (1) prolonged heating; (2) converting part of the montan wax acids, before, during, or after the esterification, into metal salts, especially of calcium, lead, or other divalent metal; or (3) dispersing the powdered wax-resin ester produced as above in an aqueous solution of formaldehyde and a phenol, and adding ammonia or other agent effecting condensation of the phenol and aldehyde. Stability to temperature and resistance to solvents may be increased by treating the esters with trioxymethylene or other substance yielding formaldehyde on heating. Dyestuffs, kieselguhr, wood meal, cork powder, asbestos fibre, natural or artificial resins, asphalts, pitches, gums, rubber, cellulose esters or ethers, or other fillers may be added, e.g. by mixing with the solution, suspension, or jelly of the wax-resin ester in hot benzene, toluene, butanol, cyclohexanone, or other solvent, and removing the solvent; the product may then be powdered, and pressed hot into solid objects, maybe in presence of hexamethylene-tetramine or other hardening accelerator. High-molecular resinous condensation products specified are artificial resins or organic glasses such as are obtained by condensation of aldehydes with aldehydes, with phenol and its homologues, or with urea and its derivatives, e.g. thiourea, aldol resins, and formaldehyde, hexamethylene-tetramine, or trioxymethylene, with phenol, cresol, naphthol, or hydroquinine are referred to. Light coloured products are obtained by operating out of contact with oxygen, e.g. *in vacuo* or in carbon dioxide or nitrogen, and by starting with montan wax bleached by chromic acid or other oxidizing agent or with the free acids extracted therefrom as by glacial acetic acid. In examples, 30 lb. of phenol are gradually stirred into 70 lb. of bleached montan wax at 80—90° C. in an atmosphere of carbon dioxide or nitrogen. 10 lb. of hexamethylene-tetramine are added, and the temperature is raised to 150° C. in 3 hrs. The melt cools to a homogeneous hard brown solid, which when gradually heated to 180° C. loses its fusibility and its solubility in a mixture of alcohol and benzene, and becomes brown red and resinous. (2) 300 lb. of an acid compound obtained by melting bleached montan wax with lead oxide are powdered and stirred into a solution of 600 lb. of phenol and 840 lb. of 30 per cent formaldehyde; 110 lb. of concentrated ammonia are added drop by drop, and the mass stirred for 2 hrs. at 50° C. After distilling off volatiles by gradually raising the temperature to 115° C. a brown resinous solid is obtained. With or without fillers or further hardening this product is moulded into hard solid objects at 150—160° C. and several hundred kg. per sq. cm. Specification 322,496 is referred to.

Reference has been directed by the Comptroller to Specification 219,368.

327,722. Johnson, J. Y., (*I. G. Farbenindustrie, Akt.-Ges.*). Dec. 10, 1928.

Compositions containing synthetic resins.—Synthetic resins are prepared by reacting ether or thio-ether dicarboxylic acids or their anhydrides with polyhydric alcohols (including ether-alcohols such as polyglycols and polyglycerols containing at least two hydroxy groups) or esters of polyhydric alcohols with fatty acids, such as oleic, elaeostearic, or the acids of linseed or China-wood oil, or the hydroxyalkyl esters of higher fatty acids which may be obtained by the reaction of olefine oxides or halogen hydrins on the corresponding acids, the esters in all cases containing at least one free hydroxy group. The dicarboxylic acids mentioned are diglycollic, methyl-diglycollic, dihydracrylic, salicyl- acetic, thiodiglycollic, thiodilactylic, and 2-carboxyphenyl thioglycollic acids. A part of the dicarboxylic acid may be replaced by phthalic, succinic, adipic or like dicarboxylic acid. The reaction mixture may contain higher fatty acids such as oleic or elaeostearic acids or the acids of linseed or China wood oil. The reaction may be effected with exclusion of oxygen, for instance in a current of inert gas or in vacuo or under pressure and with or without condensing agents such as metals, metal oxides, acids, acid or alkaline substances, sodium acetate, and zinc chloride, and with or without diluents or solvents, such as phthalic esters, butyl diglycollates, glycol diacetate, natural or artificial resins such as colophony or phenol-formaldehyde condensation products. The products are suitable for the production of lacquers, films, insulating materials and many other articles, and various additions such as ketones, alcohols, acetic esters, softening agents such as phthalic or phosphoric esters, oils such as linseed and China wood oil, waxes, fillers, and colouring matters may be added, at any stage before the final hardening, for instance during the condensation process. Asbestos, slate-meal, talc, mica, alumina, slag-powder, lime and gypsum are mentioned as suitable fillers. The products may be used as substitutes for marble, slate, and ceramic products, for cementing or embedding wire windings in electrical apparatus, for brake bands, grinding tools, window glass, windscreens, coloured signal glass, wired or reinforced glass, drinking-glasses, vases and bowls. In the examples (1) and (2) diglycollic acid is condensed with glycerol; the liquid condensation product may be poured upon a plate or mould; (3) diglycollic acid is condensed with glycerol, the product dissolved in acetone, a dye such as thioindigo added, and the concentrated solution applied to metal which is subsequently heated; (4) diglycollic acid is condensed with glycol; (5) salicyl acetic acid is condensed with glycerol; (6) methyl diglycollic or dihydracrylic acid is condensed with glycerol, a solution of the product in a mixture of acetone and monoethyl ether of glycol, if desired with the addition of a dye such as indanthrene blue or of titanium dioxide gives a paint for metal (7) salicyl acetic acid is condensed with glycerol, hydrogen being passed through during the reaction; (8) diglycollic acid is condensed with phthalic anhydride and glycerol, the product dissolved in acetone, glycol, alkyl ethers, &c., with or without zinc or iron oxide being a paint for metal, or the liquid condensation product may be poured into moulds or trays; (9) and (10) thiodiglycollic acid is condensed with glycerol; (11) asbestos millboard is impregnated with a 20 per cent acetone solution of the diglycollic acid-glycerol condensation product, the impregnation being repeated five times with progressively stronger solutions and the final heating being at 175° C.; the product has high dielectric properties; (12) thin unsized paper or asbestos paper is coated on one or both sides with a 51 per cent solution of diglycollic acid-glycerol condensation product in a mixture of methanol, ethylalcohol, and ethyl acetate, the paper being prehardened at 100° C. and then a stack of 20—30 sheets is heated in a press at 150—160° C.; (13) Portland cement is kneaded into a 50 per cent acetone solution of diglycollic acid-glycerol condensation product and the mass is used for cementing articles such as heating-bodies, porcelain contacts, insulators, &c., and finally heated at 100° C.; (14) diglycollic anhydride is condensed with monoglycerol ester of linoleic acid; (15) diglycollic anhydride is condensed with monoglycerol ester or hydroxyethyl ester of linoleic acid in presence of sodium acetate; (16) diglycollic acid is condensed with hydroxy-ethyl ester of linoleic acid; (17) mica plates are painted with a 50 per cent acetone solution of diglycollic acid-glycerol condensation product and a pile of these plates is heated in vacuo at 100° C. and then without vacuum at 150° C.; the product may be used for lining grooves, covering copper bars, intermediate layers for insulating collectors, &c.; (18) mica plates are coated with a 50 per cent solution in methyl alcohol, methyl acetate, ethyl acetate, and glycol monoethyl ether or ethyl lactate, of diglycollic acid-glycerol condensation product, the composite plate being made as before; inorganic substances such as zinc or iron oxide may be added to hasten the hardening; (19) diglycollic acid-glycerol condensation product is poured into a sheet mould and heated for 3—4 months at 90—100° C. or for shorter periods at higher temperatures, preferably in nitrogen, carbon dioxide, &c. to avoid coloration, colouring matters such as indanthrene dyes being added if desired; (20) and (21) paper and mica respectively are made into compound sheets by means of solutions of thiodiglycollic acid-glycerol condensation product; (22) thiodiglycollic anhydride is condensed with linoleic acid monoglycerol ester in presence of sodium acetate. Specification 328,190 is referred to.

327,969. Wade, H., (*Bakelite Corporation*). Jan. 12, 1929.

Compositions containing urea-aldehyde.—A moulding material is obtained by mixing a urea-aldehyde resin with a cellulose ester stable at 165° C. and a filler. Plasticizing agents such as ethylene glycol, naphthalene and the dialkyl esters of oxalic, tartaric or phthalic acid may be added. In the example urea paraformaldehyde, cellulose acetate and wood flour are mixed and sheeted. The reaction takes place during sheeting and this is continued until the loss of weight corresponds to the water produced by the re-action. The sheets are then pulverised and the resulting powder is moulded by the hot-press method. Specifications 281,993 and 301,133 are referred to.

328,030. Morgan, J. S. Nov. 17, 1928.

Concretes, manufacture of. — In the manufacture of concrete the adherent air is removed by agitating the cement alone with water in a disintegrator (preferably operated at high speed) with or without the application of vacuum, such, for example, as a pugging machine, and then mixing, if desired, in vacuo with watered aggregate. The proportion of water in the final product may be reduced below that usually employed, in an example the proportion of water being reduced from 8 to 6½ per cent.

328,166. Robinson, S. J. L., and **Collis, W. T.** July 5, 1929.

Compositions containing stony materials, pitch, and creosote.—Aggregate is mixed with powdered pitch, then creosote is added and the mixing continued until the creosote is evenly distributed. In an example the proportions by weight are:—Aggregate containing fines and dust 170, ground pitch 25, creosote 3 to 4.

328,190. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). Oct. 20, 1928.

Compositions containing resins and organic esters.—Hydroxyalkylesters of abietic acid, prepared by the action of alkylene monoxides on abietic acid, and acyl derivative of such esters, are stated to be useful as softening agents for resinous substances capable of being hardened. The Provisional Specification also states that ethers of hydroxyalkyl esters of abietic acid may be used for the same purpose. Specifications 265,233, 292,059, 302,041, and 312,523, [all in *Class* 2 (iii), Dyes &c.], are referred to.

328,746. Macdonald, J. March 22, 1929.

Concretes and mortars.—A road surface is made from a composition of 2 parts of granite chips, 1 part of cement sold under registered Trade Mark "Ferrocrete," and ½ part granite dust, mixed into a paste with water, spread and allowed to harden.

328,969. Fox, C. G. Feb. 7, 1929.

Emulsified bituminous compositions.—Stone road surfaces, &c., which are to be treated with bituminous, &c., emulsions, are given a preliminary treatment with highly diluted solutions or emulsions of the emulsifiers used in the preparation of the bituminous emulsion.

329,107. Cadman, H., and **Cadman, N.** April 6, 1929.

Compositions containing cement and hair.—A composition for use as a plaster or as an ingredient therein consists of a dry mixture of Portland or like cement and hair. The proportions may be four to five parts by volume of cement and one part of hair.

329,291. Berry, A. F. Feb. 9, 1929.

Cement concrete.—A cellular concrete is made by mixing a hard porous aggregate, such as burnt clay, and cement which is subjected in the presence of water and a metal powder to the action of sodium thiosulphate or its equivalent and optionally also to a rubbing or grinding action. Stalloy may be used as the metal powder. Blocks, bricks, slabs, &c., may be moulded from the concrete and may have pieces of hard material such as granite or hard metal incorporated in their upper surfaces.

329,313. Imperial Chemical Industries, Ltd., Morgan, H. H., and **Drummond, A. A.** Nov. 9, 1928.

Compositions containing synthetic resins.—Synthetic resin varnishes, &c., are prepared by incorporating phenolic compounds and formaldehyde with fatty acid esters in the presence of a volatile organic solvent. Synthetic resins may be prepared from the varnishes by distillation or evaporation of the solvent. Suitable phenolic compounds are phenol and its homologues and mixtures of phenols including coal tar fractions such as cresylic acids and creosote oils. Suitable fatty acid esters are wood oil, linseed, perilla, soya bean, fish, olive, rape-seed, cotton-seed, or castor oils. Phenolic compounds and formaldehyde may be heated for 24 to 90 hours with fatty acid esters in the presence of organic solvents such as cyclohexanol and homologues, benzyl alcohol, monoalkyl esters of ethylene glycol, ketones, esters or turpentine and preferably with a catalyst such as caustic soda or boric acid in methylated spirit. Alternatively, phenolic compounds and formaldehyde are boiled for 12 to 15 hours with excess of an organic solvent such as cyclohexanol or homologues, aliphatic alcohols or ketones, benzyl alcohol or turpentine in the presence of an alkaline catalyst, after which the product is acidified with a weak acid such as boric acid and distilled in the presence of a high-boiling solvent such as benzyl alcohol or cyclohexanol until all water is removed. A fatty acid ester is added and distillation continued until a drop of the mixture heated in a metal plate dries clear and glossy. Driers and colours or pigments may be incorporated in the varnish or resin.

329,330. Bell's United Asbestos Co., Ltd., Cann, J. A., and **Harrap, E. R.** Nov. 16, 1928. *Divided on* 326,825.

Concretes and mortars, lime, magnesia, and cement.—Relates to processes for producing moulded articles by subjecting to heat and pressure powdered mixtures of bodies adapted to react in the substantial absence of added water. According to the invention the bodies comprise basic and acidic bodies adapted to yield reaction products which are difficulty soluble in water. Examples of basic bodies are Portland cement, calcined magnesite and hydraulic or fat limes. Suitable acidic bodies are citric, tartaric, oxalic, tannic, lactic and boric acids. The temperatures are relatively low, for example that of steam at 10 lb. pressure per sq. inch, and the pressures may be up to 10 tons per sq. inch. Waterproofing materials may be added and also inert fillers such as mica and asbestos.

329,345. Williams, R. C. Feb. 16, 1929.

Mortars, lime.—Hot mortar and paint are made by mixing hot sand burnt with sulphur, unslaked lime burnt with sulphur or sulphuric acid or other ingredients, and water containing bitumen, sulphate of iron or other colouring matter. In an example a mortar is made by burning sand and sulphur on an iron plate over a hot fire, adding unslaked lime and sulphur while continuing the burning, and then adding the burnt materials to water containing an ounce of bitumen to the quart. Other colours may be produced by replacing the bitumen with sizes, syrups, treacle, waxes, copperas, resin or seaweed. A hot green paint is made by mixing hot sand burnt with sulphur, lime burnt with sugar, sulphate of iron, sulphuric acid and water, and water containing sulphate of iron. Other colours may be produced by replacing the sulphate of iron with treacle or sulphate of copper, cobalt, or zinc.

329,382. Boorne, W. H. Feb. 19, 1929.

Compositions containing bituminous or resinous materials and clay.—Tiles, slabs, and other bodies are made by moulding or rolling under heat and pressure a powdered mixture of an acid binder comprising natural or synthetic resin, pitch or the like and clay, a basic substance such as lime, a filler, and water in the proportion of about 2 to 8 per cent of the weight of the powder. In an example the powder comprises 28 parts by weight of pitch, 21 parts of clay, 1 part of lime, 20 parts of sawdust, 20 parts of sand or slag and 8 parts of water. This composition may be used alone or as a backing for a facing layer which may comprise a mixture of 4 parts of china clay, 2 parts of white rosin, $\frac{1}{4}$ part of lime, 2 parts of pigment and 2 parts of a liquid vehicle such as sub-turps. The surface layer cracks due to the shrinkage on drying and under the pressure of moulding the backing percolates through the fine cracks to produce a decorative crazed effect. Other effects may be produced by stencilling and relief moulding, and the percolation of the backing through the cracks may be prevented by a layer of paper or the like.

329,569. South Metropolitan Gas Co., Pickard, H., and **Hughes, C. M. C.** July 23, 1929.

Compositions containing bituminous and stony materials.—A road making, &c., material comprises a binder consisting of coal dispersed in coal tar, and an aggregate of stone dust and hard stone. The melting point of the binder is 115—122° C., and its penetration 1—5, its consistency being adjusted, if necessary, during manufacture by the addition of pitch. The hard stone ranges from ⅜ to ¼ ins. The proportions are approximately, binder 15—18, stone dust 26—30 and stone 55—58.

329,628. Wade, H., (*Bakelite Corporation*). Feb. 18, 1929.

Compositions containing synthetic resins and casein.—A mouldable composition comprises a resin of the urea formaldehyde type, and casein plasticized with a polyhydric alcohol such as glycol. According to an example, 100 parts of casein, 100 parts of urea, 100 parts of paraformaldehyde, 50 parts of water, 40 parts of ethylene glycol, and 13 parts of aqueous ammonia, are mixed until reaction takes place, and most of the water is driven off. Inert fillers such as wood fibre or lithopone, cellulose esters as the acetate or dinitrate and additional plasticizers such as diethyl or dibutyl oxalates, tartrates, or phthalates, may also be added. The amount of resin may be less than that shown in the example.

329,803. Jackson, L. Mellersh-, (*Hartford-Empire Co.*). April 27, 1929.

Refractory substances.—Grog for use in the manufacture of refractories is prepared by compressing the initial materials under a pressure greater than 200 lb. per sq. in., firing and grinding. The finished refractories are dense and free from voids and resistant to corrosion by molten glass.

330,072. Berry, Wiggins, & Co., Ltd., and **Holmes, H. H.** April 22, 1929.

Bituminous compositions.—Road-making and like compositions are made by treating damp, dirty or mud coated stone or road metal with a small quantity of cold creosote or creosote oil, and then applying a bituminous cement. In an example, 5 cwt of crushed stone and one pint of ordinary creosote are mixed, and 2 gallons of bitumen heated to 280° F are added. Specification 1381/07, [*Class* 70, Indiarubber &c.], is referred to.

330,271. Unaphalt (Roads), Ltd., and **Richards, H. E. G.** March 4, 1929. *Addition to* 316,108.

Bituminous compositions.—The foundation of a road, or the like, is first covered with a layer of fine asphaltic grout, the remainder of the construction of the road being as described in the parent Specification, i.e., composed of successive layers of coarse granulated asphaltic concrete mixture, fine asphaltic grout, and fine asphaltic surfacing mixture. The solid constituents employed, such as slag, clinker, &c., are coated at a temperature between 70° C. and 135° C. with a bitumen or bitumen and tar mixture of such viscosity that a float test of 25° C. gives a result of between 60 and 90 seconds. A final top-dressing of asphaltic grout may be applied.

330,278. Case, G. O., Ellis, E. M., and **Montigue, L. H.** March 1, 1929.

Compositions containing lime and chalk; concretes and mortars, lime and magnesia.—A cementitious material comprises an intimate mixture, in a finely divided state (cement fineness), of natural calcium or magnesium carbonate rock and its respective oxide, or mixtures of the two carbonates and oxides, in such proportions as to give in the mixture a ratio of pure carbonate to oxide of approximately 4—1. The cementitious material may be made by mixing the natural rock and lump lime or magnesia and then grinding to cement fineness, by grinding the ingredients first and then mixing them, or by partially calcining the natural rock to give the required proportion of oxide and then grinding. Retarding and accelerating agents such as colloids and calcium sulphate may be added. The mixture may be mixed with sand, stone, fibres, &c., to make mortar, plaster or concrete. Specification 173,015 is referred to.

330,374. Bendixen, N., and **Morgan, J. D.** May 7, 1929.

Bituminous compositions.—Aqueous bituminous emulsions, for use as paints or for coating roads, are prepared by the use, as emulsifying agents of fossil diatomaceae, for example commercial kieselguhr, and alkali, for example caustic soda, preferably in quantity less than that equivalent to the silica in the composition. The alkali, in combination with excess silica is stated to form, on drying of the emulsion, a hard, water-resistant bituminous composition.

330,440. South Metropolitan Gas Co., Pickard, H., and **Hughes, C. M. C.** July 23, 1929.

Compositions containing bituminous products and vegetable fibres.—A road making, &c., material comprises a mixture of peat moss, coconut fibre, &c., stone or sand, and a dispersion of coal in coal tar. In an example, 4.340 lb. of stone ranging from ¼ in. to dust are mixed with 700 lb. of peat and 2,340 lb. of the binder at a temperature of about 145° C, and, if desired, compressed into blocks. The consistency of the binder is adjusted by the addition of tar oil until it has a penetration of 14 and a melting point (Ring and Ball method) of 100° C.

330,561. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). March 7, 1929.

Clay compositions.—The deposit of carbon, on ceramic materials which come into contact with carbon-containing gases at high temperatures, is prevented by the addition of copper or copper compounds either to the raw material of the article or to the partly-manufactured or completed article. As examples, the iron-containing component of the article may be treated with a copper compound in solution or suspension, or copper compounds or metallic copper in the form of bronze powder may be mixed with the materials, or the completed article may be soaked in solutions of copper salts. As a specific example, burnt fire-clay bricks are soaked in a 10 per cent solution of ammoniacal copper sulphate and then air-dried. As an alternative a copper salt of a sulphonic acid may be used.

330,712. Gerley, A., and **Mackinlay, W. A.** May 3, 1929.

Compositions containing mineral oils; resins.—A composition suitable for use as a substitute for ebonite, horn, bone, &c., consists of middle tar oils, copper sulphate, methyl alcohol, an aqueous solution of glue, rosin, and hydrochloric acid or alkali with or without inert fillers. In an example, 15 parts of oils passing over at 170°—230° C., are heated to 50° C. with copper sulphate, 20 parts of methyl alcohol, and 2 parts of glue are mixed in, 15 parts of rosin are added and the whole is heated to 60° C. when 2 parts of hydrochloric acid are added and the composition is heated to 125° C. preferably under pressure. 45 parts of horn, bone, wood pulp, old tyres may be incorporated in the mass.

330,745. McBryde, W. May 24, 1929.

Refractory substances.—The carbon in carbonized clays, which have been produced by the process of Specification 149,440, is removed by oxidation. Preferably the oxidation is effected during or immediately after the production of refractory units by introducing preheated air into the firing-kiln.

330,895. Johnson, J. Y., (*I.G. Farbenindustrie Akt.-Ges.*). March 15, 1929.

Compositions containing cellulose ethers.—Lacquers and priming compositions are prepared by incorporating cellulose ethers such as ethyl cellulose, ethyl butyl cellulose and benzyl cellulose with resinous condensation products from polybasic carboxylic acids and such esters of polyhydric alcohols as contain at least one free hydroxyl group, which swell or dissolve in benzene hydrocarbons, and with organic solvents. Examples of suitable polybasic acids are phthalic, succinic, maleic, diglycollic and salicyl-acetic acids or mixtures or derivatives thereof, for example phthalic anhydride and chlor-phthalic acids. Examples of polyhydric alcohols are glycerol, sorbitol, pentaerythritol, glycols, and the hydroxyalkyl ethers of these alcohols. Suitable esters are the partial esters of these alcohols with acids such as abietic, linoleic, ricinoleic, naphthenic, lauric and china wood oil acids. The acids of drying oils such as linoleic acid may be oxidized or polymerized before or after esterification. The resinous condensation products may be obtained by treatment of the esters of the polyhydric alcohols with polybasic acids or their anhydrides or by conversion of the polyhydric alcohols with polybasic acids or their anhydrides with the simultaneous or subsequent action of the components of the esters. The quantity of the resinous condensation product may be from 10 per cent to 1,000 per cent by weight of the cellulose ether. Examples of suitable solvents are benzene hydrocarbons and mixtures thereof with esters, ketones, benzine hydrocarbons, alcohols or dioxane. Softening agents, drying oils, driers, natural or artificial resins, such as colophony, condensation products of cyclic ketones and coumorone resins, cellulose esters, soluble or insoluble colouring materials and fillers may be added. The composition may be employed for coating metals, wood, paper, glass, textiles, leather, wire, brickwork, articles required for the electrical industry and as priming and cementing compositions. In one example, 100 parts of a benzene-soluble ethyl cellulose and 20 to 50 parts of a resinous condensation product from 3.5 molecular proportions of phthalic acid with such a proportion of a linoleic acid glycerol ester containing one or two non-esterified hydroxyl groups as may be obtained, e.g. from 3 molecular proportions of glycerol and 1 molecular proportion of linoleic acid are dissolved in a mixture of 700 parts benzene, 100 parts toluene and 50 parts ethyl alcohol. In another example, 50 parts of benzyl cellulose, 20 parts of a resinous condensation product from 2 molecular proportions each of glycerol, colophony, and palmitic acid and 1 molecular proportion of maleic acid are dissolved with 10 to 20 parts of dibutyl phthalate in a mixture of 300 parts of benzene, 400 parts of toluene, 50 parts each of ethyl alcohol, butyl alcohol, butyl acetate and ethylene glycol, mono-ethyl ether and 100 parts of Milori Blue are added to the solution. Specifications 303,915 and 320,041, [both in *Class* 95, Paints &c.], are referred to.

330,968. Wade, H., (*Bakelite Corporation*). March 20, 1929.

Compositions containing artificial resins.—A process for preparing a moulding mixture comprises mixing a high boiling aldehyde with a filler and then adding a potentially reactive phenolic resin, or mixing a methylene containing body and a high boiling aldehyde with a filler and then adding a non-reactive phenolic resin. Examples of aldehydes are benzaldehyde, hexoic aldehyde, isohexylaldehyde, mannokeptose, methyl-furfural, nitro benzaldehyde, phenyl acetaldehyde, tetrahydrobenzaldehyde, &c., and of a methylene containing body is hexamethylenetetramine. The aldehyde acts as solvent, plasticizer and hardening agent. In an example wood flour is kneaded with about 10 per cent of its weight of furfural, and with a calculated quantity of hexamethylenetetramine. An amount equal to the weight of the wood flour and furfural of a permanently fusible resin prepared by reacting 7.5 mols. of phenol with 6 mols of formaldehyde is slowly added and kneading continued at approximately 100° C. The mixture is then cooled and ground. The amount of hexamethylenetetramine added is calculated on the basis of 15 parts by weight to each 200 parts of the resin. Specifications 225,436 and 230,619 are referred to.

331,207. Bell, W. T., and **Bennett, J. F.** March 23, 1929.

Concretes.—A composition for use in marking lines in tennis courts or roads consists of a filler of porcelain or pottery, ground to any degree of coarseness or fineness, and mixed with a binder of white cement, plaster of paris, and water to form a plastic paste. If desired, the filler and binder may be mixed and filled in position in the dry state, being damped with water after rolling or leaving for the humidity of the air to effect the binding action.

331,584. British Portland Cement Manufacturers, Ltd., Panisset, S. G. S., and **Hannah, W. S.** April 6, 1929. *Drawings to Specification.*

Cements, Portland and Roman, materials, processes, and apparatus for making.—White Portland cement is produced by treating the raw materials with a reducing agent immediately after the calcination process, after which the clinker is rapidly cooled to prevent reoxidation. The reduction may be effected by a spray of a reducing powder, e.g. coal dust or by causing the red hot clinker to fall on a surface covered with a volatile reducing agent, e.g. paraffin oil. Cooling is effected by immersion in a trough of water, from which the clinker is removed by a conveyer while still warm enough to drive off moisture. According to the Provisional Specification the reduction may be effected during calcination.

331,851. Bayon, H. P., (*Magnasco, Roggero, & Co.*). April 8, 1929.

Compositions containing synthetic resins.—Formed cellulosic material, e.g. wood shavings, leaves, woven fabrics, &c., is treated successively with a dilute caustic alkali, e.g. 1 per cent caustic soda at 100° C., and an aqueous solution of an oxidizing acid, e.g. a mixture of 5 per cent sulphuric and nitric acids, being washed and dried after each treatment and finally neutralized with ammonia. The material is then impregnated with a solution of a synthetic resin, or with the ingredients of a synthetic resin, heated and pressed, thus producing an insoluble form of the resin in the material, while at the same time preserving its original texture. The resin ingredients may be phenol and formaldehyde, successively introduced and followed, after drying, by paradichlorbenzene and hexamethylenetetramine.

332,257. Scholz, V., and **Atlas Ago Chemische Fabrik Akt.-Ges.** March 13, 1929.

Compositions containing oxidized oils.—Linoxyns or linoxyn-like substances are made from drying or non-drying oils containing unsaturated groups or from their fatty acids by blowing with air or other oxygen-containing gas until no further oxidation or polymerization can take place and then kneading the product with air, whereby the oxidation and polymerization are carried to a further stage and a light-coloured, granular material having a relatively high melting point is produced. Linseed oil, with or without ½ to 2 per cent of a catalyst such as litharge or lead linoleate is blown with air at a constant temperature of 60° C. to 150° C. until the passage of air is practically stopped by the viscous mass, which is then kneaded with access of air at a temperature of 100° C. for 3 to 4 hours. ½ to 2 per cent of organic bases such as aniline oil, naphthylamine and urea may be added during the blowing or kneading. Other suitable oils include wood-oil, Para rubber seed oil, perilla oil, sunflower oil, nut, hemp and castor oils alone or mixed. 5 parts of resin and 3 parts of kauri-copal may be added to 25 parts of the kneaded product to form linoleum cement which with the addition of pigments and fillers may be made into linoleum base. Nitro-cellulose may be incorporated with the linoxyns to form adhesives, primers, roofing materials, wall and floor coverings, and pressed articles, by dissolving linoxyns in alcohol at a temperature of 100° to 150° C. and at a pressure of 2 to 10 atmospheres, evaporating the alcohol and mixing the "solution linoxyn oil" formed with gun-cotton or celluloid solutions, with or without the addition of aniline oil, castor oil or old caoutchouc. The viscous solutions formed by evaporation of the nitro-cellulose solvents may be thinned without decomposition by heating to a temperature of 80° to 120° C. Alternatively homogeneous, transparent materials (" linoloids ") which may be elastic, tough or hard, according to their nitro-cellulose content, are prepared by kneading the linoxyns with nitro-cellulose or celluloid swellings, evaporating the solvent and unifying the resulting mass by rolling. Fireproofing agents such as phosphates, borates, carbonates and silicates, fillers and pigments may be added to the nitro-cellulose-linoxyn compositions. Specification 29656/97, [*Class* 91, Oils &c.], is referred to.

332,282. Sperni, J. C. G. April 18, 1929.

Cement.—A magnesian cement is mixed with 5—25 per cent by bulk of manganese oxide to prepare a hard setting cement. A solution of sodium silicate may be added, to improve the waterproof properties, and small quantities of potassium salts. A suitable magnesian cement is produced by finely powdering together burnt magnesite and dry unburnt clay, or magnesite and clay may be burnt together, the manganese oxide being added before or after. Fillers such as sand, sawdust, fibre, cork, leather waste, or pigments, such as 5 per cent ferric oxide may be incorporated. Specification 200,311 is referred to.

332,322. Watt, F. S. May 7, 1929.

Cements, Portland, processes and apparatus for making.—Relates to processes for the manufacture of Portland and like cements in which a fine spray of slurry is caused to pass through the hottest part of the flame in a kiln to produce a clinker in a fine state of sub-division. According to the invention, the slurry nozzle or nozzles and the burner or burners are arranged parallel to each other, or are arranged so that the jets of slurry converge at the hottest part of the flame or so that the flames converge upon a central spray of slurry. As shown in Fig. 1, a number of slurry nozzles *a* surround a central burner and are parallel thereto. The clinker is deposited as a fine powder and passes down through an outlet *e* on to a travelling belt *l*. In a modification, Fig. 4, a number of burner jets b^1 surround a central slurry nozzle *a* and are bent inwards to cause the flames to converge.

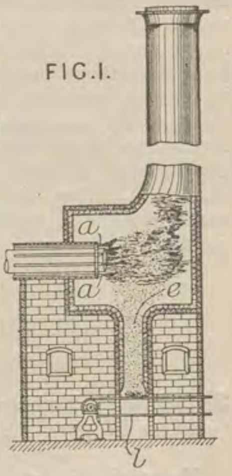


FIG.1.

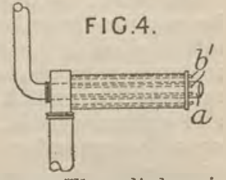


FIG.4.

332,356. White, A. E., (*Mosler Safe Co.*). June 11, 1929.

Porous concretes; plaster compositions.—A heat insulating composition for use as a filling for the walls of safes, &c., is prepared by mixing a vermiculite material such as jefferisite, kerrite, or maconite, which has preferably been heated to open out the scales, with a binder such as Portland cement, plaster of Paris, &c. Diatomaceous earth or other similar substance may be added if desired.

332,604. Cross, R. Feb. 25, 1929.

Compositions containing hydraulic cements: gelatinizing clays.—To gelatinizing clays is added a substantially smaller quantity of one or more modifying agents to improve their gelatinizing properties. As gelatinizing clays are included Bentonite, chemically treated clays, natural and artificial hydrated silicic acids, and precipitated hydrates such as aluminium hydrate. Modifying agents are defined as materials having approximately the same hydrogen ion concentration in water as an equal weight of magnesium oxide and include hydraulic cements, such as Portland cement, magnesia cements, furnace slags, alkaline earth phosphates and silicates, aluminates, and magnesium oxides. Lime may be added to adjust the hydrogen ion concentration to the correct value. The treated clay with or without a treatment with about 10—15 per cent of oil may be added to Portland cement to give a waterproof concrete. When the treated clay contains a small percentage of alkalis it has an accelerating effect on the hardening of the cement. A paint may be made of the untreated clay and cement alone or admixed with a heavy hydrocarbon oil, or drying oil and zinc oxide or where a black coating is made dark coloured oil or asphalt may be used. In an example, the proportions by weight are white gelatinizing clay 25, white Portland cement 10—20, white zinc oxide 25, oil 50. For surface waterproofing concrete, steel, timber, &c., an emulsion of the untreated clay, Portland cement, asphalt and water may be applied, for example to freshly laid concrete roads to prevent evaporation of moisture. In an example the proportions are untreated clay 25 lb., Portland cement 5 lb., asphalt cement 25 lb., water 250—500 lb. For making fibrous roofing compositions the treated clay is mixed with fibrous materials and gives a heat-insulating material. The treated clay may be mixed with inert filler to give a putty or mortar, an example being treated clay 20 lb., limestone dust 100 lb., water 180 lb. An example of a masonry cement is mortar sand 1,500 lb., fine inert filler 300 lb., Portland cement 2 sacks, treated clay 30 lb., and water as required. Pigments may be added if required.

332,639. Triggs, W. W., (*Armour Fertilizer Works*). April 25, 1929.

Materials for cements.—The product obtained by calcining together ground phosphate rock with added silica if necessary, an alkali metal for instance a potassium salt, and carbonaceous material, is treated with a solution of ammonia and carbon dioxide, it may be in an autoclave, or with ammonium carbonate, to give calcium carbonate, and a solution containing alkali metal and ammonium phosphates from which the mixed phosphates may be crystallized out. By adding say 10—25 per cent of finely divided material such as clay, feldspar, greensand, alunite, or alumina the reaction is accelerated, and a residue comprising calcium carbonate and clay, &c. is obtained which may be burnt and ground to form a cement. This residue may first be washed to recover adherent ammonia and ammonium carbonate for re-use.

332,897. Fox, C. G. March 20, 1929.

Bituminous compositions.—The spreading of bituminous emulsions upon stone aggregate for roads or upon the road surfaces themselves is facilitated by treating the aggregate or the road surface with solutions of pyridine or pyridine bases. The solutions may comprise industrial waste liquors containing pyridine or pyridine bases. For example, 10—30 mm. chippings, before admixture with $^1/_{12}$th—$^1/_{15}$th of their weight of bituminous emulsion are treated with 0.5—1.0 per cent of a 0.5—2.0 per cent solution of pyridine or pyridine bases.

332,902. Triggs, W. W., (*Norton Co.*). April 27, 1929.

Refractory substances containing alumina. —Aluminium oxide, free from impurities such as iron, silica, and titanium, for use in the manufacture of refractory articles is prepared by fusing aluminous materials comprising impure alumina with carbon, iron and aluminium sulphide, this latter not exceeding 3 per cent of the product. The fused product, consisting of small crystals of alumina separated by aluminium sulphide is disintegrated, preferably with steam, dried, screened and subjected to magnetic separation, and then treated with chlorine at 500° C. to remove other impurities. The product may be re-fused.

332,925. Berry, H. April 30, 1929.

Cements, Portland and Roman.—A cement is formed by heating calcium or magnesium oxide or hydroxide in an atmosphere containing sulphuric or sulphurous acid and grinding the resulting product with a base material such as waste slate, china clay, coal shale, sand, flint, or other mixtures of silica and alumina. The heat treatment in the acid atmosphere may be the primary calcination, for instance of the carbonate, or may be a secondary calcination, and is preferably carried out at a temperature of 700°—900° C. and in the presence of steam. The products of a primary calcination may be dipped in a solution of sulphuric or sulphurous acid or their salts before being heated in the acid atmosphere, a preferred solution being aluminium sulphate acidified with sulphuric acid. Blast furnace slag may be regarded as a composition of base and binding materials, and may be used directly by calcining in an acid atmosphere.

332,964. Bakelite Ges. Feb. 3, 1928, [*Convention date*]. *Divided on* 305,211.

Compositions containing synthetic resins.—Shaped articles are made from urea or thiourea. solid polymerized formaldehyde and fillers by mixing the reaction components fillers, and water-binding agents at a raised temperature, and pressing with simultaneous or subsequent heating. Dyestuffs, fire protectives, and natural or artificial resins may be added, but the temperature of the mixing is not sufficient to fuse any additional substances. In an example, urea, paraformaldehyde, *p*-toluene sulphonamide (an aldehyde-binding substance), burnt gypsum, lithopone, and paper fibre are employed. The urea-paraformaldehyde mixture begins to melt at 60—70° C. and completely penetrates the fibrous material.

333,166. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). April 25, 1929.

Compositions containing organic condensation products.—In the preparation of thermo-hardening artificial resins formed by condensing one or more vinyl esters, for example, vinyl acetate, in the presence of at least 5 per cent by weight thereof of acid condensing agents, with mono- or polyhydric phenols or mixture thereof, inert solvents or diluents, for example, softening agents such as mineral, animal, or vegetable oils, long chain fatty acids or their esters, also factis, cellulose esters, and the usual fillers and colouring material may be added before or during the condensation. Phenols specified are phenol, cresol, resorcinol, hydroquinone, and pyrogallol. In addition to the simple vinyl ester the starting material may also contain polymerized vinyl esters which may, for example, be dissolved in the simple ester, or the latter may be partially polymerized before the reaction; in these cases the products may be improved by treatment with sulphur or sulphurizing agents such as mono- or polysulphides, sulphur halides, or silenium sulphides, and, if desired, vulcanization accelerators, for example, zinc oxide, lead oxides, hexamethylenetetramine, diphenylguanidine, furfuramide, aldehyde-ammonia compounds, and piperidine pentamethylenedithiocarbamate. Polymerized vinyl acetate or chloracetate are mentioned as suitable polymerized vinyl esters.

333,240. Crossley, P. B. Feb. 8, 1929.

Refractory substances containing mica, asbestos, zirconia.—Plastic vitreous materials consist of finely ground mica and asbestos with a proportion of relatively infusible material and a proportion of relatively fusible material, part of all the ingredients being in a colloidal state of subdivision. The relatively infusible material includes porcelain, soda lime and lead glass, and the relatively fusible material includes fluxes, glazes, &c., such as lead salts, lead borates and borosilicates, and compound borates in which the lead oxide has been partly displaced by oxides such as zinc or bismuth oxide. In an example, 60 per cent of the infusible material admixed with mica and asbestos are compounded with 40 per cent of the fusible material. A small proportion of liquid is then introduced, the material moulded cold and vitrified. When the mass contains over 30 per cent of materials in the colloidal state it may be slip cast into preferably porous moulds. Zirconium oxide may be incorporated in or applied to the surface of the article and coloured metal oxides or opalizing agents such as tin oxide or suitable fluorides may be employed. The finished articles may be glazed. The moulds employed for hot pressing are preferably made from alloy steels, the interior faces being plated with chromium. The material may be used in the manufacture of sparking plugs, electric resistance elements and insulators, &c.

333,296. Bakelite Ges. Sept. 13, 1928, [*Convention date*]. *Divided on* 318,959. *Addition to* 318,883 *and* 333,298.

Compositions containing synthetic resins.—In the production of shaped articles from urea or its derivatives and solid polymerized formaldehyde in fused organic compounds as described in the parent Specification and Specification 333,298, any of the known catalysts for the condensation are added, whereby the reaction is accelerated or retarded. To retard the reaction so as to keep the mass fluid for a longer time, basic catalysts are added, such as ammonia, calcium hydroxide, hexamethylenetetramine, or salts of alkaline reaction such as sodium carbonate; and to accelerate the reaction acid catalysts are used which may be acids or acid salts, such as citric, acetic, or hydrochloric acid, or urea nitrate; neutral catalysts usually accelerate the reaction. Ammonia or hydrochloric acid may be added in the gaseous state, the reaction mass being contained in a closed vessel. The various additions mentioned in the parent Specification and in Specification 333,298 may also be added. In an example, a small quantity of citric acid is added to a mixture of urea, paraformaldehyde, lithopone, and sawdust, the mass being fused until it is brittle when cold, when it is ground and hot-pressed. Specifications 262,148 (as open to inspection under Sect. 91 (3) (a) and 280,520, [both in *Class* 2 (iii), Dyes &c.], are referred to.

333,298. Bakelite Ges. Sept. 11, 1928, [*Convention date*]. *Divided on and addition to* 318,883.

Compositions containing synthetic resins.—In the production of shaped articles as described in the parent Specification, the reaction between urea or its derivatives and solid polymerized formaldehyde is effected in a melt of a solid hydrocarbon or a solid nitrated, chlorinated or hydogenated hydrocarbon in absence of catalysts and of water or volatile liquids. The fusible substance employed may be anthracene, naphthalene, or chlorinated, nitrated or hydrogenated naphthalene. Additions may be made as in the parent Specification, such as fillers, plastifying agents such as liquid organic substances of high boiling point, also aldehyde-binding and water-binding substances, and dyestuffs.

333,409. Carborundum Co., Ltd., (Assignees of *Robie, N. P.*). Oct. 27, 1928, [*Convention date*].

Compositions containing artificial resins and abrasive materials.—Abrasive wheels and other articles comprising abrasive grains bonded with artificial resin are made by mixing the grains with a liquid reactive resin containing no volatile solvent, adding dry powdered reactive resin or other dry powdered material, forming by pressure and finally hardening by heat. Suitable resins are phenol-aldehyde, urea-aldehyde and acid-glycerol resins. Inert fillers such as graphite, flint, clay, &c., or organic fillers such as pitch, rosin, shellac, powdered plastic waste, cellulose acetate and natural and synthetic gums may be mixed with the powdered resin to modify its properties or may be used without the powdered resin. Suitable abrasives are alumina, emery, garnet, flint, corundum and silicon carbide. In an example, 1,820 parts of fused alumina grit are mixed with 38 parts of an A stage phenol-aldehyde resin and 130 parts of a dry powdered solid phenol-aldehyde resin are added; abrasive wheels are cold pressed at pressures from 1,500 to 2,500 lb. per sq. inch and hardened by heating to 350° F.

333,433. Naamlooze Vennootschap Koninklijke Stearine Kaarsenfabriek Gouda. Feb. 4, 1929, [*Convention date*]. *Grant of Patent opposed.*

Compositions containing bituminous emulsions and stony materials.—Aggregate to be coated with bituminous emulsion is given a precoating with molten bitumen which may be thinned with agents such as petroleum. The emulsion may contain stabilizers or a finely divided material such as cement. Two examples are given.

333,535. Ros, D. de. May 13, 1929.

Stone, bricks, &c., preserving.—A process for preserving natural and artificial building material, e.g. stone, bricks, &c., by removing the absorbed water and deleterious salts and compounds, consists in applying to the material an aqueous liquid in which is dispersed a protective colloid, e.g. gum arabic, the liquid being applied, preferably hot, in sufficient volume to saturate the material in the capillary ducts. The colloid retains the deleterious salts, &c., in solution and draws them to the surface from which, upon evaporation of the water, they can be removed by washing or brushing. The amount of colloid may be up to 10 per cent by weight of the water.

333,582. Davis, N. R., Wood, G. A., and Associated Electrical Industries, Ltd. May 15, 1929.

Refractory substances for furnace linings.—The material for lining an induction furnace is graded axially so that some parts are less refractory and more easily sintered than other parts. The normal lining material comprises 65 per cent magnesite and 35 per cent lime. For the bottom of the furnace 6—7 per cent of borax is added. At about 6 inches from the bottom only 4 per cent of borax is used. The amount of borax present is then increased up to 15 per cent at the wash line. At the rim 25 per cent or more of borax and 5 per cent of dextrine are added.

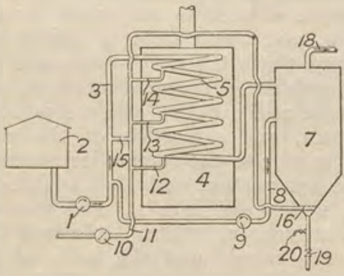
333,937. Naamlooze Vennootschap Koninklijke Stearine Kaarsenfabriek Gouda. Feb. 5, 1929, [*Convention date*].

Bituminous emulsion compositions.—Pavement materials are made by mixing a bituminous emulsion with a stony material of such porosity that strong adhesion is obtained between the bitumen and the stone. Suitable aggregates are basalt lava, blast furnace slag, limestone, &c. The porous stone may be pretreated with fatty or mineral oils, petroleum residues, resin oils, &c. as described in Specification 304,114. The invention also comprises a mortar for use in roadmaking consisting of powdered porous material, e.g. ground blast furnace slag, mixed with bituminous emulsion. Specifications 284,908 and 290,323 also are referred to.

334,000. Tassaud, J. T. June 27, 1929.

Compositions containing plaster and fats.—A composition for use in modelling, sculpture, pottery, &c., consists of two to three parts of a plaster like constituent to one part of an oleaginous constituent. In an example, 2 lb. of plaster of Paris are mixed with 1 lb. of lard. The process of modelling consists in first working the composition to the required design and then allowing it to come into contact with water either applied directly or absorbed from the atmosphere or contained in the oleaginous constituent. The model may be hollowed out after the hardening of the surface, and the surfaces may be strengthened with varnish, linseed oil, paint, &c., or covered with fabric, which is then covered with plaster of Paris or an emulsion of the modelling composition in an oil spirit. The composition may be melted and poured into moulds which may be of gelatine or applied melted as a paint, which may contain layers of an open fabric. It may also be used for the formation of coloured stones or imitation marble.

334,032. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, (*formerly* De Bataafsche Petroleum Maatschappij). Oct. 23, 1928, [*Convention date*].



Asphalts.—Hydrocarbons such as asphalt, petroleum residues, tar and pitch are treated with gases by a continuous process in order to obtain, for example, blown bituminous products for roofing and insulating. Gases used include air or oxygen, ozone, nitric peroxide, sulphur dioxide, chlorine, or mixtures of air or oxygen with the other gases. The process is described in connection with blowing asphalt. Molten asphalt is forced from a reservoir 2 by pumps 1 through line 3, coils 5 in tube furnace 4, and into the separator 7. Air is passed through a meter 10 and line 11 with connections 12—15 to the feed line 3 and/or the coils 5. The air line 11 leads to a perforated pipe 16 in the bottom of the separator. The asphalt is heated to 340° in the coils (or according to the Specification as open to inspection under Sect. 91 (3) (a) to 250° C.). Air and gaseous products leave the separator at 18, and yield a certain quantity of liquid fuel and combustible gas. Asphalt is returned from the separator to the feed line through pipe 8 by pump 9. When a sample taken at 20 has the desired properties, blown asphalt is drawn off continuously at 19 and a fresh supply is admitted continuously to the feed line 3.

334,053. Stewart, A. Aug. 20, 1929.

Concretes and mortars, cement.—A composition for waterproofing cement mortars and concretes is made of 4 lb. of soft soap, 3 gills of ammonia, ¼ lb. of alum, 1 lb. of washing soda, ½ lb. of lard, 2 gills of boiled linseed oil and 5 gills of water. The ingredients are mixed, brought to the boil and allowed to cool slowly. One gallon of the composition is mixed with three barrow loads of sand and one bag of cement to form a waterproof mortar.

334,232. Novak, I. J. May 27, 1929.

Compositions containing phenols and aldehydes.—Liquid compositions for impregnating fibrous materials are made by condensing cresylic acid with formaldehyde in the presence of at least one molecular proportion of ammonia for every four of cresylic acid, thus forming an oil-soluble condensation product capable of transformation by heat to an infusible state, mixing this condensation product with china wood oil, and heating the mixture until it is sufficiently clarified to remain limpid when cool. Any excess of cresylic acid in the condensation product may be removed by an addition of hexamethylenetetramine or paraformaldehyde. When the solution of the condensation product in china wood oil has been clarified by heat, if desired with the addition of a small proportion of solvent naphtha, turpentine, or the like, it may be cooled rapidly to retard thickening. The concentrated impregnating solution may then be thinned with acetone, benzene, or other coal tar solvent before use. Modifying agents such as vegetable oils, pitches, and rubber, and also inert fillers may be added thereto or used therewith. The solution may be used for impregnating fibrous bases for clutch facings, brake linings, and the like, also cambric, paper, cotton braids for insulated wire, and other fibrous materials to which it is desired to impart body or hardness. Specifications 136,298; 255,516, 267,736, [both in *Class* 2 (iii), Dyes &c.], and 272,947 are referred to.

334,336. South Metropolitan Gas Co., and **Pickard, H.** July 23, 1929.

Bituminous compositions containing coal, tar, and stony materials.—A bituminous material suitable for spreading while hot on a road foundation consists of an admixture of 18—25 per cent coal dispersed in tar, which may contain an amount not exceeding 25 per cent of its weight of pitch, and hard stone of size between ⅜ inch down to dust. The temperature of mixing is 120°—150° C. The quantities of binder and stone are adjusted so that the mixture attains a specified hardness measured as described in the Specification. In an example a mixture of 1,600 lb. of refined tar and 200 lb. of pitch is heated to a temperature of 100°—110° C., and 400 lb. Durham coal added. The mixture is then warmed slowly to 150° C. and then rapidly with stirring to about 300° C. The mixture is then cooled to about 200° C. and stone ranging from ¼ in. to dust, and warmed to 140°—150° C. added, the temperature falling during this operation to 120°—150° C. The quantity of stone added is 5,000 lb.

334,588. Wallace, E. C. June 6, 1929.

Compositions containing bituminous and stony materials.—In a process for preparing bituminous paving compositions the aggregate is divided into a coarse fraction (the load bearing element), a finer fraction (the mortar element), and a filler material. The coarse fraction is then coated with bituminous cement, the finer fraction then added, with more cement and finally the filler added and the mass agitated. The coarse fraction may comprise particles of

$\frac{1}{8}$ in. upwards, the finer fraction $\frac{1}{8}$ in. down to dust and the filler so that all passes a 50 mesh sieve and 60 per cent or more passes a 200 mesh sieve, and may range from $\frac{3}{8}$ the volume of bituminous cement to an equal volume. The bituminous cement ranges from 4 to 9 per cent of the amount of dust free aggregate. Specification 316,017 is referred to.

334,831. Cemsil Soc. Anon., and **Boggero, G.** March 9, 1929.

Compositions containing soluble silicates and precipitated silica; cement and concrete surfaces, hardening and preserving.—A binding agent for mineral aggregates, bone dust, sawdust, cement, &c., is prepared by treating a solution of an alkaline silicate or mixture of silicates with weak acids such as carbonic acid, sulphurous acid, boric acid, or acid salts with constant stirring up to the maximum permissible degree preceding coagulation. The agglomerates are dried and treated with a fixing agent such as calcium chloride. To improve the waterproofing qualities of the solution, sulphur preferably in the colloidal state may be introduced. In the manufacture of street paving, ballast is watered and compressed and the binding agent poured on at the rate of about 5 to 10 kilos. per square metre. It is then dried and less coarse ballast, mixed with the binding agent, laid on, compressed, dried and sprayed with the fixing solution. In the manufacture of slabs, stones, &c., about 10 per cent of the binding agent is mixed with the aggregate and rammed in moulds, dried and immersed in the fixing solution. In mineralizing and waterproofing surfaces the binding agent with or without pigments is applied to the surface, allowed to dry, and the operation repeated two or three times. The binding agent may be employed for facing cement buildings with other materials such as marble, and for manufacturing refractory or ordinary bricks.

335,107. Burke, J. J. Nov. 8, 1929.

Concretes and mortars.—Artificial stone, marble, &c., is made by mixing cement, sand, water, sodium silicate, boric acid, and alginic acid to a plastic mass, which is then moulded to the desired shape. Example, 1 part of cement is mixed with 2 parts of sand and the mixture wetted with a solution made by adding 40 gallons of water to 4 lb. of sodium silicate, 2 lb. of boric acid and 2 lb. of alginic acid. sufficient solution being used to form the mixture into a plastic mass, which is then moulded.

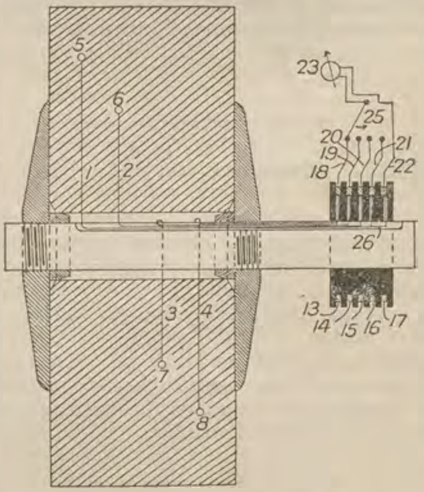
335,194. Chemie & Technik, J. M. S. Ges., and **Menz, H.** June 18, 1929.

Compositions containing phenol-aldehyde resins.—Pure phenol is boiled with formaldehyde in the presence of an alkaline catalyst comprising a mixture of sodium carbonate and sodium bicarbonate, and acetic acid is added after boiling to retard the setting. An example is given. In order to obtain a coloured product, a mixture of the phenol and alkaline catalyst is boiled with formaldehyde, and a portion of the condensate is allowed to set; to the remainder is added acetic acid. The set portion is boiled with bone oil or glycerine, which dissolves it, and the colouring matter is stirred in. This coloured liquid is placed in the mould and the bulk of the condensate containing the acetic acid is afterwards added, whereupon the mould is heated to about 80° to 100° C. The product can be cut, planed or turned after a preliminary hardening.

335,219. Chemie & Technik, J. M. S. Ges., and **Menz, H.** June 19, 1929. *Addition to 335,194.*

Compositions containing synthetic resins.—Gramophone discs, &c., are formed from a composition comprising old gramophone discs composed of shellac and vulcanite, and waste material of the composition claimed in the parent Specification. The old discs are ground, mixed with the waste composition and boiled in bone oil with the addition of spirit.

335,521. Ruhlemann, F. June 21, 1929.



Grindstone, artificial.—A grindstone of concrete, for the manufacture of wood pulp, has the external temperature surrounding the stone made equal to the internal temperature of the stone during the manufacture thereof in order to avoid unequal stresses developing during the setting and hardening. Thermo-elements 1—4 are embedded in the stone with their junction points 5 - - 8 turned towards the circumference of the stone. The copper wires from the elements 1 - - 4 are led to slip rings of copper 13 - - 16 and the constantan wires of the elements are united in a lead 26 and fixed to a constantan slip ring 17. Brushes 18 - - 22 collect the electric current from the slip rings and any thermo-element may be connected up to the measuring instrument 23 through a switch 25. The temperature of the room in which the stone is made may be regulated by heating conduits or stoves or the stone may be enclosed in an envelope maintained at a suitable temperature. The moisture content of the room or envelope is also regulated with the temperature.

335,525. Wake, J. F. April 24, 1929.

Bituminous compositions.—Aggregate is coated first with bituminous material and then with tar or tar compound which comprises 20 to 75 per cent of the total material used in the two coatings. A third coating of oil or low viscosity tar may also be applied. The tar material contains about ½ per cent of tar acids and about 2 per cent of naphthalene. The Provisional Specification describes the tar &c. coating as comprising 5 to 75 per cent of the total coatings. Specifications 193,440, [*Class* 86, Mixing &c.], and 266,420, [*Class* 107, Roads &c.], are referred to.

335,549. Novak, I. J. May 21, 1929.

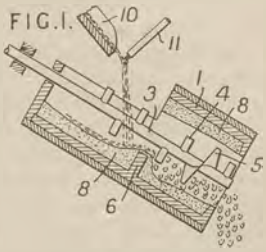
Compositions containing organic condensation products.—Relates to friction elements comprising an incombustible fibrous base impregnated with a mixture of a phenolic resin and a substance for modifying the frictional characteristics of the resin. According to the invention, the modifier comprises, or contains, one or more drying oils. In an example, clutch facings are made by impregnating rings of asbestos millboard with a saturant consisting of equal parts of cresylic acid-formaldehyde resin and china wood oil. The rings are drained, dried in an oven at 150—175° C., held in a pack between steel plates and hardened at about 400° F. In another example the saturant comprises 80 parts of boiled linseed oil, 20 parts of phenolic resin and 200 parts of benzol. Part of the oil may be substituted by waxes, asphalts, or tars.

335,668. South Metropolitan Gas Co., Pickard, H., and **Stanier, H.** July 23, 1929. *Addition to* 316,897.

Compositions containing bituminous and siliceous and calcareous materials.—Material for surfacing roads is made by dispersing at 250°—300° C. 1—10 lb. of coal in 100 lb. of tar which may contain up to 10 per cent of added pitch, and then mixing in 30—60 per cent of dried and warm finely divided mineral matter.

335,875. Norske Aktieselskab for Elektrokemisk Industri. Feb. 27, 1929, [*Convention date*].

FIG. 1.



Slags, treatment of.—Apparatus for treatment of liquid slags and the like in which the liquid slag is discharged as a fluid or plastic foam, and is then cast or otherwise formed into porous material, comprises a horizontal or slightly inclined container having a stirrer or conveyer shaft running through it, the liquid slag entering at one end and being discharged as foam at the other end by the action of the stirrer or conveyer. The container may be provided with an adjustable outlet. The foaming may be carried out with the aid of water and one or more separating walls or weirs provided in the chamber to prevent liquid slag from passing through the apparatus beneath a layer of foam. The inner walls of the container are preferably protected by forming a slag lining thereon. As shown, Fig. 1, a metal container 1 is provided with a stirring device 3 with stirring arms 4 and conveyer blades 5. 6 is a separating weir, and 8 is the lining of solidified slag. The liquid slag is fed in from a vessel 10 and water supplied from a pipe 11.

335,980. Masters, P. G. July 5, 1929.

Compositions containing oils.—A composition for placing in inner tubes for sealing punctures consists of the following ingredients, preferably in the proportions stated, viz. ½ pint of castor oil, 1½ oz. of talc, ½ oz. of cellulose, e.g. wood dust, ½ pint of water, up to 1 oz. of gum acacia, with or without 1-20th pint of benzol mixture or petrol. Rubber solution may replace or be used in conjunction with the gum acacia.

336,237. I. G. Farbenindustrie Akt.-Ges. Nov. 16, 1928, [*Convention date*]. *Grant of Patent opposed.*

Compositions containing resinous materials.—In the manufacture of condensation products from vinyl esters, or of lacquers therefrom, there is added before, during, or after polymerization of the ester a small proportion of a basic substance soluble in organic solvents. The resin is thus rendered non-corrosive and is stabilized to light and heat. Suitable basic substances are guanidine and derivatives thereof, hydrazine and derivatives thereof, dimethylaniline, condensation products of amines such as ethylamine and aldehydes such as formaldehyde, phenylhydrazones, and mixtures of such compounds; examples show the use of diphenyl guanidine, cyclohexylamine, hexamethylene tetramine, dimethylaniline, and phenylhydrazine. A nitrogen compound having plasticizing properties, for instance a condensation product of urea and formaldehyde or a polyvalent alcohol, may be employed in addition. The basic substance may be fused with the polymerized vinyl ester, or be mixed with a lacquer prepared from the resin; it is added in quantity sufficient to produce neutrality. The examples relate to polymerization products of vinyl acetate, chloracetate, chloride, and benzoate; in the polymerization of the last-named benzoyl peroxide is added as well as phenylhydrazine. In the production of lacquers, vinyl chloracetate resin is dissolved in acetone, with the addition of cyclohexylamine, and the vinyl chloride resin in chlorbenzene and cyclohexanone, with the addition of small amounts of a soluble urea-formaldehyde condensation product and of dimethylaniline.

336,264. Wade, H., (*Bakelite Corporation*). July 10, 1929.

Compositions containing artificial resins.—A moulding mixture is prepared by admixing a potentially reactive resin, a filler such as wood flour and a pigment and extruding the mass. The coloured particles are distributed in the mass along definitely distributed flow lines.

336,440. Cases, M. Oct. 24, 1928, [*Convention date*].

Refractory substances are formed by the use of a substantial proportion of the residue of combustion of rice chaff. A refractory material may consist of 60—90 per cent of the rice chaff residue, with 40—10 per cent of clay, with or without about 2 per cent of fused silicate as a binder. In another example, a mixture of 10—40 per cent clay, 2 per cent granulated cork, and 88—58 per cent rice chaff residue yields a light porous material, from which the cork may be removed by combustion. Non-porous insulating material may be obtained by mixing rice chaff residue with a small proportion of clay, and may be applied externally to buildings to be insulated.

336,550. Locreille, C. April 9, 1929, [*Convention date*]. *Drawings to Specification.*

Concretes, cement.—A table for receiving or casting glass plates or sheets is made of a sandless concrete composed of fragments of porphyry and of a cement formed of a ground mixture of burned lime, silica, and alumina.

336,860. George, E. L., (*S.A.I.G. Soc. Anon. Invenzioni Guadagnin*). Dec. 9, 1929.

Cement.—A waterproof cement for use in the foundations or outer walls of buildings, &c., is prepared by sifting and mixing together washed sand, gypsum, resin, alum, flaxseed oil and water. Example, washed sand 57 parts, gypsum 10 parts; resin 10 parts; alum 2 parts; flaxseed oil 11 parts; and water 10 parts.

337,521. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). Sept. 4, 1929.

Bituminous compositions containing synthetic rubber.—Coating materials for road construction, lining vessels, &c., are made by incorporating bituminous materials such as natural or artificial bitumens, mineral or brown coal tars and the like or their distillation products with synthetic polymerization products of diolefines preferably of butadienes. The quantity employed of the polymerization products may be as low as 0.5 per cent or even 0.1 per cent by weight of the bituminous materials, but it may be increased to as much as 20 per cent if desired. The incorporation may take place in the presence of diluents, e.g. benzol or cyclohexonal, and the mixture may be emulsified with water at any stage of its production, if desired in the presence of emulsifying agents such as alkali metal, or ammonium oleates or linoleates, Turkey red oil and the like, with or without a buffer system maintaining preferably a hydrogen ion concentration between $p_H = 4$ and $p_H = 8.4$. Filling materials such as indiarubber, sand, ground lime, and the like may be added. Example, 35 parts oleic acid are stirred into 1,000 parts of Mexican asphalt heated to 110° C., the mixture cooled to 90° C., and 180 parts of a 1 per cent aqueous solution of ammonia added slowly, after which 150 parts of a dispersion of butadiene polymerization product of 50 per cent concentration and at 50° C. are added. This gives a coating composition suitable as a cold asphalt for road construction. Specification 312,201, [*Class* 2 (iii), Dyes &c.], is referred to.

337,605. Metallges. Akt.-Ges. Nov. 7, 1929.

Refractory substances.—Relates to processes for making refractory substances from magnesium silicates, e.g. olivine, serpentine, talc, &c., containing substantial quantities of iron by heating the silicates, without fusion, with substances rich in magnesium, e.g. magnesium oxide and magnesite, in an oxidizing atmosphere. According to the invention the substances rich in magnesium are present in quantities which are sufficient for the conversion of the whole of the iron into magnesium ferrite and of the free silica into magnesium orthosilicate. The treatment may also be applied to silicates containing, instead of or in addition to iron, other metals such as nickel, manganese, chromium and aluminium. When silicates which are poorer in magnesium than magnesium orthosilicate are present, the proportion of magnesium oxide or the like is calculated so that the silicates are converted into magnesium orthosilicate. In some cases the amount of magnesium oxide, &c. is calculated to give an excess of magnesium oxide in the final product. The temperature of heating is below the melting point of the product, generally from 700 to 1,500° C. Other substances may be incorporated with the raw materials or with the products, for instance iron oxide or ores such as magnetite, aluminium compounds such as clay, kaolin and bauxite and chromium compounds such as chromites. In the manufacture of moulded articles, temporary binding agents, e.g. sulphite cellulose waste lyes may be used, and the moulding may be effected under high pressure, e.g. 500—1,000 kg. or more per sq. cm. Materials which on being treated increase in volume, e.g. certain olevines, may be mixed with substances which decrease in volume, e.g. serpentine, to form compositions having the desired change of volume characteristics. In an example, 1,000 kg. of a rock containing 800 kg. of an iron-containing olevine and 200 kg. of iron-containing bronzite, with an average content of 10 per cent of FeO are mixed with sufficient magnesium oxide to convert the iron into $MgFe_2O_4$ and the silica into magnesia orthosilicate. The materials are ground to a fineness not exceeding 2 m.m. Moulding is effected with if desired binding agents and high pressure, and the moulded article is heated in an oxidizing atmosphere at 1,450° C. for 6 hours. Other examples are given in the Specification. Specification 301,547 is referred to.

337,796. Durium Products Corporation, (Assignees of *Beans, H. T.*). April 2, 1929, [*Convention date*].

Phenol-aldehyde condensation products.—Sound record blanks are made with a core of paper material, such as cardboard made of rag stock, coated with a resorcinol formaldehyde condensation product in which a plasticizer, preferably glycerine, is incorporated to avoid brittleness. The record material is made by heating and stirring 1000 c.c. of commercial formaldehyde with 1000 grams of ground commercial resorcinol (meta dihydroxy benzene) to a temperature of 70° C. until the required viscosity is obtained and then adding 1000 c.c. of ethyl or methyl alcohol or a mixture thereof. After rapid cooling, an abrasive for example 200 grams of rouge ground in glycerine is added, and the resulting mixture is applied at once to the paper stock which is subsequently dried until a slightly tacky surface is presented.

Reference has been directed by the Comptroller to Specifications 3497/11, 607/13 *and* 219,368.

337,806. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). Aug. 6, 1929.

Compositions containing polymerized vinyl alcohol condensation products.—Condensation products which may be rubber-like, plastic and elastic or hard and brittle are obtained by treating polymerized vinyl alcohols, obtainable by saponification of polymerized vinyl esters, with aliphatic aldehydes in the presence of acid catalysts. The reactions may be accelerated by heating and by the use of increased pressures. The condensation products may be modified by the addition of softening agents such as paraffin wax or combined with other materials such as natural or synthetic rubber, celluloid, and cellulose esters or ethers. The aldehydes may be employed in the form of their polymers such as trioxymethylene and metaldehyde or derivatives such as acetals which split off aldehydes under reaction conditions. The products may be subjected to heat treatment in the presence of sulphur and sulphurizing agents such as sulphur chlorides, this treatment being more particularly useful when the products are obtained by the use of unsaturated aldehydes such as acrolein or crotonaldehyde. In the following examples the parts are by weight—(1) 100 parts of polymerized vinyl alcohol, obtained by saponifying with a one per cent solution of hydrochloric acid in ethyl alcohol a polymeric vinyl acetate that had been polymerized by means of 0.5 per cent of benzoyl peroxide, is dissolved in 3000 parts of water and heated while stirring with 125 parts of a 30 per cent solution of formaldehyde in a reflux condenser, about 10 parts of concentrated hydrochloric acid being added gradually. The excess of formaldehyde and acid is removed by steam distillation and the reaction product washed on hot rollers until dry. The insoluble product is converted into a dark coloured mass having the properties of hard rubber by the addition of from 2 to 10 per cent of sulphur and treatment between rollers at 150° C. and subsequent heating. (2) 55 parts of acetaldehyde and 20 parts concentrated hydrochloric acid are added to 100 parts of slightly polymerized vinyl alcohol obtained as in Example 1 and dissolved in 300 parts of water, the whole being heated while stirring. A white rubber-like mass separates out and is worked up as described in the preceding example. (3) To 100 parts of polymerized vinyl alcohol prepared according to the previous examples and dissolved in 4000 parts of water are added 20 parts of hydrochloric acid and 80 parts of crotonaldehyde, the mixture being heated while stirring. The precipitate is a pale, spongy tenacious mass. (4) 100 parts of strongly polymerized vinyl alcohol, obtained by polymerizing vinyl acetate by means of 0.5 per cent of sodium perborate and 5 per cent of acetic anhydride and then saponifying the polymerized product with a weak hydrochloric acid solution as in the previous Examples, are slowly added to a solution of 1000 parts of 60 per cent aqueous sulphuric acid in 1000 parts of 30 per cent solution of formaldehyde while cooling externally with ice. The viscous solution subsequently obtained is poured into ice water and a white and fibrous flaky precipitate obtained. (5) 100 parts of polymerized vinyl alcohol obtained in the manner described in Example 4 are dissolved in 750 parts of 70 per cent sulphuric acid, whereupon 100 parts of trioxymethylene are added. After stirring for 6 hours at 10 to 20° C. the solution is poured into ice water. The product is soluble in methylene chloride and chloroform and can be worked into transparent sheets similar to acetylcellulose or into films or threads like artificial silk. (6) 100 parts of polymerized vinyl alcohol obtained in the manner described in Example (4) are slowly added to a cooled solution of 1000 parts of 60 per cent sulphuric acid and 30 parts of glyoxyl sulphate. After stirring for 8 hours at a temperature rising to 25° C. and pouring into water a precipitate is obtained which can be worked up in the manner indicated in Examples 4 and 5.

337,926. Lefebure, V. Oct. 10, 1929.

Compositions containing plaster of Paris and anhydrite.—A plaster is prepared by mixing anhydrite with plaster of Paris or any standard plaster, e.g. Keenes cement. The anhydrite may be " accelerated " anhydrite as disclosed in Specifications 236,695 and 317,672. By varying the relative proportions of the ingredients the setting time may be varied upwards from an almost instantaneous set, and tables are given showing this effect. In general the mixture has a shorter setting time than either of the ingredients, but by the use of a large quantity of untreated anhydrite, which per se displays no practical set, the setting time of standard hemihydrated calcium sulphate is retarded. In an example a wall plaster consists, by volume, of 1 part of hemihydrated standard plaster, with a set of about 60 minutes, with 9 parts of anhydrite containing 0.2 per cent of potassium sulphate and zinc sulphate in molecular proportions, having itself a set of about 5 hours. The mixture has a set of about 60 minutes. In another example, a casting or moulding plaster consists of 1 part by volume of a semi-hydrated plaster with 4 parts of anhydrite containing 2 per cent of potassium sulphate and zinc sulphate in molecular proportions. This has a quick set.

338,206. Hill, F. A. Aug. 16, 1929. *No Patent granted (Sealing fee not paid).*

Bituminous compositions.—A cold-lay composition for surfacing roads, canal beds, &c., and which is stable when stored in hermetic containers, is made by mixing at 212—400° F. asphalt, bitumen, tar, pitch or asphaltic petroleum residues with a fuel oil or petroleum product from which all the lighter portions including the illuminating oils have been removed. The oil (65 to 45 parts) is added slowly with agitation to the heated asphaltic material (35 to 55 parts). Specifications 22738/13 and 257,114 are referred to.

338,242. Battersby, J. W. Aug. 27, 1929.

Cements, Portland; concretes and mortars.—A waterproof cement is prepared by adding a powder of colloidal readily soluble water-containing alkali silicate (prepared, e.g. as in Specification 11959/14, [*Class* 1 (iii), Oxides &c., Metallic], in amounts of 2—5 per cent to Portland cement or lime concrete or mortar prior to mixing with water. The product has high strength, low porosity, and greater resistance to acids. The silicate is preferably added to the cement clinker before the latter is ground. The initial set period may be controlled by varying the amount of water in the silicate which may be from 10—30 per cent, the period being shortened with increasing amounts of water. For some purposes, e.g. sealing porous places or "weeps" in floors, &c. a mixture of equal parts of cement powder and silicate powder may be used. The advantages of the invention are not obtained if the silicate is added to wet cement.

338,465. Garner, F. J. G. Feb. 28, 1930.

Stone, hardening and colouring.—A process for treating blocks and shaped articles of alabaster or gypsum, to give them the hardness and appearance of marble, consists in drying them by heating to 150° to 200° C., and impregnating them with a solution in 1 gallon of water of 1 lb. of concentrated solution of sodium silicate, 1 oz. of magnesium sulphate and 1 oz. of fused calcium chloride. The surface is then polished and rubbed with raw linseed oil.

338,538. Antal, L. d'. Oct. 19, 1928, [*Convention date*].

Compositions containing oxidized oils.—A material suitable for coating or impregnating jute bags or other fabric is obtained by oxidizing a vegetable drying oil or a mixture of such oils by treating to 180°—200° C. and over with acid sludge from oil refining. Resinous or asphaltic substances with or without siccatives may be mixed with the oil, and mineral oils may be added during or after oxidation. The oil resin mixture is heated above 180°—200° C. before the acid sludge is added, and the reaction continues until a homogeneous foamless mass is obtained.

In one method of working, the amount of sludge is insufficient for complete oxidation, and the impregnated fabrics prepared from the product are dried in heated air to complete the oxidation. Vegetable oils specified are linseed oil and sunflower oil. The oxidized oil is of soft rubber-like consistency. It may be rolled in liquid or plastic condition on one side of a fabric, for making bags lined on the inside only; or the fabric may be impregnated in any known manner, to form a linoleum, a proofed jute or other fabric.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also treating the oils, which may include castor oil, by melting or heating them with substances containing the SO_4 radical. This subject-matter does not appear in the Specification as accepted.

338,664. Reismann, W., Schloss, R. H., and Evers, W. H. Oct. 3, 1929.

Cements; concretes and mortars.—A cement for use as a binder in hydraulic mortar comprises 50 parts by weight of water glass of 25° Bé. and 100 parts of a mixture of finely ground slag and burnt magnesite in which the slag predominates. In an example, the slag and magnesite mixture comprises 92 parts of slag and 8 parts of magnesite. A mortar may be made by adding one part by weight of the slag and magnesite mixture to three parts of fine aggregate, e.g. sand, and gauging with the water glass solution.

338,937. Johnson, J. Y., (*I. G. Farbenindustrie Akt.-Ges.*). July 29, 1929.

Compositions containing synthetic resins.—Urea or thiourea and formaldehyde condensation products of a non-inflammable character are obtained by effecting the condensation in the presence of organic solvents consisting of or containing a substantial proportion of halogen-aryl substituted aliphatic alcohols and preferably in the presence of an acid reacting substance, the reaction being accelerated by heating. It is stated that the substituted alcohols appear to take part in the reaction so that products are obtained which contain the halogen chemically combined to resemble the ethers or acetals obtainable according to Specification 266,752. Examples of halogen-aryl substituted aliphated alcohols are the mono- and di- bromo-benzyl alcohols and the chloro-benzyl alcohols, and these substituted alcohols are defined so as to include the use of alcohols in which the aliphatic chain is connected with the aromatic nucleus by at least one oxygen atom, such as the glycol mono-halogen-aryl ethers and glycol mono-brombenzoic esters, or mixtures of such compounds with each other or with organic solvents such as alcohols, esters, or ethers, the halogen substituted alcohols in each case being present in the mixtures in a preponderating quantity. The formaldehyde used is preferably in the form of paraformaldehyde or trioxymethylene, and the urea may be in the form of N-methyl urea, a methylol or anhydride thereof, thiourea and its similar derivatives, and these ureas may be used separately or together as a mixture. The reaction is generally accelerated by the addition of acid reacting substances such as acetic acid, hydrochloric acid and potassium tetraoxalate, or preferably by an addition of buffer mixtures which with water furnish a constant hydrogen-ion concentration, such as primary alkali metal phosphates. The condensation products may be freed from the solvents in which they have been prepared by distillation or by precipitation; in the latter case by the addition of organic liquids, as described in Specification 327,673. [*Class* 2 (iii), Dyes &c.]. The condensation may be carried out in the presence of natural or artificial resins, or of cellulose esters such as cellulose nitrate, soluble in the solvents used, so that mixed products can be obtained; the addition of these substances may also be made after the condensation. The condensation products may be moulded or dissolved in suitable solvents such as glycol monoalkyl ethers or glycol mono-esters of organic acids, and, together with cellulose esters, resins, plasticizing agents, and other organic substances, worked up into lacquers, films, and artificial masses which are combustible with difficulty or are incombustible. Specifications 260,253, [*Class* 95, Paints &c.], 261,029; 262,148, [*Class* 2 (iii), Dyes &c.], 296,361, and 301,696 are also referred to. The following Examples are described, the reaction temperatures being generally between 80° C. to 120° C. (1) Dimethylol urea is suspended in ortho-chloro-benzyl alcohol, oxalic acid added, and the mixture heated until the urea has dissolved; calcium carbonate is then stirred in and the solution cooled and filtered. The condensation product is freed from the solvent by distillation in the steam, and is dried and pulverized. (2) Dimethylol urea is condensed in ethylene glycol-mono-bromo phenyl ether and the product precipitated by the addition of ether. (3) Dimethylol thiourea is condensed in o-chloro-benzyl alcohol in the presence of glacial acetic acid and the reaction mixture neutralized by the addition of calcium carbonate subsequently added and filtered; the condensation product is precipitated from the filtrate by adding ether. (4) The anhydride of dimethylol urea in ethylene glycol mono-bromo-phenyl ether or dichloro- or dibromo-benzyl alcohol is condensed in the presence of a small quantity of formic acid. Subsequently calcium carbonate is added with stirring and the condensation product is precipitated from the filtrate by the addition of benzene. (5) Trioxymethylene in ethylene glycol mono-bromo-phenyl ether and urea are condensed in the presence of a small quantity of oxalic acid; after the addition of calcium carbonate the condensation product is precipitated from the filtrate by the addition of methyl acetate. The product may be pressed, after incorporating fillers such as asbestos, sawdust, lithopone, paper pulp, cork meal, colouring matters and softening agents, to form difficulty-combustible masses. (6) Dimethyl urea and dimethyl thiourea, together with a small quantity of oxalic acid, are stirred into fused dibromo-benzyl alcohol. After the addition of teriary sodium phosphate, calcium carbonate is added for neutralization; the reaction product is precipitated from the filtrate by ether. (7) Fused dichloro-benzyl alcohol and trioxymethlene are incorporated with the addition of a small quantity of alcoholic potash; thiourea and a small quantity of phosphoric acid solution are then added and the reaction mass heated. The filtrate obtained after first neutralizing with calcium carbonate is worked up as in Example 3. (8) Dimethyl urea is dissolved in fused ethylene glycol mono-bromo-salicylic ester in the presence of m-xylene sulphonic acid. After neutralizing with tertiary sodium phosphate and calcium carbonate, filtering and precipitating with acetone, the dried condensation product is pressed into moulded articles according to Example 5. (9) Dibromo-benzyl alcohol and benzyl alcohol are heated in the presence of toluene sulphonic acid, dimethylol urea then added, and the reaction mass heated. After neutralizing with tertiary sodium phosphate and calcium carbonate and filtering, the condensation product is isolated by steam distillation. (10) Trioxymethylene and o-chloro benzyl alcohol are fused in the presence of alcoholic potash, urea and thiourea added, together with a trace sulphuric acid as condensing agent. The condensation product is separted by neutralizing, filtering, and steam distillation. Non-inflammable moulded articles are made by pressing the dried product mixed with wood pulp.

339,271. Groves, W. W., *(I. G. Farbenindustrie Akt.-Ges.).* Sept. 3, 1929. *Divided on 318,549, under which a Specification was laid open to inspection under Sect. 91 of the Acts, Sept. 6, 1929.*

Compositions containing resinous condensation products.—Homogeneous artificial resins are prepared by mixing in solution or otherwise a polymerization product of a vinyl ester with the condensation product of a phenol derivative and an aldehyde or an agent yielding an aldehyde. Solutions of the mixtures may be used as lacquers either alone or mixed with nitrocellulose. Example, 60 parts of polyvinyl chloride are dissolved in a mixture of 160 parts of acetone and 240 parts benzene, and 150 parts of a resin from anisole and formaldehyde are separately dissolved in 350 parts of benzene. On mixing the two solutions, a lacquer solution is obtained. Specification 298,085 is referred to.

339,470. Anderson & Son, Ltd., D., and Child, R. O. Nov. 25, 1929.

Asphalts.—In purifying bitumen, pitch, tar, &c., the material is dissolved in a solvent and a colloidal substance such as silicic acid is added thereto. The impurities are allowed to settle and the purified solution is then syphoned off and decanted and/or distilled. The purified substance is stated to be adapted for use in electrical contrivances, and as a medium for carrying pigmentary matter in the manufacture of paints. Specification 291,858 is referred to.

339,853. Schless, S. Jan. 27, 1930. *Drawings to Specification.*

Compositions containing fibres, silica, lime.—An artificial wood which may be laminated comprises a mixture of pulverulent calcium oxide or hydroxide with pulverulent silica and cellulose or other fibrous materials. The mixture is moistened, allowed to stand, pressed, heated to about 100°—110° C. and then treated with carbonic acid at ordinary or raised temperature. The mass may then be oiled, impregnated or polished. The proportions of the mixture may be silica 40 per cent, calcium oxide 30 per cent and fibrous material 30 per cent. The mass may be subjected to a felting operation prior to pressing, using a blower, a form of which is described. When a laminated composition is desired, layers of different composition are used, for example, alternate layers of compositions, the weight of one cubic metre being respectively 1,000 and 1,500 kilograms.

339,958. Johnson, J. Y., *(I. G. Farbenindustrie Akt.-Ges.).* Aug. 12, 1929.

Compositions containing artificial resins.—Oily resinous products are obtained by esterifying the hydroxyl groups of aliphatic long chain carboxylic acids containing hydroxyl groups in the chain, or esters of such acids with alcohols, by heating these materials with colophony or other natural resinic acids until and under such conditions that the acid value of the resinic acids has practically disappeared. The esterification may be effected in vacuo or the water may be removed as formed by the passage of an inert gas; acid or alkaline condensing agents may be used. The almost acid-free viscous oily products are stated to be useful as softening agents. According to examples the parts being by weight, (1) 150 parts of castor oil and 50 parts of colophony are heated at 260° C. under reduced pressure to yield a viscous oil. A still more viscous oil is obtained by employing 100 to 150 parts colophony for the same quantity of castor oil, which is readily miscible in paraffin oil. It is suitable as a softening agent for celluloid, condensation products of formaldehyde with urea or phenols, or casein. (2) A brown viscous oil soluble in most organic solvents except the lower aliphatic alcohols, is obtained by heating 15 parts ricinoleic acid with 13.5 parts colophony for 10 hours under reduced pressure. (3) 3.4 parts of dihydroxystearic ethyl ester are heated with 3 parts of abietic acid at 260° C. in vacuo until the acid value has been reduced to zero.

340,041. Carpmael, A., (*I. G. Farbenindustrie Akt.-Ges.*). Sept. 24, 1929.

Compositions containing sulphur and chloronaphthalene. — A mixture of chloronaphthalene (having a chlorine content of 45 to 60 per cent) with up to about 26 per cent of sulphur is used for sealing electric blasting fuses and detonators. Reference is made to Specification 308,701, [*Class* 9 (i), Ammunition &c.], for use of mixtures of tetrachloronaphthalenes with bitumen or asphalt for the same purpose.

340,101. British Celanese, Ltd. Nov. 17, 1928, [*Convention date*].

Compositions containing synthetic resins. — Mixed resinous products are prepared by condensing benzaldehyde with an aromatic sulphonamide, e.g. benzenesulphonamide or a toluene- or xylene-sulphonamide, in the presence of other synthetic resin components, e.g., formaldehyde, furfural, acetone, urea, phenol, or aniline. The condensation may be effected in the absence of a catalyst or in the presence of an acid, neutral, or alkaline catalyst. The products so obtained are useful as ingredients of compositions having a basis of cellulose ester or ether. Such compositions may include also other synthetic resins, e.g., fusible and soluble phenol-formaldehyde resins, diphenylolpropane-formaldehyde resins, preferably those prepared in the presence of an acid catalyst, phenol-furfural resins, and toluene-sulphonamide-formaldehyde resins, semi-synthetic resins, e.g. ester gum, natural resins, e.g. acaroid resins, manila, pontianak, kauri, dammar, rosin, and shellac, plasticizers, e.g. diphenylolpropane, xylenemonomethylsulphonamide, *o*- or *m*-toluene-ethylsulphonamide, fire retardants, e.g. bromtricresyl phosphates, and pigments, &c. Specifications 315,807, 315,808, and 340,102 are referred to.

340,102. British Celanese, Ltd. Nov. 17, 1928, [*Convention date*].

Compositions containing synthetic resins.—Mixed resinous products are prepared by condensing furfural with an aromatic sulphonamide, e.g. benzenesulphonamide or a toluene- or xylene-sulphonamide in the presence of other synthetic resin components, e.g. formaldehyde, acetone, urea, phenol, or aniline. The condensation may be effected in the absence of a catalyst or in the presence of an acid or alkaline catalyst. The products so obtained are useful as ingredients of compositions having a basis of cellulose ester or ether. Such compositions may include also other synthetic resins, e.g. fusible and soluble phenol-formaldehyde resins, diphenylolpropane- formaldehyde resins, preferably those prepared in the presence of an acid catalyst, phenol-furfural resins, and toluenesulphonamide-formaldehyde resins, semi-synthetic resins, e.g. ester gum, natural resins, e.g. acaroid resins, manila, pontianak, kauri, dammar, resin and shellac, plasticizers, e.g. diphenylolpropane, xylenemonomethylsulphonamide, *o*- or *m*- toluene-ethylsulphonamide, fire retardents, e.g. bromtricresyl phosphates, and pigments, &c. Specifications 315,807, 315,808, and 340,101 are referred to.

340,112. Tustian, G. R. Dec. 3, 1929.

Hardening concrete.—Concrete bricks, pipes, and other articles are waterproofed and hardened by coating them, while still moist, with a composition of cement, sand, powdered mica and water, subjecting them to steam saturation in a closed chamber and drying.

340,141. Gray, T. H. Jan. 1, 1930.

Refractory substances.—A furnace lining is made from used foundry sand and fireclay. The sand is screened and damped and then made into a paste with the clay in the proportion of 1½ parts by volume of sand to 1 part of clay. Other fillers may be added if desired.

APPENDIX

The following abridgments should be inserted in place in this volume.

248,369. Pfälzische Chamotte - und Thonwerke, (Schiffer & Kircher), Akt.-Ges., (Assignees of *Wagapoff*, *G.*). Feb. 25, 1925, [*Convention date*].

Refractory compositions.—Firebricks are made by taking refractory clay, with a moisture content of not more than twenty per cent by weight, disintegrating it to a size of granule varying from dustlike fineness up to 10 millimetres, mixing the various sizes of granules intimately, pouring the mixture into moulds and compressing it, then firing in the usual way. In this process, the clay is not moistened, dried, or heated at any stage or mixed with lean materials.

266,420. Wake, J. F. Oct. 30, 1925.

Bituminous compositions.—A lubricating film or coating of unctuous material, such as linseed oil, is applied to the usual tarred aggregate. The film is such that it facilitates handing the tar macadam, but has no fluxing or cutting-back action on the original coat. The tar macadam may be made in a mixer, as described in Specification 193,440, [*Class* 86, Mixing &c.], the oil film being subsequently applied in the same mixer by spraying or trickling.

293,453. Bakelite Corporation, (Assignees of *Turkington*, *V. H.*). July 7, 1927, [*Convention date*].

Resinous compositions are made by reacting a phenol with a fatty oil, and combining the product with a methylene-containing hardening agent, a sufficient proportion of non-phenolic resin being present to act as a blending agent. Suitable fatty oils comprise tung, linseed or rape oils or mixtures thereof, tung oil being preferred. Non-phenolic resins suitable for use comprise most natural resins including rosin, rosin-glycerine ester, copals and elemi, and also coumarones, phthalic-anhydride-glycerine resins, furfural and acetone resins. The proportions of a phenol and oil are such that all or nearly all the phenol combines with the oil. The amount of methylene-containing body, such as formaldehyde, paraformaldehyde, hexamethylene tetramine, &c. should be the equivalent of 6 mols of formaldehyde to 6 mols of phenol used. The amount of non-phenolic resin should be not less than 20 parts by weight to 100 parts of phenol used, but may be increased up to 1500 parts. In a typical example, 100 parts of phenol, 150 parts of tung oil, and 1 part of phosphoric acid is heated, and 100 parts of 40 per cent formaldehyde, 50 parts of rosin, and 3 parts of aqueous ammonia are added. After heating and evaporation of water heating is continued until the product is a clear non-tacky solid at room temperature. Phosphoric or boric acids may be used as catalysts for the phenol and oil reaction. The second reaction may be produced with or without acid, neutral or alkaline catalysts. The products may be liquid when hot and non-tacky solids when cold. Specification 267,736, [*Class* 2 (iii), Dyes &c.], is referred to.

The Specification as open to inspection under Sect. 91 (3) (a) describes the presence of acid resins, such as rosin or manila copal, during the reaction between the phenol and oil. This subject matter does not appear in the Specification as accepted.

311,751. Sharroch, C. W. Feb. 16, 1928.

Bituminous compositions. — Aggregate mixed with powdered bitumen, with or without a suitable oil, is laid cold and subjected to a hot rolling operation. The rollers may be heated internally by liquid fuel jets fed through the axle or by a brazier or other fire arranged within the roller. In addition to the heated rollers, one or more cold rollers may be employed. Specification 237,129, [*Class* 107, Roads &c.], is referred to.

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Series (A)—List of Classes (1855–1908).	Corresponding Classes—Series (B) (1909–1930).	Corresponding Group Volume —Series (C) (1931 *onwards*).
1, ACIDS, ALKALIES, OXIDES, AND SALTS, INORGANIC.	1 (i), Chemical processes and apparatus. (1909–15 *out of print.*) 1 (ii), Inorganic compounds other than metallic oxides, hydrates, oxyacids, and salts, (*including* Alkali manufacture *and* Cyanogen compounds). 1 (iii), Oxides, hydrates, oxyacids, and salts, Metallic, (*other than* Alkali manufacture *and* Cyanogen compounds).	III.
2, ACIDS AND SALTS, ORGANIC, AND OTHER CARBON COMPOUNDS, (*including* Dyes).	2 (i), Acetylene ... ... 2 (ii), Cellulose, Non-fibrous, and cellulose derivatives, (*including* Artificial filaments, sheets, and the like containing same). (1909–15 *out of print.*) 2 (iii), Dyes and hydrocarbons and heterocyclic compounds and their substitution derivatives.	IV.
3, ADVERTISING AND DISPLAYING	3 (i), Advertising and displaying apparatus, Moving and changing. 3 (ii), Advertising and displaying other than by moving and changing apparatus.	XVIII.
4, AERONAUTICS. (1905–8 *out of print*) ...	4, Aeronautics	XXXIII.
5, AGRICULTURAL APPLIANCES, FARMYARD AND LIKE, (*including* the housing, feeding, and treatment of animals).	5 (i), Farmyard and like appliances. (*other than* Housing and feeding animals). 5 (ii), Housing and feeding animals, (*other than* Chaff and vegetable cutters).	I.
6, AGRICULTURAL APPLIANCES FOR THE TREATMENT OF LAND AND CROPS, (*including* Gardening appliances).	6 (i), Cultivating implements and systems ... ... 6 (ii), Gardening and like appliances, (*including* Miscellaneous agricultural appliances). 6 (iii), Harvesting-appliances	I.
7, AIR AND GAS ENGINES. (1889–1892, 1897–1908 *out of print*).	7 (i), Combustion-product and hot-air engines. (1909–15 *out of print.*) 7 (ii), Internal-combustion engines, Arrangement and disposition of parts of, (*including* Construction of parts peculiar to internal-combustion engines). 7 (iii), Internal-combustion engines, Carburetting-apparatus, vaporizers, and heaters for. 7 (iv), Internal-combustion engines, Igniting in ... ... 7 (v), Internal-combustion engines, Starting, stopping, and reversing. 7 (vi), Internal-combustion engines, Valves and valve gear for, (*including* Other means and methods for regulating and controlling internal-combustion engines).	XXVII.
8, AIR AND GASES, COMPRESSING, EXHAUSTING, MOVING, AND OTHERWISE TREATING.	8 (i), Air and gases, Compressing, exhausting, and moving, (*including* Bellows *and* Vacuum and like dusting and cleaning apparatus). (1909–15 *out of print.*) 8 (ii), Air and gases, Treating otherwise than by compressing, exhausting, and moving.	XXVIII.

Series (A)—List of Classes (1855–1908).	Corresponding Classes—Series (B) (1909–1930).	Corresponding Group Volume —Series (C) (1931 *onwards*).
9, AMMUNITION, TORPEDOES, EXPLOSIVES, AND PYROTECHNICS.	9 (i), Ammunition and ammunition receptacles. (1909–15 *out of print.*)	XXI.
	9 (ii), Torpedoes, explosives, and pyrotechnics...	
10, ANIMAL-POWER ENGINES AND MISCELLANEOUS MOTORS.	10, Animal-power engines and miscellaneous motors	XXVI.
11, ARTISTS' INSTRUMENTS AND MATERIALS	11, Artists' instruments and materials	XV.
12, BEARINGS AND LUBRICATING-APPARATUS	12 (i), Bearings and bearing-surfaces	XXXIV.
	12 (ii), Lubricating passages, channels, reservoirs, and baths, and lubricating-cans.	
	12 (iii), Lubricators and lubricating bearing-surfaces, (*other than* Lubricating passages, channels, reservoirs, and baths).	
13, BELLS, GONGS, FOGHORNS, SIRENS, AND WHISTLES.	13, Bells, gongs, foghorns, sirens and whistles	XXXVIII.
14, BEVERAGES, (*excepting* Tea, coffee, cocoa, and like beverages).	14 (i), Aerating liquids, and gazogenes, seltzogenes, and siphon bottles.	VI.
	14 (ii), Beverages, malt products, and organized ferments, (*other than* Aerating beverages).	
15, BLEACHING, DYEING, AND WASHING TEXTILE MATERIALS, YARNS, FABRICS, AND THE LIKE, (*excepting* Dyes).	15 (i), Dyeing and otherwise treating textiles, textile materials, and the like with liquids and gases, Apparatus for, (*including* Bleaching and washing, Processes and materials for).	IV.
	15 (ii), Dyeing, Processes and materials for	
16, BOOKS (*including* Cards and card cases and the like).	16, Books, mercantile forms, and the like	XV.
17, BOOTS AND SHOES	17 (i), Boots and shoes, Apparatus for making and repairing...	VII.
	17 (ii), Boots and shoes, Construction of	
	17 (iii), Boots and shoes, Protectors and trees and other accessories for.	
18, BOXES AND CASES. (*excepting* Trunks, portmanteaux, hand and like travelling bags, baskets, hampers, and other wickerwork).	18, Boxes and cases	XVII.
19. BRUSHING AND SWEEPING	19, Brushing and sweeping	XXIII.
20, BUILDINGS AND STRUCTURES	20 (i), Buildings and structures, Kinds or types of	X.
	20 (ii), Buildings and structures, Miscellaneous accessories and details applicable generally to.	
	20 (iii), Doors and windows and their accessories	
	20 (iv), Floors, roofs, walls, and ceilings ...	
21, CASKS AND BARRELS	21, Casks and barrels	XVII.
22, CEMENTS AND LIKE COMPOSITIONS	22, Cements and like compositions	V.
23, CENTRIFUGAL DRYING, SEPARATING, AND MIXING MACHINES AND APPARATUS.	23, Centrifugal machines and apparatus, (*other than* Centrifugal fans, pumps, and reels).	II.
24, CHAINS, CHAIN CABLES, SHACKLES, AND SWIVELS.	24, Chains, chain cables, shackles, and swivels	XXV.
25, CHIMNEYS AND FLUES, (*including* Ventilating-shaft tops).	25, Chimneys and flues, (*including* Ventilating-shaft tops).	X.
26, CLOSETS, URINALS, BATHS, LAVATORIES, AND LIKE SANITARY APPLIANCES.	26, Closets, urinals, baths, lavatories, and like sanitary appliances.	I.
27, COIN-FREED APPARATUS AND THE LIKE	27, Coin-freed apparatus and the like	XVIII.
28, COOKING AND KITCHEN APPLIANCES, BREAD-MAKING AND CONFECTIONERY.	28 (i), Bread-making, confectionery, and cooking-appliances.	VI.
	28 (ii), Kitchen and like appliances other than cooking-appliances.	
29, COOLING AND ICE-MAKING, (*including* Refrigerators *and* Ice-storing).	29, Cooling and ice-making, (*including* Refrigerators *and* Ice-storing).	XIII.
30, CUTLERY	30, Cutlery	XIV.
31, CUTTING, PUNCHING, AND PERFORATING PAPER, LEATHER, AND FABRICS, (*including* the general treatment of paper after its manufacture)	31 (i), Cutting and severing machines for paper, leather, fabrics, and the like.	VIII.
	31 (ii), Punching and perforating machines and hand tools for cutting, punching, perforating, and tearing paper, leather, fabrics, and the like.	
32, DISTILLING, CONCENTRATING, EVAPORATING AND CONDENSING LIQUIDS, (*excepting* Steam-engine condensers).	32, Distilling and evaporating liquids, (*including* Condensing vapours *and* Crystallizing).	III.
33, DRAINS AND SEWERS	33, Drains and sewers	I.
34, DRYING	34 (i), Drying gases, clothes, and materials in long lengths	XIII.
	34 (ii), Drying systems and apparatus, (*other than* Drying gases, clothes, and materials in long lengths).	
35, DYNAMO-ELECTRIC GENERATORS AND MOTORS, (*including* Frictional and influence machines, magnets, and the like).	35, Dynamo-electric generators and motors, (*including* Frictional and influence machines, magnets, and the like).	XXXV.
36, ELECTRICITY, CONDUCTING AND INSULATING	36, Electricity, Conducting and insulating	XXXVI.
37, ELECTRICITY, MEASURING AND TESTING	37, Electricity, Measuring and testing, (*including* Electric resistances and inductances). (1909–15 *out of print.*)	XXXVI.
38, ELECTRICITY, REGULATING AND DISTRIBUTING.	38 (i), Electric couplings, and cut-outs other than electro-magnetic and thermal.	XXXVI.
	38 (ii), Electric currents, Converting and transforming other than by rotary converters and rotary transformers, and condensers. (1909–15 *out of print.*)	XXXV.
	38 (iii), Electric motor control systems and motor and like controllers. (1909–15 *out of print.*)	XXXVII.
	38 (iv), Electric supply and transmission systems and apparatus not otherwise provided for.	XXXV.
	38 (v), Electric switches and electro-magnetic and thermal cut-outs, (*other than* Motor and like controllers).	XXXVII
39. ELECTRIC LAMPS AND FURNACES	39 (i), Electric lamps, Arc and incandescent-arc and vacuum or low-pressure apparatus for electric discharges through gases or vapours.	XL.
	39 (ii), Electric lamps, Incandescent	XI.
	39 (iii), Heating by electricity, (*including* Electric furnaces and ovens). (1909–15 *out of print.*)	

Series (A)—List of Classes (1855–1908).	Corresponding Classes—Series (B) (1909–1930).	Corresponding Group Volume —Series (C) (1931 *onwards*).
40, ELECTRIC TELEGRAPHS AND TELEPHONES. (1884–8 *out of print.*)	40 (i), Electric signalling systems and apparatus, (*other than* Telegraphs *and* Telephones).	XXXVIII.
	40 (ii), Phonographs, gramophones, and like sound transmitting and reproducing instruments.	
	40 (iii), Telegraphs, Electric	XL.
	40 (iv), Telephones and telephone systems and apparatus, Electric.	XXXIX.
	40 (v), Wireless signalling and controlling. (1909–15 *out of print.*)	XL.
41, ELECTROLYSIS, (*including* Electro-deposition *and* Electroplating).	41, Electrolysis, (*including* Electro-deposition *and* Electroplating). (1909–15 *out of print.*)	XXXVI.
42, FABRICS, DRESSING AND FINISHING WOVEN AND MANUFACTURING FELTED, (*including* Folding, Winding. Measuring, *and* Packing).	42 (i), Fabrics, Finishing and dressing.	VIII.
	42 (ii), Fabrics, Treating otherwise than by finishing and dressing.	
43, FASTENINGS, DRESS, (*including* Jewellery).	43, Fastenings, Dress, (*comprising* Buckles, Buttons, Jewellery, *and certain other fastenings specially applicable to wearing apparel*).	VII.
44, FASTENINGS, LOCK, LATCH, BOLT, AND OTHER (*including* Safes and strong-rooms).	44, Fastenings, Lock, latch, bolt, and other, (*including* Safes and strong-rooms).	XXV.
45, FENCING, TRELLIS, AND WIRE NETTING	45, Fencing, trellis, and wire netting	I.
46, FILTERING AND OTHERWISE PURIFYING LIQUIDS.	46, Filtering and otherwise purifying liquids	I.
47, FIRE, EXTINCTION AND PREVENTION OF	47 (i), Fire-escapes and fire and temperature alarms	XXI.
	47 (ii), Fire-extinguishing and fire preventing and minimizing	
48, FISH AND FISHING	48, Fish and fishing	VI.
49, FOOD PREPARATIONS AND FOOD-PRESERVING	49, Food preparations, food preserving and the like	
50, FUEL, MANUFACTURE OF	50, Fuel, Manufacture of	XII
51, FURNACES AND KILNS, (*including* Blowpipes and blowpipe burners; Smiths' forges and rivet hearths; *and* Smoke and fumes, Treating).	51 (i), Furnaces and kilns, Combustion apparatus of, (*including* Details in connection therewith).	XII.
	51 (ii), Furnaces and kilns for applying and utilizing heat of combustion, (*other than* Combustion apparatus and details in connection therewith).	
52, FURNITURE AND UPHOLSTERY	52 (i), Furniture, Fittings and details applicable generally to, and articles of furniture not otherwise provided for.	XIV.
	52 (ii), Furniture for sitting and lying upon	
	52 (iii), Tables, desks, and leaf turners and holders	
	52 (iv), Upholstery, wall furniture, screens, and looking-glasses.	
	52 (v), Window, stair, and like furniture, brackets, racks, and stands, (*including* Antimacassars *and* Table and like covers).	
53, GALVANIC BATTERIES	53, Galvanic batteries	XXXVI.
54, GAS DISTRIBUTION	54, Gas distribution	XXIX.
55, GAS MANUFACTURE	55 (i), Coking and gas-producers	XII.
	55 (ii), Gas manufacture other than gas-producers and retorts	
56, GLASS	56, Glass	XXIII.
57, GOVERNORS, SPEED-REGULATING, FOR ENGINES AND MACHINERY.	57, Governors, Speed-regulating, for engines and machinery	XXVI.
58, GRAIN AND SEEDS, TREATING, (*including* Flour and meal).	58, Grain and seeds, Treating, (*including* Flour and meal)	I.
59, GRINDING, CRUSHING, PULVERIZING, AND THE LIKE.	59, Grinding, crushing, pulverizing, and the like	II.
60, GRINDING OR ABRADING, AND BURNISHING	60, Grinding or abrading, and burnishing	XXIII.
61, HAND TOOLS AND BENCHES FOR THE USE OF METAL, WOOD, AND STONE WORKERS.	61 (i), Hand-tool, brush, mop, and like handles	XXIII.
	61 (ii), Hand tools, (*other than* Wrenches and bolt, nail, screw, and like inserting and extracting tools *and* Boring and drilling tools).	
	61 (iii), Wrenches and bolt, nail, screw, and like inserting and extracting tools.	
62, HARNESS AND SADDLERY	62, Harness and saddlery	I.
63, HATS AND OTHER HEAD COVERINGS	63, Hats and other head coverings	VII.
64, HEATING, (*excepting* Furnaces and kilns: *and* Stoves, ranges and fireplaces).	64 (i), Heating liquids and gases.	XIII.
	64 (ii), Heating systems and apparatus, (*other than* Heating liquids and gases *and* Surface apparatus for effecting transfer of heat).	
	64 (iii), Surface apparatus for effecting transfer of heat, (*other than* Apparatus in which the heat is transferred from products of combustion).	
65, HINGES, HINGE-JOINTS, AND DOOR AND GATE FURNITURE AND ACCESSORIES, (*excepting* Fastenings, Lock, latch, bolt, and other).	65 (i), Door and gate operating-appliances, furniture and accessories, (*other than* Fastenings, Lock, latch, bolt, and other *and* Hinges and pivots).	XXV.
	65 (ii), Hinges and pivots.	
66, HOLLOW-WARE, (*including* Buckets, Pans, Kettles, Saucepans, *and* Water-cans).	66, Hollow-ware, (*including* Buckets, Pans, Kettles, Saucepans, *and* Water cans)	XVII.
67, HORSESHOES	67, Horseshoes	I.
68, HYDRAULIC ENGINEERING	68 (i), Excavating earth and rock, booms, buoys, canals and rivers, ferries, and water supply.	XXI.
	68 (ii), Subaqueous buildings and structures, diving, and raising sunken ships and objects.	
69. HYDRAULIC MACHINERY AND APPARATUS, (*excepting* Pumps and other means for raising and forcing liquids).	69 (i), Hydraulic apparatus not otherwise provided for	XXIX.
	69 (ii), Hydraulic presses, meters, motors, and like apparatus for use with high pressures.	
	69 (iii), Spray-producers and liquid-distributing sprinklers and nozzles.	
70, INDIA-RUBBER AND GUTTA-PERCHA, (*including* Plastic compositions *and* Materials of constructive utility, other than metals and stone).	70, India-rubber and gutta-percha, (*including* Plastic compositions *and* Materials of constructive utility other than metals and stone).	V.

Series (A)—List of Classes (1855–1908).	Corresponding Classes—Series (B) (1909–1930).	Corresponding Group Volume —Series (C) (1931 *onwards*).
71, INJECTORS AND EJECTORS	71, Injectors and ejectors	XXVIII.
72, IRON AND STEEL MANUFACTURE	72, Iron and steel manufacture	II.
73, LABELS, BADGES, COINS, TOKENS, AND TICKETS.	73, Labels, badges, coins, tokens, and tickets	XV.
74, LACE-MAKING, KNITTING, NETTING, BRAIDING, AND PLAITING.	74 (i), Braid and braiding-machines, crochet, lace and lace-making, and net-making machines...	VIII.
	74 (ii), Knitting and knitted fabrics.	
75, LAMPS, CANDLESTICKS, GASALIERS, AND OTHER ILLUMINATING-APPARATUS, (*excepting* Electric lamps).	75 (i), Burners and burner fittings.	XI.
	75 (ii), Lamp chimneys, globes, lenses, shades, reflectors and smut-catchers, and holders therefor.	
	75 (iii), Lamps for lighting and heating, Details and accessories applicable generally to, (*including* Lighting burners, pipes, cigars, and the like).	
	75 (iv), Lamps for lighting and heating, Kinds or types of, (*including* Lighting, Systems of).	
76, LEATHER, (*including* Treatment of hides and skins).	76, Leather, (*including* Treatment of hides and skins) ...	VIII.
77, LIFE-SAVING, (MARINE), AND SWIMMING AND BATHING APPLIANCES.	77, Life-saving, (Marine), and swimming and bathing appliances.	XXI.
78, LIFTING, HAULING, AND LOADING, (*including* Lowering, winding, and unloading).	78 (i), Conveyors and elevators for dealing continuously with articles and materials in bulk.	XXX.
	78 (ii), Lifting, lowering, and hauling not otherwise provided for.	
	78 (iii), Lifts, hoists, and jacks.	
	78 (iv), Loading and unloading, (*including* Transporters and cranes).	
	78 (v), Winding and paying-out apparatus for lifting, lowering, and hauling, (*including* Pulley-blocks and the like).	
79, LOCOMOTIVES AND MOTOR VEHICLES FOR ROAD AND RAIL, (*including* Portable and semi-portable engines).	79 (i), Locomotives and tramway, traction, portable and semi-portable engines.	XXXI.
	79 (ii), Motor-vehicles, Arrangement and disposition of driving, transmission, balance, and reversing gearing on.	
	79 (iii), Motor vehicles, Arrangement and disposition of parts of, not otherwise provided for, (*including* Construction of parts peculiar to motor vehicles).	
	79 (iv), Motor vehicles, Frames and under-carriage work of.	
	79 (v), Motor vehicles and locomotives, Steering and controlling.	
80, MECHANISM AND MILL GEARING. (1877–1883 *out of print*).	80 (i), Gearing, Belt, rope, chain, toothed and friction, and gearing for converting and conveying rotary or reciprocating motion.	XXIV.
	80 (ii), Gearing, Variable-speed, differential, and reversing, and for stopping and starting, and shafting and its accessories.	
	80 (iii), Link-work, cams and tappets, and ratchet and screw-and nut gearing.	
	80 (iv), Mechanism not otherwise provided for	
81. MEDICINE, SURGERY, AND DENTISTRY ...	81 (i), Disinfecting and deodorizing, and medical and like preparations.	VI.
	81 (ii), Medical, surgical, and dental appliances.	
82, METALS AND ALLOYS, [*excepting* Iron and Steel manufacture].	82 (i), Metals, Extracting and refining, and alloys.	II.
	82 (ii), Washing granular, powdered, and like materials, and amalgamating, cleaning, coating, and granulating metals.	
83, METALS, CUTTING AND WORKING	83 (i), Casting and moulding metals.	XXII.
	83 (ii), Metal articles and forms, Combination apparatus and processes specially designed for producing and treating.	
	83 (iii), Metals, Cutting.	
	83 (iv), Metals, Working.	
84, MILKING, CHURNING, AND CHEESE-MAKING ...	84, Milking, butter-making, and cheese-making	I.
85, MINING, QUARRYING, TUNNELLING, AND WELL SINKING.	85, Mining, quarrying, tunnelling, and well-sinking	XXI.
86, MIXING AND AGITATING MACHINES AND APPLIANCES, [*excepting* Centrifugal machines and apparatus].	86, Mixing and agitating machines and appliances	II.
87, MOULDING PLASTIC AND POWDERED SUBSTANCES, (*including* Bricks, building and paving blocks, and tiles, *and* Pottery).	87 (i), Bricks, building and paving blocks, slabs, tiles, and pottery.	X.
	87 (ii), Moulding, plastic and powdered substances, (*including* Casting substances other than metals *and* Presses, (Mechanical).	V.
88, MUSIC AND MUSICAL INSTRUMENTS	88 (i), Musical instruments, Automatic.	XXXVIII.
	88 (ii), Music and musical instruments other than automatic.	
89, NAILS, RIVETS, BOLTS AND NUTS, SCREWS AND LIKE FASTENINGS.	89 (i), Bolts, studs, nuts, washers, and rivets.	XXV.
	89 (ii), Hooks, nails, cotters, pins, staples, wedges, and wood-screws.	
	89 (iii), Nailing and stapling and wire-stitching	VII.
90, NON-METALLIC ELEMENTS	90, Non-metallic elements	III.
91, OILS, FATS, LUBRICANTS, CANDLES, AND SOAPS	91, Oils, fats, lubricants, candles, and soaps. (1909–15 *out of print.*)	III.
92, ORDNANCE AND MACHINE GUNS	92 (i), Ordnance and machine-gun carriages and mountings.	XXI.
	92 (ii), Ordnance and machine-guns	
93, ORNAMENTING	93, Ornamenting	XV.
94, PACKING AND BALING GOODS	94 (i), Packing and wrapping-up for transit and storage, (*including* Baling).	XVII.
	94 (ii), Paper bags, sacks, wrappers, and the like, (*including* Making envelopes).	
95, PAINTS, COLOURS, AND VARNISHES	95, Paints, painting, and the like	III.
96, PAPER, PASTEBOARD, AND PAPIER MACHE ...	96, Paper, pasteboard, and papier mache	VIII.

Series (A)—List of Classes (1855–1908).	Corresponding Classes—Series (B) (1909–1930).	Corresponding Group Volume —Series (C) (1931 *onwards*).
97, PHILOSOPHICAL INSTRUMENTS, (*including* Optical, nautical, surveying, mathematical, and meteorological instruments).	97 (i), Optical systems and apparatus. (1909–15 *out of print.*)	XX.
	97 (ii), Surveying, navigational, and astronomical instruments. (1909–15 *out of print.*)	
	97 (iii), Thermometers, meteorological and mathematical instruments, and miscellaneous philosophical instruments.	
98, PHOTOGRAPHY	98 (i), Photographic cameras and auxiliary apparatus therefor.	XX.
	98 (ii), Photographic processes and apparatus other than for taking photographs. (*including* Photographic plates, films, and papers).	
99. PIPES, TUBES, AND HOSE	99 (i), Pipes and tubes, Joints and couplings for, (*including* Joints for tubular framework *and like* Wire and rod couplings and joints).	XXVIII.
	99 (ii), Pipes, tubes, and hose, (*other than* Joints and couplings for).	
100, PRINTING, LETTERPRESS AND LITHOGRAPHIC	100 (i), Feeding and delivering webs and sheets.	XVI.
	100 (ii), Printing processes and apparatus, (*other than* Type setting and composing).	
	100 (iii), Type making, setting, and composing, (*including* Type-bar-making machines).	
	100 (iv), Typewriters and like machines.	
101, PRINTING, OTHER THAN LETTERPRESS OR LITHOGRAPHIC.	101, Now included in 100 (ii).	
102, PUMPS AND OTHER MEANS FOR RAISING AND FORCING LIQUIDS, [*excepting* Rotary Pumps].	102 (i), Pumps, Reciprocating, for liquids, (*including* Steam-engine air-pumps *and* Combined pumps for liquids and gases).	XXVIII.
	102 (ii), Water and other liquids, and semi-liquids, Raising and forcing otherwise than by pumps.	
103, RAILWAY AND TRAMWAY VEHICLES ...	103 (i), Brakes and retarding apparatus	XXXIV.
	103 (ii), Rail and road vehicles, Details applicable generally to.	XXXII.
	103 (iii), Railway and tramway vehicles, Accessories for.	
	103 (iv), Railway and tramway vehicles, Body details and kinds or types of.	
	103 (v), Railway and tramway vehicles, Draught, coupling, and buffing appliances for.	
	103 (vi), Railway and tramway vehicles. Undercarriage and underframe details of.	
104, RAILWAYS AND TRAMWAYS	104 (i), Railway and tramway crossings and points and switches.	XXX.
	104 (ii), Railway and tramway permanent way other than crossings and points and switches, and railway and tramway systems other than electric.	
	104 (iii), Railways and tramways, Electric, (*including* Electric traction).	
105, RAILWAY SIGNALS AND COMMUNICATING-APPARATUS.	105, Railway signals and communicating-apparatus	XXX.
106, REGISTERING, INDICATING, MEASURING AND CALCULATING, (*excepting* Signalling and indicating by signals).	106 (i), Calculating, counting, and cash-registering apparatus.	XIX.
	106 (ii), Dynamometers, gauges, measures of length, steam-engine and like indicators, and testing-apparatus.	
	106 (iii), Fares and admission-fees checking, revolution and speed indicators, and odometers.	
	106 (iv), Indicating, recording, and registering apparatus not otherwise provided for.	
	106 (v), Measured quantities delivering, measures of capacity, and sampling liquids.	XVIII.
107, ROADS AND WAYS	107, Roads and ways	X.
108, ROAD VEHICLES	108 (i), Road vehicles, Body details and kinds or types of.	XXXII.
	108 (ii), Road vehicles, Undercarriage details and draught appliances for.	
	108 (iii), Springs and vibration-dampers	
109, ROPES AND CORDS	109, Ropes and cords	XXV.
110, ROTARY ENGINES, PUMPS, BLOWERS, EXHAUSTERS AND METERS. (1877-83 *out of print.*)	110 (i), Centrifugal and screw fans and pumps.	XXVI.
	110 (ii), Rotary engines, pumps, blowers, exhausters, and meters, (*including* Rotary pump plant).	
	110 (iii), Turbines and reaction-wheels and motor power plant	
111, SEWAGE, TREATMENT OF, (*including* Manure).	111, Sewage, Treatment of, (*including* Manure)	I.
112, SEWING AND EMBROIDERING	112, Sewing and embroidering	VII.
113, SHIPS, BOATS, AND RAFTS, DIV. I	113 (i), Ship and boat fittings and accessories, and pontoons and rafts.	XXXIII.
	113 (ii), Ships and boats, Kinds or types and structural details of.	
114, ——— DIV. II. ...	114, Ships, boats, and rafts, Propelling, steering, and manoeuvring.	XXXIII.
115, ——— DIV. III. ...	115, Ships, boats, and rafts, Rigging, sails, and spars for, (*including* Boat raising, lowering, and disengaging gear).	XXXIII.
116, SHOP, PUBLIC-HOUSE, AND WAREHOUSE FITTINGS AND ACCESSORIES.	116, Shop, public-house, and warehouse fittings and accessories.	XVIII.
117, SIFTING AND SEPARATING	117, Sifting and separating	II.
118, SIGNALLING AND INDICATING BY SIGNALS, (*excepting* Railway signals and communicating-apparatus).	118 (i), Indicators and burglar and like alarms	XXXVIII.
	118 (ii), Signals, (*including* Marine signals)	
119, SMALL-ARMS	119, Small-arms	XXI.
120, SPINNING, (*including* the preparation of fibrous materials *and* the doubling of yarns and threads).	120 (i), Spinning, Preparation of fibrous materials for, (*including* Obtaining, opening, carding, and like treatment of fibres in general).	IX.
	120 (ii), Spinning, twisting, and winding yarns and threads, (*including* Winding cords, wire, and the like.)	
	120 (iii), Yarns and threads and miscellaneous spinning accessories and processes and treatment of fibres.	

Series (A)—List of Classes (1855-1908).	Corresponding Classes—Series (B) (1909–1930).	Corresponding Group Volume —Series (C) (1931 *onwards*).
121, STARCH, GUM, SIZE, GLUE, AND OTHER STIFFENING AND ADHESIVE MATERIALS.	121, Starch, gum, size, glue, and other stiffening and adhesive materials.	V.
122, STEAM-ENGINES, (*including* Details common to fluid-pressure engines generally).	122 (i), Engine and like cylinders, connecting-rods, cross-heads and guides, fly-wheels, piston-rods, and pistons.	XXVI.
	122 (ii), Steam-engine distributing and expansion valves and valve gear and valve-actuating arrangements therefor.	
	122 (iii), Steam-engines, Kinds or types of and details not otherwise provided for, (*including* Steam and other fluid-pressure hammers and presses.	
	122 (iv), Steam-engines, Regulating or controlling, starting, stopping, and reversing.	
	122 (v), Stuffing-boxes and substitutes therefor, (*including* Packing therefor).	
123, STEAM GENERATORS, (*excepting* Furnaces)...	123 (i), Liquid-level regulating, indicating, and registering, incrustation and corrosion preventing and removing, and door lids and covers for resisting fluid pressure.	XVIII.
	123 (ii), Steam-generators	XIII.
	123 (iii), Steam separators and superheaters	
124, STONE, MARBLE, AND THE LIKE, CUTTING AND WORKING.	124, Stone, marble, and the like, Cutting and working... ...	XXIII.
125, STOPPERING AND BOTTLING, (*including* Bottles, jars, and like vessels).	125 (i), Bottles, jars, and like vessels, (*including* Non-refillable bottles, jars, and vessels).	XVII.
	125 (ii), Bottles, jars, and like vessels, Filling, opening, and closing, (*other than* Stoppers, lids, covers, and capsules).	
	125 (iii), Stoppers, lids, covers, and capsules, Bottle, jar, and like.	
126, STOVES, RANGES, AND FIREPLACES	126, Stoves, ranges, and fire-places	XI.
127, SUGAR	127, Sugar	VI.
128, TABLE ARTICLES AND APPLIANCES	128, Table articles and appliances	XIV.
129, TEA, COFFEE, COCOA, AND LIKE BEVERAGES	129, Tea, coffee, cocoa, and like beverages	VI.
130, TOBACCO	130, Tobacco	
131, TOILET AND HAIRDRESSING ARTICLES, AND PERFUMERY.	131, Toilet and hairdressing articles, and perfumery	XIV.
132, TOYS, GAMES, AND EXERCISES	132 (i), Amusement and exercising apparatus other than games and toys.	XV.
	132 (ii), Games	
	132 (iii), Toys	
133, TRUNKS, PORTMANTEAUX, HAND AND LIKE TRAVELLING BAGS, BASKETS, HAMPERS, AND OTHER WICKERWORK.	133, Trunks, portmanteaux, hand and like travelling bags, baskets, hampers, and other wickerwork	XVII.
134, UMBRELLAS, PARASOLS, AND WALKING-STICKS.	134, Umbrellas, parasols, and walking-sticks	VII.
135, VALVES AND COCKS	135, Valves and cocks	XXIX.
136, VELOCIPEDES, (1877–83 *out of print.*) ...	136 (i), Cycle, velocipede, and like vehicle brakes, steering-mechanism, and miscellaneous accessories.	XXXI.
	136 (ii), Cycle, velocipede, and like vehicle driving-mechanism, (*including* Human power driving mechanism for apparatus other than vehicles.)	
	136 (iii), Cycles, velocipedes, and like vehicles, Kinds or types and structural details of.	
137, VENTILATION	137, Ventilation	X.
138, WASHING AND CLEANING CLOTHES, DOMESTIC ARTICLES, AND BUILDINGS.	138 (i), Washing and cleaning buildings and domestic articles other than clothes, and dry cleaning clothes and other absorbent materials.	XXIII.
	138 (ii), Washing, mangling and wringing, ironing, and starching clothes.	VIII.
139, WATCHES, CLOCKS, AND OTHER TIMEKEEPERS	139, Watches, clocks and other timekeepers	XVIII.
140, WATERPROOF AND SIMILAR FABRICS... ...	140, Waterproof and like fabrics	VIII.
141, WEARING-APPAREL	141, Wearing-apparel	VII.
142, WEAVING AND WOVEN FABRICS	142 (i), Looms, Driving, reversing, stopping, and starting, and loom-shedding mechanism and pattern cards, chains, surfaces, and the like.	IX.
	142 (ii), Looms, Kinds or types of, and details not otherwise provided for.	
	142 (iii), Looms, Weft supplying, inserting, beating-up, cutting, doubling, and twisting-in.	
	142 (iv), Woven fabrics and articles, and warping, leasing, balling, and beaming yarns, (*including* Pile fabrics *and* Floor coverings).	
143, WEIGHING-APPARATUS	143, Weighing-apparatus	XVIII.
144, WHEELS FOR VEHICLES, [*excepting wheels for* Locomotives and tramway and traction engines; Railway and tramway vehicles; *and* Toys]. (1877–83; 1893–96; 1901-04 *out of print.*)	144 (i), Wheels for vehicles, (*other than* Wheel tyres, Pneumatic and other elastic, and rims for use therewith).	XXXIV.
	144 (ii), Wheel tyres, Pneumatic and other elastic and rims for use therewith.	
145, WOOD AND WOOD-WORKING MACHINERY.	145 (i), Wood, Cutting, (*other than* Sawing)	XXIII.
	145 (ii), Wood, Working, (*including* Sawing)	
146, WRITING-INSTRUMENTS AND STATIONERY, AND WRITING-ACCESSORIES, (*including* Educational appliances).	146 (i), Filing paper and like sheets.	XV.
	146 (ii), Stationery, wafers and seals, educational appliances, and ciphers and codes.	
	146 (iii), Writing-instruments, ink, and receptacles for writing-materials.	

To supplement the information relating to the Group volumes of Abridgments given in column 3 above, a full list of the 40 Groups showing the Classes of the present classification covered by each Group is given below.

Group.	Corresponding Classes in existing Classification.
I. Agriculture. Fencing. Filtering. Sewage	5 (i–ii). 6 (i–iii). 26. 33. 45. 46. 58. 62. 67. 84. 111.
II. Metals and alloys. Mixing. Pulverizing. Separating	23. 59. 72. 82 (i–ii). 86. 117.
III. Chemistry, Inorganic. Distillation. Oils. Paints	1 (i–iii). 32. 90. 91. 95.
IV. Acetylene. Cellulose. Chemistry, Organic. Dyes and dyeing.	2 (i–iii). 15 (i–ii).
V. Cements. Indiarubber. Moulding, Non-metallic. Starch.	22. 70. 87 (ii). 121.
VI. Beverages. Food production. Medicine and surgery. Tobacco.	14 (i–ii). 28 (i–ii). 48. 49. 81 (i–ii). 127. 129. 130.
VII. Boots. Dress and dress fastenings. Nailing. Sewing.	17 (i–iii). 43. 63. 89 (iii). 112. 134. 141.
VIII. Fabrics. Laundering. Leather. Perforating and severing, Non-metallic. Waterproofing.	31 (i–ii). 42 (i–ii). 74 (i–ii). 76. 96. 138 (ii). 140.
IX. Spinning. Weaving	120 (i–iii). 142 (i–iv).
X. Buildings. Roads. Ventilation	20 (i–iv). 25. 87 (i). 107. 137.
XI. Electric heating. Lamps. Stoves	39 (ii–iii). 75 (i–iv). 126.
XII. Combustion furnaces. Fuel. Gas	50. 51 (i–ii). 55 (i–ii).
XIII. Cooling. Drying. Heating. Steam	29. 34 (i–ii). 64 (i–iii). 123 (ii–iii).
XIV. Cutlery. Furniture. Table and toilet articles	30. 52 (i–v). 128. 131.
XV. Books and stationery. Filing documents. Games. Ornamenting. Writing.	11. 16. 73. 93. 132 (i–iii). 146 (i–iii).
XVI. Printing. Typewriting	100 (i–iv).
XVII. Containers. Packing	18. 21. 66. 94 (i–ii). 125 (i–iii). 133.
XVIII. Advertising. Coin-freed apparatus. Horology. Measured quantities. Regulating liquids. Shop accessories. Weighing.	3 (i–ii). 27. 106 (v). 116. 123 (i). 139. 143.
XIX. Calculating. Registering	106 (i–iv).
XX. Photography. Scientific instruments	97 (i–iii). 98 (i–ii).
XXI. Excavating and mining. Fires, Fighting. Lifesaving. Subaqueous buildings. Warfare.	9 (i–ii). 47 (i–ii). 68 (i–ii). 77. 85. 92 (i–ii). 119.
XXII. Casting, cutting, and working metals	83 (i–iv).
XXIII. Abrading. Brushing and cleaning. Glass. Hand tools. Stone. Wood.	19. 56. 60. 61 (i–iii). 124. 138 (i). 145 (i–ii).
XXIV. Gearing	80 (i–iv).
XXV. Chains and ropes. Doors, Operating. Hinges. Locks and fastenings.	24. 44. 65 (i–ii). 89 (i–ii). 109.
XXVI. Centrifugal and rotary pumps. Governors. Steam engines. Turbines.	10. 57. 110 (i–iii). 122 (i–v).
XXVII. Internal-combustion, hot-air, and combustion-product engines.	7 (i–vi).
XXVIII. Compressing and conveying gases. Injectors. Pipes. Reciprocating pumps.	8 (i–ii). 71. 99 (i–ii). 102 (i–ii).
XXIX. Gas distribution. Hydraulic apparatus. Valves.	54. 69 (i–iii). 135.
XXX. Conveyors, Lifts. Railways. Railway signals	78 (i–v). 104 (i–iii). 105.
XXXI. Cycles. Motor vehicles	79 (i–v). 136 (i–iii).
XXXII. Rail and road vehicles. Springs	103 (ii–vi). 108 (i–iii).
XXXIII. Aircraft. Ships	4. 113 (i–ii). 114. 115.
XXXIV. Bearings. Brakes. Wheels	12 (i-iii). 103 (i). 144 (i-ii).
XXXV. Dynamo-electric machines. Electrical converters and transformers, supply and transmission systems.	35. 38 (ii). 38 (iv).
XXXVI. Electrical conduction, insulation, measurement, and testing. Electrolysis. Galvanic batteries.	36. 37. 38 (i). 41. 53.
XXXVII. Electric switches, switchgear, protective cut-out and motor control systems.	38 (iii). 38 (v).
XXXVIII. Music. Phonographs. Signals and alarms	13. 40 (i–ii). 88 (i—ii). 118 (i–ii).
XXXIX. Telephones	40 (iv).
XL. Arc lamps. Telegraphs and television. Thermionic valves. Wireless.	39 (i). 40 (iii). 40 (v).

ABRIDGMENT CLASS AND INDEX KEY

(*Revised Edition*, 1927).

Key to the Abridgment Classes and Index Headings under which Inventions are classified in the official publications of the Patent Office.

Vol I. 7*s*. 6*d*. (inland) ; 8*s*. 1*d*. (abroad).

Contents :—Lists of Abridgment Classes arranged numerically and alphabetically, Table of Contents of Abridgment Classes, Consolidated List of Index Headings and main cross-references, arranged alphabetically.

Volume II, showing in detail the subdivisions of each Index Heading and the cross-references thereunder, is in course of preparation. It should be noted, however, that the detailed contents of any particular Index Heading can be ascertained from an inspection of the index of the appropriate Class Abridgment Volume for the period 1921–1925 or 1926–30 (if published).

FIFTY YEARS SUBJECT INDEX 1861—1910.

6*d*. *per volume*.

A subject index of all published Complete Specifications of the years 1861–1910 classified in 271 volumes corresponding to the series (B) of Illustrated Abridgment Classes. To some extent the headings in the " Fifty Years Subject Index " may be regarded as a compilation of the corresponding headings in the Abridgment volumes, and, so far as this is the case, the Index may be used with the Abridgments. But, generally speaking, the Index headings represent an extended and improved classification of matter, and it may often be found more convenient to use the " Fifty Years Subject Index " with the Specifications, as the contents of the new Index headings will not always be found collected in any one Abridgment Class.

For a continuation of the " Fifty Years Subject Index " the searcher should consult the appropriate Abridgment Volumes for the periods 1909–15, 1916–20, and 1921–25, the subsequent Annual and Quarterly Subject-Matter Indexes, and the Subject-Matter Indexes published weekly in the Official Journal (Patents).

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