PATENTS FOR INVENTIONS

ABRIDGMENTS OF SPECIFICATIONS

CLASS 22

CEMENTS AND LIKE COMPOSITIONS

PERIOD—A.D. 1921-25 [155,801—244,800]

LONDON
PRINTED UNDER THE AUTHORITY OF HIS MAJESTY'S STATIONERY OFFICE
BY THE COURIER PRESS, BEDFORD STREET, LEAMINGTON SPA
PUBLISHED AT THE PATENT OFFICE, 25, SOUTHAMPTON BUILDINGS,
CHANCERY LANE, LONDON, W.C.2.

1927

Price Two Shillings Net

Crown copyright reserved. Permission to reproduce extracts must be obtained from the Controller of H.M. Stationery Office.

PATENTS FOR INVENTIONS

ABRIDGMENTS OF SPECIFICATIONS

CLASS 22

CEMENTS AND LIKE COMPOSITIONS

PERIOD—A.D. 1921-25 [155,801—244,800]

R. BIBLIOTECNICO CENTRALE INGEGNERIA TORINO

LONDON
PRINTED UNDER THE AUTHORITY OF HIS MAJESTY'S STATIONERY OFFICE
BY THE COURIER PRESS, BEDFORD STREET, LEAMINGTON SPA
PUBLISHED AT THE PATENT OFFICE, 25, SOUTHAMPTON BUILDINGS,
CHANCERY LANE, LONDON, W.C.2.

1927

SISTEMA BIBLIOTECARIO
POLITECNICO DI TORINO
CAT. 2 N. 30848

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. A revised edition of the *Abridgment-Class and Index Key* showing Abridgment Classes and Index Headings to which inventions are assigned in the official publications of the Patent Office is now published, price 7*s.* 6*d. net.*

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, price 1s., may be purchased at the Patent Office, or ordered by post, no additional charge being made for postage.

NOTE.—The Patent Office does not guarantee the accuracy of its publications, or undertake any responsibility for errors or omissions or their consequences.

SUBJECT-MATTER INDEX

[Published 11/27.]

Bituminous &c. compositions—*cont.*
bituminous compositions—*cont.*
concretes *not* containing Portland cement &c.—*cont.*
containing naturally-occurring bitumens or asphalts in addition to artificially-prepared tar or pitch—
added mineral oils and condensates from tar distillation, containing. 183,914. 216,911. 218,750.
fats and fatty oils and their derivatives, resin oils, and waxes, containing. 159,956. 202,235.
not containing fats, mineral and fatty oils, resins, soaps, and waxes. 179,166. 183,914. 185,838. 231,653. 237,010. 243,831.
resins and resinates, containing. 202,235. 218,750.
containing naturally-occurring bitumens or asphalts without artificially-prepared tar or pitch—
added mineral oils and condensates from tar distillation, containing. 178,558. 212,106. 212,188. 216,911. 218,750. 238,586.
fats and fatty oils and their derivatives, resin oils, and waxes, containing. 162,007. 178,558. 202,235. 208,879.
not containing fats, mineral and fatty oils, resins, soaps, and waxes. 167,997. 179,166. 185,838. 205,887. 210,343. 212,106. 213,659. 228,257. 231,503. 238,586. 243,831.
resins and resinates, containing. 202,235. 208,879. 218,750.
not containing special bituminous materials, but containing—
acids. [*No cases.*]
alkaline-earth solids, clay, marl, ground schist, shale, or slate, in addition to stony materials. 158,674. 203,740.
alkaline-earth solids without stony materials. 158,674.
ashes, coke breeze, coal, carbon, and graphite. 227,279.
clay without stony materials. 206,888. 230,008.
fines for filling interstices. 161,671. 167,997. 169,079. 177,458. 201,650. 205,887. 216,911. 228,257. 230,008. 237,010.
glass. [*No cases.*]
grit from china clay. [*No cases.*]
house-bin refuse. [*No cases.*]
india-rubber. 185,838. 196,950. 198,136. 216,245. 216,602. 231,503.
lead ore. [*No cases.*]
metallic salt solutions. [*No cases.*]
oxidizing-agents. 185,838.
pyrites or iron oxides. 227,279.
slag or destructor clinker. 167,997. 177,458. 210,343. 211,205.
slate, schist, and shale without other stony materials. [*No cases.*]
special grits or stony materials not covered by other Key subdivisions. 238,219.
sulphur. [*No cases.*]
titanium compounds. [*No cases.*]

Bituminous &c. compositions—*cont.*
bituminous compositions—*cont.*
concretes *not* containing Portland cement &c.—*cont.*
processes for making not dependent on particular materials. 156,671. 156,750. 159,239. 167,341. 177,458. 178,558. 179,664. 187,779. 196,950. 201,813. 202,230. 202,235. 203,740. 206,888. 210,343. 216,911. 219,150. 221,234. 222,602. 230,008.
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. 167,757. 224,058.
fats and fatty oils and their derivatives, resin oils, and waxes, containing. 167,757. 224,058. 231,461.
not containing fats, mineral and fatty oils, resins, soaps, and waxes. 186,861. 201,006. 220,349.
resins and resinates, containing. [*No cases.*]
containing naturally-occurring bitumens or asphalts in addition to artificially-prepared tar or pitch—
added mineral oils and condensates from tar distillation, containing. 221,234.
fats and fatty oils and their derivatives, resin oils, and waxes, containing. [*No cases.*]
not containing fats, mineral and fatty oils, resins, soaps, and waxes. 186,861. 221,234.
resins and resinates, containing. [*No cases.*]
containing naturally-occurring bitumens or asphalts without artificially-prepared tar or pitch—
added mineral oils and condensates from tar distillation, containing. 178,558. 238,586.
fats and fatty oils and their derivatives, resin oils, and waxes, containing. 178,558. 208,879. 233,371.
not containing fats, mineral and fatty oils, resins, soaps, and waxes. 156,527. 186,861. 238,586.
resins and resinates, containing. 208,879. 233,371.
not containing special bituminous materials, but containing—
barium sulphate. [*No cases.*]
calcined bones. [*No cases.*]
carbon, coal, and coke. [*No cases.*]
flue dust. 169,079.
grain-mill dust. [*No cases.*]
india-rubber. 196,950. 198,136. 201,006. 216,245. 216,602. 231,461.
iron oxides. *See* concretes &c. *above.*
litharge, powdered white lead, and zinc oxide. [*No cases.*]
oxidizing-agents. [*No cases.*]
soluble metallic compounds. [*No cases.*]
sulphur. 188,354.

Bituminous &c. compositions—*cont.*

cellulose esters, compositions consisting essentially of. *See* Plastic compositions, [*Class* 70].

creosote oil, green oil, vaseline, and other condensates from the distillation of tar or petroleum, containing. *See subdivisions which comprise mineral oils above and below.*

fats, oils, and waxes, oxidizing, sulphuretting, and otherwise chemically treating. *See* Fats &c., [*Class* 91]; Oils, [*Class* 91]; Waxes, [*Class* 91].

granulating or pulverizing. *See* Metals, alloys, &c., Granulating &c., [*Class* 82 (ii)].

hydrocarbon substitution products, compositions containing, (*other than* those in which the important ingredients are bituminous or resinous materials, fats, oils, waxes, and condensates from tar distillation)—

other than phenols and aldehydes or ketones, condensation products of, containing. 156,137. 156,151. 171,094. 173,225. 181,014. 186,861. 187,605. 202,651. 203,310. 208,137. 208,193. 209,697. 220,949. 225,953. 227,216. 228,415. 230,678. 231,242. 235,595. 236,591. 237,320. 238,904. 240,840.

phenols and aldehydes or ketones, condensation products of, containing. 156,151. 156,675. 156,896. 160,482. 165,758. 169,451. 171,803. 174,656. 176,828. 179,586. 182,886. 187,480. 188,012. 195,559. 201,916. 203,302. 203,733. 208,132. 208,137. 208,193. 214,124. 218,793. 219,368. 221,475. 223,873. 225,436. 225,953. 228,415. 230,619. 230,678. 231,242. 231,431. 237,320. 239,590.

mixing bituminous and oily substances with the gauging-water used with Portland cement and concretes. *See* Cements, Portland &c.; Concretes &c.

oils, fats, higher fatty acids, soaps, and condensates from tar distillation, compositions containing—

containing unspecified oils. 216,911.

fats and fatty oils unmodified, fatty acids, resin oils, and soaps, containing. 179,546. 222,192. 232,237. 235,595.

mineral oils and condensates from tar distillation, containing. 158,546. 167,235. 216,911. 237,885.

halogen, nitrogen, and sulphur derivatives, containing. *See* hydrocarbon substitution products, compositions containing *above*.

phenol-aldehyde condensation products, compositions containing. *See* hydrocarbon substitution products, compositions containing *above*.

oils modified by other means than oxidation or vulcanization, containing. 166,180. 171,661.

oxidized oils or heated wood oil, containing. 166,180. 179,203. 180,807. 222,192.

sulphurized oils and sulphonated fatty acids, containing. 167,235. 175,389. 180,807.

oily residues from sewage sludge, wool and silk washing, and leather waters, containing. *See subdivisions which comprise fatty oils above and below.*

petroleum residues, containing. *See subdivisions which comprise artificially-prepared tar above.*

Bituminous &c. compositions—*cont.*

pitch and tar, obtaining, (*including* petroleum residues and stearin pitch). *See* Pitch &c., [*Class* 55 (ii)].

refractory and other compositions containing tar which is subsequently burnt out or carbonized. *See* Plastic compositions, [*Class* 70]; Refractory substances &c.

resins, chemical treatment of. *See* Resins &c., [*Class* 95].

resins, resinates, balsams, and gums, compositions containing—

fats, fatty oils, and their derivatives, containing. 166,180. 201,916. 209,997. 213,016. 234,714.

not containing fats, oils, and waxes. 156,671. 156,750. 181,092. 187,779. 195,559. 207,616. 208,132. 211,203. 213,016. 216,519. 222,167. 222,180. 225,944. 236,345. 239,590. 241,807.

oils other than fatty oils, hydrocarbons, and their substitution products, containing. 187,376. 200,981. 209,064. 209,065. 209,997.

waxes, containing. 201,916. 213,016. 225,944. 234,714. 239,590.

wax, paraffin wax, and ozokerit, compositions containing. 162,007. 209,064. 209,065.

white and red leads and like oxide-oil cements. *See* Plastic compositions, [*Class* 70].

Calcium-sulphate cements, Plant for making. [*No cases.*]

Cements, Portland and Roman.

calcium sulphate, manufacture of. *See* Oxides &c., Metallic, [*Class* 1 (iii)].

casting. *See* Moulding plastic &c. substances, [*Class* 87 (ii)].

colouring. *See* Plastic compositions, [*Class* 70].

conveyers and elevators for. *See* Conveyers &c., [*Class* 78 (i)].

cooling. *See* Cooling granular &c. materials, [*Class* 29].

cutting and working. *See* Stone, marble, &c., Cutting &c., [*Class* 124].

drying. *See* Drying systems &c., [*Class* 34 (ii)].

filtering. *See* Filtering &c., [*Class* 46].

furnaces and kilns for. *See* Furnaces and kilns for applying &c., [*Class* 51 (ii)].

grinding, crushing, pulverizing, and the like. *See* Grinding, crushing, &c., [*Class* 59].

making by treating slag. 187,066. 187,362. 197,702. 199,575. 203,963. 211,517. 221,017. 227,837. 228,128. 228,129. 229,331. 235,606. 237,779. 238,340. 239,404.

granulating by scattering, spraying, or running molten slag into water and other liquids. *See* Metals, alloys, &c., Granulating &c., [*Class* 82 (ii)].

making otherwise than by treating slag. 156,183. 168,406. 173,504. 180,081. 187,579. 194,738. 199,056. 199,575. 210,366. 211,497. 215,357. 218,075. 219,369. 221,017. 227,977. 228,128. 228,129. 230,424. 231,007. 232,155. 233,764. 237,182. 238,340. 243,410. 243,876. 244,756.

processes depending upon the use of special materials and compositions. *See* materials &c. *below*.

Cements, Portland &c.—*cont.*

materials and compositions for making. 156,547. 169,808. 170,063. 172,087. 193,372. 215,357. 216,120. 221,017. 222,122. 222,151. 225,858. 227,837. 231,535. 232,898. 232,930. 233,698. 234,233. 234,846. 235,138. 235,924. 237,182. 237,779. 239,364. 243,876. 244,078. 244,756.

mixing. *See* Mixing and agitating machines &c., [*Class* 86].

moulding. *See* Moulding plastic &c. substances, [*Class* 87 (ii)].

pug-mills. *See* Mixing and agitating machines &c., [*Class* 86].

retorts or kilns. *See* Furnaces and kilns for applying &c., [*Class* 51 (ii)].

separating or sorting. *See* Separating or sorting solid materials, [*Class* 117].

sifting or screening. *See* Sifting &c., [*Class* 117].

storing. *See* treating after manufacture *below*.

testing. *See* Chemical processes &c., [*Class* 1 (i)]; Testing physical qualities &c., [*Class* 106 (ii)].

treating after manufacture. 158,390. 168,847. 169,807. 170,260. 210,154. 210,366. 227,966. 228,292. 230,424. 237,515. 244,603.

treating with various materials after burning. *See* treating after manufacture *above*.

wash-mills. *See* Mixing and agitating machines &c., [*Class* 86].

weighing. *See* Weighing-apparatus, [*Class* 143].

Concretes and mortars, Lime, magnesia, magnesium-carbonate, and cement.

aggregates, grading by screening. *See* Sifting &c., [*Class* 117].

aggregates, grading by separating. *See* Separating or sorting solid materials, [*Class* 117].

compositions. 156,621. 160,974. 161,061. 161,797 [*Appx*]. 162,318. 162,683. 163,731. 163,746. 164,666. 166,012. 167,138. 168,847. 170,260. 171,144. 173,015. 173,965. 178,896. 179,029. 180,887. 185,838. 187,066. 187,582. 187,779. 189,745. 189,892. 190,849. 191,265. 193,829. 194,526. 197,702. 198,884. 200,311. 200,915. 201,121. 202,698. 210,470. 211,947. 212,419. 214,394. 216,120. 217,279. 217,343. 217,388. 218,472. 218,944. 221,017. 221,468. 221,687. 222,923. 223,458. 223,884. 227,022. 227,679. 231,141. 231,242. 231,867. 232,543. 233,446. 234,233. 234,707. 235,006. 235,231. 236,450. 236,827. 239,633. 240,041. 240,386. 241,724. 242,345. 242,446. 244,142. 244,178. 244,312. 244,603. 244,671.

bituminous concretes. *See* Bituminous &c. compositions.

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

calcium sulphate, binders consisting largely of. *See* Plaster &c. compositions.

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.

Concretes &c.—*cont.*

compositions—*cont.*

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. 187,362. 202,698. 217,633. 235,257.

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.

acids and salts, containing, (e.g. Keene's and Parian cements). 199,122. 201,121. 207,497. 209,114. 213,468. 234,302. 236,695. 238,949. 239,504.

albuminous and gelatinous matter, containing. 170,001. 180,237. 199,122. 213,468. 223,369. 229,358. 239,497.

concretes. *See* Concretes &c.

fibres, containing. 170,001. 194,215. 216,835. 218,042. 223,369. 224,802. 232,341.

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

india-rubber and like gums, containing. *See* India-rubber &c. compositions, [*Class* 70].

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

materials not met by other Key subheadings, containing. 163,578. 164,299. 168,774. 178,896. 200,915. 213,468. 218,042. 224,802. 227,279. 232,341. 234,302. 236,827. 239,504.

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. 200,915. 209,114. 216,835. 217,633. 221,853. 238,949. 243,015.

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. [*No cases.*]

barium and strontium compounds. 231,650.

basalt. 211,846.

bauxite, natural and artificial corundum, and emery, (*including* pure or fused alumina *and* alumina fused with other metallic oxides). 176,437. 184,887. 190,545. 196,972. 200,903. 207,677. 211,944. 216,514. 220,603. 227,270. 231,141. 240,277.

beryllium compounds. 179,928.

binding-agents of general interest and not covered by other Key subdivisions. 240,277.

carbides, nitrides, silicides, and siloxicon. 168,261. 176,436. 183,219. 184,887. 189,692. 189,781. 190,545. 196,972. 207,677. 219,423. 227,270. 228,142. 228,599. 236,255. 239,499. 242,951.

carbon, (*including* carbonizable binding-agents). 176,436. 176,437. 180,675. 186,968. 189,492. 196,021. 199,444. 200,903. 207,677. 211,873. 221,799. 223,986. 227,270. 228,142. 239,499. 244,391.

chrome iron ore and chromium oxide. 183,219. 189,692. 211,944. 219,423. 240,277.

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. 186,968.

not mixed with asbestos. 156,416. 159,731. 168,261. 183,572. 186,968. 196,972. 197,340. 199,444. 208,067. 211,846. 212,501. 216,514. 216,515. 217,897. 218,495. 218,720. 219,423. 220,603. 221,799. 223,986. 226,184. 227,270. 230,248. 231,650. 235,505. 236,063.

fluorides. 208,710. 208,711. 208,712. 225,494.

Refractory substances &c.—*cont.*

materials and compositions containing—*cont.*

ganister and silica. 159,865. 186,968. 193,999. 196,021. 198,463. 199,444. 200,903. 203,062. 211,944. 217,897. 218,495. 218,720. 220,603. 223,986. 226,801. 227,270. 227,679. 230,248. 231,650.

gelatinous silica. *See* soluble silicates &c. *below*.

iron ores and oxides, (*other than* titanic iron ores). 193,576. 197,791. 207,172. 211,944. 218,720. 227,802.

limestone, magnesia, magnesite, and dolomite, (*including* lime blocks and compositions consisting almost wholly of lime). 156,447. 191,412. 193,576. 193,999. 197,340. 197,791. 199,444. 207,172. 207,677. 211,873. 211,944. 218,720. 219,369. 219,423. 221,799. 223,616. 223,986. 226,184. 226,801. 227,802. 228,142. 230,248. 244,391.

magnesium oxychloride binding-agents. *See subdivisions above and below*.

manganese compounds. [*No cases.*]

materials other than binding-agents and refractory materials. 159,865. 193,576. 197,791.

metals. 184,887. 185,435. 190,545. 196,972. 197,340. 227,802. 228,142. 228,599. 239,499.

non-refractory clay mixed with sand. *See* Plastic compositions, [*Class* 70].

old crucible, firebrick, and like scrap from refractory articles. 212,501. 227,679.

rare metals, compounds of—

other than compounds of thorium, titanium, and zirconium. 165,051. 165,052. 173,237. 179,928. 189,492. 200,903. 220,301. 244,720.

thorium compounds. 165,051. 165,052. 173,237. 179,928. 189,492. 244,720.

titanium compounds. 173,237. 197,340. 197,791. 200,903. 210,708. 232,679. 232,680. 236,255.

zirconium compounds. 165,051. 165,052. 173,237. 179,928. 184,887. 190,545. 196,972. 197,791. 221,852. 223,573. 224,214. 242,267. 244,720.

sewage. *See* carbon *above*.

silica. *See* ganister &c. *above*.

silicon. 228,599.

single refractory materials not covered by other Key subdivisions, (*including* single materials mixed with binders which are subsequently burnt out). [*No cases.*]

slags. 156,447.

soapstone, talc, and like magnesium silicates. 193,576. 197,791. 211,944.

soluble silicates and gelatinous silica. 183,219. 183,572. 184,887. 189,692. 190,545. 192,780. 196,972. 211,944. 219,423. 231,650. 235,505. 240,277.

spinels, (*other than* chrome iron ore). [*No cases.*]

volcanic dust. 230,248.

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)].

Refractory substances &c.—*cont.*
processes for making—*cont.*
other than simultaneous use of high temperatures and pressure and rendering non-plastic materials colloidal. 159,737. 168,261. 173,237. 189,492. 191,412. 193,081. 196,021. 207,677. 208,710. 208,711. 208,712. 216,514. 216,515. 219,369. 225,494.
rendering non-plastic materials colloidal or plastic, (*including* processes dependent upon extremely fine grinding and upon addition of organic materials of high molecular weight). 159,737. 193,520. 212,501. 224,257. 235,257.
simultaneous use of high temperatures and pressure. 211,944. 223,616.
refining by fusion. *See* Glass, Manufacture of, [*Class* 56].
rendering porous. *See* Plastic compositions, [*Class* 70].
treating. *See separate headings, such as* Drying systems &c., [*Class* 34 (ii)]; Grinding, crushing, &c., [*Class* 59]; Mixing and agitating machines &c., [*Class* 86]; Moulding plastic &c. substances, [*Class* 87 (ii)].
treating subsequent to moulding. *See* processes &c. *above*.

Slags, Treatment of. 170,287. 172,087. 227,848. 235,257. 236,255.
Excepting Centrifugal machines &c., [*Class* 23]; Drying systems &c., [*Class* 34 (ii)]; Grinding, crushing, &c., [*Class* 59]; Iron and steel manufacture, [*Class* 72]; Magnetic &c. separators, [*Class* 72]; Metals, alloys, &c., Granulating &c., [*Class* 82 (ii)]; Metals, Extracting &c., [*Class* 82 (i)]; Mixing and agitating machines &c., [*Class* 86]; Moulding plastic &c. substances, [*Class* 87 (ii)]; Sifting &c., [*Class* 117]; Slagwool, Preparation of.
compounds of definite chemical composition, obtaining. *See separate headings, such as* Alkali manufacture, [*Class* 1 (ii)]; Oxides &c., Metallic, [*Class* 1 (iii)].
furnaces and kilns. *See* Furnaces and kilns for applying &c., [*Class* 51 (ii)].
making cements by treating slag, (*other than* preliminary treatment of interest apart from cements). *See* Cements, Portland &c.

Slagwool, Preparation of. [*No cases.*]

Statuary. 207,503.
compositions for. *See* Plastic compositions, [*Class* 70].
facilitating the production of by photography. *See* Photographic processes &c., [*Class* 98 (ii)].
imitation by photography. *See* Photographic processes &c., [*Class* 98 (ii)].
making and treating by operations of interest apart from statuary. *See separate headings, such as* Electrolysis &c., [*Class* 41]; Glass, Manufacture of, [*Class* 56]; Metals, Coating with metals, [*Class* 82 (ii)]; Metals, Cutting &c., [*Class* 83 (iv)]; Moulding plastic &c. substances, [*Class* 87 (ii)]; Ornamenting, [*Class* 93]; Pottery, Manufacture of, [*Class* 87 (i)]; Stone, marble, &c., Cutting &c., [*Class* 124]; Stone, Natural &c., Hardening &c.; Wood, Cutting &c., [*Class* 145 (i)].

Stone, Artificial and imitation, (*including* Stone-like products obtained by fusing materials at very high temperatures, *but not including* the manufacture of figured stone).
Excepting Concretes &c.; Fabrics coated &c., [*Class* 140]; Gems, [*Class* 43]; Slags, Treatment of.
bricks, building and paving blocks, slabs, and tiles, forms of. *See* Bricks &c., [*Class* 87 (i)].
coating with metals. *See* Coating non-metallic surfaces &c., [*Class* 82 (ii)].
colouring. *See* Stone, Colouring.
composite and faced blocks. *See* Bricks &c., [*Class* 87 (i)].
compositions, (*other than* compositions fused together at a high temperature). *See* Plastic compositions, [*Class* 70].
cutting and working. *See* Stone, marble, &c., Cutting &c., [*Class* 124].
enamelling. *See* Enamelling, Vitreous, [*Class* 87 (i)].
furnaces and kilns for. *See* Furnaces and kilns for applying &c., [*Class* 51 (ii)].
hardening and preserving. *See* Stone, Natural &c., Hardening &c.
hearthstones for whitening and colouring hearths. *See* Paints, varnishes, &c., [*Class* 95].
india-rubber and like gums, making from. *See* India-rubber &c., [*Class* 70].
inlaid work. *See* Mosaics, [*Class* 20 (iv)].
lime, slaking. *See* Oxides &c., Metallic, [*Class* 1 (iii)].
mixing materials. *See* Mixing and agitating machines &c., [*Class* 86].
mosaics. *See* Mosaics, [*Class* 20 (iv)].
moulding and casting. *See* Moulding plastic &c. substances, [*Class* 87 (ii)].
obtaining by fusing materials at a high temperature. 157,747. 157,749. 158,356. 162,318. 165,051. 172,295. 173,965. 175,638. 176,058. 185,313. 187,066. 193,978. 194,264. 201,880. 204,337. 211,846. 218,275. 238,690. 239,765. 241,576. 244,358. 244,724.
obtaining otherwise than by fusing materials at a high temperature. 159,865. 162,483. 163,512. 164,319. 172,004. 179,204. 194,526. 196,202. 196,342.
ornamenting during casting or moulding. *See* Stone, Colouring.
rendering porous. *See* Plastic compositions, [*Class* 70].
slabs, processes for making. *See* Bricks &c., [*Class* 87 (i)].
stucco-work, artificial. *See* Plastering, [*Class* 20 (iv)].
surfaces, ornamenting. *See* Ornamenting, [*Class* 93].
synthetic production of minerals. *See separate headings, such as* Oxides &c., Metallic, [*Class* 1 (iii)].
transfers. *See* Transfers, [*Class* 100 (ii)].

Stone, Colouring, (*including* Manufacture of figured and ornamented stone). 159,100. 163,512. 166,307. 172,295. 173,738. 178,736. 178,880. 202,282. 217,633. 217,812. 221,857. 222,500. 229,885.
colours. *See* Paints, varnishes, &c., [*Class* 95].

Stone, Colouring—*cont.*
pipeclay preparations for. *See* Paints, varnishes, &c., [*Class* 95].
plastic compositions. *See* Plastic compositions, [*Class* 70].
stonework, ornamental. *See* Stonework, Ornamental, [*Class* 124].
surfaces, ornamenting by colouring otherwise than during casting or moulding. *See* Ornamenting, [*Class* 93].

Stone, Natural and artificial, Hardening and preserving, (*including* Hardening and preserving bricks). 155,883. 156,551. 162,683. 170,497. 187,587. 191,243. 196,769. 200,564. 203,826. 204,256. 217,791. 227,107. 233,819. 239,633.
coating with metals. *See* Coating non-metallic surfaces &c., [*Class* 82 (ii)].

Stone, Natural &c., Hardening &c.—*cont.*
enamelling. *See* Enamelling, Vitreous, (*firing processes*), [*Class* 87 (i)].
hardening-chambers. *See* Wood, cork, &c., Treating with liquids &c., [*Class* 140].
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.

CLASS 22

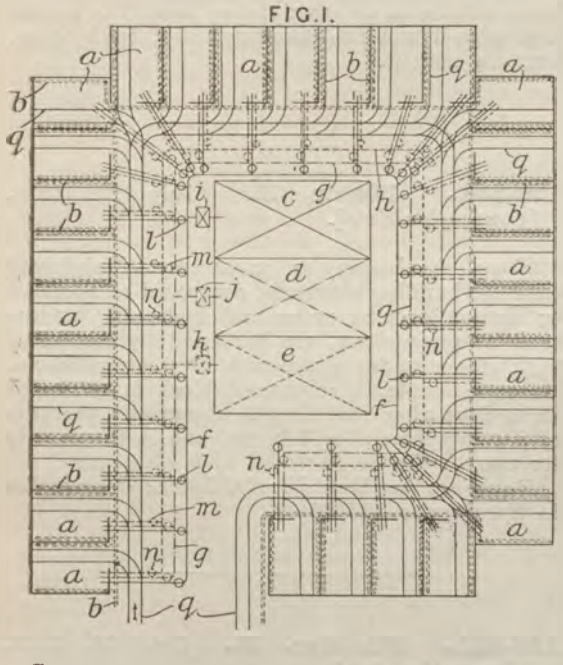
CEMENTS AND LIKE COMPOSITIONS

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.

PERIOD 1921—25

155,883. Pattison, W. Sept. 11, 1919.

FIG. 1.



Cement surfaces, hardening.—An apparatus for hardening, curing, colouring, &c. sheets of asbestos cement or the like by treatment with a number of liquids in succession consists of a number of chambers *a* provided with heating coils *b* and connected to a series of vats *c*, *d*, *e* for containing the treating liquids by a system of pipes *f*, *g*, *h* provided with pumps *i*, *j*, *k*, and cocks *l*, *m*, *n*, so that any one of the liquids can be supplied to or withdrawn from any one or any number of the chambers *a* as required. The chambers *a* are provided with steam liquid-tight doors, and rails *q* to allow the sheets to be introduced into the chambers easily. Means may be provided for siphoning liquid from one chamber to another. The sheets may be first heated and treated with dry air, then soaked in water, then treated with acid to neutralize alkali, and then with a colouring-liquid.

156,137. Traun's Forschungslaboratorium Ges., H. O. March 15, 1919, [*Convention date*].

Compositions containing organic condensation products.—A resinous body, prepared by condensing an aliphatic or aromatic ketone, such as acetone, and an aldehyde, such as formaldehyde, by treatment with an alkali, is produced in presence of a pulverulent substance such as ground wood, peat, straw, paper, asbestos, or metal. After removal of excess alkali and moisture, the powder is pressed or stamped into any desired form at pressure of 150—500 atmospheres and temperatures of 120—200° C. Fillers such as cement, graphite, talc, kaolin, heavy spar, lithopone, glass powder, &c. may be mixed with the materials before condensation, or elastic and insulating properties may be obtained by the addition of oils, waxes, rubber resin, or other natural or artificial resins, shellac, cellulose esters, ebonite, hæmoglobin, &c., either before or after the condensation. As condensing-agents ammonia, alkaline hydroxides, carbonates, or sulphides, or alkaline earth hydroxides may be used. The aldehyde may be replaced by its polymers, by hexamethylenetetramine, or by substances which liberate formaldehyde.

156,151. Traun's Forschungslaboratorium Ges., H. O. May 24, 1918, [*Convention date*].

Compositions containing phenol-aldehyde condensation products. — Synthetic resins are pro-

500. Wt. 19A/365. 6/25. C.P.Leam. Ps 1179.

duced by effecting condensation between phenols and formaldehyde or its polymers or hexamethylenetetramine in the presence of vinyl compounds or their polymerization products, or by adding the vinyl compound or its polymerization product to the phenol-aldehyde compound. Suitable vinyl compounds are vinyl acetate; chlor-, oxy-, amido-, and aryl-acetic esters; propionic esters; polymerized vinyl esters; vinyl halides, e.g. vinyl chloride; and vinyl esters, such as vinyl ethyl ether or vinyl propyl ether. The reaction is accelerated by the addition of small quantities of an organic anhydride, or superoxide, or non-explosive ozonide. The products are used for the preparation of varnishes; they take up certain oils and esters to form non-fragile products capable of cutting and moulding. The raw materials may be dissolved in a low-boiling solvent, and used for the impregnation of wood, paper, cellulose, asbestos, graphite, &c., the solvent being evaporated at a low temperature. The condensation products can be stuck together by softening their surfaces with acetone or chlorinated hydrocarbons, e.g. chlorbenzene, dichlorhydrin, epichlorhydrin, or mesityl chloride.

156,183. Giesecke, C. Dec. 20, 1917, [*Convention date*].

Cements, processes for making.—In a process for obtaining sintered balls or lumps from mixtures of waste gravel, grit or the like, with fine fuel such as coke dust, the mixture is supplied with 30—35 per cent of water and is treated in an extrusion press. The extruded wet masses are heated in a shaft furnace to sintering temperature.

156,416. South Metropolitan Gas Co., and **Hollings, H.** Jan. 21, 1920.

Refractory substances containing fireclay.—In the manufacture of gas-fire radiants a mixture of a suitable clay and a vegetable or animal fibre, such as hair (tanner's waste), flax, hemp, cotton, jute, or the like, is moulded to the required form and burnt in the usual manner. The fibre used is first washed with dilute hydrochloric acid and water to remove any impurities containing iron.

156,447. Rollason, A. April 21, 1920.

Refractory substances containing magnesite, dolomite, &c. — A refractory material for lining furnaces is made by roasting at about 1800° C. magnesite or dolomite in granular form with from 5 per cent to 10 per cent of basic slag in an internally fired rotary kiln having a basic lining. From the kiln the material passes into an annealing-chamber, where it is allowed to cool slowly.

156,527. Siemens - Schuckertwerke Ges. Oct. 20, 1917, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*].

Compositions containing bituminous materials.—A plastic insulating composition comprises Mexican or other bitumen, cellulose derivatives such as nitrocellulose, acetylcellulose, viscose, or esters of these compounds, and camphor or camphor substitutes, e.g. tetraline, which however may be omitted if the bitumen is soft. The composition is preferably vulcanized, for example by heating to 125° for 10 minutes.

156,547. Jourdan, F., and **Blanc, G. A.** Jan. 5, 1920, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*].

Cements, compositions for.—Leucite or leucitic rocks, isolated from extraneous materials, are finely ground and agitated in an autoclave at elevated temperatures, with a milk formed from lime, magnesia, or other strong base. The potash is dissolved and the resulting mud, on heating, forms a cement.

156,551. Maier, E. July 29, 1918, [*Convention date*].

Stone, hardening or preserving.—Reinforced concrete building elements, composed of Portland or Roman cement or natural hydraulic binders such as puzzuolana, are hardened by treatment with steam under a pressure of 9 atmospheres. As an example, a reinforced block is subjected three days after moulding to steam at a pressure of 9 atmospheres for 9 hours, and is then ready for use.

Reference has been directed by the Comptroller to Specification 23680/02.

156,621. Winkler, K. Oct. 24, 1918, [*Convention date*].

Concretes &c.—A waterproofing composition to be added in the proportion of about 1 kilo to 12 kilos of the gauging water for mortar, cement, concrete, &c. is made by mixing about 3 parts 10° Bé potassium silicate solution with 2—2½ parts freshly made calcium chloride solution of 7—10° Bé., and mixing the colloid thus produced with 8—15 per cent of its weight of dust-fine pure carbonate of lime, and 5—8 per cent fat or oil emulsified with 7—18 per cent potassium hydrate solution. Carbide mud may be used for carbonate of lime, chalk is unsuitable. The properties of the mortar &c. may be varied by altering the proportions of the constituents of the waterproofing composition. Thus, quick setting is obtained

by increasing the proportion of calcium chloride, rapid hardening and watertightness by increasing the potassium silicate, and improved adhesion by increasing the potassium hydrate. The proportion of fat or oil and lime carbonate must never be increased. To prevent efflorescence, decomposition, cracking, &c. when the original proportions are departed from, an addition of a small percentage of one or more of the following may also be made, viz. sugar, potassium bichromate, chromate, ferrocyanide, chloride, or chlorate, bauxite or manganese dioxide. Potassium chloride and chlorate are not suitable as additions when there is an excess of potassium silicate.

156,671. Fohr, C., and **Kleinschmidt, E.** Dec. 18, 1916, [*Convention date*].

Compositions containing bituminous or resinous materials.—Sand for cores is combined with 2—3 per cent of pitch, asphalt, or other bitumen, which has been atomized by scattering-nozzles, or separated as a fine powder by wind-sifting.

156,675. Lorival Manufacturing Co., Ltd., (Assignees of *Bruhat, J.*). Nov. 4, 1916, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*].

Compositions containing phenol-aldehyde condensation products.—An initial liquid phenol-formaldehyde condensation product is prepared by the reaction of phenols (phenol, cresols, naphthols) with anhydrous polymers of formaldehyde (para-formaldehyde, trioxymethylene) in the presence or absence of alkaline catalysts; this liquid product is converted into the final insoluble infusible product by addition of liquid organic acids (lactic, acetic, formic, ricinoleic, sulphoricinoleic, &c.) or solid organic acids such as oxalic, tartaric, citric, gallic or tannic acid, dissolved in a liquid organic acid together with small amounts of a mineral acid (hydrochloric, oxyacids of sulphur or phosphorus, boric, &c.); the conversion takes place in the cold, or more rapidly on heating. The initial liquid product with the acids added can be used as a varnish, or for glueing together laminæ of wood, wood and fabric, &c. Fillers, such as pumice, sand, glass, emery, asbestos, insoluble mineral bodies, paper pulp, sawdust, cotton, &c. may be incorporated in the mass, or its properties varied by addition of gelatine, glue, naphthalene, rubber, &c. Vessels resisting chemical reagents can be made from the final product, or laminæ or plates thereof can be glued on surfaces by means of the initial product varnish.

156,750. Chemische Fabriken Worms Akt.-Ges. March 31, 1919, [*Convention date*].

Compositions containing bituminous or resinous materials.—Cores are made as described in Specification 156,671 except that other binding-agents are added to the finely divided pitch or the like, for example loam, clay, kaolin, puzzuolana, Portland or magnesia cement, lime, gypsum, alkalies, blast-furnace dust, brown coal, peat, or lignite in order to prevent the pitch from caking and reduce the quantity necessary.

156,896. Howse, G. H. Oct. 13, 1919.

Compositions containing phenol-aldehyde condensation products.—Solutions of resinous phenol-aldehyde condensation products, suitable for use in making insulating-materials &c., are prepared by dissolving the resins in benzyl alcohol with or without the addition of nitrobenzene. Any one or more of the following materials may be added to the solution:—aliphatic oxygen compounds (such as ketones or methylated spirit), aliphatic hydrocarbons, or their halogen compounds, benzene, xylene, nitronaphthalenes, chlornaphthalenes, aromatic acids, or their salts or esters, e.g. benzene sulphonic acid, naphthalene sulphonic acids, or naphthionic acid, pitches, bitumen, nitrated or sulphonated fatty acids or oils, unsaturated fatty acids, drying oils, linseed, tung, fish, lumbang, or perilla oils, resins, e.g. shellac, gums, rubber, waxes, cellulose, nitrocellulose, casein, dyes, pigments, or fillers.

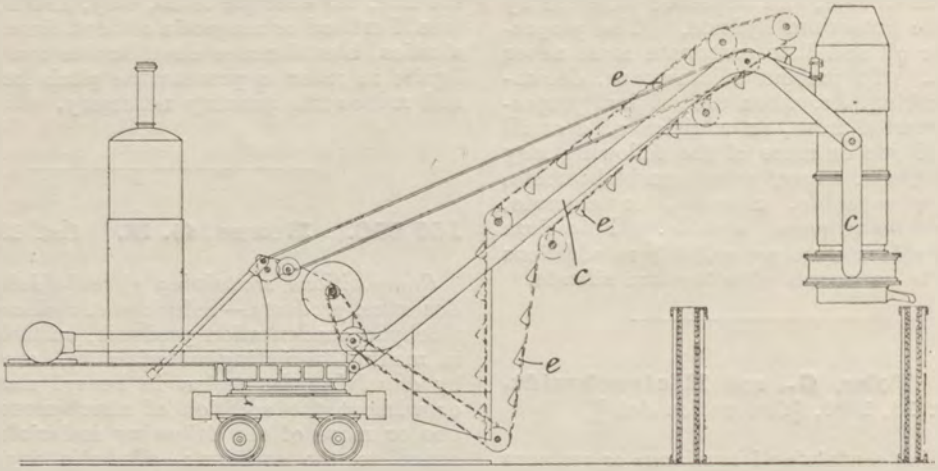
157,747. Lohmann-Metall Ges, (*formerly* Voigtländer & Lohmann Metall Fabrikations Ges.). Jan. 2, 1914, [*Convention date*].

Stone, artificial.—Blocks, tools, dies, bearings, and other articles are made of tungsten or molybdenum carbides or mixtures of them by finely grinding the fused carbide, moulding it to the desired form in carbon moulds, and then heating nearly to the melting point for a sufficient length of time to cause a new process of crystallization throughout the mass. The heating is effected without passing an electric current through the material.

157,749. Lohmann-Metall Ges., (*formerly* Voigtländer & Lohmann Metall Fabrikations Ges.). Jan. 29, 1914, [*Convention date*]. *Addition to* 157,747.

Stone, artificial. — In the production of tools and other articles of tungsten or molybdenum carbides or mixtures of them as described in the parent Specification, the powdered carbide is moulded in iron moulds, and the heating to near the melting-point is effected in a reducing atmosphere.

158,356. Whitelegge, J. G. Nov. 4, 1919.



Stone, artificial. — Material for use in casting walls of buildings in situ or for casting blocks is obtained from a mixture of ash or clinker, clay, shale, coal, and coke melted or fused with ordinary glass flux in a portable cupola furnace, the heat for which is obtained from the carbonaceous portion of the ash. The cupola may be suspended from the end of a crane jib which carries a conveyer *e* for the ash and an air conduit *c* for the compressed air to the cupola.

158,390. Baylor, H. D. Nov. 8, 1919.

Cements, Portland, &c., treating after manufacture.—Quick-setting cements are converted into slow-setting by the addition of 10—17 per cent of quick-lime and sufficient water to hydrate the lime produced by the decomposition of the aluminates, and also the added lime, the mass being agitated to prevent setting during the hydration, and finally re-ground. In an example, 1650 lb. of hydraulic cement is ground with 200 lb. of lime, the mixture is agitated, and about 150 lb. of water is added. When the reaction is complete, the mass is re-ground.

158,546. Bates, L. W. Feb. 6, 1920, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*]

Compositions containing oily materials and carbon.—The stable composite of coal dust &c. in a liquid hydrocarbon usually known as "colloidal fuel" is separated into a paste and into a liquid containing only a small proportion of suspended particles by centrifuging, by reducing the viscosity of the liquid, and allowing the suspended particles to settle out, or by filtration through cheese-cloth, linen, or filter paper, or by any combination of these processes. The necessary reduction in viscosity may be effected by heating, or by adding benzol, alcohol, or other suitable liquid. The liquid may be used mixed or not with alcohol or gasoline, as a fuel for internal-combustion engines, and the percentage of molecular and colloidal coal may be increased by stabilizing further coal dust in it and, if required, again separating the larger particles. The paste, thinned or not with liquid hydrocarbon, may be used as a fuel, or it may be briquetted, or be mixed with hardening substances to form a road compound.

158,674. Crosbie, M. Talbot-. Nov. 7, 1919.

Compositions containing bituminous and siliceous and calcareous materials.—A cement for road-making, roofing, &c. consists of approximately 55 per cent of purified chalk such as whiting mixed with 45 per cent of bitumen &c. heated to about 150° C. A small quantity of linseed or like oil may be added. The cement may be mixed with sand before use, suitable proportions being 23.5 per cent cement and 76.5 per cent sand.

159,100. Smith, C. G. March 17, 1920.

Ornamented artificial stone.—Plaster of paris shades, globes, and reflectors used in indirect lighting, and fibrous plaster cornices, proscenium fronts, and other decorative architectural work

are rendered translucent by permeation with paraffin wax, collodion, or other suitable substance. In the method described, the castings are heated to 180° F. and are then dipped in or coated with melted paraffin wax to which preferably an eleventh part of alcohol is added. In order to produce an effect resembling alabaster or marble, the plaster may be reinforced by fabric, such as muslin of open texture, arranged in irregular folds or creases. Holes are cut in the fabric so as to leave irregular patches without reinforcement. The fabric or the permeating-material may be coloured, and decorative designs may be painted on the surface of the castings. Reflecting-surfaces are usually coated thinly with white enamel. The Provisional Specification states that cellulose solution may be used as the permeating-substance.

159,239. Hughes, C. M. C., Brown, A. E., and **Hill-Jones, Ltd., T.** Sept. 13, 1919.

Compositions containing bituminous materials.—In the manufacture of bricks, building and paving blocks, slabs, tiles, &c., the component materials in a granular or powdered state, together with a filler, if necessary, and a binder such as bitumen or pitch, are mixed cold or at a temperature below that required to flux the binder, with oil, tar, water, or a chemical solution into a sufficiently plastic state to enable them to be moulded into shape by pressure. The moulded blocks &c. are then heated first to dry out the water, and subsequently, to a greater degree, to flux the binder. Both the filler and the binder should be ground in the dry state before being mixed with the other materials. The drying may be carried out in a tunnel drying arrangement, which may be heated by the products of combustion of a coke furnace. The filler, the bitumen or pitch, and the oil and tar, where such are used, may be melted together, then allowed to cool and harden, and be ground into a finely divided state before being mixed with the main body of the material. A suitable composition is 60 parts by weight of clinker or slag, 27 parts of limestone dust, 10 parts bitumen, and 3 parts creosote oil.

159,737. Osmosis Co., Ltd., Laurie, D. Northall-, and **Ormandy, W. R.** Jan. 22, 1920.

Refractory substances containing clay &c.—Refractory articles are made by firing specially purified china clay without a flux at temperatures below 1500° C. The clay is purified by the methods set forth in Specifications 2379/11, [*Class* 82 (ii), Washing granular &c.], 3364/11, [*Class* 41, Electrolysis], 27930/11, [*Class* 82 (ii), Washing granular &c.], 27931/11 and 28185/11, [both in *Class* 41, Electrolysis], and 14235/12; for example, it is made into a slip with a dilute electrolyte such as caustic soda or sodium silicate, allowed to stand for about 24 hours, and is either subjected to electro-osmosis, or precipitated by a coagulating-agent such as aluminium sulphate and reconverted to the sol condition by treatment with an alkali. The purified clay is made into a slip to which a grog made of vitrified china clay may be added to minimize contraction on firing.

159,865. Rebuffat, O. Feb. 27, 1920, [*Convention date*].

Refractory substances containing silica &c.—Bricks and other refractory articles composed chiefly of silica are made from a mixture containing a small proportion, for example 0.45 per cent, of phosphoric, tungstic, molybdic, boric, or other acid stable at high temperatures, or a salt of such acid. The bricks are baked at a temperature of 1300—1450° C. to convert the silica into modifications of low specific gravity, such as tridymite.

Reference has been directed by the Comptroller to Specifications 74/06 *and* 3353/06, [both in *Class* 70, India-rubber &c.], 113/09, 1925/10, 18439/14, *and* 108,619.

159,956. Harden, F. J. Dec. 4, 1919.

Compositions containing bituminous and siliceous materials.—An acid-proof insulating-material which can be rolled or moulded is made by mixing asphaltum, coal-tar pitch, sulphur, paraffin wax, iron or other silicate, finely-divided carbon, and an inert body such as pumice.

160,482. Claessen, C. Oct. 17, 1919.

Compositions containing phenol-aldehydes.—A resinous substance for use in the manufacture of asphalt is obtained during the extraction of cellulose from wood &c. by heating with phenols and a catalyst such as hydrochloric acid.

160,801. Locke, J. A., (Assignee of *Hathaway, C. S.*). March 24, 1920, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*]. *Drawings to Specification.*

Compositions containing bituminous, fatty, oily, resinous, calcareous, and siliceous materials.—A caulking composition consists of soya bean oil and resin, water gas tar, menhaden oil, sodium silicate solution, hydraulic cement, and asbestos. A pasty insulating composition for making blocks and joints consists of the foregoing materials with the addition of resin and resinate of manganese.

160,974. Collingwood, F. J. Jan. 13, 1920.

Concretes.—" Devon red earth " derived from red sandstone or the conglomerate associated therewith, or mixtures of the two is screened to remove stones, mixed with lime or cement, moistened with water, and moulded into bricks by manual or mechanical power and allowed to set. The bricks may have a facing of waterproofing material. Walls may be built in situ by ramming the composition between shuttering.

161,061. Monnoyer, M., and **Kirkpatrick, H. T. E.,** (*trading as* Soc. La Rhoubenite). March 17, 1920.

Concretes &c.—A road covering and like composition of the kind described in Specification 4349/14, [*Class* 70, India-rubber &c]., consists of concrete and 0.6—1.0 per cent of cork, sawdust, or other fibrous material impregnated with tar and bitumen. In an example, 8—12 kg. sawdust, 6—9 kg. tar, and 0.120—0.180 kg. of rock asphalt bitumen is added to a concrete consisting of 400—500 kg. of cement, 600 kg. of sand, 1200 kg. of stone, and water.

161,671. Wright, T. H. Jan. 13, 1920.

Compositions containing bituminous and siliceous, calcareous, &c. materials.—Tar macadam for roads comprises granite or other road metal coated with tar and subsequently mixed with a binder consisting of crushed or powdered material such as granite, limestone, sand, dust, stone or slag, mixed with creosote oil. The gauge of the powdered material may vary from $\frac{1}{4}$ inch to the consistency of flour. The ingredients are preferably mixed in the proportion of one ton of powdered material to six gallons of oil, and the powdered material is preferably heated to 100° Fahrenheit before adding the oil. In making macadam, the proportion of binding material to tarred road metal is $7\frac{1}{2}$ per cent to $92\frac{1}{2}$ per cent when metal of $2\frac{1}{4}$ in. gauge is employed, the proportion of binder being increased for finer gauges of road metal. The binder is added just before the completion of the tar-coating process, preferably in a batch mixer, although a continuous mixer, or hand mixing, may be employed.

162,007. Badder, H. C. Oct. 22, 1919.

Compositions containing bituminous or resinous material.—For decorating and weatherproofing the surface of concrete or brick walls, roofs, floors, and ceilings, or separate tiles or blocks, finely ground silica, to which ground glass may be added, is saturated with paraffin wax or a melted mixture of paraffin wax, fossil resins, and asphalt, and the material when cool is ground and mixed with Portland cement and water, applied to the surface, and heated by means of a blow lamp or other means after it has set. The silica may be white or coloured, and mineral or earth colours may be mixed with the wax.

162,318. Bayer, E. C. Nov. 17, 1919.

Concretes; stone, artificial.—Diatomaceous earth is mixed with feldspar or other siliceous mineral and the mixture is heated to about 1200—1300° C. until the feldspar is fused or softened and forms a coating round the particles of diatomaceous earth. The materials may be mixed with a little water and formed into small pieces or into a block which is broken up after being heated. The product forms a light aggregate for concrete and may be used as a heat-insulating composition.

162,483. Wallace, C. W. March 11, 1920.

Stone, artificial.—Artificial stone products are obtained from clayey material, such, for example, as the white clayey material found near Molo in British East Africa, by introducing shaped or unshaped pieces of the clay directly into the flames of a furnace, heating throughout, and effecting sudden cooling by plunging into water &c.

162,683. Crawford, W. W. Dec. 1, 1919.

Compositions containing common earth &c. and cement &c.—In the manufacture of bricks, building blocks, &c., common earth, soil, clay, &c. is burnt in an oxidizing atmosphere at a temperature of about 1500° C., for example in a furnace having oil burners, as described in Specification 2860/15, [*Class* 75 (i), Burners &c.]. The burnt material is mixed with a relatively small quantity of Portland or like cement previously dehydrated preferably at about 130° C., moistened with preferably warm water, and moulded under pressure preferably at least 150 lb. per sq. in. The blocks are then immersed in cold water for several hours and air-dried at a temperature slightly above freezing-point.

163,512. Wilkinson, A. March 1, 1920.

Stone, artificial; stone, colouring.—In the manufacture of building blocks &c., composed of pieces of stone, slag, brick, or other hard material held together by a cement-like binder, the mould is lined with a granular substance, such as sand, in which the hard objects are partly embedded before the binder is run in, so that they stand out in relief on the finished block. Part of the sand is taken up by the binder, and ornamental effects are produced by using suitably coloured material. The hard objects, if of unpleasing appearance, may be coated before use with the binding-agent, which may be, for example, a mixture of cement and fine sandstone.

163,578. Gilman, F. A., and **Lawson, M.** April 26, 1920. *Drawings to Specification.*

Compositions containing plaster of paris, whiting, cement, &c.—Receptacles for cooling butter, milk, and like substances are made by moulding a porous plastic composition, consisting of calcium sulphate, in the form of plaster of paris, three parts, calcium carbonate, in the form of whitening, one part, Portland cement or other binding-agent, one part, and colouring-matter such as raw sienna.

163,731. Dale, D. July 27, 1920.

Concretes.—Building-materials such as slabs, bricks, &c. are made from a mixture of cement, sand, and sawdust or wood-pulp. Suitable proportions are 1 part of cement, 1 part of sand, and 3 parts of sawdust. The cement is added to the other ingredients in three equal portions, and after the first two additions the mixture is treated with water and then allowed to become nearly dry. After the final addition of cement sufficient water is added to produce a suitable consistency. The sawdust or wood-pulp may be partly or wholly replaced by powdered clay or similar earthy material, and feathers, straw, or other fibrous material may be added if desired. The bricks may be laid in position without mortar while in a plastic condition.

Reference has been directed by the Comptroller to Specifications 5737/92, 21295/95, [*Class* 87, Moulding &c.], *and* 24224/05, [*Class* 70, India-rubber &c.].

163,746. Alexander, H. Jan. 12, 1920.

Compositions containing cement and fibres. — Sheets, blocks, tiles, and the like for building or other purposes are composed of a mixture of cement, flax fibre, a small amount of asbestos, and either silica sand or pumice. Specifications 27800/09 and 9792/13, [both in *Class* 70, India-rubber &c.], are referred to.

164,299. Halverson, H. A., and **Samins, N.** June 4, 1920, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*].

Compositions containing infusorial earth, plaster, lime, chalk, &c. — In combustible wicks for oil burners are made from a composition consisting essentially of infusorial or diatomaceous earth mixed with a binder, moulded to the desired shape, and kiln dried. A suitable composition consists of 4 parts of infusorial earth, preferably calcined, 2 parts of calcium oxide or carbonate, and 1 part of plaster of paris, all finely divided and thoroughly mixed in a wet state.

164,319. Deussing, P. June 7, 1920, [*Convention date*].

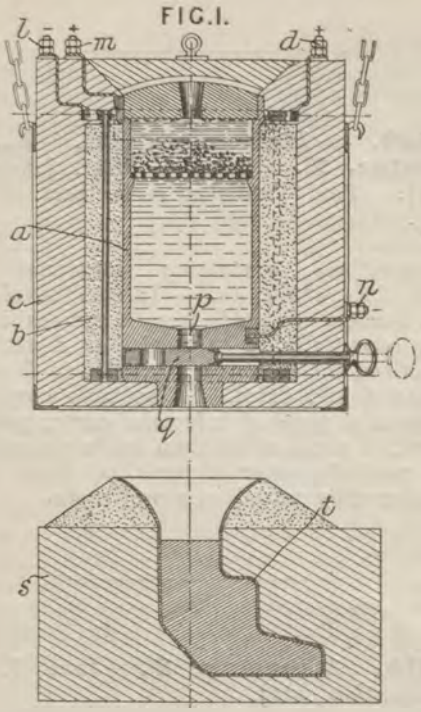
Stone, artificial or imitation.—Artificial meerschaum consists of Hallic earth, raw Meissner clay, whitening, and quartz dust. The Hallic earth may be replaced by roasted Meissner clay, and feldspar, magnesia, or potash may be added to increase the flexibility of the mixture. The ingredients, after being separately pulverized, are ground together with water into a semi-liquid paste, which is cast in dry gypsum moulds. After a few minutes, the still liquid portion is removed from the mould, leaving a hollow casting, which is dried in the mould, roasted, and oiled or waxed. An example of proportions is 30 parts by weight of Hallic earth, 10 of Meissner clay, 4 of whitening, and 8 of quartz dust, to which 50 parts of water are subsequently added.

164,666. Curtis, C. F. Oct. 13, 1920.

Concretes.—A composition suitable for flooring, paving, &c. consists of 3 bushels of coke breeze, 2 of sand, 3 of wood dust, 1 of plaster of paris or a similar setting composition, and 6 of Portland cement, with 5 oz. of alum, and colouring-matter according to requirements. The wood dust and plaster of paris are first mixed together and the coke breeze, sand, and cement are also mixed. These two mixtures are then incorporated and gauged with water, in the last 5 gallons of which the alum is dissolved. The composition may be either applied with a trowel or moulded into tiles &c.

165,051. Roiboul, M. de. June 15, 1920, [*Convention date*].

FIG.I.



Stone, artificial; refractory substances.—Refractory minerals belonging to the silica or alumina group such as sand, rock-crystal, quartz, alumina, corundum, and the like are fused in a crucible *a* made of refractory oxide such as oxide of zirconium, of yttrium, of thorium, of erbium, or mixtures of such oxides. The crucible is surrounded by an insulating wall *b* enclosed in a casing *c* of refractory bricks. Current is admitted at *d* and passes to a semicircular ring connected by vertical carbon rods to a conducting ring at the lower part of the furnace, this ring being connected by vertical carbon rods to a second semicircular ring in connection with the terminal *l*. The current passing through the carbon rods raises the temperature to 500° C. The electric circuit is then completed through the crucible between the terminals *m*, *n*. The charge, which fuses betwen 1800° and 2700° C., flows through a taphole *p* controlled by a slide *q* into a mould *s* of ordinary sand faced with refractory oxide *t*. The castings may be cooled quickly by exposing the mould to the air or slowly by exposure to progressively reduced temperatures in an electric furnace or by enclosure in a heat insulator. The castings are stated to be applicable for electric insulators and gems and as substitutes for optical or ordinary glass, for porcelain, faience, bricks, terracotta, ferroconcrete, and stone. As an example the following composition for the crucible is given :—60 per cent of zirconium oxide, 15 per cent of yttrium oxide, 5 per cent of thorium oxide, and 20 per cent of erbium oxide.

165,052. Roiboul, M. de. June 16, 1920, [*Convention date*]. *Drawings to Specification.*

Refractory substances containing oxides of zirconium, yttrium, thorium, and erbium.—The body of an electric furnace is composed of refractory oxides, for example zirconium oxide 60 per cent, yttrium oxide 15 per cent, thorium oxide 5 per cent, erbium oxide 20 per cent.

165,758. Eilertsen, L. July 2, 1920, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*].

Compositions containing phenol-aldehydes.—A material for dental and other purposes is prepared by first condensing phenol or a derivative with trioxymethylene or other solid body capable of liberating formaldehyde in the presence of a little alkali to yield an initial condensation product; then incorporating a body such as phosphoric anhydride to absorb the water of a later addition; next adding a sulphur-containing-salt, such as sodium or potassium bisulphite, for the purpose of inhibiting oxidation; and finally hardening by means of an aqueous solution of an acid, particularly hypophosphorous acid, but also sulphuric acid or hydrochloric acid, or by means of a mixture of fuming sulphuric acid with crystalline acetic acid. The acid treatment may be dispensed with when an acid anhydride is the water-absorbent added; amyl acetate or zinc sulphide may be added to the initial condensation product to give a light colour.

166,012. Bell Bros., Ltd., and **Kirby, M. R.** May 13, 1920. *Drawings to Specification.*

Concretes.—Slabs for walls are made of the refuse of coke breeze washeries.

166,180. Nagel, O. H. L., and **Möller, A.** Jan. 18, 1918.

Compositions containing modified fats and oils.—Packing which is applicable for preserve tins is made by thickening a vegetable oil by heat, an electric current, or by exposure to light or air. The oil may e.g. be maintained for from half an hour to three hours at a temperature of from 250° to 300° C., and thickening substances such as asbestos or other fibrous substances, calcium or magnesium compounds, cork, resins, or wax &c. may be added. Rings or discs &c. may be cut from the packing.

166,307. Sanders, A. J. March 12, 1920.

Stone, colouring.—Recently-formed artificial stone, composed of Portland cement, mortar, or asbestos cement mortar, is impregnated in succession with solutions of two or more metallic salt, which react with one another and with the soluble component of the stone to form a coloured precipitate. Suitable salts are lead acetate followed by sodium chromate, or potassium ferrocyanide followed by copper chloride.

167,138. Winkler, K. July 26, 1920, [*Convention date*].

Concretes &c.—Cements, mortars, concretes, &c. are rendered waterproof, adhesive, and quick-setting by being gauged with a calcium chloride solution of about 23° Bé. Preferably from ¼ to 3 per cent of calcium nitrate, strontium nitrate, magnesium nitrate, manganese dioxide, manganese oxide, barium peroxide, chromic oxide, oxide of antimony, butter of antimony, manganese borate, or sugar, or a mixture of these substances, is also added to the cement. The action of the metallic chloride is further intensified if from 2 to 7 per cent of coal cinders, calc-spar, feldspar, bauxite, heavy spar, or fluor-spar is incorporated with it during its manufacture from the corresponding carbonate or oxide.

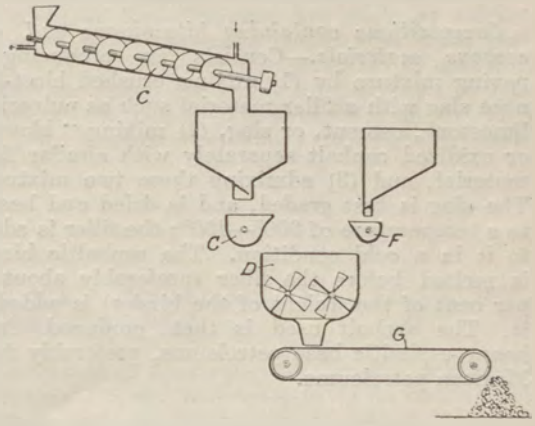
The Specification as open to inspection under Sect. 91 (3) (a) comprises also the use of at least one metallic chloride soluble in water, preferably dissolved in the gauging water. This subject-matter does not appear in the Specification as accepted.

167,235. Mayer, F. D. April 28, 1920.

Compositions containing vulcanized oils.—Slaked lime is used as a hardening-ingredient in a composition containing a vegetable oil, preferably sunflower-seed oil, and sulphur chloride. The oil and slaked lime are first mixed with a portion of the sulphur chloride, and after standing 24 hours the remaining portion is added, while the mixture is agitated. "Soap oil," which is a mineral oil boiling at about 270° F., may be added to delay vulcanization until the product has been moulded, and colouring-matter may be added.

167,341. Alexander, A. E., (*Blackstone International Corporation*). May 26, 1920.

Compositions containing bituminous materials.—In making a bituminous composition for roads &c. of the class in which the aggregate is first covered with a thin layer of hard bitumen so that it can be transported &c. without the fragments adhering, a softer bitumen being added when the composition is to be used, the hard bitumen before being mixed with the aggregate is caused to froth by the addition of small quantities of water. The bitumen, which may be natural asphalt, coal-tar pitch, petroleum residues, &c., is from 2—4 per cent by weight of the aggregate, according to the fineness of the latter, which may



be crushed stone, gravel sand, dry marble dust, ashes, shell marl, &c. In the apparatus shown, the mineral to be coated is dried by hot air whilst passing through the conveyer *c*. The liquefied bitumen and the dried mineral are fed into a mixing-tank D, through measuring-receptacles F, C, respectively from which they pass on to a travelling band G to the desired place.

167,520. Bultemann, A. F. E. March 2, 1920.

Compositions containing bituminous or resinous materials.—A built-up insulator of the high-tension type is constructed by cementing its component parts with a wet mixture of a hydraulically-setting cement with finely ground asphalt and heating after the mixture is set. Preferably 75 per cent of Portland cement and 15 per cent of ground asphalt are used with an addition of a pulverous or fibrous filling substance such as asbestos or ground quartz.

167,757. Kambach, H. Aug. 14, 1920, [*Convention date*].

Compositions containing bituminous and siliceous &c. materials and oils.—Small quantities of a mixture of drying and non-drying oils are added to compositions consisting of pitch, tar, tar oils, and, optionally, earthy substances used for caulking, filling joints in wood or other pavements, painting wood, insulating and like purposes, to increase the resistance to high temperature and

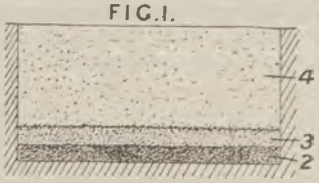
water, and also the pliancy and toughness. Suitable proportions are 75 parts by weight of pitch, 10 parts tar, 5 parts anthracene oil, and 10 parts of a mixture of linseed and colza oil.

167,997. Jackson, W. J. Mellersh-, (*Bitoslag Paving Co.*). Dec. 23, 1920.

Compositions containing bituminous and calcareous materials.—Consists in producing a paving mixture by (1) mixing crushed blast-furnace slag with a filler material such as pulverized limestone, cement, or slag, (2) mixing "blown" or oxidized asphalt separately with similar filler material, and (3) admixing these two mixtures. The slag is first graded, and is dried and heated to a temperature of 350°—450°; the filler is added to it in a cold condition. The asphaltic binder is melted before the filler (preferably about 35 per cent of the weight of the binder) is added to it. The asphalt used is that produced from heavy asphaltic base petroleums, preferably from Mexican petroleums.

168,261. Carborundum Co., Ltd., (*Linbarger, S. C.*). Sept. 25, 1920.

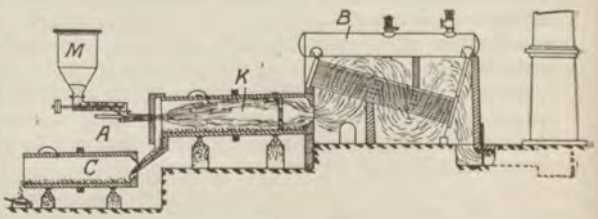
FIG. 1.



Refractory substances containing fireclay and silicon carbide.—Firebricks and other refractory articles having a body portion 4 consisting substantially of fireclay are provided with a facing portion 2 containing more than 50 per cent of silicon carbide, and one or more intermediate layers 3 containing silicon carbide in proportions decreasing from the facing layer inwards. In making the articles, the different compositions are successively introduced into the mould, the surface of each layer being roughened before the addition of the next layer.

168,406. Fujiyama, T. May 31, 1920.

Cements, Portland, processes for making. — Lime or substances containing lime and, if necessary, other mineral substances such as quartzite, ganister, or the like are mixed with pulverulent fuel in sufficient quantity to combine with the ashes in the fuel during its combustion in a furnace and produce Portland cement clinkers. The Figure shows a boiler furnace in which the above method of burning fuel is carried out. The lime and, if necessary, other mineral substances are added to the fuel in the hopper M and the mixture is fed to the rotary combustion chamber K



by blast from a pipe A. The cement clinkers formed in the chamber K travel downwardly to a rotating cooling device C and the hot gases pass to the boiler B.

168,774. Vaughan, J. Aug. 25, 1920.

Compositions containing lime and whitening.—A cement for joining metal or wood or as a substitute for putty consists of 1 lb. of whitening, ½ lb. of spent calcium carbide, and 1 gill of copal varnish. The proportions may be varied, and for carpenters' use the mixture is thinned with copal varnish to the consistency of glue.

168,847. Winkler, K. Aug. 30, 1920, [*Convention date*].

Concretes and mortars; cements, treating after manufacture.—Cement, mortar, and concrete are rendered waterproof, their adhering power is increased, and their setting and hardening accelerated by the addition to the gauging water of potassium silicate in quantities containing 4—20 parts of SiO_2 to 100 parts of the dry cement or the like. The action of the potassium silicate may be supplemented by the addition to the solution, or in some cases to the dry cement, of small quantities of one or more of the following substances:—calcium nitrate, strontium nitrate, antimony oxide, potassium chromate or bichromate, potassium ferro- or ferri-cyanide, manganese carbonate, alkali, particularly potassium hydroxide, calcium carbonate, borax, bauxite, coke derived from tar, and sugar.

169,079. Jackson, W. J. Mellersh-, (*United States Asphalt Refining Co.*). July 30, 1920.

Compositions containing bituminous and siliceous &c. materials. — Electrically precipitated dust from the floating discharge of mineral-reducing plants such as smelting plants, ore and

rock crushers, milling plants, is added to bituminous material to produce a mixture for use in making paving and like compositions. The dust is of such an impalpable nature that no appreciable precipitation takes place. Slate dust is specially suitable, but calcareous, argillacious, &c. dust may be used, undesirable elements being removed by calcining or other means if necessary. At least one or two per cent of the dust should be added, but the quantity may be increased so long as the continuity of the bitumen &c. is not interrupted.

169,451. Metropolitan - Vickers Electrical Co., Ltd., (Assignees of *Weber, H. C. P.*). Sept. 24, 1920, [*Convention date*].

Compositions containing phenol-aldehyde condensation products.—Compositions comprising a fibrous base containing a carbohydrate such as cellulose, impregnated with a condensation-product such as phenol-formaldehyde are made by parchmentizing the fibres and treating the product with the reacting substances successively or simultaneously so that the condensation takes place within the fibres. The usual parchmentizing-agents may be employed, but caustic soda, sodium or ammonium zincate, stannates, stannites, antimonates, aluminates, titanates or similar substances are preferred as they act as catalysts for the subsequent condensation. In one example of the process, a roll of paper is led through a 20 per cent solution of caustic soda containing 10—15 per cent of sodium chloride, then through a bath of phenol, and then through a chamber containing formaldehyde vapour. The paper is next pressed between hot rollers to cause partial condensation, after which the parchmentizing-agent may be washed out before the reaction is completed by further heat and pressure. The phenol may be replaced by cresol and other homologues, and the formaldehyde by trioxymethylene, hexamethylene tetramine, or other substances having an active methylene group. The subject-matter of Specifications 28009/07, 1922/08, 28155/10, 2098/13, and 121,301 is disclaimed.

The Specification as open to inspection under Sect. 91 (3) (a) states that other carbohydrates, such as sugar and starch, may be substituted for cellulose. This subject-matter does not appear in the Specification as accepted.

169,807. Wade, H., (*Bombrini Parodi-Delfino*). July 5, 1920.

Cements, Portland and Roman, treating after manufacture.—A cement mixture for use in concretes resisting the action of sea-water or sulphated water comprises cement of the kind described in Specification 170,063 with the addition of finely-ground puzzuolana, trass, basic slag, or the like in quantities sufficient to absorb the lime liberated during the setting of the concrete.

169,808. Wade, H., (*Bombrino Parodi-Delfino*). July 5, 1920.

Cements, Portland and Roman, materials and compositions for.—Cements are made by calcining mixtures of limestone and leucite, both free from iron, to which small quantities of metallic oxides are added for colouring purposes. The potash of the leucite is recovered from the kiln gases by condensation and settling in a dust-chamber.

170,001. Driesmans, H. Oct. 7, 1920, [*Convention date*].

Compositions containing plaster &c., gelatinous materials &c., and fibres.—A paste for coating flat surfaces and adapted to receive coloured designs is composed of zinc white, chalk, plaster, cement, asbestos, glue, cork powder, standoil, gold size and turpentine.

170,063. Wade, H., (*Bombrini Parodi-Delfino*). July 5, 1920.

Cements, Portland and Roman, materials and compositions for.—A slow-setting cement free from calcium aluminates and ferrites is prepared by adding ferric oxide to the usual ingredients of Portland cement so that the ratio of ferric oxide to alumina is between 1 and 1.563 to 1. Silicious sand is also added to restore the ratio of silica to sesquioxides to the normal value. The materials are treated in the usual manner.

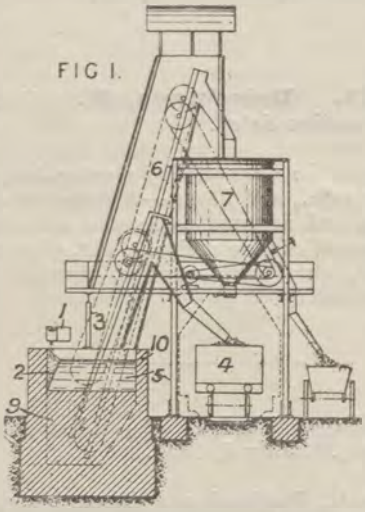
170,260. Winkler, K. Oct. 15, 1920, [*Convention date*].

Cements, treating after manufacture; concretes and mortars.—Mortar, cement, and concrete are rendered waterproof and quicksetting, and their hardness and adhering power are increased, by being gauged with potassium hydroxide solution of 10—12 Bé. or of 36—40 Bé. Alternatively, the solution may be made from a mixture of potassium and sodium hydroxides containing about 2—7 per cent of the latter substance. The action of the solution may be reinforced by the addition of 5 per cent of coke of tar, 1½—3 per cent of sugar or alkali salts such as Stassfurt salts, or 15 per cent of manganese dioxide, or mixtures of these. These additional substances may be mixed with the solution or with the dry

lime, lime-sand mixture, cement, or concrete mixture.

According to the original form of the Specification, as open to inspection under Sect. 91 (3) (a), the gauging-liquid may be a solution of potassium or sodium hydroxide or a mixture of these having a density of 10—45° Bé. This subject-matter does not appear in the Specification as accepted.

170,287. Schol, C. H. March 7, 1918, [*Convention date*].



Slags, treatment of.—Apparatus for producing porous masses from slag, in which the molten slag falls on to an horizontal or inclined plane 2 from which it flows on to the surface of water in a vessel 5, is fitted with an elevator 3 which removes the porous masses floating on the surface of the water and a second elevator 6 to remove to a silo 7 the heavy granular portions which sink to the bottom of the depression 9. The shoot 1 may be provided with an alternative outlet from which the slag flows straight into the water to yield the granular product only.

170,497. Nielsen, N. P. Oct. 26, 1920.

Cement and concrete surfaces, preserving.—Cement and like articles are impregnated with asphalt, pitch, &c., preferably of mineral origin, by heating the articles and impregnating-material separately to a similar temperature of over 200° C., or between 300° and 500° C. and bringing them into contact by dipping, pouring, immersion under pressure, or the like.

171,094. Pollak, F. Nov. 3, 1920, [*Convention date*].

Compositions containing organic nitrogen derivatives.—Condensation products are obtained by heating urea, thiourea, or their derivatives with formaldehyde or a polymer thereof in the presence of a base, such as ammonia or pyridine. The initial condensation product first produced is a colourless liquid, soluble in water; on further heating, this is transformed into an intermediate rubber-like product, which is insoluble in water and infusible; the final product, obtained by still further heating or by combined heat and pressure, is a hard infusible transparent mass, insoluble in acids and alkalies. The presence of free formaldehyde must be avoided during the conversion of the initial product into the intermediate and final products; that is to say, the formaldehyde should not be present in greater excess than corresponds to three molecules of formaldehyde to one molecule of urea. Filling substances may be added before the hardening treatment, e.g. wood-pulp, asbestos fibre, chalk, plaster of paris, carborundum, or sand. Specification 151,016 is referred to.

The Specification as open to inspection under Sect. 91 (3) (a) describes also the use of hexamethylenetetramine and urea itself as condensing agents. This subject-matter does not appear in the Specification as accepted.

171,144. Jackson, W. J. Mellersh-, (*American Aggregate Co.*). July 30, 1920.

Concretes &c.—An aggregate for concrete or mortar for making bricks, &c., paving &c., or plastering &c. consists of a rough clinker which is not porous, but of cellular formation and produced by heating argillaceous material for a short period, for example, two hours at a suitable temperature, says 1700°—2500° F. Material generally unsuitable for brick-making such as clay, shale, shale rock, mixed or not with gravel, sand, lime, &c. is broken to pass a 4-inch screen and burnt in a rotary or other kiln at a temperature above 1500° F. until it swells. The burning must not be continued until shrinkage of the material takes place. Preferably, the material is subjected to the maximum temperature at the outset, the subsequent burning being conducted at a lower temperature. The material is allowed to cool and is crushed to a convenient size, water being added at this stage if necessary to slake any free lime. The resulting particles are mixed with cement, lime &c. and moulded into bricks &c. or otherwise employed as concrete &c.

Reference has been directed by the Comptroller to Specification 153,030.

171,661. Lilienfeld, L. May 15, 1920, [*Convention date*].

Compositions containing modified oils.—The oily liquids obtained by the process described in Specification 163,271, [*Class* 91, Oils &c.], in which coumarone resins obtained by treating aromatic hydrocarbons with sulphuric acid are freed from low boiling fractions and distilled in vacuo are added to alkyl or aralkyl derivatives of carbohydrates of the type $n(C_6H_{10}O_5)$, such as cellulose, starch, dextrine, &c., or their conversion products or derivatives, to produce masses suitable for the manufacture of artificial leather, photographic and like films, lacquers, varnishes, paints, electric insulation, sizes and dressings for textiles, leather, paper, &c., printing compositions &c., filaments, adhesives, &c. Preferably ethers insoluble in water but soluble in organic solvents are employed. Additions such as cellulose esters, gelatinizing or softening agents such as camphor, phosphoric esters of phenols, oils and the like may be made as desired. Several examples are given of which the following is typical: 30 parts by weight of an ethyl or benzyl cellulose or starch soluble in the oils described in Specification 163,271, [*Class* 91, Oils &c.], are kneaded with 20—35 parts of these oils, preferably at a raised temperature until a uinform paste is obtained. Colouring matter is added and the paste is rolled on to a suitable support in one or more layers to make artificial leather. Small quantities of an organic solvent may be employed to assist the kneading. Specifications 6035/13 and 6387/13, [both in *Class* 2 (ii), Cellulose &c.], and 3370/14, [*Class* 2 (iii), Dyes &c.], also are referred to.

171,803. Speedy, A., and **Crouch, A. P.** Aug. 31, 1920.

Compositions containing phenol-aldehydes. — A phenol-aldehyde condensation product of the plastic class, (e.g. fusible and/or soluble) forms an ingredient of a rubber mixing, the subsequent treatment being such that the condensation product is not rendered non-plastic. In an example, commercial carbolic acid is mixed with an equal volume 40 per cent formalin, and 5 per cent ammonia solution. This is heated until reaction commences, and the temperature is maintained at 80° C. until a plastic mass results. 20 per cent of this mass is mixed with 40 per cent rubber, 7—8 per cent sulphur, and the usual fillers, and the composition is vulcanized for 2 hours at 280° F., at which temperature the condensation product is not converted into the hard infusible variety.

172,004. Deussing, P. Nov. 23, 1920, [*Convention date*]. *Addition to* 164,319.

Stone, artificial and imitation.—The artificial meerschaum described in the parent Specification, and consisting substantially of Hallic earth or roasted Meissner clay, raw Meissner clay, whitening and quartz dust, is modified by the addition of kieselguhr to the ingredients or by substituting kieselguhr for the quartz dust. The composition is moulded, roasted, and finished in the manner described in the parent Specification.

172,087. Tyrer, D. Aug. 24, 1920.

Cements, materials and compositions for; slags, treatment of.—Aluminium ores or aluminous material such as clay, slags or ashes are mixed with lime or equivalent calcium or magnesium compound in such quantity that there are at least 2 molecules of lime &c. for every molecule of silica and in addition at least one molecule of lime &c. for every molecule of alumina. Allowance is made for any base such as potash that may be present. The materials are ground and calcined; a flux such as fluorspar being added if desired. After cooling, the product is digested with a solution of an alkali salt, such as sodium carbonate, in order to extract alkali aluminate, and leave an insoluble calcium or magnesium salt, together with the calcium silicate, as a residue. The latter being free from insoluble alkalies is particularly suitable as raw material for the manufacture of cement. Specification 9662/15, [*Class* 1 (iii), Oxides &c., Metallic], is referred to.

172,295. Tralls, R. Nov. 30, 1920, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*].

Stone, artificial; stone, colouring.—In the production of artificial stone, minerals containing clay, lime, or iron and bituminous materials are smelted by means of their own combustible constituents. The minerals mentioned are various clays, lime formations, and iron oxides which are found in lignite and black coal swamps, turf or moor deposits, or independent deposits such as aluminite, oil schist and certain marls having bituminous constituents. The materials, which are air dried, are placed in a smelting-furnace and heated by the waste combustible gases until incandescent, when the combustible constituents complete the smelting. If necessary, a small proportion of coal &c. may be added and a suitable flux such as lime, gypsum, fluor spar, &c. introduced. For colouring and varying the quality of

the casting, metals, or metallic compounds such as iron oxide, copper sulphate, manganese, cobalt, antimony, zinc, lead, &c. are employed.

173,015. Brown, C. A. H. Aug. 21, 1920. *Drawings to Specification.*

Concretes and mortars, lime.—A composition for making building slabs or for jointing them consists of 20 per cent lime and 80 per cent ground chalk.

173,225. Barrett Co., (Assignees of *Downs, C. R., and Weisberg, L.*). Dec. 22, 1920, [*Convention date*].

Compositions containing condensation products of alcohols and acids.—Resins are produced by heating a polyhydric alcohol with a dibasic, tribasic or polybasic aliphatic acid with or without an anhydride-forming dibasic aromatic acid or a polynuclear aromatic acid. Glycerol, glycol, diglycerol and triglycerol are given as examples of polyhydric alcohols; fumaric, maleic, malic, succinic and tartaric acid as examples of dibasic aliphatic acids; citric acid as an example of a tribasic aliphatic acid; phthalic acid as an example of an anhydrde-forming dibasic aromatic acid; and diphenic, 1.8-naphthalic, benzoylbenzoic, methylbenzoylbenzoic and chlorbenzoylbenzoic acids as examples of polynuclear aromatic acids. The reaction passes through three stages. On gentle heating, there is produced a sticky viscous mass which solidifies on cooling to a fusible solid, soluble in acetone, and rapidly decomposed by cold water; further heating gives a product which is infusible, insoluble in acetone, and is affected by treatment with boiling water for two minutes; still further heating results in the formation of a resin which is insoluble in acetone and other organic solvents, is resistant to cold and boiling water, is unattacked by acids at ordinary temperature, but is decomposed by boiling caustic soda to give the alcohol and the sodium salt of the acid employed in the manufacture or its transformation products. Fillers, such as fibrous asbestos, cotton, wood pulp, talc, rotten stone, wood flour and ground asbestos, may be incorporated at any stage before the final heat treatment is applied and the product may be moulded under pressure before or after the final treatment. Examples are given of the formation of the intermediate and final resins from molecular proportions of glycerol and maleic acid, and of the production of moulded articles containing the final resin from the first or second-stage resins. Specifications 4147/08, [*Class* 2, Acids and salts, Organic &c.], 22449/12, 24060/12, 24254/12, 3271/13, 3566/13 and 22421/13, [*Class* 2 (iii), Dyes &c.], are referred to.

173,237. Westinghouse Lamp Co., (Assignees of *Marden, J. W., and Rentschler, H. C.*). Dec. 21, 1920, [*Convention date*].

Refractory substances.—Coherent masses are formed from oxides of refractory metals such as zirconium, thorium, titanium, uranium, vanadium, tantalum, tungsten, and beryllium, by slowly heating one or more of the oxides in a high vacuum to expel volatilizable constituents and occluded gases and then heating them strongly to cause sintering. The powder, loose or in compressed form, may be heated in a crucible or on a plate of molybdenum or tungsten closely surrounded by a coil through which is passed first direct or low-frequency alternating current, and afterwards high-frequency alternating current. Refractory materials such as zirconia suitable for making crucibles and other articles may be obtained.

173,504. Praceiq, E. Bouchard-. Dec. 24, 1920, [*Convention date*].

Cements, Portland and Roman, processes for making. — Fuel for use in powder form is obtained by mixing finely divided fuels having calcareous ash, for example most peats, with fuels having silico-aluminous ash such as most coals and certain lignites, in such proportions that after combustion the ashes are utilizable after refining as hydraulic cements. Iron oxide is an essential constituent of the mixture.

173,738. Tetlow, T. Jan. 3, 1921, [*Convention date*].

Ornamented artificial stone. — Objects resembling stone are obtained by sprinkling fragments of natural stone upon the surface of a mould of foundry sand by means of sieves, pouring in a backing of cement mortar, and filling up the mould with a coarser mortar or concrete. The larger pieces of stone are first distributed in the mould and are followed by progressively finer grades, concluding with sand either mixed or not with cement. Part of the fragmentary material may be first distributed upon a sheet of paper or like substance coated with adhesive, and transferred from this to the surface of the mould, the

facing layer being then completed as before by means of sieves. The fragments may be arranged in the form of a design or inscription upon the paper.

The Specification as open to inspection under Sect. 91 (3) (a) describes also the casting of cement compositions in moulds of foundry sand without special preparation, the facing layer, if required, being applied after casting. The use of stencil plates &c. to protect, during the sprinkling operation, parts of the mould to be afterwards coated with fragments of a different nature is also described. This subject-matter does not appear in the Specification as accepted.

173,965. Dalhoff, L. G., and **Lunn, W. K.** Dec. 22, 1920.

Concretes; stone, artificial.—Porous bodies for use as aggregates for light concrete are made by sintering at about 1200° C. a mixture of moler and granite, gneiss, basalt, or other rock containing feldspar. Instead of ordinary moler, black moler or a mixture of clay and kieselguhr may be used.

174,656. Wade, H., (*Redmanol Chemical Products Co.*). July 29, 1920.

Compositions containing phenol-aldehydes. — Moulded phenol-methylene condensation products are prepared according to the process described in Specification 146,159, employing as a constituent of the binder a fusible condensation product containing two and a third to three and a half (preferably two and a half) phenolic groups to each methylene group. The proportions of the methylene compound which comprises the other constituent of the binder are then selected to give to the binder as a whole one methylene group to each phenolic group present. A slowly volatile hydrocarbon solvent such as creosote oil may be incorporated in the mixture. Specification 9291/14 also is referred to.

175,389. Hayward, W. H., and **Adanac, Ltd.** Nov. 12, 1920.

Compositions containing vulcanized oils.—In the manufacture of tyre filling compositions consisting of oils treated with sulphur chloride and magnesia, different kinds of oil are mixed together so as to produce a blend having an iodine value of approximately 110. Soya bean, poppy-seed, or linseed oils may be mixed with rape, arachis, or olive oils; maize oil may be mixed with cotton seed oil or sesame oil, or both. A typical composition is made by mixing 12 lb. of rape oil (iodine value 100), 12 lb. of soya bean oil (iodine value 120), 1½ lb. of calcined magnesia, 6 oz. of Venetian red, and 5 lb. 1 oz. of sulphur chloride.

175,638. Goldstein, S. Feb. 16, 1921, [*Convention date*].

Stone, artificial.—Artificial stones for making drilling and turning tools and wire-drawing dies are produced by mixing powdered tungsten or tungsten compounds with diamond dust, and heating the mixture in a closed mould in an electric arc or resistance furnace. The product is a carbide which may contain excess carbon in the form of diamond particles, particularly in the centre of the mass. Other metals such as iron and titanium may be added to the mixture before heating.

The Specification as open to inspection under Sect. 91 (3) (a) describes also the application of the process to the production of carbides of molybdenum and like difficultly fusible metals. This subject-matter does not appear in the Specification as accepted.

176,058. Amphlett, H. P., and **Hume Pipe & Concrete Construction Co., Ltd.** Oct. 30, 1920. *Drawings to Specification.*

Stone, artificial.—In the moulding of vitreous materials centrifugally at high speeds so as to produce cylinders from which articles or sheets may be formed, hardened outer surfaces are produced by supplying the vitreous material, such as slag, sand, and caustic soda, with carborundum as the material is rotated within the mould.

176,436. Marks, E. C. R., (*Buffalo Refractory Corporation*). Nov. 2, 1920.

Refractory compositions containing silicon carbide and carbon.—A refractory composition comprises silicon carbide, flake or crystalline graphite, a flux, and a carbonizing binder, such as tar or molasses. As fluxes clay, salts, such as borax, metallic or non-metallic oxides, or sulphides may be used. The mixture is moulded in the usual manner and baked at about 1000° C. Suitable proportions of the ingredients are 68 parts of silicon carbide, 25 parts of graphite, and 7 parts of flux, or of flux and binder. The composition is suitable for making heat-resisting articles, such as crucibles, fire-bricks, retorts, muffles, furnace cones, tubes, combustion boats, pyrometer tubes, furnace linings, and heat-resisting cements.

176,437. Marks, E. C. R., (*Buffalo Refractory Corporation*). Nov. 2, 1920.

Refractory substances containing graphite.—A refractory composition for making heat-resisting articles, such as crucibles, comprises a refractory electric furnace product such as fused alumina or silica, flake or crystalline graphite, a flux, and a carbonizing binder such as tar or molasses. As fluxes clay, salts, such as borax, metallic or non-metallic oxides, or sulphides may be used. The mixture is moulded in the usual manner and baked at about 1000° C. Suitable proportions of the ingredients are 60 parts of the electric furnace product, 20 parts of graphite, 12 parts of binder, and 8 parts of flux.

176,828. Alexander, A. E., (*Stokes, J. S.*). Oct. 12, 1920. *Drawings to Specification.*

Compositions containing phenol-aldehyde condensation products.—Fibrous material such as cardboard or woven fabric is impregnated and coated with a condensation product of phenol or a cresol and acetaldehyde or paraldehyde. For the impregnation the product is in solution, preferably in a mixture of alcohol and benzol. The material is then coated with thin films of the condensation product containing filling material heated to set the coatings, then coated more thickly with the product containing less filling material and finally baked again. The finished material may be used in the production of gramophone records, printing plates, panels, matrices, &c. Several layers of fibrous material may be used in the core united by means of the condensation product as adhesive.

177,458. Jackson, W. J. Mellersh-, (*Bitoslag Paving Co.*). Dec. 23, 1920. *Drawings to Specification.*

Compositions containing bituminous &c. materials.—A roadway comprises a foundation formed of a series of superposed layers of a mixture of oxidized asphalt and a mineral aggregate, covered with an adherent wearing surface. The mixture contains 9 to 11.5 per cent of oxidized asphalt, preferably from Mexican petroleum, and the aggregate may consist of coarse sand, or the slag aggregate described in Specification 167,997 may be employed. The layers may diminish in thickness upwards, and each is allowed to cure before the next is laid. The top wearing surface may be composed of a mineral aggregate of slag, a filler material such as pulverized limestone and Portland cement, and a binding agent of oxidized asphalt, as described in Specification 167,997.

178,558. Lamplough, F., and **Townmead Construction Co., Ltd.** Jan. 18, 1921.

Compositions containing bituminous materials.—Bituminous material, e.g. pitch, is tempered and made more resistant to temperature variations by being heated to an elevated temperature, e.g. 200—500° C. whilst kept in motion by being driven in the liquid condition through a confined space such as a coil surrounded by superheated steam. Oil, e.g. 5—20 per cent of petroleum residues or fish, animal, or vegetable oils may be mixed with the bitumen before or during the passage through the heated coil. The resulting composition serves as a binder for loose material. In a modification, the bitumen is, after treatment as above, distilled under reduced pressure, and the oily condensate and brittle residuum, added separately or together, form a binder suitable for use when disintegrators are used which are unsuitable for dealing with soft material. Or an emulsion may be formed by pumping 25—150 per cent of water through the coil simultaneously with the bitumen or bitumen and oil; and this emulsion may be used in making building blocks without the application of heat. In a further modification the bitumen is mixed during passage through the coil with unsaturated hydrocarbons and the mixture exposed to a cracking temperature for the bitumen, e.g. 600° C., whereby a quick-drying, oxygen-absorbing composition is formed, suitable as a basis for varnish or as a wood preservative.

178,736. Whitby, B. R. May 10, 1921.

Stone colouring.—Coloured artificial stone with a glazed surface is produced by filming one side of a glass plate with cement mixture coloured as required, allowing the film to set, and then placing the glass in a mould, of which it forms a removable lining, and filling up with concrete cement &c.

178,880. Greene, M., (*Oldekop, G.*). Nov. 27, 1920.

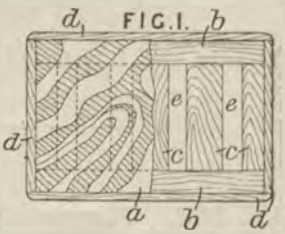


FIG. 1.

Stone, colouring. — A plastic composition for covering walls, floors, and other surfaces and for making moulded articles consists of 33 lb. of magnesite rendered caustic, 11 lb. of woodmeal, and 5 lb. of limestone meal, mixed into a stiff paste with a 20 per cent solution of magnesium chloride. 2½ lb. of talc and 2½ lb. of colouring-matter may be added to the ingredients. An imitation marble is produced by rubbing the paste through a 1 c.m. sieve to produce granules, mixing differently-coloured granules together, and subjecting to pressure. When used for covering floors, tables, &c. the composition *a* is applied to a backing consisting of a wooden framework *b*, *c*, the interstices *e* of which are fitted with a mixture of woodmeal, magnesite, and magnesium chloride solution.

178,896. Rafsky, H. R. Jan. 14, 1921.

Compositions containing calcium carbonate and magnesia.—A material that may be employed in the manufacture of cements, plaster &c. consisting of precipitated magnesium hydrate and calcium carbonate is prepared by treating a mixture of magnesia and lime with an alkali carbonate in an aqueous medium. Calcined dolomite is slaked and treated with a solution of sodium carbonate in slight excess of the equivalent of the calcium hydrate present. After agitation and boiling the precipitate is filter-pressed, washed, sieved and dried.

179,029. Hambloch, A. March 14, 1921.

Concretes.—An aggregate for use in light concretes consists of pumice which has been separated from heavy impurities by classification with water, comminuted until it resembles a mixture of sand and gravel and artificially dried. The grains are then coated with a cement or lime magma and air-dried. A mixture of fine and coarse grains is preferably used in the manufacture of concrete, a mixture of cement and trass, with or without lime, being used as a binding-agent.

179,166. Dammann, K. April 25, 1921, [*Convention date*].

Compositions containing bituminous and siliceous, calcareous, &c. materials.—Roads are paved with a cold-worked artificial asphalt comprising a mixture of powdered mineral with a bitumen e.g. distilled tar, which liquefies at or about 0° C, the proportion of bitumen being from 4 to 8 per cent by weight, to enable a high degree of compression of the mixture to be effected without the bitumen having any binding effect. The combination is effected without heating in a concrete mixer or the like, and a small proportion of finely powdered pitch may be added if desired. The mixture is poured on to the ground and flattened by a hand roller, the compression being completed by the traffic.

The Specification as open to inspection under Sect. 91 (3) (a) stated that the compression might also be effected by an unheated iron. This subject-matter does not appear in the Specification as accepted.

179,203. Melamid, M. Oct. 29, 1920.

Compositions containing bituminous &c. materials, oil, &c.—Foundry cores consist of sand and either (1) a mixture of stearin or other fat pitch with oils that are derived from coal tar, brown coal tar, or wood coal tar, and boil between about 220 and 400° C.; or (2) the same tar oils oxidized to semifluid or resinous products, and mixed or not with stearin pitch, fat pitch, or other pitch, or with other oxidized oils such as oxidized linseed, maize, fish, or other fatty oil. Resins, resin oils, or resin-like substances, and molasses or other emulsifying agent may be added. A mixture of 3—5 lbs. tar oil, 2 lbs. of stearin pitch, and 1—2 lbs. of coumaron resin is given as an example. Mixtures of sand and linseed oil, and sand with mineral oil and fat pitch are referred to.

179,204. Lamarque, R. Oct. 29, 1920.

Stone, artificial.—In the manufacture of artificial stone from natural stone fragments the latter are crushed and graded by sifting, and the graded material is further crushed and sifted alternately until a dust-free product of uniform fineness corresponding to the natural grain of the stone is obtained. If the stone is crushed wet the grading is effected by repeated washings. The crushed stone is agglomerated by means of a binding-agent capable of hardening in the air or by baking. Pure or mixed cement, coloured or otherwise, burnt or wet clay, or kaolin may be used as binders. The composition may be applied to a cor of reinforced concrete. After treatment with acids to remove calcium salts from the surface, the stone may be polished in the known manner.

179,546. Karl, H. May 4, 1921, [*Convention date*]. *Drawings to Specification.*

Compositions containing oils &c.—A cement suitable for fastening bristles in the stocks of brushes consists of chalk and linseed oil to which may be added an ethereal oil or an antiseptic of agreeable odour, e.g. extract of peppermint. A drier may be included to accelerate the setting.

179,586. Petersen, W., and **Clark, E. V.** Jan. 11, 1921.

Compositions containing phenol-formaldehyde condensation products.—An initial liquid condensation product, formed by reaction of phenol with formaldehyde or trioxymethylene in the presence or absence of basic catalysts, is mixed with over 5 per cent of an organic carboxylic acid, such as lactic, acetic or formic acid, without any mineral acid, and the mixture is heated until it becomes a viscous liquid which does not adhere to a metal surface. This product, or a

solution thereof in alcohol or other solvent, is mixed with a filler such as asbestos, wood flour, or china clay, to give a plastic mass which can be pressed in moulds. The moulded articles are subsequently converted into hard infusible products by heating. Specification 156,675 is referred to.

179,664. Dussek, A. E. H. Feb. 11, 1921.

Compositions containing bituminous and siliceous, calcareous, and like materials.—A composition to be used in a cold state for making roads comprises an aggregate, petroleum residue or pitch, thick tar, or other bituminous matter obtained from the distillation of petroleum or coal, and a solvent, such as naphtha or turpentine spirit. Suitable aggregates are granite, slag, and clinkers. Fillers such as sand, limestone, dust, slate dust, Portland cement, and rock asphalt powder may also be added. The bituminous matter preferably forms less than 4 per cent of the mixture. A typical composition consists of 6 tons of granite $1\frac{1}{2}$—$1\frac{3}{4}$ inches in size, 3 tons of $\frac{3}{4}$—$\frac{3}{8}$ inches, and 3 tons of $\frac{1}{4}$ inch including dust, mixed with $7\frac{1}{2}$ cwt. of a solution made by adding 35 gallons of naphtha to 11 cwt. of asphalt obtained from the distillation of coal.

179,928. Roïboul, M. de. May 12, 1921, [*Convention date*]. *Addition to* 165,051. *Void* [*Published under Sect. 91 of the Act*].

Refractory substances containing rare earths.—Crucibles for fusing refractory minerals are composed of a mixture of the oxides of zirconium, yttrium, thorium, and erbium, suitable proportions being zirconium oxide 60—80 per cent, yttrium oxide 13—17 per cent, thorium oxide up to 10 per cent, and erbium oxide 5—20 per cent. The thorium oxide may be omitted. Rare earths, such as cerium oxide, may be added to the foregoing ingredients in proportions up to 20 per cent. Cerium oxide or beryllium oxide may be substituted for the erbium oxide.

180,081. Seigle, A. A. F. M. Feb. 24, 1921.

Cements, Roman, processes for making.—Raw peat, lignite and similar substances are ground to a pulp which is partly dried by air or by waste heat and lime and calcium chloride are added to assist in drying the material, or calcium carbonate and silicious matter may be added together with a small quantity of calcium chloride. This mixture is moulded in briquettes which are allowed to set and are treated with steam under pressure to obtain hardening by the formation of hydrosilicates. The resulting briquettes are then heated in retorts and if cement is to be obtained the final temperature should be about 1500° C. Hydraulic lime or cement with the partial formation of anhydrous silicates or silicoaluminates remains in the retorts.

180,237. Schrot, P. July 8, 1921.

Compositions containing plaster &c. and glutinous matters.—An agglutinant for veneer is made by mixing together lenzin (an impure gypsum), water, a little ochre, and leather glue, which has been soaked in water for some hours.

180,675. Coulbeaux, P., and **Thomas, F. E.** May 25, 1921, [*Convention date*]. *Void* [*Published under Sect. 91 of the Act*].

Refractory substances containing carbon.—A compressed mixture of a cyanamide derivative such as calcium cyanamide and a carbonaceous substance such as peat is used for coating or lining furnaces, binding agents being added if required.

180,807. Brothers, W. M. March 22, 1921. *Addition to* 151,499, [*Class* 70, India-rubber &c.].

Compositions containing oxidized or vulcanized oils.—A composition to be introduced into pneumatic tyres to close puctures consists of crumb-like shreds of a rubber substitute prepared from oxidized or vulcanized oils mixed with a thin paste of colloidal clay and water.

180,887. Dyson, E. May 19, 1921.

Concretes.—A composition for floorings, tiles, sheets, or steps consists of about 1 part by measure of Portland cement, 2 parts of sawdust, ground cork, or a mixture of these, and sufficient calcium chloride solution at about 35° Tw. to bring the mass to a plastic condition. Hard wood sawdust is preferred for hard floors. Pigments may be added to the dry mixture.

181,014. Pollak, F., (Assignee of *Ripper, K.*). May 31, 1921, [*Convention date*].

Compositions containing hydrocarbon substitution products.—The gelatinization or hardening of the initial water-soluble condensation products from formaldehyde and urea, thiourea, or their derivatives is prevented, retarded, or accelerated by the addition of appropriate salts or by their formation in situ. Salts which have a retarding influence are those of weak acids, for instance alkali or alkaline earth salts of organic carboxylic acids or weak inorganic acids; accelerators are the salts of strong acids such as sulphates, chlorates, chlorides and nitrates, a well as ammonium salts in general, particularly ammonium sulphocyanide, which produce gelatinization in the cold. The soluble liquid condensation products are gelatinized and rendered insoluble, even when a salt having a retarding action is present, by heat treatment or by the addition of an accelerator or both. The hardening may take place after the addition of powdery, fibrous, cellular, or porous fillers. Examples of the process are given. Specification 171,094 is referred to.

The Specification, as open to inspection under Sect. 91 (3) (a) refers to the use of aldehydes in place of formaldehyde and includes additional examples of the process. This subject-matter does not appear in the Specification as accepted.

181,092. Sanguinetti, D. March 3, 1921.

Compositions containing resin and india-rubber. — A plastic composition resembling natural asphalt in properties and uses is made by melting together 18 kg. of india-rubber and 12 kg. of resin, adding 600 gm. of naphtha, benzene, oil of turpentine, or other solvent of both rubber and resin, and incorporating with the product 100 kg. of finely powdered colouring matter, such as oxide of iron, marble, stone, brick, or ochre.

182,886. Dehn, F. B., (*Satow, S.*). April 6, 1921.

Compositions containing phenol-aldehyde condensation products.—The initial oily condensation product obtained by heating phenol with formaldehyde in the presence of sodium sulphite is mixed with an oxyfatty acid, an alcohol, or a sugar, and the mixture heated: the liquid product obtained may be mixed with mineral fillers (clay, talc, mica, &c.), moulded and heated to give products suitable for electric insulation or building purposes.

Reference has been directed by the Comptroller to Specifications 27096/08, [*Class* 2, Acids and salts, Organic &c.], 129,993, 148,264, *and* 179,586.

183,219. Ferolite, Ltd., and **Clapp, H. B.** April 15, 1921.

Refractory substances containing chromite and ferro-silicon.—The lining of gas producers, electric furnaces, crucible furnaces, and the like is made from a mixture of chromite and ferro-silicon ground to a suitable fineness and mixed with a binding material such as sodium or potassium silicate. The plastic mass may be made into bricks or slabs or may be tamped in a continuous layer round a core.

183,572. Stafford, C. S. April 25, 1921. *Drawings to Specification.*

Refractory substances containing fireclay, sodium silicate, &c.—A non-shrinking cement having the same coefficient of expansion as a furnace wall consists of 60 per cent grog (burned fireclay), 38 per cent fireclay, and 2 per cent sodium silicate.

183,914. Tabary, A. R. April 28, 1921.

Compositions containing bituminous and siliceous, calcareous, and like materials.—A mixture of coal-tar pitch or resin pitch, clay, limestone, and asphalt is combined with an aggregate consisting of fine sand or of crushed or powdered hard materials, such as porphyrite, trap, quartzite, or slag. The proportion of clay should be from one-half to two-thirds of the quantity of pitch, and that of limestone from three-quarters to an equal quauntity of the amount of pitch. The amounts of asphalt and of aggregate should each be equal to the combined weight of the pitch, clay, and limestone. Bitumen, sawdust, destructor residues, or cement may also be incorporated in the mixture. The composition may be either used as a road-making material in conjunction with stones and tar, bitumen, oils, &c., as a surface dressing with or without an admixture of tar, or as a cement for filling the joints of stone or wood paving. It may also be compressed into paving-slabs or tiles.

184,887. Umpleby, F., and **Powers, H.** May 23, 1921. *Drawings to Specification.*

Refractory substances containing alumina, silicon carbide, and metals.—A refractory porous tube for use in surface combustion apparatus may consist of granules of fused alumina, silicon carbide, zirconia or the like, or of pellets of alloys of iron, nickel, cobalt, chromium, tungsten or the like bound with refractory cement and sodium silicate.

185,313. Rushen, P. C., (*Akt.-Ges. B. Felder-Cement*). Aug. 15, 1921.

Stone, artificial and imitation.—In the production of tools or implements from tungsten carbides (WC or W_2C) for instance by the processes described in Specifications 157,747 and 157,750, [*Class* 1 (ii), Inorganic compounds, other than &c.], it is desirable to heat to a temperature above the melting point in order to vaporize impurities such as iron, extra carbon is liable to be taken up, which separates as free carbon on solidification. This free carbon is removed by adding a quantity of molybdenum, as carbide, metal, or oxide. The carbon is volatilized with the molybdenum or oxidized by the oxygen of the molybdenum oxide without leaving any residual molybdenum. The carbide can thus be heated to much above the melting point so as to obtain a completely liquid mass from which sharp castings can be obtained, for instance by the process described in Specification 157,756, [*Class* 83 (iv), Metals, Working].

185,435. Marks, E. C. R., (*Lava Crucible Co. of Pittsburgh*). March 8, 1921.

Refractory substances containing metals.—Materials for making ceramic products, refractory or otherwise, containing clay as a base, are mixed before moulding with a metal alloy in a finely divided state to enable them to be quickly dried before being burnt. Aluminium or magnesium, or alloys or mixtures thereof, for instance, ferro-aluminium, or zinc or alloys thereof may be used. The clay may be mixed with sand, graphite, carbide of silicon, lime, magnesia, bauxite or zirconia for making refractory articles such as crucibles or pots. A glazed product may be obtained by incorporating with the mixture a further non-ferrous metal such as copper, nickel, monel metal, chromium or cobalt, in a finely divided state.

185,838. Thompson, A. D., and **Bird, H. A.** June 10, 1921.

Concretes; compositions containing india-rubber, cork, and bitumens.—An elastic compound for the upper surface of hard tennis courts, skating rinks, and like grounds consists of ground cork, finely cut rubber, and copper dust or filings mixed with cement and sand or with bitumen, tar, &c. and stone chippings. Chromium oxide viride may be added. The preferred proportions for the former compound are;—sand 28 galls., cement 12 galls., granulated cork 6 galls., shredded rubber ¼ gall., chromium oxide ¼ gall., and copper dust or filings 1/32 gall.; and for the latter compound:—sand 28 galls., stone chippings 3 galls., granulated cork 8 galls., shredded rubber ½ gall., chromium oxide ¼ gall., copper dust or filings 1/32 gall. with sufficient tar or bitumen to bind the mass. The compound is laid on a foundation of clinkers or other rubble, or reinforced concrete, and is preferably in two layers, the lower coarse and the upper fine. According to one Provisional Specification, the compound consists of powdered slate, preferably green, mixed with crushed stone and brick, treated with dilute sulphuric acid or ammonium sulphate to prevent vegetable growth, and the desired shade of green obtained by adding sulphate of iron or other iron salt before or after laying the compound. For harder courts, cement, powdered cork, leather, finely cut rubber, or cocoanut fibre may be added. The lines may be marked by inlaying a white mixture of the slate compound and whiting or plaster of paris.

186,861. Young, J. H., and **Robertson Co., H. H.** Dec. 6, 1921.

Asphalts; compositions containing bituminous materials.—Bituminous materials, such as asphalt, tar, pitch, and the like are fire-proofed by an admixture of a halogen substitution-product of naphthalene, preferably chloro-naphthalene. The solid, highly chlorinated compounds are most effective, an addition of 30 per cent of these being sufficient.

186,968. Frohman, E. D. June 10, 1921.

Refractory substances containing fire-clay and siliceous materials.—A refractory composition consists of finely divided fireclay, a siliceous refractory substance such as ganister or asbestos, and a vegetable substance which acquires binding properties when moistened with water, such as sulphite pitch (a bye-product from the manufacture of sulphite pulp) dextrine, or gum arabic. The composition is mixed with water when required for use.

187,066. Schloesser, G. Aug. 8, 1921. *Drawings to Specification.*

Stone, artifical and imitation; mortars.—In a process for treating town refuse and like waste material in which the bulky portions are removed, the remainder graded into coarse combustible and fine incombustible portions and the fine portion smelted with a suitable flux, and cast into blocks as artificial stone, the combustion of the coarser portion is utilized to generate power and to smelt the finer portion. Coagulated slag resulting from the combustion of the coarser portion is converted into mortar by granulating, mixing with lime, contact salts, &c., grinding

and subjecting to a high temperature so as to disintegrate silicates. The slag which has not coagulated may be mixed with the mortar or in admixture with lime may be pressed to form building stones, which may be hardened by aid of steam pressure. The constituents of the refuse are separated mechanically.

187,362. Schloesser, G. Aug. 8, 1921.

Slag cements; mortars.—The heat generated by the combustion of town refuse is utilized to burn calcium carbonate which is added to the residue of the refuse to form a cement or mortar. The calcium carbonate may either be added to the refuse before or during combustion, the resulting slag being granulated by water or steam and ground up, or it may be calcined in a separate chamber heated by the burning refuse, with the ash of which the lime is afterwards mixed.

187,376. Granet, J. F. E. Aug. 13, 1921. *No Patent granted (Sealing fee not paid).*

Compositions containing resinous materials and waxes.—A white composition suitable for electric insulation and other purposes consists of 40 parts of carnauba wax, 5 parts of copal or sandarac, 40 parts of powdered mica, 15 parts of lithopone, to which may be added 3 parts of borax. The proportions may be varied, and colouring matters may be added. The wax which may be dissolved in alcohol and crystallized, is melted on a water bath, and the other ingredients are successively stirred in. The mass is moulded in metal moulds heated to about 40° C., pressed under a pressure of about 10 tons per sq. cm. and cooled.

187,480. Alexander, A. E., (*Stokes, J. S.*). Nov. 17, 1921. *Drawings to Specification.*

Compositions containing phenol aldehydes.—Synthetic resins for use in making sound records are prepared by the condensation of phenol or phenol derivatives such as cresol, resorcinol, and naphthol by heating with furfurol or furfurol derivatives such as furfuramid or by heating with formaldehyde, acetaldehyde, or paraldehyde followed by treatment with furfurol or its derivatives. An acid catalyst such as hydrochloric acid, or a basic catalyst such as potassium carbonate may be used in the process of manufacture. An accelerating agent such as paraphenylenediamid may also be used. Pigments, dyes, and fillers such as barium sulphate and lamp black may be added. These compositions are used for impregnating, consolidating, and coating fibrous materials to make gramophone records.

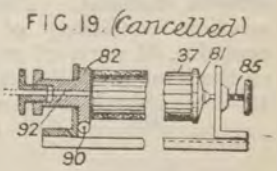
187,579. Bühler, Geb. Oct. 15, 1921, [*Convention date*].

Cements, Portland, processes and apparatus for making.—In the manufacture of cement, part of the slurry is burnt in rotary kilns, the waste gases from which are used to dry another portion of slurry, enabling it to be burnt in shaft kilns.

187,582. Kleinlogel, A. Oct. 18, 1921, [*Convention date*]. *Drawings to Specification.*

Concretes.—In concrete consisting of cement and finely-divided hard substances such as iron, steel, or other metals, or carborundum, the ratio of hard substance to cement is given by the formula $(100 \mp 177.8\ x) / (54 \mp 76.2\ x)$ where x is the difference in inches between the diameter of the grains of hard substance and 0.03937 inches, the upper signs referring to grains of larger size than 0.03937 inches and the lower signs to smaller sizes. Acid-proof cement may be used.

187,587. Macnicol, A. N. Oct. 18, 1921, [*Convention date*].



Cement and concrete surfaces, hardening and preserving. — The Specification as open to inspection under Sect. 91 (3) (a) states that concrete pipes &c. may be lined with bitumen, wax, &c., applied to the mould. To ensure close contact between the lining and the pipe material, this is fed in hot and under centrifugal action. Subsequently to moulding, the pipe ends may be closed and hot water or steam fed in under pressure to soften the coating and close any pores &c. and render the pipe fluid-proof; alternatively, fluids containing substances such as silicate of soda, in solution, or substances such as iron oxide, in suspension, may be used. Fig. 19 (*Cancelled*) shows a testing machine, adapted also for rendering the lining fluid-proof, wherein the pipe 37 is mounted between a bearer 82 apertured at 92 for the introduction of steam &c., and a bearer 81 forced home by a screw 85 or hydraulic ram. The bearer 82 is rotated through worm gearing 90. A modification is described in which both bearers are driven through spur gearing. This subject-matter does not appear in the Specification as accepted.

187,605. Goldschmidt, H., and **Neuss, O.** Oct. 17, 1921, [*Convention date*].

Compositions containing formaldehyde-urea condensation products.—Turbid materials, resembling meerschaum and porcelain, are produced by condensing urea with not more than

120 per cent of formaldehyde in the presence of at least 3 per cent of acid, the proportions being calculated on the pure anhydrous material in each case. The products are easily worked, and being porous, may be impregnated with colouring solutions, oils, resins, salt solutions, &c. Examples are given in which urea is dissolved in formaldehyde solution, the solution heated to effervescence, nitric, sulphuric or hydrochloric acid then added, and the whole finally emptied into moulds.

187,779. Hines, J. Aug. 30, 1921.

Emulsified bituminous compositions; concretes.—Colloidal solutions of bitumen, asphalt, tar, pitch, resin, and the like in water are used as binding-agents in the construction of roads, paths, &c. as hydrating-agents for cements and concretes, or as a surface dressing for roads, &c., for dust-laying purposes. For road-making purposes a colloidal solution consisting of 40 parts of Mexican asphalte, 10 parts of petroleum oil, 1 part of soap or other dispersion accelerator, and 50 parts of water is diluted with a further quantity of 400—800 parts of water and mixed with gravel, granite chips, basic slag, wood, or other suitable material. For dust-laying purposes a solution consisting of 17 parts of Mexican asphalte, 33 parts of green tar oil, 1 part of soap or the like, and 50 parts of water is diluted with 19 times its volume of water before application.

188,012. Kirschbraun, L. June 1, 1921.

Compositions containing phenol-aldehydes.—A friction-facing is formed by saturating sheeted unwoven asbestos fibres with a solution of asphalt and phenol, subjecting the saturated sheet to the action of formaldehyde and baking to harden. Articles, for example clutch rings, are cut from asbestos millboard, and calendered and dried as usual, and immersed in a solution of asphalt or asphaltic oil and phenol to which may be added a thinning agent. A suitable mixture is 80 per cent Mexican bitumen melting at less than 100° F., and 20 per cent phenol. If volatile solvent is present, it may be removed at this stage by a slight baking. The article is now immersed in formaldehyde or subjected to formaldehyde vapours at a temperature of about 300° F. for about four hours, and if desired at a pressure of 25—50 lbs. per sq. in. The article is then baked at a sufficiently high temperature until the asphalt becomes unaffected and the article attains a Brinnell hardness exceeding 15, and a tensile strength exceeding 200 lbs. per square inch. According to a modification, instead of treating with formaldehyde, an oxidizing, agent may be added to the material which will react with the asphalt on making and produce aldehyde like bodies.

188,354. Burnie, H., (*Bitumul-Matita Soc. Anon. Romana*). July 4, 1921.

Compositions containing vulcanized oils.—Bitumen is prepared by distilling crude oils in presence of a little calcium carbonate to 274° C. and heating the residue to 250° C. with sulphur. Or a mixture of crude oil, sulphur, and carbonate may be distilled up to 250° C. Natural bitumen may be hardened by heating to 250° C. with sulphur. In an example 0.2—0.5 parts of calcium carbonate, and 8.0 parts of sulphur are used with 100 parts of the residue obtained by distilling Roumanian oil free from paraffin to 274° C. Specification 3026/92 is referred to.

189,492. Terrell, T., and **Monarch Mantles, Ltd.** Aug. 2, 1921.

Refractory substances containing rare earths.—In a process for the manufacture of a refractory body of thoria and ceria for use as crucibles, furnace linings and the like wherein a soluble salt of thorium is used as the binding agent, a mixture of thoria, a cerium salt, and the thorium salt is powdered to a degree of fineness wherein the particles are not smaller than 0.01 mm. and the proportion of the thorium salt to the whole mass is substantially 20 per cent. In one example of carrying out the process, a mixture of 100 parts by weight of thoria, preferably obtained from the ash of incandescent mantles, 30 parts of thorium nitrate, a small quantity of cerium nitrate or other hardening earths is ground, converted into a thick paste by means of a small quantity of alcohol or other volatile liquid, moulded, dried, and ignited. The powdered mixture may be modified by the addition of up to 30 parts of powdered carbon.

189,692. Ferolite, Ltd., and **Clapp, H. B.** Feb. 7, 1922.

Refractory substances containing chromite and ferro-silicon.—Crucibles, retorts, and other vessels for high temperature work are moulded from a mixture of chromite and ferro-silicon with a binding-agent such as sodium silicate solution. Specification 183,219 is referred to.

189,745. Jaques, C. A. Dec. 5, 1921, [*Convention date*].

Concretes and mortars.—Portland cement is mixed in predetermined proportions with sand which has been freed from clay, if necessary, by washing with water and kiln-dried, and the mixture is stored in moisture-proof containers.

189,781. Eckert, Oppelt, et Cie, Ges., (Assignees of *Eckert, C. F.* [*Firm of*]). Dec. 5, 1921, [*Convention date*].

Refractory substances containing nitrides.—Aluminium nitride, or substances containing it, is mixed with a binder such as molasses or tar for use in the production of foundry cores.

189,892. Berry, H. Sept. 13, 1921.

Concretes.—Waste slate, coal shale, granite, broken bricks, clinker, slag or any aluminium silicate, or sand, quartz, flint, or other form of silica, is powdered and mixed with magnesium oxide, and with either tartaric acid or the carbonates, hydrates, or bicarbonates of sodium, potassium, or ammonium, or mixtures of these. 1—2 per cent of soluble silicates may be added to the alkaline substances, or the finished product may be soaked in a soluble silicate solution. Traces of barium or strontium salts, with or without ammonium salts such as the chloride, sulphate, or phosphate may be added, and an addition of 1—2 per cent of a soluble magnesium salt, preferably the sulphate may also be made. The magnesite is preferably calcined at 300—600° C. in an atmosphere of steam, any distillate being collected and added to the composition. A typical composition consists of 85 parts of powdered slate, 10 parts of magnesium oxide, 5 parts of sodium bicarbonate, and ½ part of barium compounds. The product may be used for flooring or moulded articles, or if mixed with asbestos, slag wool, or the like as an insulating covering.

190,545. Umpleby, F., and **Powers, H.** Sept. 24, 1921. *Drawings to Specification.*

Refractory substances.—Apparatus for generating gas comprises a porous refractory tube the inner surface of which is rendered incandescent by surface combustion. The tube may be built up of granules of refractory cements, alumina, carborundum or zirconia, or of pellets of iron, nickel, chromium cobalt, tungsten aluminium or the like bound with ceramic bonds or refractory cements mixed with sodium silicate or magnesium chloride and fired at high temperature.

190,849. Myles, A. J. Oct. 27, 1921.

Concretes.—A mixture of Portland cement and a light porous aggregate such as sawdust or cork dust, with or without fillers, such as barytes and chalk, and colouring-matter, such as oxide of iron, is gauged with a solution of a soluble salt such as calcium chloride.

Reference has been directed by the Comptroller to Specification 180,887.

191,243. Roucka, O. Nov. 25, 1921.

Stone, hardening.—Cement or concrete articles are heated in a closed vessel at the rate of 1—5° C. per minute, to a temperature of 60—80° C., small quantities of steam, insufficient to cause condensation, being admitted. The heating is then continued at a rate of 0.1—1° C. per minute by the admission of steam either alone or acting in conjunction with external heating means, until a pressure of 7—13 atmospheres is attained.

191,265. Sperni, J., Greig, R. B. G., and **Nuroads, Ltd.** Dec. 17, 1921.

Concretes.—A composition for making floors, decks, building and paving blocks, &c. consists of pulverized or granulated mineral material, comminuted ligneous material such as sawdust, wood pulp, or vegetable fibre, Portland cement, and sodium silicate solution, with or without calcined magnesite and magnesium chloride, or stable colouring matter. The composition may be hardened after moulding by washing with sodium silicate solution. A typical composition consists of 40 parts by bulk of Portland cement, 15 parts of sodium silicate dissolved in water to form a solution of 5° Bé., 30 parts of slate dust, 10 parts of sawdust, and 5 parts of ferric oxide, with or without magnesite and magnesium chloride up to 30 parts.

191,412. Longbottom, C. A., Duffield, F. L., and **Rees, W. J.** July 4, 1921.

Refractory substances containing dolomite.—Refractory products composed of dolomite are sealed against hydration after firing by immersion in molten wax, tallow, dehydrated oils or fats, or similar substances. Clay and either iron oxide or slag may be added to the dolomite in the pre-

ferred proportions of 2—10 per cent of iron oxide and 2—15 per cent of clay, or 2—10 per cent each of slag and clay. The mixture is moulded into bricks and shrunk by heating to about 1500° C. According to one of the Provisional Specifications iron oxide, slag, clay, or other material forming a fusible matrix may be used as an addition to the dolomite.

192,780. Cox, F. J. Nov. 9, 1921. *Drawings to Specification.*

Refractory substances.—A porous plate or diaphragm for use in a surface combustion heating appliance using a combustible gas is made from a graded granular refractory material mixed with powder or siftings of refractory material and converted into a plastic mass by the addition of diluted sodium silicate, the plastic mass being moulded in a metal mould lined with wire gauze and then heated preferably while still in the mould at a temperature of about 300° F. for about three hours, until it becomes a rigid porous mass. The plate may have a corrugated or irregular front surface and may be reinforced by means of a metal, refractory, or other supporting structure.

193,081. Wade, H., (*Carborundum Co.*). Sept. 19, 1921.

Refractory substances.—The bonding qualities of crystalline materials, e.g. refractories, such as corundum, emery, garnet, quartz, silica sand, silicon carbide, fused aluminous abrasives, are improved by pitting or etching the surfaces by heating the grains to a temperature of over 212° F. with 2 per cent or less of an acid substance distributed in small particles more or less evenly over the surfaces of the grains. According to an example, grains of fused alumina are moistened with a solution of boric acid, and heated to about 500° C. for an hour. Suitable acid substances are phosphoric acid, fluosilicic acid, sulphuric acid, nitric acid, chromic acid, silicic acid or their salts. The grains are bonded by binding-agents such as glue, rubber, shellac, clay, cement &c.

193,372. Kontzler, H. Feb. 20, 1922, [*Convention date*].

Slag cements; cements, Portland and Roman, materials and compositions for.—Slow-setting cements are produced by finely pulverizing an intimate mixture of 15—20 per cent of gypsum, previously dried at 80° C., and 80—85 per cent of aluminates, hydrates of alumina such as bauxite, or natural or artificial puzzuolanas, e.g. blast furnace slag.

193,520. Plauson's (Parent Co.), Ltd., (*Plauson, H.*). Nov. 29, 1921.

Rendering non-plastic materials colloidal.—Residues of mica, asbestos, talc, and similar silicates are partly or wholly converted into the colloidal state by high-speed mechanical disintegration, preferably in a colloid mill as described in Specification 155,836, [*Class* 1 (i), Chemical processes &c.], the colloidal solution is subjected to ultra-filtration, dried in vacuo, and moulded under pressure. Dispersion-accelerators such as colloidal silicic acid, alkaline silicates, colloidal zinc oxide, aluminates, sulphite-cellulose liquor, gum arabic, and tannin may be employed. Fillers or binding-agents such as india-rubber, natural or artificial resins, drying oils, olein, and finely-divided clay may be added to the silicate either before or after disintegration.

193,576. Hodson, T., Hodson, J., Hodson, W., and **Hodson, T. A.** Dec. 17, 1921.

Refractory substances containing dolomite, &c.—Refractory basic bricks, furnace linings, retorts, &c. are obtained by calcining dolomite, magnesite, or magnesium limestone, adding small quantities (about 15 per cent) of igneous rocks, other than granites and syenites, and in some cases a little basic iron ore, mixing with water, moulding, and firing at 2000°C. Suitable igneous rocks are the peridotites (including diorite and gabbro), the dolerites (including basalts), the serpentines, trachytes, andesites, tachylytes, eurites, and rhyolites. If rocks of the last two classes are employed, or if the dolomite contains more than 1 per cent of silica or 57 per cent of calcium carbonate, it is necessary to add 3 per cent of basic iron ore, such as titanic iron ore, magnetite, haematite, gothite or limonite.

193,829. Guy, F., and **Davey, M. L.** Feb. 22, 1922, [*Convention date*].

Concretes and motars.—A fire-proofing or waterproofing composition to be added to concretes consists of soap, sand, and alum. In making the composition 1 part of a commercial soap containing 10 per cent. of sodium silicate is dissolved in $1\frac{1}{2}$ parts of hot water and 3 parts of sand are added. The mixture is allowed to set, ground, and mixed with ground alum in the proportions of 2 : 1 for waterproofing and 1 : 1 for fireproofing. The composition is added to concrete before moulding in the proportion of 1—$1\frac{1}{2}$ lb. to the cubic foot.

193,978. Morin, L., and **Grunder, F.** Dec. 5, 1921. *No Patent granted (Sealing fee not paid).*

Stone, artificial.—A devitrified substance suitable for use as artificial stone or for electric insulation is obtained by adding to a fused vitreous mass rich in silica and having a strong tendency to being devitrified, a somewhat refractory substance in such quantities that the mass is devitrified and some of the refractory substance remains undissolved therein. Suitable vitreous masses are obtained by fusing a mixture of sand, fluorspar, feldspar, and cryolite or a mixture of fluorspar or cryolite, quartz and pegmatite. Soda may be added as a flux, and oxides of chromium, copper, or other metals to colour the product. Suitable refractory substances are quartz, crystallized alumina, magnesia, kieselguhr, graphite, tungsten, and tungsten ore.

193,999. Pease & Partners, Ltd., and **Wilson, J.** Dec. 8, 1921.

Refractory substances containing silica.—Small proportions of china clay and lime are added to Dinas stone, ganister, or other material used in making silica bricks. Preferred proportions are 96 per cent of silica, 2½ per cent of china clay, and 1½ per cent of lime. The china clay and lime are suspended in the water with which the powdered silica is rendered plastic.

194,215. White, A. E., (*New Process Multi-Castings Co.*). June 13, 1922. *Drawings to Specification.*

Compositions containing plaster and fibres &c.—A plaster material used in casting a foundry pattern plate consists of a mixture of finely powdered carbon, plaster of paris, and sawdust.

194,264. Grönroos, H. March 6, 1922, [*Convention date*].

Stone, artificial.—Blocks, tiles, slabs, plates, &c. for building purposes are obtained by mixing in a pulverized condition slag, glass refuse, clay, oxide of iron, saltpetre, and quartz, rendering the mixture plastic with water, moulding under pressure, and firing at about 740° C. Suitable proportions of the ingredients for the manufacture of building-blocks are 400 parts by weight of slag, 100 parts of glass refuse, 100 parts of clay, 1 part of oxide of iron, 5 parts of saltpetre, and 2 parts of quartz. For paving-slabs the above-mentioned proportions of slag and glass refuse are reversed.

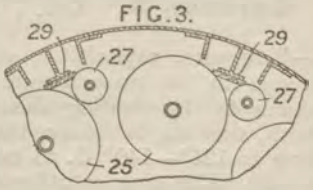
The Specification as open to inspection under Sect. 91 (3) (a) states that the slag may be replaced by other ferruginous materials, such as lava and iron ore. This subject-matter does not appear in the Specification as accepted.

194,526. Williams, R. C. Feb. 27, 1922.

Concretes and mortars.—Compositions for making artificial stone or for use as concrete or mortar comprise (1) silica stone or sandstone chips which have been heated with a mixture of treacle, sugar, honey, cane syrup, or the like, seaweed, sulphur, sulphuric acid and water; (2) lime; and (3) an agglutinant prepared by boiling together seaweed, ivy, salsola, watercress, or other marine plant, treacle, sulphate of iron, and water. For use as a concrete the treated silica stone, lime, and agglutinant are mixed together with or without an addition of seaweed. A mortar is prepared by mixing together lime, treacle, sulphur, and water, adding treated silica stone, and sprinkling the agglutinant on this mixture. Blocks, &c. are obtained by mixing this mortar with treated or untreated silica stone chips and baking the mixture in a brick kiln or in iron moulds.

194,738. Rigby, T. Sept. 16, 1921.

FIG. 3.



Cements, Portland, processes and apparatus for making.—The slurry is dried before admission to the kiln in a steam-heated film drier of the kind in which evaporation takes place in a closed space substantially free from non-condensable gases. The drier may be either single or multiple-effect; in the latter case the slurry is preferably passed through the units in parallel. The waste heat of the kiln is preferably used to generate steam which is used, either directly or after driving an engine, for heating the film evaporator. The evaporator may be of the type in which the vapours generated are compressed and used to heat the some or another unit of the apparatus. The compression may be effected by a steam jet or a compressor operated by steam generated by the heat of the kiln gases. By leading the vapours from the drier to the condenser of the engine the drying is effected at low pressure and temperature. Suitable types of dryer are described in Specifications 149,055, 150,068, 180,963, and 181,035, [all in *Class* 31, Distilling &c.]. The Figure shows an arrangement in which internally-heated drying-drums 25 are used in conjunction with smaller internally-heated drums 27 having a different peripheral speed to facilitate the distribution of the slurry, which is fed to the spaces enclosed by the drums 25, 27 and bridges 29. The kiln is preferably of the rotary type, and the dried slurry may be moulded into bricks or ovoids before being fed into the kiln.

195,559. British Thomson - Houston Co., Ltd., (*General Electric Co.*). June 20, 1922.

Compositions containing resinous materials or phenol-aldehyde condensation products.—To plastic compositions which are cured or hardened by heating to a definite temperature a small quantity of a dye which permanently changes or loses its colour at the appropriate temperature is added to serve as an indicator. Suitable substances are dyes of the triphenyl methane and diphenyl methane groups, such as malachite green, methyl violet, and auramine yellow. The invention is particularly applicable to phenol-aldehyde and other cements such as are used in the manufacture of electric lamps. One cement of this class consists of 20 lb. of a mixture of equal parts of shellac and glue dissolved in 10 lb. of alcohol, 5 lb. of dammar gum, 75 lb. of marble flour, and 4 grammes of malachite green dissolved in alcohol.

195,995. Gardner, D. Oct. 11, 1921.

Asphalts.—Bitumens, asphaltites, and like are prepared for use in the manufacture of black paints, varnishes &c. by treating them with acid or alkali or both, washing to remove the separated bodies, heating to 125°—140° C. to remove volatile hydrocarbons, skimming or otherwise removing water, and sieving the hot product. During the heating, the bituminous material is stirred, either mechanically, or by the introduction of dry or superheated steam into a closed system in which, to avoid oxidation, the air is replaced by an inert gas. The product is finely ground and treated with solvent naphtha, or other solvent boiling between 80—180° C. and containing hydrocarbons of saturated, unsaturated, aromatic, terpene, or any other of the compound cyclic types. The operation may be effected by continuous stirring at atmospheric pressure, or by treatment in an autoclave at 5—8 atmospheres pressure and at a temperature up to 180° C. When pressure is used, the solvent employed may be cymene prepared in situ by the interaction of turpentine and anhydrous copper sulphate. The bituminous extract is separated and dried.

196,021. Schaefer et Cie, R., and **Schaefer, H.** Dec. 13, 1921.

Refractory substances containing silica.—Refractory compositions for making metallurgical or other furnaces for moulding are prepared by grinding waste siliceous bricks that have been used in furnaces, or quartz that has been heated, until crystalline transformation has taken place, and mixing with an organic binder. Suitable proportions are 100 parts of powder to 5 parts of binder. Binders specified are non-hygroscopic organic agglutinants soluble in water, such as dextrine, amylaceous materials, albuminoids, glucosides, glucoses, gelatines, and sulphited liquors or residues; and carbonaceous materials such as resin or asphalt. The composition is mixed with water, naphtha, or other solvent of the binder, moulded, and dried, and is baked in situ by lighting the furnace.

196,202. Grosser, M. May 26, 1922. *Drawings to Specification.*

Stone, artificial and imitation.—Compositions resembling alabaster are produced by melting alum, which may be partly or wholly replaced by a mixture of sodium sulphate and aluminium sulphate, with small additions of casein and either quicklime or vaseline. A typical composition consists of 20 parts by weight of sodium sulphate, 20 parts of aluminium sulphate, 200 parts of alum, 2 parts of casein, and 1 part of vaseline dissolved in 1 part of spirit. Marble effects can be produced by the addition of colouring-matter.

196,342. Bacchiolelli, M., and **Devals, A. Meifred-.** Jan. 14, 1922.

Stone, artificial.—Igneous rocks such as lava, basalt, dolerite, greenstone &c. are crushed to powder and agglutinated under the influence of heat (with or without the addition of impoverishing substances such as chamotte, quartzite, sand &c. or fluxes) at a temperature lower than their own melting points.

196,769. Anderson, W. March 10, 1922.

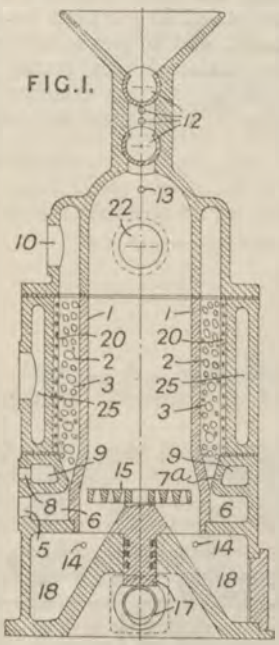
Stone, bricks, &c., hardening and preserving.—A composition to be applied as a preservative to stone, brickwork, &c. consists of a mixture of fluorides and fluosilicates of the alkali and alkaline earth metals with the addition of water.

196,950. Vielle, J. A. Nov. 8, 1921.

Emulsified bituminous and resinous compositions.—A road-dressing or binding emulsion is formed by subjecting a mixture of a bituminous or highly viscous oily substance and water to intensive mechanical disintegration in an apparatus such as is described in Specification 155,836, [*Class* 1 (i), Chemical processes &c.], whose peripheral speed is not less than 1000 metres per minute. The base used is preferably asphalt or hard pitch, which may be liquefied by heat or by the addition either before or after introduction into

the apparatus of a diluent, and is mixed with about an equal quantity of water. Small proportions of organic bodies containing sulpho groups, or sodium or ammonium oleate, or an alkali, or alkali salts of phenol, may be added to accelerate the process. A small proportion of a protective colloid may be added or substituted for the same purpose. A concentrated emulsion may be used as a road binder, and an emulsion diluted with oil or water, or formed from a mixture diluted with oil, may be used as a dust laying composition, the base being preferably of such a nature that it is not readily removed from the road by the wind. Filler substances such as china clay, cement, rubber waste &c. may be incorporated in the mixture to vary its properties. The emulsion may be mixed with cement or mortar to form a thick paste for use in road binding, and lime may be added before or after the addition of the emulsion. Specifications 6618/05, and 185,779, [both in *Class* 91, Oils &c.], are referred to.

196,972. Umpleby, F., and **Powers, H.** Jan. 4, 1922.



Refractory substances containing alumina, silicon, zirconia, or iron or steel alloys.—In a gas generator heated by surface-combustion the receptacle 1, refractory filling 2, lining 20, and grate 15 may be made of cements such as electrically fused alumina, carborundum, zirconia or from iron or steel alloyed with aluminium, chromium cobalt, nickel tungsten or the like. These cements may be mixed with a solution of sodium silicate or magnesium chloride and fired. Specification 190,545 is referred to.

197,340. Katatani, S. May 8, 1922, [*Convention date*].

Refractory substances containing fireclay, magnesite, titanium compounds, &c.—An electric resistance material which does not fuse or oxidize at high temperatures, applicable for example to electric heaters and furnaces, comprises powdered ferro-tungsten, ferro-molybdenum or ferro-titanium, or mixtures of these, mixed with powdered fireclay or magnesite or other material containing a large proportion of magnesium carbonate, the mixture being kneaded and heated to 1500—1600° C. A mixture of ferro-tungsten and fireclay powders containing 20 to 30 per cent of fireclay may be kneaded with water, pressed into a mould, allowed to dry and harden, and heated in a fireproof airtight container. Terminal layers of carbon powder kneaded with coal tar or pitch may be placed at each end of the resistance in the mould.

The Specification as open to inspection under Sect. 91 (3) (a) refers also to the use of the resistances as lighting-arresters, of other ferro-alloys such as ferro-chrome and ferro-silicon, and of any infusible material instead of fireclay. This subject-matter does not appear in the Specification as accepted.

197,702. Mueller, A. F., (Assignee of *Grothe, E.*). May 15, 1922, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*].

Slag cements.—A hydraulic cement consists of a finely-divided mixture of foundry slag with ferruginous, siliceous, and alumina-, lime-, and magnesia-containing ingredients in proportions depending upon the composition of the slag, and with or without clinkers from furnace residues. Clinkers are preferably used which have been freed from coke &c. by the process described in Specification 146,238, [*Class* 82 (ii), Washing granular &c.], and have thereby become coated with clay, chalk, gypsum, or carbide sludge. Suitable ferruginous additions are bog ore, Permian limestone, brown ore, Porta stone, ferruginous sandstones, aluminous siderite, slate, ferruginous earths from palaeozoic and Permian formations, finely-divided iron, waste sand, dust, and sludge from the grinding and polish of iron castings, and waste moulding sand. Alumina is furnished by ferruginous clay. Magnesia is preferably added in the form of mica sand. Suitable calcareous substances are slaked lime, lime-kiln waste, gypsum dust, and carbide sludge.

Concretes.—Artificial stones are obtained by mixing 15—25 parts of the above cement with 100 parts of granulated clinker, breeze, or slag, with or without the other filling materials such as sand, pebbles, ground wood, and the like. A small amount of an alkali salt, such as sodium carbonate, may be added to accelerate setting and increase strength.

197,791. Garnett, C. S., Reid, W. A., Greenwood, F. E. S., and **Cowlishaw, F. S.** March 18, 1922.

Refractory substances containing dolomite.—Dolomite or magnesian limestone is partly calcined so that the product contains 8—12 per cent of carbon dioxide; to the calcined material mineral substances, such as silicates or oxides, which prevent hydration are added, and the mixture is made plastic with water, moulded into bricks, &c., either before or after slaking is completed, and fired at about 1500° C. Suitable substances for preventing hydration are olivine, talc, serpentine, kaolin, chlorites, bauxite, felspars such has labradorite and orthoclase, oxide of iron and titanium such as ilmenite, and pyroxenes such as diallage and other augites.

198,136. Caudemberg, A. C. de. March 24, 1922. *No Patent granted (Sealing fee not paid).*

Compositions containing bituminous materials and india-rubber.—India-rubber is incorporated with asphalt, bitumen, pitch, &c. by means of liquids of high boiling-point which are solvents for india-rubber and bitumen. Suitable solvents are mixtures of tetrachlorethane with benzine or toluene containing 20 per cent of tetrachlorethane for cold preparations and 86 per cent for hot ones. An asphalt composition to be compressed cold is obtained by mixing in the cold 100 parts of powdered asphalt with 3—4 parts of a solution containing 2.5—5 per cent of rubber. An asphalt to be used in a fused condition is made by melting together 100 parts of asphalt, 5 parts of bitumen, and 4—5 parts of a solution containing 5—7.5 per cent of rubber, with or without the addition of sand or gravel. A bituminous concrete is obtained by adding 15—20 parts of rubber solution to 100 parts of melted bitumen and mixing this composition with a mineral aggregate or pouring it upon a layer of aggregate in situ.

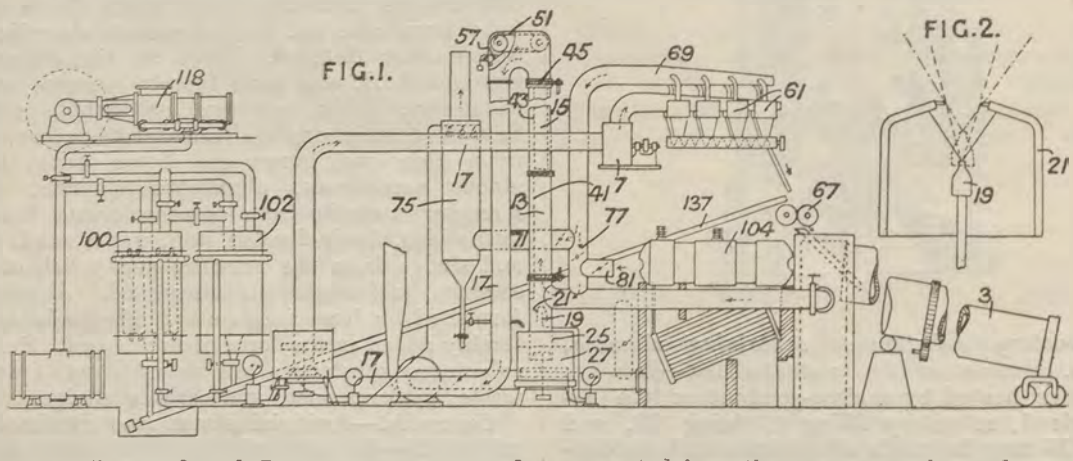
198,463. Meese, W. March 13, 1922.

Refractory substances containing sandstone and clay.—Fire-bricks are composed of a mixture of 1 ton of white or brown sandstone and 7½ cwts. of red clay. According to the Provisional Specification the proportions may be 2 parts of sandstone to 1 part of clay.

198,884. Somerfield, E. May 12, 1922.

Compositions containing lime, brick dust, and marl.—A paving for hard courts for tennis and like games consists of 70 per cent brick kiln dust, 25 per cent marl, and 5 per cent lime, approximately. The materials are mixed with water and then spread; or, in wet weather, the paving may be laid dry. Grit may be rolled into the surface.

199,056. Rigby, T. Dec. 19, 1921.



Cements, Portland and Roman, processes and apparatus for making.—Cement materials in the form of slurry or powder are dried before admission to the kiln by being dispersed and carried in suspension in a rapidly moving current of hot gases from the kiln. The dried material is separated from the gas current by cyclone separators or filters or both followed by washing, preferably with slurry. Part of the gas may be recirculated through the apparatus, or the kiln gases may be diluted with air, and the recirculated gas or air may be heated in the clinker

cooler. Before entering the drying-apparatus the kiln gases may be used to generate steam which may be used, either directly or after driving an engine, to operate film driers arranged as described in Specification 194,738, which operate on the slurry in series or in parallel with the main drying system. In a form of the apparatus for drying slurry, gases from the kiln 3 are drawn by a fan 7 through a vertical shaft 13, 15 up which a spray of slurry is directed from a jet 19, and thence through a lengthy flue 17 to a battery of cyclone separators 61 from which the dried material is delivered, optionally through briquetting-rolls 67, to the kiln. The jet 19 is situated in a downwardly-projecting branch 25 of the vertical shaft which dips into the slurry tank 27 supplying the jet, and it is surrounded by a hood 21, Fig. 2, which can be raised or lowered relatively to the jet to control the spray. To remove deposit from the side of the vertical shaft the lower part 13 revolves against a fixed internal scraper 41 and the upper fixed part 15 contains a number of revolving scrapers 43. The scrapers may be replaced or supplemented by a hammering or vibrating device, or the walls of the shaft may be enamelled to reduce deposition. Material deposited at the top of the upright shaft is caught by a travelling band 51 and returned to the gas current by a scraper 57. The gas leaving the separators may be recirculated through the drying-apparatus via the flues 69, 77, and air may be admitted at 81. Gas leaving the system by the flue 71 is washed in the scrubber 75 with a spray of slurry which is passed to the tank 27. Before entering the drying system the gas may traverse the flues of a boiler 104 supplying steam to the engine 118 and the film driers 100, 102 which dry a separate portion of slurry, the dried product being fed to the briquetting-rolls by the conveyer 137. When the process is used for drying powdered materials these may be dispersed in a current of cool air or gas before mixture with the hot gases.

199,122. Marks, E. C. R., (*Bennett, W. H.*). March 14, 1922. *Drawings to Specification.*

Compositions containing plaster, dextrin, glue, and salts.—An absorbent lining for telephone mouthpieces, adapted to be impregnated periodically with a liquid disinfectant, is composed of 90 per cent gypsum and the remaining 10 per cent of a mixture of dextrin, alum, sulphate of zinc, borax and glue, these latter ingredients serving to impart stiffness to the material.

199,444. Cone, E., and **Hale, J. W.** March 17, 1922. *Drawings to Specification.*

Refractory substances containing graphite.—A plastic material for furnace linings, which will fuse or assimilate with the brickwork at the working temperature, consists of graphite 50 parts, fire-clay 25 parts, silica rock in three to four inch lumps 5 parts, magnesite 5 parts, together with sufficient anhydrous gas tar or gas tar mastic to ensure plasticity. In the composition described in the Provisional Specification the magnesite is omitted.

199,575. Nickel, O., and **Markwitz, R.** May 25, 1922.

Cements, Portland and Roman, processes for making.—In making cements by adding quicklime to siliceous materials, such as metallurgical or boiler slag, pumice, trass, tufa, &c., the ingredients are mixed in a perfectly dry condition and ground, before or after mixing, to the fineness of cement. 1—5 per cent of gypsum may be added.

Reference has been directed by the Comptroller to Specifications 11948/84, 5412/89, 19467/91, 4594/98, 1438/14, *and* 187,362.

200,311. Sperni, J. May 30, 1922.

Concretes and mortars.—To cements of the kind comprising burnt magnesite and unburnt clay, with or without a small quantity of potassium salts, zinc oxide and one or more of the oxides of manganese, particularly the dioxide, are added to improve the adhesive and setting properties. The Provisional Specification states that the cement may be used either alone or in conjunction with filling materials, such as sand, sawdust, infusorial earth, cork- and leather-waste.

200,564. Hartgrove, F. April 10, 1922.

Concrete, preserving.—A waterproof dressing for concrete consists of white copperas, glue, and water, preferred proportions being 1 lb. each of white copperas and glue to 1 gall. of water.

200,903. Bourdeau, L. E. April 19, 1922.

Refractory substances containing bauxite, basalt, ilmenite, cerite, and carbon.—An abrasive refractory composition is made by fusing a mixture consisting chiefly of bauxite and basalt, with smaller proportions of ilmenite, cerite, carbon, and a flux such as sodium fluosilicate. Substances such as emery, corundum, flint and quartz may also be added. The product may be coloured by the addition of suitable oxides so as to indicate its degree of hardness.

200,915. Decking, C. April 20, 1922. *No Patent granted (Sealing fee not paid).*

Concretes.—In the manufacture of building elements from a composition comprising lime, an alkali carbonate, and filling materials such as sand, with or without other binding-agents such as cement, the alkali carbonate solution is incorporated with a finely-divided inert material such as hydrated ferric oxide before addition to the other ingredients, in order to delay setting until the composition is moulded under pressure.

200,981. Thomas, H. L. May 27, 1922. *Drawings to Specification.*

Compositions containing resinous and wax-like materials.—Electric inductance coils are embedded in a mould in an insulating compound comprising 83 per cent of paraffin wax, 13 per cent of resin, and 4 per cent of ivory black. The molten compound is poured through an aperture in the mould and, when set, forms a moisture-proof protection for the coil.

201,006. Claxton, J. E. June 23, 1922.

Compositions containing bituminous materials and india-rubber for road-paving, grouting, and spraying are made by mixing with 1 gallon of boiling gas tar either 1—4 oz. of plantation rubber, 1—8 oz. of scrap vulcanized rubber, or $\frac{1}{6}$—$\frac{2}{3}$ pint of rubber latex.

201,121. Soc. Anon. de Dynamite de Matagne. July 18, 1922, [*Convention date*].

Compositions containing plaster and salts.—Rigid casings for cartridges are obtained from cementitious material by mixing the material with salts containing water of crystallization and subsequently heating the mixture until the water is set free and hardens the cement. The mixture preferably also contains flame-extinguishing salts, for example calcium fluoride and sodium chloride. A mixture containing 50 per cent plaster, 30 per cent calcium fluoride and 20 per cent sodium sulphate is poured by means of a double funnel into a paper bag surrounding the cartridge so as to leave the ends thereof uncovered, and is subsequently heated to about 40° C. until a rigid sheath is obtained.

201,650. Prodor, Soc. Anon., and Levy, M. Feb. 3, 1922.

Compositions containing bituminous and siliceous &c. materials.—A composition suitable for use in road foundations, pipes, walls, coating tanks and for purposes for which cement concrete is generally used, consists of selected or specially prepared hard pitch with which graded filling materials are incorporated by heat. Suitable pitch is a gas tar residue hardened by distillation and containing a minimum of free carbon. The hardness is tested by the Brinell method and with a ball of 20 m.m. diameter and a load of 100 kg. should not fall below 10 between the temperature limits of use. According to an example 450 kg. of hard gas pitch are mixed at 200—250° C. with 3500 kg. of broken hard limestone, 1500 kg. of sand, and 700 kg. of pulverized limestone. Pipes, walls, &c. of the composition may be reinforced with steel or provided with expansion joints consisting of gaps filled with plastic material. Specifications 167,997, 202,248, [*Class* 87 (ii), Moulding plastic &c. substances], and 202,598, [*Class* 87 (i), Bricks, &c.], are referred to.

201,813. Cruijff, C. J. Oct. 10, 1922.

Compositions containing bituminous and siliceous and like materials.—Solid bodies such as sand, powdered brick or rock &c., and liquid or semi-liquid hydrocarbons, such as petroleum, petroleum pitch, petroleum residue, tar oil, gas oil, tar, mixtures of pitch and tar, &c., are rubbed together under pressure in a pug-mill. The product may be crushed, and spread upon the road as powder and subsequently consolidated under high pressure, or may be applied in the heated state as a plastic mass, and in both cases crushed stones, gravel, slag, or other aggregate may be added before spreading, or clinkers, bricks, or other paving stones may be embedded in the surface after spreading. According to an example 3 parts of petroleum residue and 3 parts of pitch are rubbed together with 100 parts of sand and 50 parts of crushed stone are added.

201,880. Naamlooze Vennootschap Glasfabriek Leerdam voorheen Jeekel, Mijnssen, & Co. Aug. 4, 1922, [*Convention date*].

Stone, artificial.—A material for making building-blocks, tiles, vases, &c. is produced by heating a mixture containing sand and glass or glass-forming ingredients under such conditions that some of the sand remains undissolved. According to one form of the invention a mixture of 100 parts of bottle glass and 40 parts of sand, with or without 20 parts of furnace slag and small quantities of manganese or cobalt, is used. According to a modification the mixture consists of 110—140 kg. of sand, 35 kg. of soda, 17 kg. of calcareous spar, 5 kg. of bone-meal, and 100 gm. of cobalt; 10 kg. of sand in this composition may be replaced by 20 kg. of kaolin.

201,916. Consortium für Elektrochemische Industrie, Ges. Aug. 7, 1922, [*Convention date*]. *Samples furnished.*

Resinous compositions.—Artificial resins obtained from polymerization and condensation of aldehydes alone or with other substances, excluding those obtained by condensation of phenols with aldehydes or urea with formaldehyde, are improved in elasticity, solubility and fusibility by incorporation in the resin of one or more compounds containing a hydroxyl or a carbonyl group on their derivatives or mixtures of them with other substances. The process is promoted by the presence of a solvent or by working under pressure. The resins may be hardened before or after treatment in known manner, for example by thermal treatment or by esterification. Examples show the incorporation by melting in polymerized acetaldehyde resins of ricinoleic acid, of castor oil alone or with aluminium oxide, and of mesityl oxide, and in polymerized crotonaldehyde resins of phenol and of castor oil. Other examples of suitable additions dioxystearic acid, salicylic acid and phorone. Specifications 26928/10 and 182,459, [*Class* 2 (iii), Dyes &c.], are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) describes also the improvement by the method described above of artificial and natural resins in general and contains also the following examples :—melting Albertol (a phenol-aldehyde resin) with castor oil, coumarone resin with dioxystearic acid, colophony with dioxylabietic acid and with castor oil, and shellac with castor oil. This subject-matter does not appear in the Specification as accepted.

202,230. Mackay, H. A. May 9, 1922.

Compositions containing bituminous and siliceous, calcareous, and like materials.—Aqueous emulsions of bitumen of the kind artificially prepared from petroleum, e.g. Mexican asphalt, are mixed with mineral aggregate to form road-making compositions, or are applied, e.g. by spraying, to a previously-laid layer of aggregate. The emulsions are prepared by melting the bitumen and adding thereto with agitation first about 2½—5 per cent of a higher fatty acid, and then a dilute (1—2 per cent) solution of potassium or sodium hydroxide or carbonate at a temperature of 215°—225° F., the heating and agitation being maintained until emulsification takes place, and the agitation preferably continued during cooling. Unsaturated acids such as oleic acid may be used. The emulsion is preferably diluted with water before use, and the aggregate may be moistened with water before the emulsion is applied thereto. Specifications 202,021, [*Class* 81 (i), Disinfecting &c.], is referred to.

202,235. Mackay, H. A. May 9, 1922.

Compositions containing bituminous and siliceous, calcareous, and like materials. —Aqueous emulsions of bituminous solids or viscous liquids, e.g. pitch, tar, and native bitumen and asphalt, but excluding bitumens artificially prepared from petroleum, are used as binding-agents for road-making materials. The bitumen is melted, and about 2½—5 per cent of a fatty acid, or a mixture of fatty acid with resin, or resin oil, or both, is added thereto. A dilute (1—2 per cent) solution of potassium or sodium hydroxide or carbonate is then added at a temperature of 215°—225° F., the heating being maintained until emulsification is effected. The mixture is agitated throughout the process, and preferably also during the subsequent cooling. Unsaturated acids such as oleic acid may be used. According to the Provisional Specification, the fatty acid may be entirely replaced by resin or resin oil. Specifications 28178/10, and 202,021, [both in *Class* 81 (i), Disinfecting &c.], 202,230, and 202,231, [*Class* 81 (i), Disinfecting &c.], are referred to.

202,282. Cullerier, J. Aug. 8, 1922, [*Convention date*].

Stone, rendering translucent.—In order to make marble translucent it is taken in the form of plates of 2 to 15 mm. thickness and treated in a bath of glycerine which is preferably warm.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the treatment of natural minerals and artificial substances and the use of glycerine derivative instead of glycerine. This subject-matter does not appear in the Specification as accepted.

202,651. Chemische Fabrik Ambra, Akt.-Ges., (Assignees of *Goldschmidt, H., and Neuss, O.*). Aug. 17, 1922, [*Convention date*].

Compositions containing urea-aldehyde condensation products.—Clear or turbid materials which are proof against water are prepared by subjecting to heat and pressure, preferably after a preliminary disintegration, the products obtainable by heating urea with formaldehyde in the presence of acids, non-alkaline salts, or organic substances of acid character such as phenols. Fillers or colouring matters may be incorporated in the products. In examples (1) urea, formaldehyde, and sulphuric acid are heated together, and the cooled product disintegrated and pressed at about 100° C.; (2) urea, formaldehyde, and resorcin are heated together and the product treated as in example (1).

202,698. Frosell, O. May 13, 1922.

Compositions containing magnesia; plastic compositions containing oxychlorides.—Magnesia is made into a paste with water and moulded into articles which are allowed to set at a pressure of 80 lbs. per square inch, or more. Hot moulds may be employed with hydraulic pressure up to 3,000 pounds, or the composition may be moulded under a pressure of 1,500 to 1,600 pounds and then steamed at 80 pounds. If the magnesia contains lime, ammonium chloride may be added in such proportions, viz. two parts of commercial sal ammoniac for one of lime, that it reacts with the lime, and not with the magnesia. Fillers, such as wood flour, cork, sawdust, rockdust or crushed stone, silica, infusorial earth or kiesilguhr, asbestos &c. may be employed, and examples are given of compositions containing such fillers.

Reference has been directed by the Comptroller to Specification 25884/04.

203,062. Thompson, W. P., (*Bong, E.*). June 6, 1922.

Refractory substances containing silica for lining gas-producers, &c., consist of quartz rock in lumps of 5—15 mm. in size and a binding-agent such as triturated fire-clay.

203,302. Soc. van Steenbrugghe et Breton. Sept. 1, 1922, [*Convention date*]. *Void* [*Published under Sect. 91 of the Act*]. *Drawings to Specification.*

Compositions containing hydrocarbon substitution products.—An insulating composition stated to be capable of withstanding temperature above 100° C. comprises a mixture of 60—70 per cent of synthetic varnish with 40—30 per cent of a mixture of porcelain powder (45 per cent), emery (45 per cent), and mica (10 per cent).

203,310. Soc. of Chemical Industry in Basle. Sept. 1, 1922, [*Convention date*].

Compositions containing organic condensation products.—Resins of the aromatic series containing hydroxyl and sulphur, such as those described in Specification 186,107, [*Class* 2 (iii), Dyes &c.], are esterified, the resulting resins being insoluble in alcohol or alkali but soluble in halogenhydrocarbons. In examples, the phenol-sulphur resin described in Specification 186,107, [*Class* 2 (iii), Dyes &c.], is treated with acetic anhydride, benzoyl chloride, or *p*-toluenesulphochloride. The products may be used as protecting and insulating varnishes or as impregnating-agents; their elasticity may be increased by adding triphenylphosphate, camphor, camphor substitutes, or natural resins, or they may be incorporated in suitable solvents such as cyclohexane with cellulose esters or rubber.

The Specification, as open to inspection under Sect. 91 (3) (a), contains additional examples, in one of which the phenol-sulphochloride resin described in Specification 13657/13 is acetylated; this subject-matter does not appear in the Specification as accepted.

203,733. Kulas, C., and **Pauling, C.** April 12, 1922.

Compositions containing phenol-aldehydes.—A normal dehydrated resol (initial condensation-product of phenol and formaldehyde) with or without the addition of fillers, &c. is moulded under pressure at a temperature of 80—100° C. to obtain a product which is hard at ordinary temperatures but is still soluble and fusible. After removal from the moulds the articles may be further hardened by gradually heating up to 120—140° C. Resols of the kind described in Specification 159,494, [*Class* 2 (iii), Dyes &c.], are suitable for the purpose of the invention, while those described in Specification 1921/08, [*Class* 70, India-rubber &c.] are unsuitable.

203,740. Taylor, H. F. May 12, 1922.

Compositions containing bituminous and siliceous materials.—A composition consisting of a bituminous or resinous substance, gravel, and an impalpable powder such as clay or ground limestone, slate, or stone, is made into flexible sheets either with or without a backing of Hessian or other fabric. The sheets are rolled up for transport and are laid as required upon a concrete or other foundation, which may be previously coated with a bituminous cement. According to an example the sheets consist of 15 parts by weight of petroleum bitumen, 15 parts of fireclay and 70 parts of granite gravel. Further quantities of gravel may be rolled into the sheets after manufacture. If Trinidad bitumen is used the impalpable powder may be omitted. Specification 1428/14 is referred to. According to the Provisional Specification, coal tar pitch mixed with creosote is used instead of petroleum bitumen.

203,826. Cuckow, A. E. E. July 1, 1922. *No Patent granted (Sealing fee not paid).*

Stone, hardening and preserving.—Building materials of an absorbent nature, such as bricks, blocks, tiles, sheets, posts, &c. of clay, concrete, composition, wood and asbestos-cement, are coated with a powdered bituminous substance, such as Gilsonite, and afterwards heated to fuse the bitumen. Powdered pigments such as earth red may be mixed with the bitumen.

203,963. Cochrane, W. R. Nov. 23, 1922.

Slag cements.—A mixture of blast furnace slag and calcium carbonate in suitable proportions is subjected to the action of crushing or stamping machinery so as to destroy the vitreous structure of the slag and reduce it to an amorphous powder. The ground mixture is washed with water to remove soluble impurities such as calcium sulphide, and the resulting slurry is calcined and ground in the usual manner.

204,256. Winks, J. Jan. 8, 1923.

Stone &c., treating with liquids.—Stone, cement, plaster, &c. surfaces are cleaned and restored by the application of a mixture of oxalic acid, carbolic acid, and water. Suitable proportions are 117 parts of oxalic acid, 6 parts of carbolic acid, and 877 parts of water.

204,337. Hartstoff-Metall Akt.-Ges., (Assignees of *Podszus, E.*). Sept. 20, 1922, [*Convention date*].

Stone, artificial and imitation.—Boron carbides having a proportion of carbon greater than that in B_6C, but not more than 30 per cent, such as B_3C, are obtained by fusing a mixture of boron, boron carbide (B_6C) or boron nitride with the requisite quantity of carbon. The product is rapidly cooled to prevent decomposition with the separation of graphite. The process may be effected under pressure, which facilitates the solution of the carbon. The ingredients may be mixed and formed into rods which are then heated by an electric current, the fused material being allowed to drop off, or a molten mass of boron or boron carbide may be heated in coal smoke until sufficient carbon has been absorbed. To increase the strength of the product small quantities of metals having a high melting point such as tungsten or titanium or the carbides of these metals may be added.

205,887. Jackson, W. J. Mellersh-, (*Hacker, W. E.*). July 25, 1922.

Compositions containing bituminous and siliceous &c. materials.—Relates to bituminous macadamized roads of the kind in which a superficial layer C of fine mineral aggregate coated with bituminous material is laid upon, and bonded by compression to, a primary layer B of coarse mineral aggregate coated with bituminous material laid upon an ordinary foundation A, and consists in grading the aggregate of the primary layer so that it shall contain not more than 18 per cent of voids. An aggregate of which 40—70 per cent is too large to pass through a sieve having ½ in. round openings, 15—40 per cent passes through the first sieve but is retained on a No. 10 mesh sieve, and 15—28 per cent passes the No. 10 mesh sieve, is stated to be suitable. Instead of the intermediate size aggregate, a mixture in which material retained on a No. 4 mesh sieve forms 10—25 per cent of the total aggregate, while material passing through the No. 4 mesh sieve but retained on the No. 10 mesh sieve forms the remaining 5—15 per cent. may be substituted. The layer C contains 8—17 per cent of bitumen. Specification 18518/14, [*Class* 107, Roads &c.], is referred to.

206,888. Murphy, T. July 11, 1922. *No Patent granted* (*Sealing fee not paid*).

Emulsified bituminous &c. compositions.—A product suitable as a binder in road making &c. consists of a bitumen-clay paste miscible with water. Bitumen which is semi-fluid at ordinary temperatures or which has been made so by the addition of about 25 per cent of flux oil while melted, is mixed cold with a clay paste consisting of approximately equal parts of dry clay and water, suitable proportions being 60 parts of bitumen to 40 parts of clay paste.

Reference has been directed by the Comptroller to Specification 9838/15.

207,172. Harr, K. Nov. 14, 1922, [*Convention date*].

Refractory substances containing magnesia.—Natural magnesite poor in iron, or artificially prepared magnesia, for example, the final solution in the manufacture of potash, is mixed with the residues produced during the manufacture of aniline, containing iron, and the mixture is dried or moulded, and baked. According to an example, magnesia slime is mixed with so much "iron oxide" from aniline oil residues, that the finished brick contains 84—89 per cent of MgO, 4—8 per cent of Fe_2O_3, 0.1—2.5 per cent of Al_2O_3, 1—2.5 per cent of CaO, and 2—6 per cent of SiO_2.

207,497. Douzal, E., (Assignee of *Soc. le Plasto-Marbre*). Nov. 22, 1922, [*Convention date*].

Compositions containing calcium sulphate and double or triple salts.—Artificial marble is produced by melting in the water of crystallization either a double salt such as alum, the constituents of a double salt such as a mixture of potassium and aluminium sulphates, or a mixture of isomorphous double salts such as chrome alum and common alum, and adding powdered calcium sulphate to the solution, which is then allowed to crystallize in a mould. The process is so conducted that all the water of crystallization is retained; for example, a reflux condenser may be used and the temperature maintained during the mixing at 92—94° C. Small quantities of oxides of iron, manganese, &c. may be added to assist the reaction.

207,503. Petrolignum Részvénytársaság, (Assignees of *Toth, J.*). Nov. 22, 1922, [*Convention date*].

Statuary consists of a skeleton made from wooden plates, veneer, cardboard, &c., covered with a waterproof mass, such as marble-cement, which solidifies. The covering is applied without the use of a mould, for example, by painting, dipping, or squirting. Varying colouring may be employed. Additions may be made to the main portion by partly embedding them in the covering before it is hard.

According to the Specification as open to inspection under Sect. 91 (3 (a), frames, figures, utensils, and fancy goods may be made in the same manner. This subject-matter does not appear in the Specification as accepted.

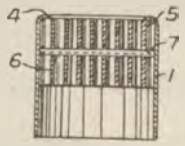
207,616. Holzapfel, A. C. Aug. 31, 1922.

Compositions containing resinous materials and rubber for use in making coating-compositions. Coumarone resin and rubber are melted together.

207,677. Marks, E. C. R., (*Buffalo Refractory Corporation*). Oct. 24, 1922.

Refractory substances containing graphite.—A mixture of graphite, a refractory electric furnace product, and a carbonizing binder, with or without a solid flux, is moulded and heated to carbonize the binder; the article is then dipped into a liquid flux, such as sodium borate or sodium silicate, and heated to a temperature of 1200° F. The refractory electric furnace product may be silicon carbide, fused magnesite, fused alumina, or fused silica. Feldspar may be used as the solid flux. The carbonizing binder may be molasses, pitch, or tar. The proportion of the ingredients may be 10—55 per cent of graphite, 20—80 per cent of refractory product, and up to 25 per cent of fluxing agent.

208,067. Visse, A. March 27, 1923.



Refractory substances containing fire-clay.—An atmospheric gas burner comprises a socket 1 containing two perforated plates 5, 6, formed of refractory material, consisting of approximately one-third of porcelain clay and two-thirds of ordinary clay.

208,132. Krug, C. Dec. 6, 1922, [*Convention date*].

Compositions containing resinous materials and organic condensation products.—A cementing or binding composition, particularly suitable for securing abrasive coverings to steel discs, consists of a mixture of shellac with a porous mineral such as chalk, heavy spar, or pumice, and a non-porous metallic oxide of great heat capacity, for example iron oxide with or without Bakelite A or Resinit for increasing the fluidity. A preferred method of preparation consists in mixing equal parts of Bakelite A, pumice, and iron oxide and adding the mixture to rather less than its own weight of shellac. An alternative composition for discs of intermediate size consists of equal parts of shellac, pumice, iron oxide, and Bakelite A. The product may be melted, stirred, solidified, and ground. Specification 10374/13, [*Class* 60, Grinding or abrading &c.], is referred to.

The Specification as open to inspection under Sect. 91 (3) (a) describes the use of artificial resins in general for increasing the fluidity of the composition. This subject-matter does not appear in the Specification as accepted.

208,137. Krug, C. Dec. 9, 1922, [*Convention date*].

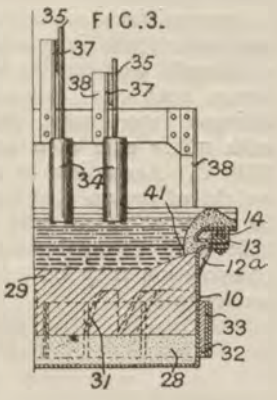
Compositions containing phenol-aldehyde condensation products and abrasives.—A thin grind-

ing-disc, for use in wet grinding, comprises a fibrous fabric foundation, the surface of which is teased to produce a thick nap, coated with a layer of liquid phenol-aldehyde resin, for example, "Bakelite A" or "Resinit," which hardens sufficiently at a temperature below 100° C. To this layer is applied an abrasive mass consisting of abrasive grains mixed with the same resin as bonding-material, shaped when plastic, pressed and dried. The disc is then finished in an oven at a temperature below 100° C. Specifications 10374/13, [*Class* 60, Grinding or abrading &c.], and 208,132 are referred to.

208,193. Alexander, A. E., (*Stokes, J. S.*). Aug. 11, 1922.

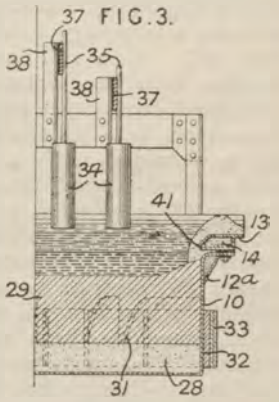
Compositions containing organic condensation products.—Synthetic resins, obtained by condensing phenols with carbohydrates and subsequently incorporating a methylene hardening agent, may be mixed with fillers, pigments, colours, or lubricants at any stage of the process, or may be incorporated with fibrous structures, for example cellulose by incorporation at the beaters of paper-making machinery, for the production of printing plates, sound records, laminated fibre products, electrical insulation, &c. Specifications 102,751 and 171,729, [*Class* 2 (iii), Dyes &c.], are referred to.

208,710. Aluminum Co. of America, (Assignees of *Hoopes, W.*). Dec. 21, 1922, [*Convention date*].



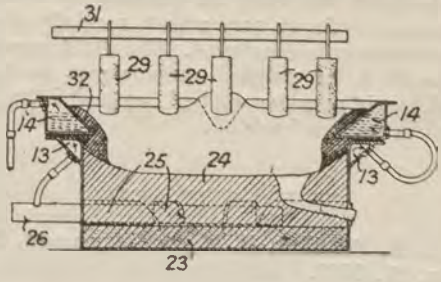
Refractory substances containing fluorides.—In a water-jacketed electrolytic cell the side lining 41 is formed by melting a mixture of suitable fluorides in the cell, the water circulating in the jackets causing a crust to form thereon. When the cell is to be used for refining aluminium, a mixture containing aluminium, sodium, and barium chlorides, or a mixture of cryolite and fluor-spar in equal proportions, is placed in the cell and fused to form a crust over the joint between the sections 10, 13. In some cases air may be used as the cooling medium in the jackets, instead of water.

208,711. Aluminum Co. of America, (Assignees of *Hoopes, W.*). Dec. 21, 1922, [*Convention date*].



Refractory materials containing fluorides.—A cell for refining metals is provided with an electric insulating lining 41, by fusing therein material, such as a mixture of fluorides, which solidifies at a suitable temperature and cooling the sides of the cell to cause a crust to be formed thereon, while maintaining electrically neutral a portion of the cell surface above an electrically separated lower portion. The cell comprises a metal shell divided horizontally into two sections 10, 13, insulated from one another, the former section being connected to a source of current. The section 10 is provided with a heat-insulating layer 28 of bauxite, alumina, magnesia or refractory bricks and a bowl-shaped lining 29 of carbon. The latter is made by tamping into the shell a mixture of tar, pitch, and granular or powdered coke when in a plastic condition and then baking in an oven at 600° C. When the cell is to be used for refining aluminium, a mixture containing aluminium, sodium and barium chlorides, or a mixture of cryolite and fluor-spar in equal proportions, is placed in the cell and fused to form a crust over the joint between the sections. Molten alloy of the kind to be used as the anode is then poured into the cell, the fluorides being lighter rising to the top and forming a layer thereon, with the subsequent formation of a crust on the sides of the upper section 13. Part of the fluoride bath is then dipped out and a layer of pure aluminium is poured on the top of the remaining bath mixture to form the cathode.

208,712. Aluminum Co. of America, (Assignees of *Hoopes, W., Edwards, J. D., and Horsfield, B. T.*). Dec. 21, 1922, [*Convention date*].



Refractory substances containing fluorides.—A cell for refining metals by electrolysis has a re-

fractory insulating lining formed by establishing on the cell a bath of fused material suitable for use as an electrolyte and containing a refractory material, such as alumina, desired as a constituent of the lining, and depositing from the mixture a crust containing such material on the walls of the cell. The cell comprises a metal shell divided into two water-jacketed sections 13, 14 insulated from one another, the former being connected to a source of current. The section 13 is provided with a heat-insulating layer 23 and a bowl-shaped layer 24 of carbon. A conductor 26 is secured to the shell and plates 25 welded to the shell ensure good contact with the carbon layer. A number of upper carbon electrodes 29, secured to a conductor 31, are provided. When the cell is to be used for refining aluminium, the bath may be composed of a mixture of alumina and fluorides of aluminium, barium, sodium, strontium, calcium, and magnesium. A suitable mixture comprises 9 parts by weight of aluminium fluoride, 9 parts by weight of barium fluoride, 7 parts by weight of sodium fluoride, and sufficient alumina to saturate the mixture. The cooling action of the circulating water in the jackets causes a crystalline crust, which is chiefly alumina, to form on the sides of the shell. During the operation of the cell for refining, the bath mixture will be situated between an upper layer of pure aluminium and a lower layer of an alloy containing aluminium and the thickness of the lining 32 will always be increasing, due to oxygen entering the bath through the oxidation of sodium formed at the cathode. The crust may be broken away when it becomes too thick, thus forming a convenient method of removing excess alumina from the bath. Specifications 208,710 and 208,711 are referred to.

208,770. Tyler, R. Sept. 25, 1922.

Compositions containing bituminous &c. siliceous &c. and oily materials.—A composition suitable for roof coverings, pipe joints, &c. consists of bitumen, Portland or similar cement, ground burnt clay, coal dust, and a vegetable oil. Suitable proportions are 400 parts by weight of bitumen, 175 parts of Portland cement, 175 parts of burnt clay pipes, 5 parts of linseed oil, and 50 parts of coal dust. The coal dust on addition to the molten mass renders it more easy to pour, and may be replaced by equivalent substances such as tar, which partially distil at the temperature employed. The fluid mass may be moulded, or painted on surfaces to be protected, or it may be applied, extruded &c. on to a canvas or like backing.

208,879. Wake, J. F., and **Spence, D. D.** Nov. 21, 1922.

Compositions containing bituminous, oily, waxlike, resinous, &c. materials.—A composition suitable for making roads, hard tennis courts, &c. comprises a binding agent composed of bitumen treated to remove excess of sulphur, and a smaller quantity of a mixture of China-wood oil, stearine, and manilla or like resin. Suitable proportions are 70—90 per cent of bitumen containing less than 0.5 per cent of sulphur, to 30—10 per cent of a mixture of 7.5 parts by weight of China wood oil, 1.25 parts of stearine, and 3.25 parts of manilla resin. For road making, aggregate is heated and sprayed with the melted binding agent, suitable proportions being about 1 cwt. of binder to 1 ton of aggregate, although the amount of binder may be 16 per cent with an aggregate of clinker, ash, &c.

209,064. Boyen, E. von. Dec. 23, 1922, [*Convention date*].

Compositions containing waxes.—Compositions resembling bees-wax are made by heating mineral, vegetable, or animal hard waxes such as brown coal wax, candelilla wax, Chinese insect wax, carnauba wax, with a drying oil and a drying agent. According to an example, 75 parts by weight of carnauba wax, 25 parts of castor oil, and 3 parts of litharge are heated for 1—3 hours at 200°—230° C. with agitation, until a drop solidifies and adheres to a glass plate. The lead may be removed, e.g. by treatment with acid, and the composition can be bleached. The composition may be mixed with paraffin, ozokerite, or resins.

209,065. Boyen, E. von. Dec. 23, 1922, [*Convention date*].

Compositions containing waxes.—A kneadable wax substitute is made by mixing the grease of sheep's wool (yolk) with a hard wax such as brown coal wax, carnauba wax, candelilla wax, Chinese insect wax, and oxidizing the mixture with nitric acid at a temperature not exceeding 130° C. According to an example, 70 parts by weight of brown coal wax, 30 parts of yolk, and 20 parts of nitric acid of 40Bé., are heated at 100°—130° C. until gases cease to be evolved. The composition may be mixed with resins, paraffin, ozokerite &c.

209,114. Mulligan, F. Jan. 20, 1923.

Plaster and like cements, processes for making.—Gypsum is calcined at a temperature of 1800—2400° C., at which clinkering commences and large quantities of free lime are released; the calcined material is ground to a fine powder and mixed with not more than one per cent of a hardening agent such as borax, soda, or potash.

209,697. Alexander, A. E., (*Stokes, J. S.*). Aug. 11, 1922.

Compositions containing organic condensation products.—Synthetic resins obtained by substituting urea for the phenolic compounds in the process described in Specification 208,193 may be mixed with the same fillers and are utilizable in the same way as described in that Specification.

209,997. Heilbron, M. April 14, 1923.

Compositions containing resin, oxidized oil and wax.—A mixture of resin or its equivalent, boiled vegetable oil, and a wax such as carnauba wax, moulded in stick form, is used as a depilatory. The end of the stick is heated, pressed on to the hair, allowed to cool and then suddenly removed, bringing the hair away with it. A small quantity of white wax is preferably added to the mixture. Suitable proportions are, resin 65, carnauba wax 20, boiled linseed 10, white wax or hard paraffin wax 5. The resin, carnauba wax and white wax are melted together, and the vegetable oil added while the mixture is cooling.

210,154. Roberts, W. L. H. Oct. 25, 1922.

Cements, Portland, treating after manufacture.—Marl or chalk is calcined at 2300° F., and the resulting clinker is passed through water, stored until it falls to powder, and mixed with Portland cement either before or after the final grinding of the latter. The composition may contain 10—30 per cent of the hydrated lime. Specification 210,153, [*Class* 1 (iii), Oxides &c., Metallic], is referred to.

210,343. Zimmer, C. L. V., and **Fränkl, E.** May 23, 1923.

Asphalts.—Powdered calcareous rock is mixed with an aqueous emulsion of natural asphalt or the like containing 100 parts of bitumen and 1000 parts of water, and the resulting bituminous deposit is removed from the aqueous liquor, dried and heated to 120—150° C. with or without pulverization. The emulsion is preferably prepared with the aid of sulphonated fatty acids, naphthene acids, sulphonaphthene acids, or acid resins, or their derivatives. The calcareous rock is limestone or other lime-containing rock either with or without an admixture of other finely divided minerals such as sand, stone-meal, slag, &c., and of a small amount of calcium chloride. According to an example, 500 parts by weight of limestone powder, 500 parts of fine gravel or sand, and 5 parts of calcium chloride are intimately mixed and introduced into an emulsion of 100 parts of Mexican natural asphalt and 1000 parts of water. Specification 11331/15 is referred to.

210,366. Patrouilleau, L. G. July 23, 1923.

Cements, processes for making; treating after manufacture.—Cements derived from bauxite are freed from magnetic metallic impurities by treatment in a magnetic separator after manufacture. The cements are obtained by treating a mixture of lime or limestone and bauxite in a furnace, with the addition of carbon to reduce metal oxides. After the first smelting the metallic pig or slag is removed by pouring or sorting, and the remaining alumino-silico-calcic slag is crushed, screened and passed to the magnetic separator, which preferably comprises an endless band with magnets so arranged as to allow the non-magnetic particles to drop from the band while the magnetic particles remain adhering to it. By thus freeing the cement from metallic impurities, a constant proportion of lime, alumina, silica and as an accessory magnesia may be obtained.

210,470. Wilkins, R. F., and **Chandler, H.** Aug. 4, 1922.

Concretes and mortars.—A composition to be applied to walls to give the appearance of stone consists of 50 per cent of freestone dust or other fine clean sand, 25 per cent of white cement, 20 per cent of silver sand, and 5 per cent of a compound containing hydrated lime, fat, and alkaline carbonates, the whole being mixed into a paste with a concentrated aqueous solution of ¼ oz. of sulphate of iron and 1 oz. of alum, to which ¼ pint of spirits of salt has been added.

210,708. Loke, J. J. May 14, 1923.

Refractory substances containing titanium compounds.—The slag, consisting chiefly of titanium oxides, which is obtained in the process of manufacturing iron from oxidized titanic iron described in Specification 157,705, [*Class* 72, Iron &c.], is mixed with a small proportion of a binding agent and used for lining furnaces or making refractory articles.

211,203. Behr & Co., Inc., H., and **Crupi, F. J.** Nov. 13, 1922.

Compositions containing resin &c. and glue &c.—A composition for use in the manufacture of waterproof sand paper &c. comprises resin dissolved in phenol mixed with an aqueous solution of glue having an acetic acid content with or without a small proportion of benzene or benzine. The most suitable proportions are 250 lbs. of resin, 75 lbs. of 87 per cent phenol, 60 lbs. of glue, 100 lbs. of water, 100 lbs. of 56 per cent acetic acid, and 5 lbs. of benzene or benzine. The resin and phenol are heated together in a container, and the solution of glue and acetic acid is subsequently added. Additional waterproof qualities may be obtained by treatment with formaldehyde &c.

211,205. Butter, G. W., and **Williams, C.** Nov. 13, 1922.

Compositions containing bituminous materials and slag.—The ferro-silicate known as "copper slag" obtainable in the neighbourhood of Swansea is intimately mixed with a tarry or bituminous binder to form road macadamizing or paving material. The percentage composition of the slag is: Silica 60.6, iron-oxide 33.48, lime 2.80, magnesia 1.00, sulphur 0.54, with traces of copper and tin.

211,497. Décolland, R. Feb. 14, 1923, [*Convention date*]. *Drawings to Specification.*

Cements, Portland &c., processes for making.—Aluminous cements are made in ordinary rotary kilns by (a) lengthening the heating zone and (b) preventing the formation of a coating due to the fusing of the fuel ashes. The lengthening of the heating zone is accomplished by employing as a fuel a coal such as lignite which contains a large proportion of volatile neutral products, or by diluting the roasting atmosphere with water-vapour or other neutral gas, e.g. waste furnace gases delivered from the foot of the chimney to the air inlet. The prevention of the formation of a coating of fused ashes is effected by mixing with the fuel a sufficient proportion of limestone to combine with the silica, iron &c. and render the ash refractory, or by removing the refractory lining of the kiln at the point of formation of the fused ash, and cooling the plating by external means.

The Specification as open to inspection under Sect. 91 (3) (a) states that the process is applicable also to the calcination of other materials. This subject-matter does not appear in the Specification as accepted.

211,517. Andrews, H. May 22, 1923.

Slag cements.—Lime, with or without other substances such as silica and iron ore, is mixed with molten blast furnace slag, and the mixture is fed into a rotary kiln at 1500° C. The waste gases from the kiln are utilized to burn limestone for the production of the lime used in the process. The clinker is ground with or without an addition of 30—50 per cent of granulated slag.

211,846. Compagnie Générale du Basalte (C. G. B.). Feb. 23, 1923, [*Convention date*]. *Void* [*Published under Sect. 91 of the Act*].

Stone, artificial; refractory substances containing basalt.—Basalt is mixed with a fusible or refractory substance such as clay or clayey sand, and either fused and moulded, or moulded and subsequently baked.

211,873. Dynamidon-Werk Engelhorn & Co. Ges., Engelhorn, R., and **Schaefer, J.** Feb. 20, 1923, [*Convention date*].

Refractory substances containing magnesia.—Raw or calcined magnesite or magnesia is fused, cooled and washed, and is made into bricks &c. or applied as a coating and burnt at a high temperature in the usual manner. A portion of the fused material which has been finely ground serves as a binding-agent, and sintered magnesite may also be added. Temporary binders such as tar and dextrin may be employed. The material should be as free as possible from lime and iron. The latter impurity may be removed by fusing under reducing conditions and passing the fused material through a magnetic separator.

211,944. Hodson, J. Nov. 28, 1922.

Refractory substances containing magnesite, dolomite, &c.—Refractory bricks, furnace linings, retorts &c. are made from raw, or a mixture of raw and incinerated naturally-occurring rocks containing magnesium and calcium carbonate such as dolomite or magnesite, together with (1) talc, steatite, or other magnesium silicate, or (2) igneous rocks with or without basic iron ores, or (3) silica sand with either magnesium silicate, or igneous rock or clay, the mixture being moulded with or without a glutinous binder and burnt, or burnt to a plastic state and subsequently moulded. Several examples are given of which the following are typical:—15 per cent of

silica is mixed with 5 per cent of serpentine, 10 per cent of raw dolomite, and 70 per cent of burnt dolomite, or 92½ per cent of raw magnesite is mixed with 5 per cent silica sand and 2½ per cent of clay. Specifications 14981/10, 23725/12, 110,147 and 197,791 are referred to.

211,947. Thornton, A. A., (*Naamlooze Vennootschap Korrelbeton Maatschappij voor Woningbouw in Poreuze Beton*). Nov. 28, 1922.

Concretes.—A concrete for forming walls, floors, roofs &c. in situ consists of an aggregate of such a size and shape, and such a quantity of cement, that the hardened concrete contains 30—55 per cent of air space. Granulated slag is a suitable aggregate, and the most suitable size is between 25 mm. and 12 mm. for walls, 25 mm. and 8 mm. for roofs, and 25 mm. and 4 mm. for floors, and the quantity of cement may vary between 1 part to 10 of aggregate and 1 part to 5 of aggregate, the higher proportion being used for reinforced work. Walls are made by moulding between shuttering without any ramming. In the case of floors and roofs, the minimum amount of ramming is employed.

212,106. Building Accessories & Flooring Co., Ltd., Goodwin, H., and **Smith, H.** March 3, 1923.

Asphalts.—Coloured asphalts are obtained by incorporating with natural or artificial asphalts, or with the ingredients of the latter, a dry finely-divided pigment, such as red iron oxide, yellow ochre, red lead oxide, chromium oxide, lead chromate, or an organic colour such as lithol red. In the case of artificial asphalts, the pigment may replace a part or all of the mineral aggregate. Several examples of particular compositions are given, of which the following are typical. (1) 213 lb. of limmer rock asphalt are heated to 200° C., 7 lb. of Mexican bitumen are added, and 40 lb. of ferric oxide heated to 110° C. are stirred in. (2) 47 lb. of an asphalt cement made by mixing 112 parts of Trinidad lake bitumen and 21 parts of heavy Texas fluxing oil are heated to 180° C. and run into a heated mixture of 112 lb. of sand, 11½ lb. of ground chalk, and 56 lb. of red ferric oxide.

212,188. Building Accessories & Flooring Co., Ltd., Goodwin, H., and **Smith, H.** Aug. 21, 1923.

Asphalts.—Gilsonite is melted with a fluxing oil and mixed with a finely-divided mineral aggregate such as limestone or a mixture of sand and ground chalk. Pigments such as red oxide of iron, yellow ochre, chromium oxide, red lead, and lead chromate may be added. The Specification describes several examples of compositions, of which the following is typical: 100 parts of Gilsonite at 160° C. and 100 parts of heavy Texas oil at 110° C. are mixed and heated for 2—3 hours at 160—170° C. to produce an asphalt cement. 25 lb. of this cement is run into a mixture of 112 lb. of sand, 40 lb. of ground chalk, and 20 lb. of anhydrous chromium oxide heated to 200° C. The mixture is agitated until a uniform dark green paste is obtained. For harder asphalts a cement consisting of 100 parts of Gilsonite and 50 parts of Texas oil is used. Specification 212,106 is referred to.

212,419. Eriksson, J. A. March 13, 1923.

Concretes.—A composition for making blocks, &c., of cellular structure consists of Portland cement, "slate-lime" (a mixture of calcined slate and lime), and a powdered metal, such as zinc or aluminium, capable of generating gas in the presence of water. The water used for mixing is preferably heated to 25—40° C. To accelerate hardening, ingredients such as sodium carbonate, gypsum, or "ciment fondu" may be added.

212,501. Danin, J. Nov. 2, 1923. *No Patent granted (Sealing fee not paid).*

Refractory substances containing fire-clay; compositions containing plaster.—A composition which is capable of being poured into a mould, whence, after setting, it may be removed for use, or for baking to make refractory articles comprises 25 per cent of grey clay, 25 per cent of white clay, 32 per cent of grog, and 18 per cent of plaster of Paris mixed with half its weight of aqueous alum solution containing ½ per cent of alum by weight.

213,016. Marks, E. C. R., (*Columbia Graphophone Manufacturing Co.*). Dec. 30, 1922.

Compositions containing resinous materials.—A thermoplastic composition suitable for the manufacture of sound records consists of a filler, shellac, a resin of higher melting point such as copal, and a solvent common to the two resins, such as unsaturated fatty acids of the linoleic or olefinic groups. According to an example, 20—30 parts of shellac, 60—70 parts of a filler as

baryta, china clay, &c. and 2 parts of colouring matter are mixed together. 7 parts of flock, 4 parts of copal, and 1 part of solvent as above are mixed and incorporated by heat (about 265° F.) until the flock is impregnated by the resin. The second mixture may be added to the first while in a plastic state, or it may be allowed to cool and ground before mixing.

213,468. Eaton, F. E. May 31, 1923.

Compositions containing plaster, glue, oil, &c.—A composition to be moulded into blocks, planks &c. or for applying directly to walls, floors &c. consists of plaster of Paris, glue, linseed oil, white lead, rubber solution and alum. Suitable proportions are $2\frac{1}{4}$ lbs. of plaster, $\frac{1}{4}$ lb. of glue, 2 oz. of boiled linseed oil containing 3 per cent of white lead, 4 oz. of rubber solution, $1\frac{1}{2}$ oz. of alum and 1 quart of water. According to the Provisional Specification, the amount of plaster in above example is $12\frac{1}{4}$ lb.

213,659. Burton, S., (*Glover, W. H.*). Jan. 2, 1923.

Compositions containing bituminous materials and anhydrous copper sulphate for paving and like purposes consist of about 9 per cent of bitumen or mineral oil residue; about 10 per cent of finely-divided filler consisting of Portland or similar cement, or limestone or chalk dust; about 80 per cent of aggregate consisting of sand, gravel, crushed rock, or slag; and about 1 per cent of anhydrous copper sulphate. The ingredients are mixed at 240°—370° F., preferably under reduced pressure.

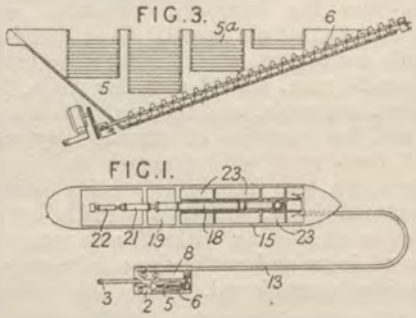
214,124. Marks, E. C. R., (*Felton & Guilleaume Carlswerk Akt.-Ges.*). June 19, 1923.

Compositions containing phenol-aldehydes and india-rubber.—Raw or depolymerized rubber and liquid or soluble, fusible phenol resins are thoroughly mixed on cooled rollers. The mixture is then heated in moulds up to 180° C., yielding a product resembling ebonite. 7—10 per cent of sulphur may be added, or the moulded articles may be vulcanized by treatment with sulphur chloride. Pigments such as cinnabar, golden sulphide, and soot may be incorporated with the mixture.

214,394. Hatton, M. March 6, 1923.

Compositions containing cement, sand, colouring-matter, &c.—Tiles, bricks, slabs &c. are made by mixing colouring matter other than lead colours, in powdered form, with sand, adding granite, cement, and water, and moulding the mixture. Suitable proportions are 3 parts by volume of sand mixed with 1 part of colouring matter, 2 parts of ground granite, 1 part of Portland cement, and 1 part of water.

215,357. Pioda, L. E. W. May 4, 1923, [*Convention date*].



Cements, Portland and Roman, materials, processes, and apparatus for making.—Portland cement is obtained by excavating a submerged deposit of shells and clay, correcting the proportions of the ingredients by removing excess clay, grinding if necessary to pulverize the shells, and burning at the usual temperature. In one form of apparatus for carrying out the process, a proportioning tank 5 and mill 8 are mounted on the barge 2 which carries the dredge 3, and the slurry is pumped through a flexible pipe 13 to a second vessel 15, which carries slurry storage tanks 23, a rotary kiln 18, clinker storage bin 19, cooler 21, and mill 22. The proportioning-tank 5 is fitted with adjustable weirs 5^a, over which excess clay and water escape while the correctly-proportioned slurry is removed by an elevator 6.

The Specification as open to inspection under Sect. 91 (3) (a) comprises the use of any clay or silt which is so finely divided that grinding is unnecessary, and also states that the shells may be pulverized by calcination. This subject-matter does not appear in the Specification as accepted.

216,120. Soc. Lefranc et Cie. May 17, 1923, [*Convention date*].

Cements, Portland, materials and compositions for; concretes.—The residue of calcium carbonate and sand or clay remaining from the decomposition of a mixture of calcium butyrate and sand or clay to produce dipropylketone can be employed in the manufacture of bricks and cements.

216,245. Meadows, S. C. March 10, 1923.

Compositions containing bituminous materials and india-rubber for making and waterproofing roads are prepared by incorporating rubber latex with a tarry or bituminous base. Vulcanizing-agents may be added and the mixture heated if necessary to vulcanize the rubber. A composition for spreading on roads as a waterproofing-agent is made by adding 1½ parts of latex (containing 50 per cent of rubber) to 98½ parts of a tar base composed of 74½ parts of coal tar, 10 parts of anthracene oil, 10 parts of petroleum pitch, and 4 parts of viscous petroleum residues. A composition for mixing with a filler such as sand, ground limestone, asbestos powder, and sawdust consists of tar base as above containing 2½—5 per cent of latex with the addition of sulphur, and is vulcanized by heating to 350° F. Compositions containing more than 5 per cent of latex are relatively infusible and may be cast into blocks; those containing less than 5 per cent can be melted in the ordinary tar boilers and used in the liquid state.

216,514. Babcock & Wilcox Co., (Assignees of *Harter, I., and Kohler, A. M.*). May 25, 1923, [*Convention date*].

Refractory substances containing silica and alumina such as mixtures of bauxite and kaolin are raised during manufacture to a temperature of at least 90 per cent of the temperature of fusion. The mixture is preferably moulded into blocks with the optional addition of a temporary binder and fired at the said temperature. It is then crushed, mixed with a refractory binding-agent, moulded, dried, and fired either at the temperature at which it was previously fired or at a lower temperature. A portion of the raw mixture is preferably used as the binding agent.

216,515. Babcock & Wilcox Co., (Assignees of *Harter, I., and Kohler, A. M.*). May 25, 1923, [*Convention date*].

Refractory substances containing clay, e.g. kaolin, are obtained by moulding crude kaolin having a melting point between 3218°—3326° F. into blocks with or without a temporary binder and burning it at a temperature of at least 90 per cent of its melting-point. The material is then crushed, mixed with a binder, moulded, dried, and fired, preferably at 3000—3250° F. The binder consists of crude unburnt kaolin and constitutes 25 per cent of the product.

216,519. Veaudelle, C. M. A. May 25, 1923, [*Convention date*]. *Void* [*Published under Sect. 91 of the Act*]. *Drawings to Specification.*

Compositions containing resinous materials.—The inner surfaces of receptacles for fluid under pressure, particularly the inner tubes of tyres, are coated with liquids carrying in solution or suspension, substances which react and form corpuscles capable of sealing punctures. The substances described consist of an alcoholic solution of resin or gum, and water to which has been added subacetate of lead, and optionally, an agglutinant and talc. According to an example, a solution of 20 parts of gum lac or other resin in 60 parts of methylated spirit forms one solution: the second mixture consists of 180 parts of water in whch 3 parts of magnesium sulphate and 15 parts of gelatine are dissolved and to which 100 parts of "extract of saturnum" (subacetate of lead) and 100 parts of talc &c. are added: finally, 1000 parts of water to form a vehicle. These are introduced through the valve stem of the tyre in any order.

216,602. Meadows, S. C. March 10, 1923.

Compositions containing bituminous materials and india-rubber for making and waterproofing roads are obtained by adding to a bituminous or tarry base either rubber treated with a solvent or softening agent or rubber mixed with vulcanizing-agents. Petroleum residues may be added to increase flexibility, and filiers, such as sand, ground limestone, asbestos powder, and sawdust may be used. Resinous rubbers such as pontianak and jelutong may be used, or rubber may be replaced by gutta-percha or balata. Compositions containing not more than 2½ per cent of rubber can be applied in the melted state: those containing more than this amount are relatively infusible and may be cast into blocks. An example of a waterproofing-composition consists of 99.25 per cent of a tar base composed of 75 parts coal tar, 10 parts anthracene oil, 10 parts bitumen, and 4 parts petroleum residue, together with 0.75 per cent of rubber previously softened with solvent naphtha, tar oil, anthracene resins, paraffin wax, &c. A composition for mixing with sand consists of the same tar base with 1.25—2.5 per cent of rubber and a small proportion of sulphur, and is heated to vulcanize the rubber content. Specification 216,245 is referred to.

216,835. Orlovsky, W. May 30, 1923, [*Convention date*].

Compositions containing plaster, lime, and fibres.—A building material suitable in wall construction as a filling between hollow structures formed of boards, or for brick-making, consists of a mixture of pulverized organic materials

such as peat powder, sawdust, or straw, with gypsum powder and lime powder which is only partially slaked. The hardening and setting takes place after the wall or other structure is built and as moisture and carbonic acid penetrate the material. Antiseptics may be added to the mixture.

216,911. Butler, T. H., and **Popham, F. J. W.** Feb. 5, 1923.

Compositions containing bituminous &c. and siliceous &c. materials.—A road-making composition is produced by dispersing mineral matter by high speed disintegration in a bituminous or oily medium, substantially without water. In the case of solid bituminous composition, a cheap carbonaceous material may replace the mineral matter. A protective colloid may be added: generally a mixture of aromatic hydrocarbons and paraffins proves most satisfactory. A suitable composition consists of 6 parts of petroleum bitumen (mexphalt), 6 parts of coal tar creosote, and 2—6 parts of dried clay, treated for one minute in a colloid mill. This composition can be thinned with creosote; with increased bitumen, precipitation may take place. According to the Provisional Specification, a suitable composition consists of 8 lbs. of tar, 4 lbs. of limestone, 250 cc. of water and 50 grams of a 10 per cent caustic soda solution, to which petroleum pitch may be added as a protective colloid.

217,279. Lefebure, V. March 5, 1923.

Concretes &c.—India-rubber is added to cement, plaster, concrete &c. in such quantities, and in such a condition as to fill, or partially fill the interstices of the cement &c., and not interfere with the setting properties thereof. The rubber must be in a finely divided state, and may be produced by coagulating latex, for example with alum, or by precipitating latex on an inert filler such as silica gel, or kieselguhr. The latex containing finely-divided coagulum may be added to dry cement, or cement paste, or it (or untreated latex) may be made into a paste with a filler which is added to the cement &c. Vulcanizing agents may be added, and the rubber vulcanized at any stage, preferably between the initial and final sets. According to an example, 480 parts of latex are diluted with 150 parts of water and 160 parts of "colloidal sulphur" (containing 80 parts of sulphur), are added. 400 parts or less of a 10 per cent solution of alum are added, and sufficient of the mixture to contain 1—5 per cent of rubber of the weight of cement is diluted with water to give 20 per cent water on the weight of cement. This is added to the cement, and additional water is added as required. The mass is allowed to set and vulcanized, preferably after several weeks. Specification 191,474, [*Class* 70, India-rubber &c.], is referred to.

217,343. Amies, J. H. March 21, 1923.

Concretes.—A cementitious composition, suitable for laying under compression on a concrete road-bed, is produced by macerating earthy material in alkaline water and mixing therewith hydroxide of calcium and Portland cement, a small quantity of oxide of calcium in granular form being added to the mass just prior to its removal from the mixer. Specification 5242/14 is referred to.

217,388. Pickstone, C. May 2, 1923.

Concretes and mortars, cement.—Concretes and cement mortars are rendered waterproof and increased in strength by substituting fine slate dust for from 5 to 20 per cent of the sand or other inert material.

217,633. Marks, E. C. R., (*Master Builders' Co.*). March 13, 1923.

Concretes and mortars; stone, colouring.—The colouring of concretes, mortars, or by the addition of a pigment or of a dyed material such as kieselguhr is improved by grinding the colouring agent in calcium chloride solution to produce a paste, which is mixed with the water used for gauging the concrete or mortar.

217,791. Harrison, C. H. Aug. 2, 1923.

Stone, hardening.—In making artificial stone by subjecting a compressed mass of comminuted stone and lime to the action of carbon dioxide, the following conditions are observed: (1) the water-content of the mass is adjusted to the proportion most favourable to carbonation, (2) the gas pressure is gradually increased, and (3) cooling means are used to prevent excessive rise of temperature. A suitable proportion of moisture is 3—7½ per cent; it may be obtained either by controlled drying of the mass or by completely drying it and subsequently dipping it in water. The gas pressure may be raised in 4 hours up to 300 lbs. per sq. in. The temperature should be prevented from rising above 80° C.; this may be effected by using cooling coils or by previously compressing and cooling the gas and allowing it to expand on entering the hardening chamber.

217,812. Delaney, J. H. Sept. 25, 1923.

Stone, artificial and imitation.—Artificial stone resembling natural travertine is produced by subjecting the surface of a plastic composition to the

action of a gas so as to produce a vermiculated effect. A reagent such as calcium carbide is applied to the surface of the mould so that the gas is generated by the contact of the wet composition. The mould surface may be provided with grooves arranged in any desired pattern, into which the calcium carbide is placed. Wall surfaces &c. may be treated in situ while still plastic, and in this case smooth or grooved surfaces are applied to confine the gas. After the composition has hardened, the residue of the gas-generating agent may be washed from the surface.

217,897. Stettiner Chamotte-Fabrik Akt.-Ges. vorm. Didier. June 21, 1923, [*Convention date*].

Refractory substances containing clay.—In the manufacture of chamotte bricks clay, with impurities or admixture of felspar, quartz, glimmer, &c., is subjected to a preliminary firing at a temperature above its softening-point. The product is crushed, with an addition of felspar mixed with binding clay moulded, and fired at the usual temperature.

The Specification as open to inspection under Sect. 91 (3) (a) states that the temperature of preliminary firing may be about 1350—1500° C., and the temperature of the final firing about 1200° C. This subject-matter does not appear in the Specification as accepted.

218,042. Landmark, H. April 17, 1923.

Compositions containing plaster, fibres, magnesite and paraffin.—Jointless floorings are made self-waxing, waterproof, and non-hygroscopic by mixing solid paraffins with the other constituents in the dry state, and then adding magnesium chloride solution to make the mass dough-like. From 5 to 20 per cent of paraffin may be added. The binding and filling agents may be of known variety such as magnesium cement, plaster, and wood dust, asbestos, &c., but the binder preferred consists of burnt gypsum, burnt magnesite, and magnesium chloride. Particular examples are: (1) burnt magnesite 27 per cent, burnt gypsum 21 per cent, mineral colours 9 per cent, asbestos 17 per cent, sawdust 6 per cent, and paraffin 20 per cent; (2) burnt magnesite 57 per cent, burnt gypsum 5 per cent, mineral colour 4 per cent, talcum 9 per cent, wood meal 6 per cent, cork 5 per cent, kieselguhr 6 per cent, and paraffin 8 per cent. The quantity of magnesium chloride solution of 20° Bé. will vary from 10 to 40 per cent by weight of the total dry mixture. The mass when laid is rubbed smooth.

218,075. Praceiq, E. Bouchaud-. May 17, 1923. *Addition to* 173,504.

Cements, processes for making.—The powdered fuel obtained by mixing fuels, such as peat, having calcareous ash, with fuels such as lignite or coal, having silico-aluminous ash, as described in the parent Specification, is modified by mixing the fuels and if necessary, the additional substances, in such proportions that the product from burning the mixture at ash-melting temperature (1400°—1800° C.) is substantially in accordance with the formula $2(Al_2O_3.CaO)+SiO_2.CaO$, so as to obtain a product of the class known as "Molten cements." The hard-set ashes are broken up and crushed.

218,275. Kaiser-Wilhelm - Institut für Eisenforschung, and **Hessel, W.** June 25, 1923, [*Convention date*].

Stone, artificial and imitation.—Boiler slag or ash, either free from fuel particles or not, is ground, moulded, and heated to the sintering point to convert it into a stone-like product. The degree of porosity and the character of the surface may be affected by intermittent variation of the firing temperature. Combustible materials may be added before moulding to produce a porous structure, and the articles may be coated by a spraying process.

218,472. Lakeland Nurseries, Ltd., and **Pierce, H.** June 19, 1923.

Compositions containing cement and slate.—Green hard slate of volcanic origin from the Lake District is powdered and mixed with a small proportion of cement or a liquid binder, which may also be coloured green, and used for paving tennis courts. A suitable proportion is 8 parts of green slate to 1 part of cement or other binder.

218,495. Sieurin, S. E. July 17, 1923.

Refractory substances containing chamotte.—Fire-proof bricks are composed of coarse grains of chamotte and a finely divided binder consisting of fire-clay to which silicic acid is added if necessary to bring its silicic acid content to 73—90 per cent. The quantity of binder is usually 30—60 per cent by weight of that of the chamotte.

218,720. Hodson, J. Jan. 7, 1924.

Refractory substances containing calcium and magnesium oxides.—Natural calcium and magnesium carbonate rocks such as dolomites and

magnesites, or the products obtained by incinerating them, are mixed with materials for preventing hydration and burned at 1550—1800° C. to produce a plastic mass: after cooling the mass is broken up or ground, moistened with water or a binding liquid, moulded, and fired at 1400—1500° C. Part of the mass may be ground to a finer state than the remainder. The materials for preventing hydration may be clay, shale, slate, magnesium silicates (e.g. steatite), silica sand, igneous rocks such as dolerite, peridotite, and eurite, or mixtures of these substances. Silicate of soda may be used as the binding-agent. Specifications 131/79, 4807/79, [both in *Class* 70, India-rubber &c.]. 4384/81, 14981/10, 110,147, and 211,944 are referred to.

218,750. Saunders, A. G. April, 13, 1923.

Asphalts.—An artificial asphalt consists of finely-divided calcium carbonate a bituminous or tar base, and either resin, or thin mineral oil, or both. The resin is used in proportions of the order of 10 per cent of the binder. The preferred binder consists of bitumen, resin, and Stockholm tar, with or without crude mineral oil. The Specification contains several examples of compositions, of which the following is typical: 117.6 lb. resin, 39.2 lb. Stockholm tar. 78.4 lb. bitumen and 9.8 lb. crude oil are melted together with the addition of 35 lb. kerosene and incorporated with a mixture of 2223 lb. calcium carbonate and 17 lb. oxide of iron for colouring purposes.

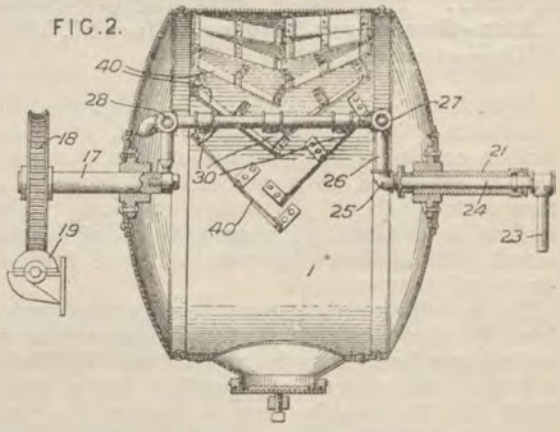
218,793. Indurit Products Co., Ltd., and **Fairgrieve, J. G.** May 15, 1923.

Compositions containing phenol-aldehyde condensation products.—Articles of phenol-aldehyde condensation products are made by carrying out the condensation between a phenol and an aldehyde in presence of cellulosic materials containing substantial amounts of oxycellulose and containing approximately 4 to 7.5 per cent of lime and 0.5 to 1 per cent of hypochlorite. A preferred material is that contained in the effluent water of esparto paper mills, in which bleaching powder has been used. If the cellulosic material contains insufficient lime and hypochlorite, lime sludge is added thereto. In an example, the suspended fibrous cellulose is separated from the effluent water, ground, mixed with phenol and formaldehyde and heated to about 50° C. The product is then ground and moulded under heat and pressure or moulded in the cold and afterwards heated under pressure. Wood pulp is also specified as a suitable cellulosic material.

218,944. Anft, P. Feb. 11, 1924.

Compositions containing Portland cement, calcite, &c.—Portland cement, calcite, and a colouring substance are mixed together in the dry state and moistened with an aqueous solution of sodium chloride or soap. Powder produced by grinding a hardened mass formed by the setting of a mixture of Portland cement, infusorial earth and milk of lime, may be added to the dry mixture before moistening.

219,150. Finley, S. E. June 26, 1923.



Compositions containing bituminous and siliceous &c. materials.—A composition for roads &c. is made by agitating an aggregate to distribute uniformly the various sized particles, and then while continuing the agitation, applying a predetermined quantity of bituminous binding material in the form of a uniform spray. Aggregate, heated to drive off moisture and open the pores is placed in a cylindrical container 1 rotatably mounted on axial trunnions 17, 21, and provided over half of its inner surface with angularly-disposed blades 40. The container 1 is rotated through gearing 18, 19, to agitate and cascade the aggregate. When uniformly mixed, about 10 per cent of a bituminous binder, heated to a temperature above that of the aggregate, is sprayed on to the cascading aggregate through spaced nozzles 30, supplied by pipes 23—28 through the hollow trunnion 21. Gas under pressure is then admitted to the container through the nozzles 30 to assist the penetration of the aggregate by the binder, and the composition is applied directly to the road &c. If the composition is to be stored, shipped, &c. a proportion of a volatile light oil should be added to the bitumen.

219,368. Peacock, A. March 29, 1923. *No Patent granted (Sealing fee not paid).*

Composition containing phenol-aldehydes.—Relates to sound records in which phenol-alde-

hyde compounds are employed, and more particularly to the kind of records made by spreading upon a flexible backing a wax-like material, which when heated is adapted to receive an impression from a matrix. According to the invention, a flexible backing such as cardboard is coated with a paste formed from formaldehyde, resorcin, and alcohol, mixed together with an alkaline catalyst such as sodium sulphite. A small quantity of naphthol may be added in preparing the composition, and a filling material and colouring matter are also employed. The preparation of two compositions is described, the proportions of the ingredients being specified in each case. In the one, naphthol is used, together with barium sulphate as a filler, and lamp black for colouring. The other composition contains no naphthol, and instead of barium sulphate, montan wax is used. The mode of preparation is somewhat different from that followed in the first case. Specification 187,480 is referred to.

219,369. Pike, R. D. April 16, 1923. *Drawings to Specification.*

Cements, Portland; refractory substances.—In the burning of carbonate rock, such as calcite, magnesite &c., the pulverized material is passed in succession through calcining, clinkering and cooling elements, and the waste gases and products of combustion from the clinkering-element are utilized in the calcining-element into which they are delivered at a point above the combustion zone. Preheated air from the cooler is supplied for combustion to the clinkering and calcining elements, the air supply to the latter being kept from intermixture with products of combustion from the former.

219,423. Jackson, W. J. Mellersh-, (*New Jersey Zinc Co.*). May 8, 1923. *Drawings to Specification.*

Refractory substances containing chromite, fireclay, bauxite, magnesia, carborundum, calcium silicide, and alkali silicates.—An electric furnace crucible lining is formed of a mixture of fire-clay with carborundum or calcium silicide. Another lining consists of a mixture of sodium silicate, furnace chrome, and calcined magnesite. The furnace chrome above-mentioned is a brick made from chromite together with fire-clay or bauxite or bauxite and magnesia or magnesia.

220,301. Naamlooze Vennootschap Philips' Gloeilampenfabrieken. Aug. 9, 1923, [*Convention date*].

Refractory substances containing hafnium oxide.—Refractory metals such as tungsten, molybdenum, or tantalum, particularly when used for making filaments for electric lamps, &c., are improved by the addition of 0.1—3 per cent of hafnium oxide, which retards the recrystallization of the metal. The hafnium oxide, or a compound yielding the same at a high temperature, is added to the metal or metallic compound from which the filament is manufactured in the known manner. Specifications 211,825 and 216,840, [both in *Class* 39 (i), Electric lamps, Arc &c.], are referred to.

220,349. Lane, L. April 16, 1923.

Compositions containing pitch and tar for use as bitumen substitutes are obtained by adding crude coal tar to liquefied pitch or waste hot neck grease, the liquid being strained either before or after the tar is added. The mixture is stirred until it acquires a suitable consistency and is then cast into blocks. From 1 to 15 parts of tar may be added to 15 parts of pitch.

220,603. Refractories Process Corporation, (Assignees of *Crawford, C. J.*). Aug. 14, 1923, [*Convention date*].

Refractory substances containing tridymite and alumina.—Refractory bricks &c. are obtained by burning a mixture of silica in the form of tridymite and a bond of high alumina content. Suitable proportions are 88 parts of tridymite and 12 parts of fireclay burnt at a temperature of cone 12. The bond is preferably a fireclay containing 35 per cent or more of alumina, and rendered plastic by weathering, but kaolin, kaolinite or bauxite may be employed. The tridymite may be that naturally occurring, or may be produced by burning quartz, silica sand, millstone grit, &c. In the latter case the burning is preferably carried out in the presence of a catalyst such as phosphorus pentoxide or others as sodium tungstate, borates, sulphur trioxide, molybdic acid, phosgene, sodium chloride. The catalyzer is suitably introduced into the atmosphere of the furnace, which in the earlier stages should be of a reducing character, being changed to an oxidizing character when the conversion of the silica is nearing completion. The silica is ground and may be burnt in this form, or it may be moulded into bricks with milk of lime, which after burning are ground and mixed with the aluminous bond.

220,949. Consortium für Elektrochemische Industrie Ges. Aug. 20, 1923, [*Convention date*].

Compositions containing organic condensation products.—Artificial resins obtained by the poly-

merization of aldehydes are used as agglutinants in the manufacture of micanite and like insulating compositions. The resins may be employed either alone, in solution in solvents such as ethyl alcohol, benzine, acetone, and trichlorethylene, or in admixture with liquids such as linseed oil and turpentine oil, filling materials such as stone dust, talc, asbestos, barytes, and lithopone, or other agglutinants such as starch and cuprene. Colouring-agents may also be added.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the general use of these resins, with or without the above-mentioned ingredients, as cements or agglutinants. This subject-matter does not appear in the Specification as accepted.

221,017. Schmidt, O., and **Hahnle, M.** June 6, 1923.

Cements, processes for making; concretes.—Hydraulic cement and artificial stones or concrete are made from oil-shale slag obtained by the burning, below the limit of sintering, of oil-shale or of the residues of the distillation of oil-shale (shale-coke). The slag is broken up and sifted, the fine part being used for making cement, and the coarse part is moistened with cold or hot water or steam for several days to destroy sulphides and slake the lime, and then mixed with the cement made from the fine part to form artificial stones or concrete. To form the cement, the fine part is ground with burnt marl (preferably a marl which in unburnt condition contains 50—75 per cent of calcium carbonate) or with cement, with or without the addition of anhydrous calcium sulphate or suitable hydraulic substances such as blast furnace slag which has been granulated by water or by a current of air. The marl may be mixed with the oil-shale or shale-coke and burnt therewith, with or without the addition of necessary combustible matter.

221,234. Butler, T. H., and **Popham, F. J. W.** Nov. 15, 1923.

Compositions containing bituminous &c. materials and tar.—The best proportions for mixing tar and bitumens or the like especially for application to roads are ascertained by making trial mixings, drying the mixtures in thin films, and subjecting these films to a bursting strain test, and selecting the mixture which has the maximum strength. The test may be performed by dipping a wire ring into the mixture, warmed if necessary, withdrawing it and allowing the film to harden, clamping to a tube to which is attached a rubber tube and reservoir containing water, and raising the reservoir until the film bursts.

221,468. Muller, C. H. F. [Firm of], (Assignees of *Daumann, W.*). Sept. 8, 1923, [*Convention date*]. *Drawings to Specification.*

Compositions containing Portland cement and barytes.—Bricks, building blocks, slabs, and tiles resistant to X-rays and radium and like emanations are formed by moulding a mixture of cement or other binding medium and barytes or other material opaque to the rays or emanations. The mortar for the joints has a similar composition. As an example, four and a half parts by volume of ground barytes are mixed with one part of Portland cement.

221,475. Riblurecord Akt.-Ges., (Assignees of *Blum, R.*). Sept. 5, 1923, [*Convention date*].

Compositions containing organic condensation products.—Sound record blanks are made by coating a base of cardboard or the like with a composition formed by mixing together naphthol, alcohol, resorcin, formaldehyde, and a catalyst such as sodium sulphite. A filling material such as barium sulphate may be added, and soot may also be added for colouring. An example is given in which the quantities of the various ingredients are specified.

The Specification as open to inspection under Sect. 91 (3) (a) describes the record composition broadly as consisting of aromatic hydroxyl compounds mixed with alcohol, aromatic polyoxy compounds mixed with formaldehyde, a heat-producing catalyzer such as sodium sulphite, and filling material. It also states that the resorcin and formaldehyde may be in approximately equal parts, and may be mixed with an approximately equal quantity of spirit in which naphthol is dissolved, the proportion of sulphite being 1 or 2 per cent, while the filling material may be equal to half or two-thirds of the other substances. This subject-matter does not appear in the Specification as accepted.

221,687. Orlovsky, W. Nov. 6, 1923.

Concretes and mortars.—Compositions for facing walls and other surfaces consist of the following ingredients, preferably in the proportion stated, viz.:—5 parts by volume of sand, 1 part of cement, 1.5 parts of slaked lime, 0.5 parts of pulverized brick, and 0.003 parts of albuminous or proteinous matter, which may be added in the form of a sufficient quantity of sawdust or similar albumen—or protein—containing substance.

221,799. Dynamidon-Werk Engelhorn & Co., Ges. Sept. 14, 1923, [*Convention date*].

Refractory substances containing magnesia.—Burnt magnesite or magnesia containing little or no flux is finely ground, pressed, and sintered at a temperature below 1700° C., for example, 1500°—1600° C. The magnesia may be hydrated before sintering. The sintered mass is crushed and may be used as mortar &c., or it may be moulded into bricks &c. To facilitate moulding, clay, starch, tar &c. may be added. In working up the sintered mass, 5—10 per cent of burnt or hydrated magnesite may be worked in. Specifications 4889/85 and 10185/85 are referred to.

221,852. Kallen, G. June 12, 1923.

Refractory substances containing zirconia. — Refractory articles are made by burning a mixture of zirconia, preferably crude zirconium ore and a plurality of binding agents which soften progressively as the temperature rises. As binding agents having a low temperature melting point, low melting point glass or water-glass are suitable, and for the high temperature melting point binding agents compounds of magnesium, calcium or aluminium, such as dolomite, felspar, Portland cement, magnesite, clay or bauxite may be used. According to an example, 88 parts of pulverized zirconium ore, 9 parts of dolomite, and 3 parts of felspar are mixed with a 3 per cent waterglass solution, moulded, and burnt at about 1000° C. An organic temporary binder may be added at the moulding stage. Articles are capable of being enamelled with a glaze having the same coefficient of expansion as the composition. The composition is suitable for the manufacture of paints. In an example, a fire proof paint consists of 40 parts of crude zirconium ore, 20 parts of water-glass, 20 parts of dolomite, 5 parts of casein, and 20 parts of water, all by weight. Partitions for buildings may consist of butt-jointed planks covered with a single or double coating of the composition.

221,853. Marks, E. C. R., (*Wiggin's Sons Co., H. B.*). June 12, 1923.

Plaster compositions consist of a mixture of anhydrous plaster of Paris and an " accelerator " consisting of plaster of Paris which has been mixed with insufficient water to set it. By regulation of the amount of water in the accelerator, the time of setting of the composition may be controlled. The composition may be mixed with cement, or magnesium oxide or magnesium chloride, or both.

221,857. Clegg, W. H., and **Whittaker, G.** Jan. 16, 1923. *No Patent granted (Sealing fee not paid).*

Figured and ornamental artificial stone, composed of a mixture of sulphur with silica sand, china-clay, or iron or steel slag, with or without asbestos, is obtained by stirring together mixtures of different colours immediately before casting.

222,122. Martin, E. Sept. 17, 1923, [*Convention date*].

Cements, Portland &c., materials and compositions for.—A cement is made by burning a mixture containing iron oxide and calcium carbonate, at a temperature below the melting point of the mixture, the proportions of the mixture being more than two molecules of calcium carbonate to each molecule of iron oxide, and one molecule of lime for each molecule of alumina, and two molecules for each molecule of silica, if the latter is present. Suitable raw materials are iron pyrites cinders, iron ores, ochres, and sludge from alumina foundries. According to an example, 160 kilos of pyrites cinders and 300 kilos of limestone are mixed wet or dry, and are burnt in a rotary or other kiln at a temperature of about 1100° C. Specification 3768/01 is referred to.

222,151. Spackman, H. S. Sept. 22, 1923, [*Convention date*].

Cements, Portland, processes for making, materials, and compositions for.—Cements of low lime and high alumina content are made by completely fusing the raw materials in a rotary kiln. The amount of lime should be not more than is necessary to combine with the acid materials in a monomolecular ratio. A typical mixture consists of equal parts of bauxite and lime.

222,167. Drefus, C. May 18, 1923.

Compositions containing resin and cellulose derivatives.—Gramophone and like record blanks are made from a composition comprising resin and cellulose acetate or other organic acid esters or cellulose or ethers of cellulose; or the resin may be incorporated with a mixture of such cellulose derivatives, with or without the addition of solvents, plasticising agents, pigments, filling-materials, stabilizers, or neutralizers. Many suitable additional ingredients of these kinds are

mentioned. The amalgamation of the resin with the cellulose derivatives may be made in solution, preferably using a solvent boiling below 150° C., or the ingredients may be mixed together under heat and pressure, or in any other way. A composition in which proportions of the ingredients are specified by way of example comprises resin, cellulose acetate, and paratoluene sulphonamide, or paratoluene sulphonanilide, or a liquid high-boiling alkylated xylene, toluene, or benzene sulphonamide derivative such as described in Specifications 132,283, 133,353, and 154,334, [all in *Class* 70, India-rubber &c.]. These substances are melted and mixed together, and after the mass has cooled it is powdered and mixed with filling-materials, and with dyes or pigments if desired. The mixture is then worked into sheets on hot malaxating rolls.

222,180. Imray, O. Y., (*Radiotive Corporation*). Jan. 20, 1923. *Drawings to Specification.*

Compositions containing shellac and mica.—A mixture containing two parts of shellac and one part of mica adhesively unites when subjected to heat and pressure, two celluloid discs and an interposed silk disc to form a diaphragm.

222,192. Idris, W. H. W. June 23, 1923.

Compositions containing oxidized oils &c.—Tennis courts, floors, &c. are made by spreading on a base a composition consisting of ground pumice or porous material of a like kind such as ground tile or brick, and a drying oil, together with colouring matter such as chromium oxide, Paris green, or Scheele's green. A suitable composition consists of 5 lbs. of colouring matter, 5 gals. of drying oil such as linseed or wood oil containing driers, and 95 lbs. of ground pumice, which is laid with a trowel at ordinary temperature to a depth of half an inch on a concrete base.

222,500. Soc. Lap, (Assignees of *Scailles (née Calogéropoulos), S.*). Sept. 29, 1923, [*Convention date*].

Ornamental artificial stone.—Refers to Specification 217,605, [*Class* 87 (ii), Moulding plastic &c. substances], and consists in incorporating with the aluminous cement loading substances such as sand, broken stone, waste metal fragments, asbestos fibre or powder, &c., to produce decorative surfaces, with or without colouring-material. The articles may be made by centrifugal casting in moulds with polished or enamelled walls.

222,602. Billinghame, W. E. Nov. 19, 1923.

Compositions containing bituminous materials and albumens &c.—A liquid emulsifying agent is produced by saturating a substance containing at least 80 per cent of pure protein with several times its weight of water and treating it below 140° F. with 50—100 per cent of caustic potash or the equivalent weight of caustic soda so as not to saponify the resulting amido-fatty acids. In an example, 10 lb. of finely-divided casein or blood albumen, 60—100 lb. of water, and 10 lb. of caustic potash or soda are allowed to react at atmospheric temperature for an hour. The agent may be used to form aqueous emulsions of oils, fats, wood tars, or bitumen or bituminous materials. The following examples are given:—(1) 1—5 lb. is dissolved in the desired quantity of water, and 100 lb. of oil or melted fat or wood tar is stirred in. (2) 1—10 lb. is agitated with 100 lb. bituminous material at 220—230° F., and the mixture stirred with the desired amount of hot water. This emulsion may be sprayed or otherwise applied to the surface of roads, or be mixed with the mineral aggregate as a binder in the making of roads.

222,923. Caccia, R. July 3, 1923.

Concretes.—Lime-sand concretes are improved by adding to the ingredients a small proportion of dilute sulphuric acid, which enables a lower proportion of lime than usual to be employed. Coal tar or other tar may also be added to render the mixture less hygroscopic. An example of a composition suitable for external walls is:—1 cubic yard of sand, 180 lb. of lime, 2¼ lb. of sulphuric acid (diluted 20 times with water), and 2 oz. of tar dissolved in fuel oil.

223,369. Haggerty, J. F. Sept. 10, 1923.

Compositions containing plaster, albuminous and glutinous matter, and fibres.—Plaster wall boards covered on one or both sides with a paper lining are made by stirring 2 lbs. of a carbohydrate material such as starch in 6 lbs. of cold water, then adding the mixture to 52 lbs. of cold water and boiling, and to the starchy medium so formed is added 40 lbs. of dry gypsum. Fibre such as asbestos, wood fibre, sulphite fibre, or jute may be added to the plaster mass. The mass is rolled out by ordinary board-making machines, and preferably the paper lining is made from wood fibre, waste paper, or a mixture of these.

223,458. Smith, W. R. Jan. 24, 1924. *Drawings to Specification.*

Concretes.—Porous tubular tiles for use in agricultural drainage and the like are formed of coarse porous material such as cinders mixed with finer materials such as ashes and hydraulic cement.

223,573. Soc. d'Etude des Agglomeres. Oct. 17, 1923, [*Convention date*].

Refractory substances containing zirconium compounds.—A process of manufacturing refractory products from zirconiferous ores comprises heating the ore to a very high temperature in an electric furnace from which it is discharged into water containing 0.1 per cent of sulphuric acid. The treated ore may be manufactured into articles in the known manner, or the process may embody one or both of the following special steps :—(1) after crushing, the raw-material is agglomerated by means of a mixture of organic and inorganic binders, e.g. 0.5 per cent of dextrin or tar and 0.25 per cent of boric acid or phosphoric acid or a salt (2) after moulding, the articles are first dried in the mould at ordinary temperature, then removed from the mould and dried at a temperature increasing to 180° C., and finally baked at a high temperature.

The Specification as open to inspection under Sect. 91 (3) (a) extends the application of steps (1) and (2) above to any zirconiferous ore. This subject-matter does not appear in the Specification as accepted.

223,616. Duffield, F. L. April 21, 1923.

Refractory substances.—Refractory bricks, blocks, &c. are made from dolomite or other materials possessing plasticity at high temperature, by moulding under pressure at high temperature. Dolomite, alone or mixed with fluxing-agents such as ferric oxide, clay or basic slag may be heated to 1500° C. and moulded under pressure, or the bricks may be moulded in the ordinary way and heated until rendered plastic when they are re-moulded under pressure. The bricks may be annealed in a cooling-chamber or tunnel.

Reference has been directed by the Comptroller to Specification 211,944.

223,873. Revere Rubber Co., (Assignees of *McGavack, J.*). Oct. 22, 1923, [*Convention date*].

Compositions containing india-rubber and phenol aldehydes.—India-rubber is heated with a phenol, an aldehyde, and a halogen, and the reaction product is moulded to form articles for which hard rubber or synthetic resins are usually employed, such as electric insulators, battery jars, knife handles, pipe stems. According to an example, 15 kg. of pale crepe are dissolved in 400 kg. of carbon tetrachloride, and chlorine is introduced until the rubber has absorbed twice its weight. 30 kg. of phenol mixed with 30 kg. of 40 per cent formaldehyde solution are added to the rubber solution, and the mixture is heated in a reflux condenser for two hours. The mass is placed in boiling water, and thoroughly washed, pulverized, and dried at 95° C., and may be moulded under a pressure of 3,000—4,000 lbs. per sq. in. at a temperature of 175° C. According to other examples, the phenol and aldehyde may be added to the rubber solution before the latter is chlorinated, or after partial chlorination, or pulverized phenol-aldehyol condensation product may be mixed with pulverized chlorinated rubber. Latex may be added to the rubber solvent in place of crepe. Fillers such as wood flour, casein, iron-oxide, asbestos, soapstone, mica, may be added to the pulverized material prior to moulding. The properties of the material may be varied by varying the proportions of the ingredients.

223,884. Fournier, S. E. Oct. 24, 1923, [*Convention date*].

Concretes.—Zinc fluosilicate is added to mixtures of stone waste and cement used for making artificial freestone. In carrying out the invention, non-chalky stone waste is mixed with dry cement, and moistened with an aqueous solution of zinc fluosilicate, alum, and molten tallow, and the mixture is moulded under high pressure. Preferred proportions are 1500 cubic decimeters of stone waste, 200—500 kgms. of cement, and 180 litres of a liquid consisting of 100 parts of water, 5 parts of zinc fluosilicate, 3 parts of alum and 7 parts of tallow.

223,986. Wade, H., (*Vesuvius Crucible Co.*). July 31, 1923.

Refractory substances containing graphite, clay, &c.—Hollow refractory containers are made from a composition containing graphite in excess of 15 per cent, and a ceramic bond also in excess of 15 per cent, and are burnt at a temperature exceeding 2000° F. to vitrify the bond. According to an example, 15—65 parts of graphite, 15—50 parts of clay and 5—15 parts of siliceous material are mixed and burnt until the bond is vitrified (at least 2000° F.). Other refractory materials, as alumina, silicon carbide, zirconia may be employed in addition. Fluxes such as dolomite, or magnesite may be added and on burning produce a glaze on the articles.

224,058. Ekman, O. Oct. 4, 1923. *Drawings to Specification.*

Compositions containing bituminous, fatty, oil, &c. materials.—In junction boxes of the kind comprising a bowl-shaped container and a cover in which the bared conductors are enclosed by an insulating mass, a compound is used which at ordinary temperatures is plastic but not resilient, and this is subjected to mechanical pressure either after or during assembly. Suitable compounds are (1) equal parts of heavy asphaltic petroleum crude residue and ceresin and (2) petroleum crude residue 2 parts, ceresin 1 part, and oil, such as heavy petroleum, 1 part.

224,214. Soc. d' Etude des Agglomeres. Oct. 29, 1923, [*Convention date*].

Refractory substances containing zirconium compounds.—A refractory cement for attaching refractory articles of zirconium ore to one another or to other articles comprises powder obtained by crushing agglomerated zirconium ore, zirconium oxide, an organic binder such as dextrin, and an inorganic binder such as boric acid, with or without addition of other refractory earths. The zirconium ore is agglomerated in the manner described in Specification 223,573, then heated to 2500° C. in an electric furnace, passed into cold water, and subsequently crushed.

224,252. Duclaux, J. Nov. 2, 1923, [*Convention date*].

Asphalts.—Asphalt, bitumen, and residual products of their manufacture or refining are decolorized and otherwise purified by submitting their solutions in volatile solvents to fractional dialysis. Apparatus comprising membranes of nitro cellulose or cellulose acetate, and in which the solvent is circulated so as to be progressively enriched is preferred.

224,257. Beaumont, J. H., (*Kraus, C. E.*). May 1, 1923.

Refractory substances.—The plasticity of ceramic materials, refractory compositions, mortars &c. comprising kaolin, clay, bauxite, flint, asbestos, calcium carbonate and the like, is increased by the addition of a small proportion of a highly colloidal earth such as bentonite, ehrenbergite, damonterolite, montmorillonite. The colloidal earth may be added as a fine powder, or mixed with water, or as a gelatinous mass produced by the addition of a solution of alum, sodium silicate &c. The proportion to be added to clay, kaolin &c., is about 5—10 per cent, and to bauxite, flint, calcium carbonate, &c., about 15—20 per cent. Articles may be made which are non-conductors of heat by the addition of materials which burn out on firing to form pores. Several examples of proportions are given in the Specification of which the following are typical (a) 10 per cent of cork, 75 per cent of infusorial earth, 15 per cent of bentonite; (b) 90 per cent of granite or flint shale, 10 per cent of bentonite. These form refractory mortars on the addition of water.

224,802. Schnell, H. W. H., and **Schnell & Schelling's Patenten.** April 10, 1924.

Composition containing gypsum and lime for heat-insulating purposes or for buoyant articles are obtained by adding plaster of Paris to a froth obtained by beating a mixture of air-slaked lime and a soap solution or an aqueous emulsion of fat or oil. The preferred proportions are 1 part by weight of plaster, 2 parts of lime, and 3 parts of a 1 per cent soap solution. The product, which is porous, may be either cast into blocks or other articles, or it may be cast and then ground to powder, which after mixing with chalk and fibres may be made into insulating cord.

225,436. Wade, H., (*Carborundum Co.*). March 6, 1924. *Drawings to Specification.*

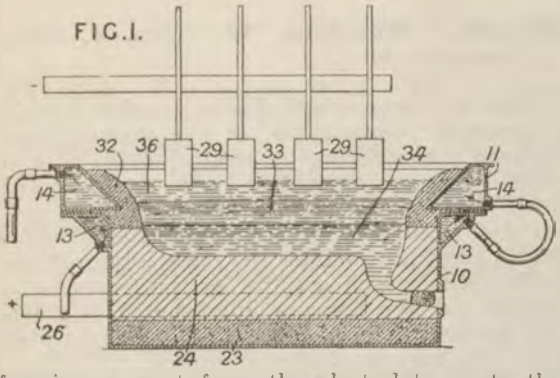
Compositions containing phenol-aldehydes &c.—Grinding-discs, wheels, stones, &c., which may have a cloth or paper backing, are formed by mixing with the abrasive grains a resin solvent, for example, furfural, in sufficient quantity to coat the surfaces of the grains, which are then mixed with a powdered phenol resin, for example that known under the registered Trade Mark "Redmanol." The mixture is placed in an iron mould and moulded under a pressure of approximately 900 pounds per square inch, after which it is removed from the mould and baked for fifteen hours at a temperature of about 350° F. The disc may then be mounted on a cloth backing by means of a magnesia oxychloride cement.

225,494. Aluminum Co. of America, (Assignees of *Tilson, D. H.*). Nov. 30, 1923, [*Convention date*].

Refractory substances containing fluorides.—A process of putting an electric cell in condition for refining a metal comprises establishing in the

cell in suitable order upper and lower metallic layers 36, 34 of different densities and an intermediate layer of electrolyte 33 of intermediate density, and before the layer 36 is established

FIG.I.

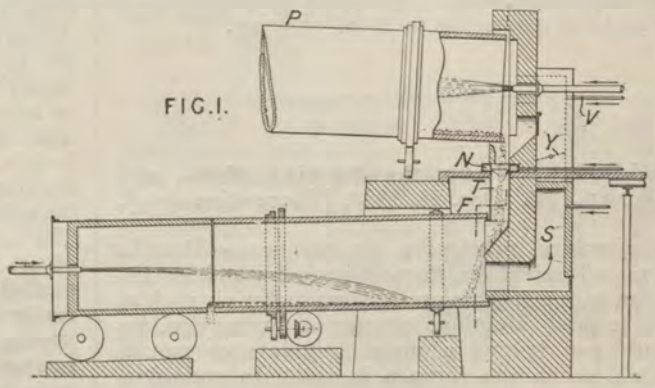


freezing a crust from the electrolyte on to the sides of the cell to serve as part of a side lining 32 and after the layer 36 is established completing the formation of the lining. The cell comprises upper and lower steel shells 11, 10 insulated from one another and provided with water jackets 14, 13. The shell 10 has a carbon bottom 24 provided with a conductor 26 and resting on a layer of bauxite 23. When refining aluminium the electrodes 29 are lowered into contact with the carbon bottom and current is passed to raise the latter to a red heat. The cell is then charged with an electrolyte consisting of sodium and aluminium fluorides with the addition of barium and/or strontium fluorides and current is passed therethrough. Sufficient anode alloy, consisting of aluminium, copper, and silicon is then added in a molten or solid form to raise the level of the electrolyte above the joint between the shells. The cooling action of the jackets causes the formation of a crust 32 on the sides of the cell and covering the joint. The cathode metal consisting of part aluminium is now added by pouring it slowly on an asbestos board inclined at an acute angle to the cell. The electrolyte creeps up the side of the cell by capillary attraction and solidifies thereon to complete the formation of the lining on the part surrounding the cathode.

225,858. Soc. des Ciments Francais, and **Bureau d'Organisation Economique.** Dec. 4, 1923, [*Convention date*].

Cements, Portland, processes for making.—In the manufacture of cement by a two-stage process, a preliminary lower temperature heating-chamber P is provided for effecting decarbonation and a high temperature chamber F for fusion or sintering, and the chambers are connected by two conduits S, T. All the heating gases pass through the conduit S and the conduit T is thus reserved for the transfer of materials, which therefore are not exposed in the conduit to temperatures high enough to cause incipient fusion with consequent stoppage of the conduit. Air under pressure may be supplied through a ring nozzle N to the conduit T to prevent any flow of heating-gases therethrough. A damper Y is fitted in the conduit S to maintain the pressure in the chamber F, and the heating-gases may be cooled

FIG.I.



before entering the chamber P by air supplied through a pipe V. The two chambers may both be rotary as shown, or the fusion chamber may be a fixed cylinder or a reverberatory furnace.

225,944. British Thomson-Houston Co., Ltd., (*General Electric Co.*). Sept. 13, 1923.

Compositions containing resinous compounds.—Natural aromatic resins as acroides gum or gum benzoin, are rendered infusible by heating in the presence of formaldehyde to about 160° C. Hexamethylenetetramine &c. may be the source of formaldehyde. The resin may be powdered or in solution, and for a moulded article is mixed with about 10 per cent of its weight of hexamethylenetetramine. Fibrous or other fillers may be added as usual.

225,953. Arnot, R. Sept. 15, 1923.

Compositions containing organic condensation products.—A cement comprises a mixture of an artificial resin and a gelatine or gluelike proteid that has been rendered liquid or non-gelatinous by partial hydrolysis; other proteid materials, such as blood albumin or casein, may be added, and where such addition is made the liquid glue may be replaced by other colloidal materials such as oil emulsions, glycerosols, glucososols, and sols prepared from gum arabic, dextrine, starch, agar-agar and other seaweeds, soaps, resinates,

linoleates, and india-rubber A suitable artificial resin is prepared by condensing phenols, naphthols, or their homologues with aldehydes in presence of a hypochlorite as an accelerator. An example is given describing the admixture of liquid glue with an artificial resin, and another example shows the addition to the above ingredients of blood albumin obtained in homogenous solution by means of carbamide. Other examples describe the incorporation with an artificial resin of: indiarubber and glue; factis prepared from china-wood oil or linseed oil and glue; soap and glue; starch and blood albumin; gum arabic and blood albumin. The products may be used in cementing china or glass, and their properties may be modified by the addition of powders, such as zinc oxide, kieselguhr, graphite or wood dust.

226,184. Guillaume, P. Dec. 10, 1923, [*Convention date*].

Refractory substances containing pipe clay and magnesite.—The stoppers and the linings of the outlets of crucibles and ladles used in the casting of manganese steel are made of a mixture of pipeclay and magnesite. Preferred proportions are 80 parts of magnesite to 20 of pipeclay.

226,801. Vacuumschmelze Ges., and **Rohn, W.** Dec. 24, 1923, [*Convention date*].

Refractory substances for furnaces.—Hearths of metallurgical &c. furnaces are formed by filling in a dry granular refractory material, such as quartz sand, alumina, magnesite, or bauxite, beneath and behind a metal template or mould, which, when the furnace is put into operation, retains its shape long enough for the lining to frit and thereafter melts. When the normal working temperature is not sufficiently high to frit the refractory material, small quantities of other substances may be added, for example, glass powder, ground iron oxide, ground slag, boracic acid, silicates, and borates. A suitable mixture for hearths used in melting nickel-copper and nickel-copper-zinc alloys consists of quartz sand with 2 per cent powdered glass or 3 per cent boracic acid. A crack may be repaired by pouring in finely powdered material and covering the crack with a strip of metal.

227,022. Lodge-Cottrell, Ltd., (*International Precipitation Co., Inc.*). April 3, 1924. *Drawings to Specification.*

Concretes and mortars.—Parts of an electric gas purifier are made of masonry or concrete, rendered conductive by incorporating a powdered material such as carbon or magnetic oxide of iron in the brick and mortar or in the cement.

227,107. Eberlein, W. Jan. 4, 1924, [*Convention date*].

Stone &c., preserving.—Tanks or other vessels of concrete, porous stone, or like material are rendered acid-resisting by treating them with a molten mixture of sulphur and finely-divided silicic acid, which may be in the form of precipitated silicic acid, or Kieselguhr, Kieselkreide, &c. After a few minutes the mass is poured out of the vessel which acquires by the treatment a coating and also becomes impregnated to a certain depth with the mixture. Other acid-resisting bodies may be similarly formed.

227,216. Potts, H. E., (*Canadian Electro Products Co., Ltd.*). Oct. 18, 1923.

Compositions containing synthetic resins.—Fibrous or cellular material is incorporated with a phenol-acetylene condensation product, and the mass is converted into a dense, hard body by subsequent treatment. Wood pulp, sawdust, animal or vegetable fibres with which may be mixed earthy or mineral matter or colouring material, is mixed with a condensation product such as that described in Specification 183,830, [*Class* 2 (iii), Dyes &c.], which may receive a preliminary treatment with an aldehyde or the like, for example, as described in Specification 232,277. The condensation product may be treated with other known hardening agents, such as hexamethylenetetramine, or phenylenediamine, or furfur amide. The fibrous material may be impregnated with the condensation product in a molten condition or in solution, or the powdered resin may be mixed with pulp in a beater, and the mass sheeted, or the resin may be incorporated on heated calendar rolls. In some cases the resin and aldehyde &c. are incorporated separately. After impregnation and removal of the solvent if necessary, the mass is subjected to heat and pressure, a temperature of 135° C. or higher being suitable for quick work. Suitable proportions are 100 parts of resin, 10 parts of hexamethylenetetramine, and 70 parts of wood flour.

227,270. Morgan Crucible Co., Ltd., and **Lindsay, P.** Dec. 17, 1923.

Refractory substances containing clay, graphite, aluminium silicates, &c.—Crucibles &c. are made from a mixture of clay, graphite, and a compound of alumina and silica having the composition $Al_2O_3.SiO_2$, such as sillimanite. Sand, silicon carbide &c. also may be added. Several examples are given in the Specification, of which

the following is typical, 30 per cent of crystalline graphite, 20 per cent of clay, 10 per cent of sand, 10 per cent of silicon carbide, and 30 per cent of $Al_2O_3.SiO_2$.

227,279. Battaliou, H. A. Jan. 11, 1924.

Compositions containing chalk: compositions containing bituminous and siliceous, calcareous, &c. materials.—A mixture for use in the construction of roads, pavements, and other smooth surfaces, or for combination with bituminous material to form blocks, slabs, tiles &c. is composed of the following substances preferably in the percentage proportions stated: Sand 37, carbonate of calcium 35, oxide of iron 15, silicate of aluminium 12 and amorphous carbon 1. These constituents are stated to be present in the natural mineral deposits of iron-stone gravel, silicious limestone, and carbonaceous gravel found in and around Cape Town. These deposits are ground to rough powder and mixed preferably in the percentage proportions 40 : 50 : 10 when they unite to form a solid mass under the influence of weather and traffic. To form a macadamized road, one or more thick layers of aggregate are placed between thin layers of the composition, the whole being united by watering and rolling. The mixture may be combined with 25 to 10 per cent of bituminous material to form blocks or asphaltic paving.

227,679. White, A. E., (*Tehafo Technische Handels-u. Forschungs-Ges.*). April 8, 1924.

Refractory substances containing Portland cement, silica, and alumina.—Concretes which resist heat and exposure to furnace gases consist of cement, an aluminous aggregate of the size of sand or gravel, and a substance which contains soluble silicic acid capable of combining with the free lime of the cement, and is in a state of subdivision approximating to that of the cement. The aluminous aggregate may consist of chamotte or comminuted bricks. The siliceous substance is preferably one that has been subjected to a high temperature, for example a volcanic substance such as phonolith, trass, or cernolith or an artificially prepared substance of similar character. A concrete described by way of example consists of 3 parts of cement, 1 part of trass and 11 parts of chamotte.

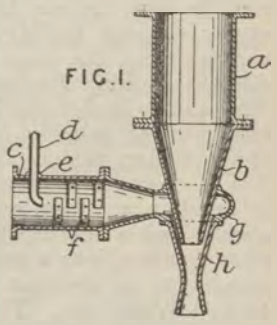
227,802. Deutsche - Luxemburgische Bergwerks-und Hütten - Akt. - Ges., (Assignees of *Steinhoff, E.*). Jan. 16, 1924, [*Convention date*].

Refractory substances containing magnesia and iron oxides.—Mixtures of magnesia or magnesite with ferriferous sintering agents are treated with a solution of an acid, base, or salt, particularly an iron salt, to cause uniform distribution of the sintering agent. The latter may be added in the form of metallic iron, iron ore, slag from puddling furnaces, rolling-mill scale, or the like.

227,837. Eckel, E. C. Jan. 14, 1924, [*Convention date*].

Slag cements.—Titaniferous iron ore is mixed with a calcareous material such as limestone and heated in a furnace (of electric or other type) preferably equipped with a hot blast, until the mixture fuses at about 1400—1500° C. The greater part of the iron is tapped off from the bottom of the furnace, while the upper layer of slag is withdrawn continuously or intermittently, cooled, and ground to a fine powder which constitutes cement. The cement consists essentially of calcium titanate, $TiO_2.CaO$, and contains 25—45 per cent of lime, less than 20 per cent of silica and iron oxide together, and 10—60 per cent of titanic oxide.

227,848. Nettel, F. Jan. 15, 1924, [*Convention date*].



Slags, treatment of.—A method of moulding glass refuse and vitreous slags consists in mixing the molten material with a substance adapted when heated to develop a gas within the molten material, and introducing the mixture into a mould. The glass or slag in a thinly fluid condition is introduced into a pipe *a* which terminates in a nozzle *b*. This nozzle is surrounded by a mixing nozzle *h* projecting from a casing *g*. Air under pressure is admitted to the casing *g* by a pipe *c*, and powdered substances are introduced through a pipe *d* into the pipe *c* where they are mixed with the air by baffles *f*. The substances are such as develop gases when they are mixed with the molten material, e.g. unburnt limestone or other carbonates. The air and powdered substances are mixed with the molten glass or slag in the nozzle *h*, and the mixed material thus obtained is injected into or cast in moulds. The development of gas in the material yields a porous substance which is stated to be adapted for use as blocks or bricks for building purposes.

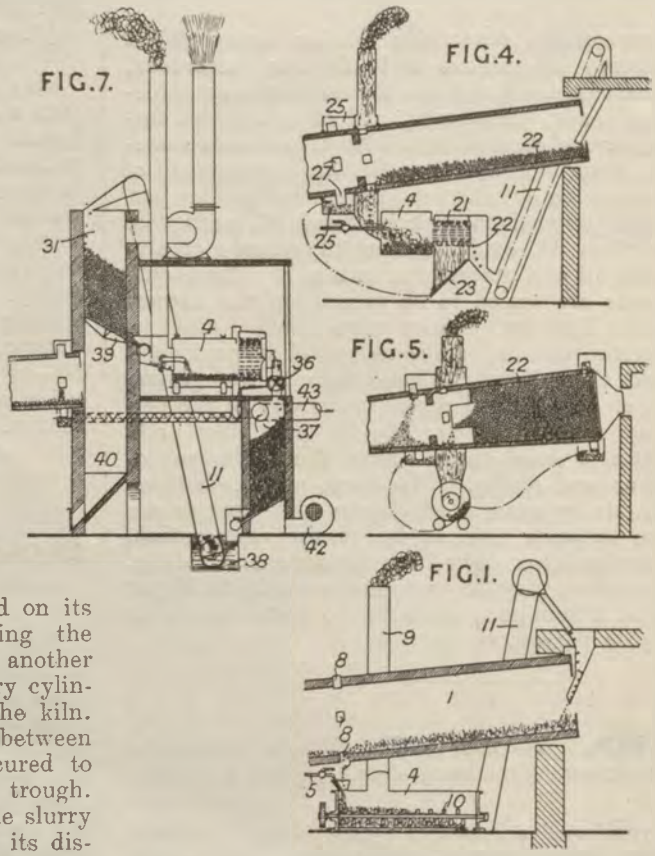
227,966. Coletta, G. D. Sept. 10, 1924.

Compositions containing bitumen and Portland cement consist of 15—20 per cent of asphaltic

bitumen, 80—75 per cent of Portland cement, 3—4 per cent of lime, and 2—1 per cent of inert substances such as silica. The lime, silica, and part of the cement are added to the melted bitumen, and the mixture after cooling is crushed and ground in cooled mills with the remainder of the cement, to which a little cement clinker may be added. The product is used in the same way as Portland cement.

227,977. Fasting, J. S. Dec. 15, 1923.

Cements, Portland and Roman, processes and apparatus for making.—In a process of drying cement slurry, the slurry is dried by loose bodies which are brought alternately into contact with a heating-medium and with the slurry, the steam thus generated being used for industrial purposes. According to one method of carrying out the invention, the slurry is run through a pipe 5 into a fixed drier 4, wherein it is dried in contact with heated bodies, which may consist of a portion of the slurry which has been heated in the burning-kiln 1, and carried by a helical conveyer 10 to the foot of an elevator 11 which feeds the dried slurry into the kiln. The steam generated in the drier is exhausted through a pipe 9, while the bodies heated in the kiln pass through openings 8 into the drier. In a modification, the drier consists of a fixed chamber surrounding the gas outlet end of the kiln, which is provided on its outside with helical blades for conveying the slurry through the drying-chamber. In another arrangement, the drier consists of a rotary cylinder surrounding the gas outlet end of the kiln. The slurry is delivered into the space between the cylinder and the kiln by scoops secured to the cylinder, which dip into a slurry trough. Fig. 4 shows an arrangement in which the slurry is dried in a rotary cylinder 4 having at its discharge end a screen 21 through which the dried slurry passes into a receptacle 23, the bodies 22 passing to an elevator 11 by which they are returned to the kiln. The dried slurry is conveyed to a chamber 25 surrounding the kiln and delivered into the kiln by scoops 27. Fig. 5 shows a further modification in which the bodies 22 occupy the whole of the space at the gas outlet end of the kiln and form a filter for the kiln gases. The bodies may be wetted with slurry before passing into the kiln. In Fig. 7 is shown a further arrangement in which the bodies are heated in a shaft 31 and after passing through the rotary drier 4 are discharged by a measuring-drum 36 into another shaft in which they give up heat to cold air which is forced into the chamber by a fan 42 and withdrawn through a pipe 43. This air may be used in the kiln. The shaft 37 is maintained air-tight by the measuring-drum and a liquid seal 38 through which the bodies pass to the conveyer 11, which discharges them into the shaft 31 to be reheated. The liquid used in the seal may be either water or slurry. The shaft 31 is provided with a screen 39 through which potash &c., which may have collected on the bodies, passes into a chamber 40, the potash being dislodged from the bodies by the agitation of the screens. Specification 160,423, [*Class* 34 (ii), Drying systems &c.], is referred to.



228,128. Gewerkschaft Lutz III. Jan. 21, 1924, [*Convention date*].

Slag cement.—Lime is added to the charge of a blast furnace to produce a slag having the proportions of a Portland or aluminous cement. The higher temperature necessitated thereby is obtained by enriching the blast, hot or cold, with oxygen.

228,129. Gewerkschaft Lutz III. Jan. 22, 1924, [*Convention date*].

Cements, Portland &c., processes for making.—The air employed in a gas producer is enriched with oxygen to enable a charge to be heated which produces, as slag, a cement, and also which enables bituminous coal to be employed. The temperature of distillation may be influenced by

the admission of steam. The composition of the slag may be such that Portland or aluminous cement is produced.

228,142. Holmgren, T. A. F. Jan. 22, 1924, [*Convention date*].

Refractory substances for electric resistances consist of a mixture of silicon, titanium, or like carbide and a refractory cementing medium consisting wholly or partly of calcium, magnesium, or other oxide of a metal of the alkaline earth or magnesium groups, the mixture being burnt at a temperature of about 1200° C. in an atmosphere containing carbon monoxide. In an example, the mixture consists of 60 per cent silicon carbide, 37.5 per cent magnesium oxide, and 2.5 per cent bauxite. One or more refractory metals or graphite may be included in the mixture.

228,257. Prodor Soc. Anon., and **Levy, M.** Aug. 3, 1923. *Drawings to Specification.*

Compositions containing bitumen and siliceous, calcareous, and like materials.—Bituminous concretes of the type referred to in Specifications 201,650, 202,248, [*Class* 87 (ii), Moulding plastic &c. substances], and 202,598, [*Class* 107, Roads &c.], consist of a graded mineral or like aggregate and a naturally occuring bitumen, e.g. gilsonite, of suitable hardness. The suitability of the bitumen may be determined either by the Brinell test described in Specification 201,650, or by a penetrometer test. In the latter case the penetration of a finely pointed needle 1 mm. in diameter under a load of 3 kgms. acting for 5 seconds is determined at different temperatures, and a bitumen is regarded as suitable if the penetration curve does not show any rapid increase within the range of temperature at which the concrete is to be used. A typical composition consists of 100 parts of gilsonite, 250—375 parts of acid-resisting powder passing a sieve of 600 meshes per sq. cm., 250—500 parts of washed river sand passing a sieve of 4 to 100 meshes per sq. cm., and 250—500 parts of broken stone of 3—15 mm. diameter. The concretes may be used in the construction of road surfaces, tanks, and vats and linings for these, pipes, conduits, parts of machinery, &c., and steel or other reinforcements or expansion joints or both may be provided in these articles.

228,292. Waddell, W. F. Nov. 19, 1923.

Cements, Portland and Roman, treating after manufacture.—A composition to be added to cement for blocks, paving, &c. for the purpose of destroying or driving away rats &c. consists of casein, phosphate of lime, phosphate of potash, glue or glue size, soft soap, alum, and sulphate of lime.

228,415. Keay, H. O. June 2, 1924.

Compositions containing organic condensation products and sand.—An abrasive cementing material for cementing grinding stones consists of a mixture of sand, resin known under the Registered Trade Mark "Redmanol," and an organic solvent mixed and kneaded to form a paste. Two stones to be cemented together are coated first with "Redmanol" resin dissolved in an organic solvent, as furfural solvent, and then with the cement; they are clamped together and heated to 140° C. for two days and then the temperature is raised to 170° C. for one day, after which the stones are cooled. Specification 9291/14 is referred to.

228,599. Sperling, M. Oct. 31, 1923. *Drawings to Specification.*

Refractory substances.—In an electric furnace having walls of conducting masonry the latter consists of refractory bricks, the surfaces of which are exposed to the action of aluminium powder at a high temperature in a reducing atmosphere, whereby the surface of the bricks is reduced to metallic silicon, the binding material between the particles of carborundum being made conductive by the addition of aluminium.

229,331. Chavanne, L. Feb. 13, 1924, [*Convention date*]. *Drawings to Specification.*

Slag cements.—In the continuous gasification of solid fuel in an ash-melting producer aluminous or silico-aluminous compounds may be added to give a slag constituting an aluminous cement.

229,358. Blachorovitch, I. A. S. Aug. 23, 1923.

Compositions containing plaster and glutinous matter.—A process for agglomerating materials such as sand, pebbles, mica, metal or alloy particles, paper, cork and saw-dust, consists in mixing therewith a small proportion (about 10—15 per cent by weight) of plaster of Paris, subsequently adding a solution of different kinds of gelatine, and finally a hardening solution containing a mixture of hardening agents, such as chrome

alum, potash alum, potassium bichromate and formaldehyde, with or without tannin. The gelatine solution may comprise gelatines from bones and large and small sinews, together with highly refined gelatines. The gelatine and hardening solutions are added in the proportion by volume of two to one, the percentage strength of the gelatine solution being about three-fourths the percentage strength of the hardening solution.

229,885. Goffart, E. March 31, 1924.

Stone, colouring.—A process of manufacturing artificial marble and granite, and imitations of stoneware, pottery, crockery, and the like, consists of first depositing upon a non-absorbing support or mould a colouring layer imitating the product to be obtained, this layer being coated after hardening with a consolidation layer. Each layer is mixed with a binding ingredient, such as aluminate of lime, which crystallizes quickly and prevents subsequent chemical action within the mass. Any small proportion of calcium hydrate set free may be neutralized by impregnating the colouring layer with an easily emulsified vegetable oil, an insoluble calcareous soap being formed, the vegetable oil impregnation further clearly marking the colours, making the impregnated mass neutral, thereby preserving the colours, and making the surface liquid-proof. To produce a moulded article the original may be coated with a layer without colouring matter, which can be used as a counterpart or dismountable mould.

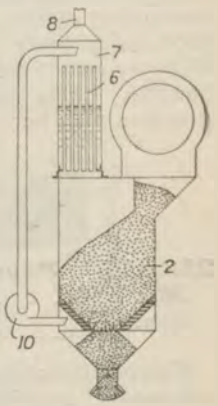
230,008. Lindsley, H., (Assignee of *Dow, A. W.*). Feb. 29, 1924, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*].

Compositions containing bituminous and siliceous and like materials, particularly mixtures of bitumen and soil with or without sand, are obtained by selecting the filling materials and determining their proportions according to their capacity for adsorbing bitumen. The adsorption value may be determined by agitating 10 grams of the filler, which has been lightly ground and passed through a 200-mesh sieve, with 20 c.c.'s of a carbon disulphide solution containing 0.1 gram of bitumen, filtering off the solution, and colorimetrically estimating its loss of strength. The filler should contain not less than 35 per cent of material passing the 200-mesh screen; the adsorption value of this fine portion should be not less than 70 per cent, and that of the whole filter not less than 60 per cent. If the adsorption value exceeds the minimum the filler may be mixed with sand or a softer bituminous cement may be used.

230,248. Cobb, F. W. Feb. 22, 1924.

Refractory substances.—Firebricks, crucibles, &c. are moulded from a composition consisting of one part of fireclay and two parts of ground pebble obtained from sand beds and comprising quartz, limestone, volcanic ash, and sandstone. Tessara may also be added, the proportions then being 3 parts of fireclay, 4 parts of ground pebble, and one part of ground tessara.

230,424. Krupp Grusonwerk Akt.-Ges., F. March 10, 1924, [*Convention date*].



Cements, treating after manufacture. — Cement clinker from a rotary kiln is cooled and hydrated by circulating a current of air and steam through the cooler 2 and an evaporator or steam generator 7. The steam produced in the generator enters wholly or in part into the circulating current in order to maintain its required water content, the surplus being discharged at 8, either to atmosphere or otherwise. Control is effected by varying the speed of the fan 10 and the level of the water around the tubes 6. The circulating current may be divided between the generator and a heater for the combustion air of the furnace.

230,619. Marks, E. C. R., (*Redmanol Chemical Products Co.*). March 4, 1924.

Compositions containing phenol aldehydes.—A composition containing a filler, and a potentially-reactive phenol-aldehyde resin is mixed with sufficient of a high-boiling aldehyde capable of acting as a solvent for the resin, such as furfural, to yield a mass mouldable in the cold; articles are cold-moulded, and are baked at a temperature sufficient to transform the resin, but insufficient to vaporize a material proportion of the aldehyde. The potentially-reactive resin may comprise a phenol-aldehyde condensation product in which the reaction has been stopped before the infusible stage is reached, or to which aldehyde hardening agents have been added. Suitable high-boiling aldehydes are benzaldehyde, hexoic aldehyde, iso-hexyl aldehyde, manno-heptose, methyl-furfural. According to an example abrasive grains are mixed with about 10 per cent of a potentially-reactive phenol resin, preferably in powder form. About 3 per cent of a high-boiling aldehyde as furfural is added and the tacky mass is moulded under heavy pressure, for example 500—1000 lbs. per sq. in. The article is removed from the mould and baked at 150°—200° C. for one to five hours, and allowed to cool slowly.

230,678. Keay, H. O. June 2, 1924.

Compositions containing organic condensation products and sand.—Two or more stones are cemented together by an abrasive cementing material consisting of a mixture of sand, resin known under the Registered Trade Mark "Redmanol," and furfural solvent mixed and kneaded to form a paste, which is described in Specification 228,415. Two stones to be cemented together are coated first with a solution of "Redmanol" resin in furfural solvent, and then with a layer of cement. They are clamped together and baked at a temperature of 130° to 150° C. for two days and at a temperature of 170° C. for one day or more, and then cooled slowly.

231,007. Gaertner, A. April 11, 1924.

Cements, Portland and Roman, processes and apparatus for making.—A finely-powdered mixture of fuel and materials which react with the ash to produce cement is injected upwardly into a vertical cylindrical furnace in which the fuel burns with a mushroom-shaped flame. The furnace of a Bettington boiler is suitable for the purpose.

231,140. Liais, L. March 18, 1924, [*Convention date*].

Ashphalts.—A process is described for making an asphaltic bitumen binder in granulated form and suitable for briquetting fuel by the same treatment as briquetting with coal tar. Asphaltic bitumen having a melting point between 90 to 120° C. is melted and treated with e.g. 2½ to 5 per cent of bicarbonate of soda or other substance capable of forming gas within the mass, so as to convert it into a foam which is rapidly cooled as by being run into cold water. The resulting porous material is then crushed and mixed with the coal dust.

231,141. Kestner, P. J. F. March 21, 1924, [*Convention date*].

Refractory substances containing bauxite and aluminous substances; concretes.—A mixture of 1—10 parts of bauxite with 2 parts of aluminous cement is used, with or without a refractory aggregate, for making and repairing furnaces, bricks, tiles, and other refractory goods. Combustible material may be added to produce a porous product.

231,242. Lefebure, V. Dec. 29, 1923.

Compositions containing cement, plaster, &c., and synthetic resins.—Cement, plaster, or like liquid-setting cement is mixed with a material such as phenol-, urea-, or thiourea-formaldehyde condensation products, capable of being rendered plastic and of setting to an irreversible product by heat, liquid is added, the mass is moulded and allowed to set, and is finally heated to convert the condensation product into its final form. The synthetic resin may be added as powder or liquid, in quantity preferably less than 10 per cent of the cement, but if desired up to 50 per cent. When high percentages are added, e.g. to Portland cement, it is advantageous to add the resin adsorbed or mixed with a filler as kieselguhr or colloidal clay, in order that the setting properties of the cement may not be impaired. The final heating may be by direct stream, with or without mechanical pressure. Specification 217,279 is referred to.

231,431. Petroff, G. March 25, 1924, [*Convention date*].

Compositions containing phenol-aldehydes, cellulose derivatives, &c.—Oxy- or hydrocellulose with or without other substances such as gypsum together with an acid catalyst is added to the liquid product obtained by warming phenol and aldehyde without a catalyst, the mixture is moulded at ordinary temperature, and the articles formed are heated to harden them. According to an example 100 parts of phenol and 110 parts of 40 per cent formalin are heated until the mixture separates into two layers. To the oily layer are added 2 parts of benzene sulphonic acid, 5 parts of 40 per cent formalin, and 110 parts of hydrocellulose. The mass stiffens on standing, and is then moulded. The articles are heated to 110° C. to harden them.

231,461. Benzonaftène. March 28, 1924, [*Convention date*]. *Drawings to Specification.*

Compositions containing bituminous materials and india-rubber.—Liquid hydrocarbons prepared as described in Specifications 231,157 and 231,459, [both in *Class* 32, Distilling &c.], are distilled and the residue from the still is mixed with vegetable pitch and oil and para rubber and the mixture is moulded into sticks for use as an electric insulating composition.

231,503. Haagen, R. C. van. March 27, 1924, [*Convention date*].

Compositions containing bituminous materials and india-rubber.—A composition for covering roads, roofs, and floors consists of a solution of vulcanized rubber in asphalt mixed with a mineral filler such as sand or pulverized basalt, slag, &c. A typical composition consists of 2 parts of Trinidad asphalt, 1 part of rubber, and 6 parts of sand.

231,535. Kühl, H. March 31, 1924, [*Convention date*].

Cements, Portland, materials and compositions for.—A cement having high initial strength without excessive speed of setting is obtained by increasing the content of iron oxide in a cement which is rich in alumina but poor in silica, so as to obtain a product having approximately the following composition: silica 14—18 per cent, alumina 6—10 per cent, iron oxide 5—10 per cent, and lime 60—65 per cent. As raw materials may be used generator slag, blast furnace slag, siliceous bauxites, pyrites cinders, siliceous iron ores, &c.

231,650. Sellars, B. C. March 11, 1924.

Refractory substances.—Soluble silicate of soda is dried and mixed with a refractory material such as alumina, asbestos, fireclay, gannister, barytes, to form a composition which only requires mixing with water to form a mortar for repairing furnaces &c. 10 per cent of silicate is a suitable proportion.

Reference has been directed by the Comptroller to Specifications 17120/00; 14567/01, [*Class* 51, Furnaces and kilns]; 15735/06; *and* 108,278, [*Class* 70, India-rubber &c.].

231,653. Walker, F. T. March 13, 1924.

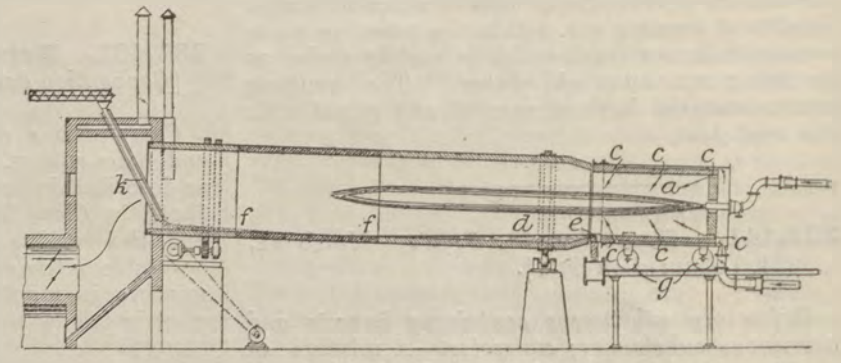
Compositions containing bituminous and calcareous materials.—A waterproof composition suitable for use in building comprises ground oolitic rockstone (a limestone overlying the Ketton oolite, and found near Ketton, Rutlandshire), pitch, tar, and, optionally, bitumen. The pitch and tar, and bitumen if used, are boiled, and the rockstone added, the boiling being continued until most of the tar is eliminated. The hot material is run off to cool into blocks &c., which may be hard or pliable according to the proportions of the ingredients used. A small proportion of cement may be mixed with the rockstolne.

231,867. Soc. Lap, (Assignees of *Seailles, (née Calogeropoulos), S.*). April 1, 1924, [*Convention date*].

Concretes.—A layer of aluminous cement or concrete is formed, and, before it sets, another layer or backing of ordinary hydraulic cement is applied, and the two layers are allowed to set simultaneously. The order of forming the layers may be reversed. Aluminous cement may also be combined with calcareous binding substances by making a dry mixture, putting the dry mixture into its final position with ramming or compression if necessary, and finally adding water. The rate of setting may be varied by the addition of calcium chloride solution. Centrifugal processes are applicable in carrying out the processes.

232,155. Soc. Anon. des Ciments Français, and **Bureau d'Organisation Economique.** April 9, 1924, [*Convention date*].

Cements, Portland, processes for making.—Cement is made by fusion in a rotary furnace into which materials are fed to a zone maintained at a temperature below 1000° C. under action of external cooling and loss of heat due to dehydration and decarbonation and then pass to a zone at a temperature of 1600 to 1700° C. and is discharged in a molten state at a temperature about 1500° C. The drawing shows the rotary furnace having the zone *f*, made of materials of high thermic conductivity such as carborundum or fused alumina; cooling means may be added, if desired. The materials are fed by a shoot *k* which is water-jacketed. Fusion takes place in the zone *d* and the fused cement is discharged over the edge of the rotary part of the furnace through a gap *e* in the front of the stationary separate hearth *a*. The hearth *a* is long enough to contain the cool part of the flame and is cooled by air entering the furnace through the double walls and openings *c*. It may also be water-jacketed. It is mounted on rollers *g* to permit axial displacement to allow for expansion of the furnace.



232,237. Morse, W. G. April 10, 1924, [*Convention date*].

Oleaginous compositions.—A screen for use as a projection screen &c. comprises an intimate mixture of a comminuted transparent or translucent substance and a transparent or translucent vehicle having a different coefficient of refraction; the screen may consist of a base of cloth or other material having one or more coats on one or both sides of a mixture of magnesium carbonate, linseed oil, turpentine, and white driers. The relative quantities of the ingredients may be varied to produce variations in the density of the screen and in the character of the surface, and gums, varnishes, stains, &c. may be added to the mixture. The mixture may be applied as a paste or thick cream, may be cast or moulded, and may be used without a fabric &c. base.

232,341. Semple, W. B., and **Garland, J.** Jan. 21, 1924.

Compositions containing calcium sulphate, lime, fibres, &c.—A heat-insulating and fire-resisting material is prepared by heating fully hydrated, precipitated calcium sulphate in water, and evaporating, decanting, or otherwise removing the excess water to leave a plastic, spongy mass. Before, during, or after the boiling, any of the following ingredients may be added to the calcium sulphate,—paper, jute, or rag pulp, clay, lime and common salt, wood ash, infusorial earth, silica, plaster of Paris, silicate of soda, cork, wood pulp, asbestos, fibres, &c. The boiling may be done under pressure. The composition may be used at once, or it may be dried and granulated, and rendered plastic with water when required.

232,543. Anderson Puffed Rice Co., (Assignees of *Anderson, A. P.*). April 21, 1924. [*Convention date*].

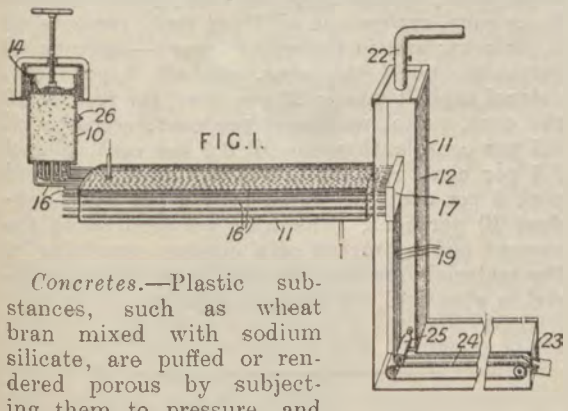


FIG. I.

Concretes.—Plastic substances, such as wheat bran mixed with sodium silicate, are puffed or rendered porous by subjecting them to pressure and heat in admixture with moisture, and passing the material through an orifice so that the pressure is suddenly reduced. The material, containing water up to 50 per cent, is placed in a chamber 10 to which a pressure of about 5000 lb. per sq. in. can be applied, as by an hydraulic or screw plunger 14. The material is forced through pipes 16 in a steam cooker 11 at a temperature of about 225° F, and emerges from the header 17 through apertures having a total cross-section substantially less than that of the pipes 16 and of any desired form to produce filaments, ribbons, or sheets 19. The chamber 12 surrounding the header 17 is heated to about 450° F. by air supplied from a pipe 22 and escaping at 23, the temperature being less at the outlet end. The filaments &c. that expand and form a porous mass on leaving the header 17 are rapidly dried and set, being guided by a roller 25 on to an endless conveyer 24. The product may be used as a filler in concrete and gypsum work.

232,679. Mond, A. L., (*Metal & Thermit Corporation*). Jan. 23, 1924.

Refractory substances containing rutile.—Refractory articles are produced by grinding titanium dioxide, forming articles from the ground material by pressure alone, or with added water to form a paste, or with 1—2 per cent of a temporary binder such as clay, alumina, sodium silicate, bentonite, starch, gum, and treating the article, without exclusion of oxygen, to a temperature sufficient to agglomerate the rutile—above 800° C. Mixtures of relatively coarse and fine particles of rutile may be employed in some instances, or articles may be moulded entirely from fine particles. Other refractory substances such as zirkite may be added, but rutile must form the predominating ingredient. Specification 232,680 is referred to.

232,680. Mond, A. L., (*Metal & Thermit Corporation*). Jan. 23, 1924.

Refractory substances containing titanium compounds.—A black form of titanium dioxide which is a conductor of heat and electricity is obtained by heating titanium dioxide or rutile to a temperature substantally below fusion point in a reducing or neutral atmosphere. The oxide may be heated to 800—1000° C. in a covered crucible in a gas- or oil-fired furnace or in hydrogen. Articles such as electrodes, conductors, or containers for electrical or chemical purposes may be made by first moulding titanium oxide or rutile into the desired shape and then heating as above described, or by moulding the calcined material into the desired shapes, with or without a binder. Specification 232,679 is referred to.

232,898. Patrouilleau, L. G., and **Alumine et Dérivés.** Dec. 19, 1924, [*Convention date*].

Cements, Portland, materials and compositions for.—A substance capable of furnishing sulphur dioxide is added to the raw materials for making aluminous cement to prevent the formation of silicates. The added substance may be hydrogen sulphide, sulphur, sulphides, hyposulphites, sulphites, sulphates, sulphur dioxide, sulphur trioxide, or the product of dehydration of the acid H_2SO_5. It may be added before, during, or after charging the materials into the furnace, or, if gaseous, mixed with the blast. Examples are given illustrating the use of iron pyrites, ferrous sulphate, ferric sulphate, aluminium sulphate, and calcium sulphate.

232,930. Norsk Aluminium Co., (Assignees of *Pedersen, H.*). April 23, 1924, [*Convention date*].

Slag cements.—Iron having a low sulphur content is prepared by smelting iron with slag-producing materials containing a large proportion of alumina to form a calcium aluminate slag containing from 30 to 50 per cent alumina, the rest being chiefly lime, and having a silica content below 10 per cent. Bauxite in lump form, diaspore or other material containing aluminium oxide together with limestone in small lumps, finely divided iron ore, coke and anthracite fines are smelted together in an electric or other furnace. Ferruginous bauxite is preferably used, in which case the iron present is reduced. The aluminate slag produced may be used as the raw material for Portland cement.

233,371. Westrum, L. S. van. Nov. 8, 1923.

Compositions containing bituminous or resinous materials.—A bituminous binding and waterproofing emulsion, used cold for binding paving material such as stone, sand, cinders, wooden blocks, or the like, and also for binding and waterproofing building materials such as bricks and stones, is formed by saponification, by caustic soda, potash or other alkali, of asphaltums, tar, or oily substances or mixtures of these materials, with linseed or other drying oil. The emulsion is mixed with the broken stones or other materials, the drying qualities of the oil and atmospheric action forming an insoluble soap. Rape-seed or like non-drying oil may be added to retard the drying action. The emulsion is formed, in an example given, by mixing hot 30 to 50 parts by weight of bitumen of any kind, 3 to 8 parts of resin or resinous substances, 3 to 8 parts of linseed or other drying oil, and 5 to 50 parts of alkali lye until saponification occurs. 1 to 4 parts by weight of rape-seed oil may be added. The emulsion may be stored in barrels, a small quantity of water being then added to facilitate the removal of the emulsion from the barrels. Specification 6823/15 is referred to.

Reference has been directed by the Comptroller to Specification 121,533, [*Class* 95, Paints &c.].

233,446. Marvle Products, Ltd., and **Svandalsflona, A. N.** Feb. 14, 1924.

Concretes.—Imitation marble, tiles, slabs, and like articles are made by applying a thin coating of cement, dissolved casein and water, with or without colouring matter, to a smooth, polished, or other moulding surface and adding thereto a layer of similar materials mixed with sand or other filling materials. The second layer may be differently coloured and may be applied so as to displace the first coating and show through or between the displaced material. A further layer may contain, in addition, ballast stone chips or the like. Designs or patterns may be produced as required. The surface may be treated with a waterproofing composition.

233,531. Ritter, K., and **Härtel, E.,** (*trading as* Ritter & Härtel, Dr.). May 26, 1924.

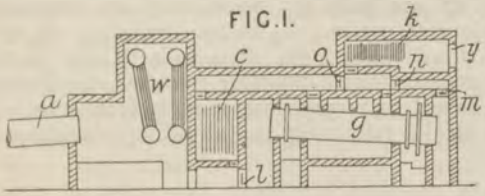
Compositions containing bituminous materials, cement, slag, and pumice.—In flooring-tiles of the kind comprising two layers, the lower layer consists of pumice, slag, and cement impregnated with molten paraffin, bitumen, petrol residue, and benzene derivatives, and the upper layer is formed of powdered cork, bark, sawdust, bitumen, pitch, tar, asphalt, natural asphalt mastic, tar and pitch residues, benzene derivatives, and disinfecting oils. The proportions of the materials used in the lower layer may be:—pumice 20 per cent, slag 20 per cent, cement 40 per cent, paraffin 6 per cent, bitumen 10 per cent, petrol residue 2 per cent, anthracene oil 1 per cent, creosote oil 1 per cent; and in the upper layer:—bitumen 30 per cent, tar 1 per cent, asphalt 5 per cent, natural asphalt mastic 20 per cent, tar residue 10 per cent, petrol residue 4 per cent, creosote oil 0.5 per cent, anthracene oil 0.5 per cent, phenol 0.5 per cent, raw cresol 0.5 per cent, powdered cork 4 per cent, powdered bark 4 per cent, sawdust 10 per cent. The tiles are secured to the cement bed by means of a cement consisting of the materials forming the top layer, which material is also used for filling the joints.

233,698. Voisin, U. B., (Assignee of *Roche, E. M.*). May 6, 1924, [*Convention date*].

Cements, materials and compositions for.—An aluminous cement is made by heating to a clinkering temperature, for example, 1200°—1500° C., a mixture of bauxite and lime or limestone poorer in lime than the mixtures usually employed, the proportion of lime being at most equal to half that of the sum of the alumina and silica. According to an example, 50 parts by volume of medium hydraulic lime or limestone, and 50 parts of bauxite are ground, mixed, briquetted and burnt at 1200—1500° C. for 12 hours, yielding a hard-grinding black clinker, which after grinding sets in 2—3 hours. By employing fat lime and slowing down the burning, a cement is obtained which sets almost immediately.

233,764. Marks, E. C. R., (*Polysius, G.*, [*Firm of*]). Feb. 11, 1924.

FIG.1.



Cements, Portland, processes and apparatus for making.—In a wet process for the manufacture of cement the sludge is dried by the waste gases of the rotary burning kiln, the drying being effected in a drum, situated in the smoke-box or like structure interposed between the upper end of the rotary kiln and the smoke stack, and which smoke-box is so constructed as to provide alternatively for the external heating or both external and internal heating of the drum. The plant shown in Fig. 1 at the upper end of the burning kiln *a* comprises a drying drum *g*, steam generator *w*, and electric dust removers *c*, *k*, damper-controlled openings being provided in the various chambers and flues so that the waste gases in their passage from the burning-kiln to the stack opening *y* can be caused to take a number of different paths. For example, if the dampers *l*, *m*, *n*, and *o* are closes the gases pass through the dust remover *c* and around the drum *g*, while if all the dampers except *o* are opened, part pass around the drum and part through it. In a modified arrangement the gases pass around the drum, then through a chamber containing air-heating pipes, and finally through the drum with the hot air from the heating-pipe system. Cold air may also be passed through the interior of the drum. The sludge may be sprayed into the drying-drum, and the heating gases may be delivered so that they act first on the inlet end of the drum. When the drum is being heated externally the moisture-laden gases from the interior may be drawn off by a fan and injected into the chimney.

233,819. Brune, A. March 3, 1924.

Cement &c. surfaces, hardening.—Glazed tiles &c. in which the glaze is produced by pressure at normal temperature, consisting of, for example, a facing of cement and colour, and a backing of cement and sand, are hardened by submitting them to the action of moisture at a temperature of 20°—40° C. and at ordinary pressure, and subsequently, and in the chamber, treating them with steam at a pressure up to 9 atmospheres for 6—8 hours. By performing both treatments in the same chamber, draughts are excluded, and the glazed surface is preserved.

234,233. Tetens, O., and **Rekord-Zement-Industrie Ges.** March 25, 1924.

Cements, Portland and Roman, materials and compositions for; concretes and mortars. — Mixtures containing siliceous, calcareous, and bituminous ingredients are burned without addition of fuel at temperatures below the vitrifying temperature, and with recovery of oil. The residue may be either moulded into bricks &c. or ground for use as cement, and in either case it may be either used as a whole, or the lime may be separated from the siliceous portion and the latter remixed with lime from the same or another source or with lime-containing substances such as cement or gypsum. The raw materials may be a mixture of bituminous limestone and siliceous earth or clay, or a mixture of bituminous or oil-shale and limestone or lime and clay. A highly siliceous and a highly calcareous mixture may be burned separately, and the residues mixed. Oil-shale and similar residues obtained by other processes may also be added to the residue. To facilitate the separation of the calcareous and siliceous portions of the residue the raw materials may be mixed in different degrees of subdivision, or the residue may be exposed to air or water to slake and so pulverize the lime. The ammoniacal liquor obtained from the distillation may be used to slake the lime with the production of ammonia gas.

234,302. Marks, E. C. R., (*Polysius, G.*, [*Firm of*]). June 24, 1924.

Compositions containing calcium sulphate and slag.—A process for manufacturing artificial stone consists in mixing slags of all kinds more or less finely ground with unburnt gypsum or anhydrite. The slag may be ground, either dry or moist, with the gypsum or anhydrite or separately before mixing. Part of the slag may be replaced by sand and an alkaline substance such as soda, calcium oxide or the like may be added.

234,707. Tidy, C. J. Nov. 12, 1924.

Concretes and mortars.—A composition of Portland cement, alumina, and calcium chloride solution, with or without pigments is used for producing a glazed surface on concrete and like tiles, &c. A thin layer of the composition is placed in a mould and after partial setting the mould is filled up with the concrete forming the body of the tile.

234,714. Calderwood, W., and **Webb, A. E.** Nov. 18, 1924.

Compositions containing resinous and silicious materials.—A composition for covering tennis courts, floors, &c., consists of ground shells, and fossil gum such as copal, and a mineral oil, with or without a vegetable oil. Suitable proportions of binder are 7 parts of fossil gum to 5 parts of mineral oil, or 7 parts of fossil gum, 4 parts of vegetable oil, and 6 parts of mineral oil. 2 parts of the binder are mixed with about 10 parts of shell.

234,846. Soc. Lap, (Assignees of *Seailles, (née Calogeropoulos), S.*). May 30, 1924, [*Convention date*].

Cements, Portland, compositions for.—Cement objects are formed from aluminous cements in which the index (silica and alumina)/(lime and magnesia) is greater than 0.6 and in which the proportion of iron is less than 1.5 per cent; or aluminate of lime Al_2O_3CaO containing less than 5 per cent of impurities and less than 5 per cent of iron. Specifications 217,605, [*Class* 87 (ii), Moulding plastic &c. substances], 222,500, and 231,867 are referred to.

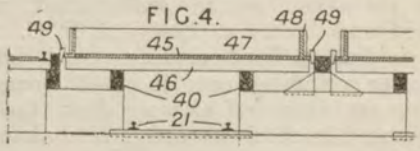
234,862. Marks, E. C. R., (*Quaker Oats Co.*). Jan. 7, 1924.

Asphalts, if not sufficiently black in themselves, are coloured black by treatment with furfural and an acid, such as hydrochloric acid, with or without the application of heat.

Reference has been directed by the Comptroller to Specification 187,480.

235,006. Eriksson, J. A. June 17, 1924.

Concretes.—In making porous-concrete or gas-concrete from cement or cement and lime, with or without slate-ashes, slate-lime, blast furnace slag, brick-dust, pumice or the like and metal powder which causes the generation of gas on mixing with water, the solid constituents are mixed and finely divided and then introduced into water while stirred to obtain a homogeneous mixture, which is then put into a transportable vessel from which it is transferred to moulds. The transportable vessel is divisible by movable partitions so as to divide a mixing into several parts each of which is put in a separate mould. The moulded blocks are afterwards trimmed and



subdivided into pieces of suitable size in dividing-machines. Prior to mixing with the cement, the lime mixed, or not, with other materials may be sprinkled with water and stored for a sufficient time for the slaking of the lime. The moulds are arranged as shown in Fig. 4. The moulds rest on beams 40 and the side and end members 47, 48 are held by hooks and are pressed by wedges 49 against the bottom members 45, which are fixed to bars 46. The rails 21 are provided for wagons, the supporting member of which may be raised to remove the moulds from the beams 40 to the trimming and dividing machines.

235,138. Pontoppidan, C., and **Bonde, H. P.** June 5, 1924, [*Convention date*].

Cements, Portland, processes for making. — Aluminous cements are obtained by burning the raw materials in a rotary kiln which is heated by a gas flame in order to avoid excessive heating of the material by direct radiation.

The Specification as open to inspection under Sect. 91 (3) (a) includes also other methods of protecting the materials from direct radiation, such as (1) forming the flame in an extension of the kiln, through which the material does not pass, (2) surrounding the flame with an annular jet of cool air, (3) diluting the flame with inert gas or excess air, and (4) cooling the kiln shell at the point where radiation is greatest. This subject-matter does not appear in the Specification as accepted.

235,231. Chanard, P., and **Chanard, R.** June 7, 1924. [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*]. *Drawings to Specification.*

Concretes, cement.—Light slabs for partitions and ceilings may be moulded from a mixture of

Portland cement, ashes, and cork. The surfaces may be moulded to imitate bricks, cut stones, &c., and may be coated with plaster before being erected.

235,257. Schoenhoefer, R. Feb. 12, 1924.

Concretes and mortars; slags, treatment of; rendering non-plastic materials plastic.—Cementitious materials suitable for use as mortar, concrete and artificial stone are obtained by applying a wet crushing and kneading treatment to the following classes of material, viz.: ashes, flue-dust, &c. from the combustion of wood, peat, coal, coke, refuse, sludge, oil-shale &c.; slags and flue-dust from metallurgical processes; volcanic slags; and products manufactured from the previously-mentioned substances or from cement or concrete. The treatment consists in crushing and kneading the material in a moderately moist condition, preferably in a heavy edge-runner mill. Heat may be applied during the process. The quality of the product may be improved by the addition of small quantities of chemicals such as alkaline hydroxides and salts, magnesium salts, calcium salts, aluminium salts, iron oxides and salts, and alkaline silicates. Fillers such as gravel, sand, slag, pumice, ashes, asbestos, kieselguhr, sawdust, peat, &c. may also be added. The product may often be improved by prolonged soaking in water with occasional agitation to prevent setting.

235,505. Holley, E., (Assignee of *Meloche, D. H.*). Jan. 10, 1925, [*Convention date*].

Refractory substances containing sodium silicate.—A liquid wash for repairing furnace linings consists of a considerable amount of powdered refractory material, for example fireclay, suspended in a dilute solution of " C grade " sodium silicate, which grade corresponds in composition to the formula $5(Na_2O).11(SiO_2).46(H_2O)$. Suitable proportions are 70 parts by weight of water, 5 parts of sodium silicate, and 25 parts of fireclay. The wash is applied by spraying or otherwise in successive layers to the heated surface of the furnace until the desired thickness is obtained.

235,595. British Thomson-Houston Co., Ltd., (Assignees of *Adams, L. V.*). June 13, 1924, [*Convention date*].

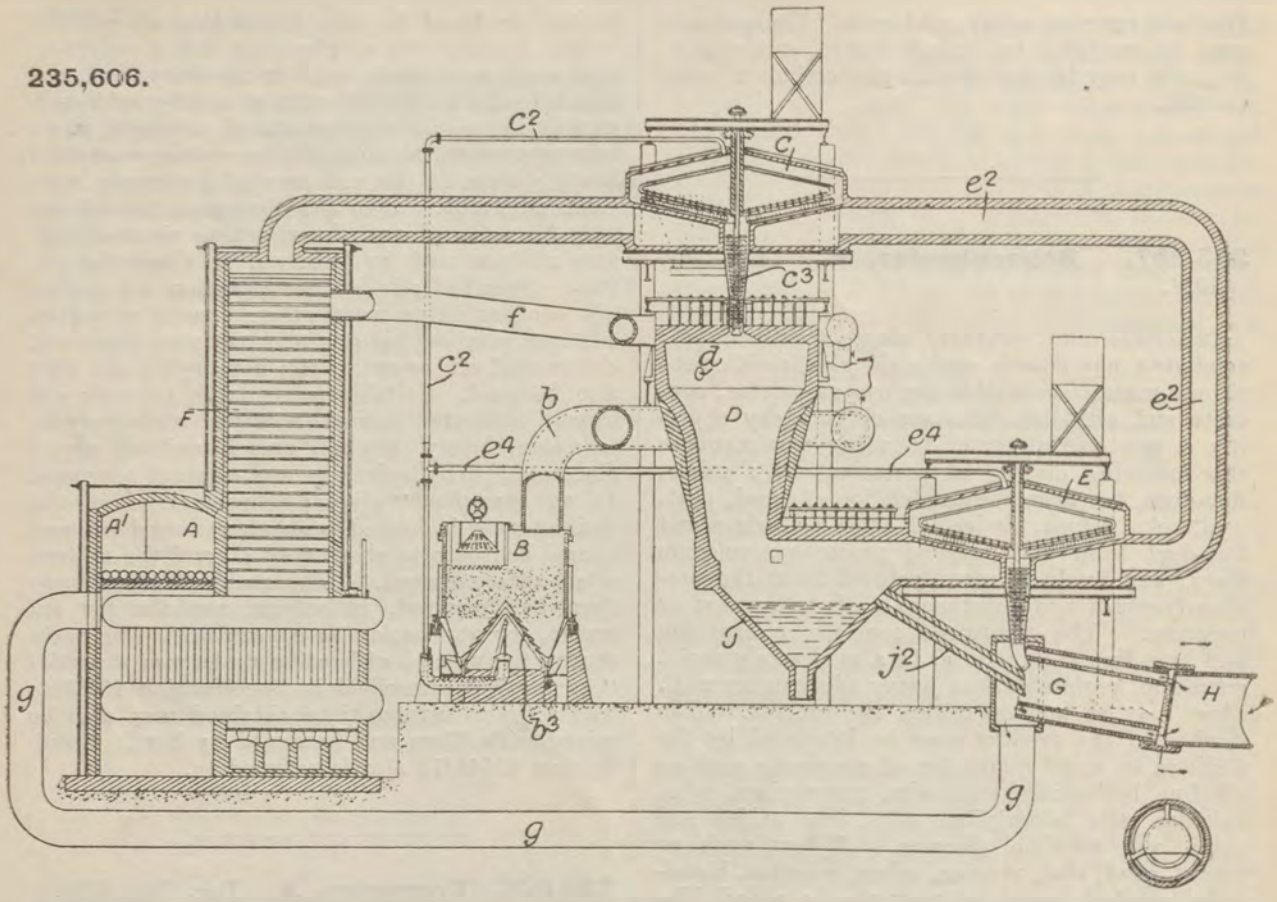
Compositions containing organic condensation-products and fatty oils. — The complex ester resins, produced by the interaction of a polyhydric alcohol such as glycerine and a polybasic acid such as phthalic acid or its anhydride, are blended with a glyceryl ester of a fatty acid such as a drying oil for the purpose of making a japan base or varnish, for example for coating wires, by heating them in the presence of a common non-volatile solvent. After the dispersion the solvent may be removed and the resulting viscous mixture used as such or dissolved in a volatile solvent. Specified oils for incorporation are drying oils such as china wood oil or linseed or perilla oil, and semi-drying oils such as soya bean oil, cotton-seed oil, or castor oil; non-drying oils may also be used. Suitable non-volatile solvents are benzyl benzoate, benzyl acetate, nitrobenzene, toluidine, benzyl alcohol, cresol, aniline, glycol diacetate, phenylhydrazine and *o*-cresyl benzoate. In an example " glyptal " preferably in the fusible state is heated with china wood oil and benzyl benzoate to about 200° C. and the solvent afterwards removed. The resin-oil blend may then be dissolved, in solvent naphtha for example, for application as a varnish. The resin during the process of heating undergoes a partial " curing," as described in Specification 235,589. The resinous compositions obtained may also be mixed with fillers and hardened by heat. Specification 22544/13 also is referred to.

235,606. Ferguson, A. Dec. 19, 1923.

Slag cements. — Oxide ores are reduced and cement materials made by feeding finely-divided ore and cement-making fluxes in the form of a cloud into the top of a furnace in which they are heated by a whirling flame, the metal and slag being driven centrifugally to the furnace walls, and falling to a chamber at the bottom: further cement-making material may be added to the slag produced. In the plant shown, the mixture of ore and flux is heated in preheaters A, C, and cement-making material in a preheater E, coal or other fuel being heated in a retort A^1. A producer B is supplied with fuel from the retort A^1 and with carbon dioxide under the grate b^3 from the preheaters C, E through pipes c^2, e^4. The producer gas from pipe *b*, which may be mixed with the gases from the retorted fuel, and air from pipe *f* heated in a recuperator F, are supplied to tangential burners *d* in the furnace D to the top of which the ore and flux are supplied by a feeder c^3: similar burners may also be arranged in the lower part of the furnace. The molten metal collects in the chamber J at the bottom of the furnace, while the slag overflows through a pipe j^2 into a rotary drum G where it mixes with material from the preheater E, the mixture passing into a rotary cooler H through which cold air is passed. Cement from the cooler H may be pulverized in a hydrogen charged atmosphere. Air from the cooler H may pass round the drum G and thence through a pipe *g* to the recuperator F, to which the hot gases from the furnace D may also be passed through pipes c^2.

(*For Figure see next page.*)

235,606.



235,924. Mehner, H. Jan. 1, 1924. *Drawings to Specification.*

Cements, Portland, materials and compositions for.—Phosphates, silicates and other compounds reduced by means of carbon at elevated temperature are decomposed by heating with carbon in the absence of air with or without the addition of reagents such as silica or iron and the combustible volatile reaction products are burned in the reaction zone to supply sufficient heat to maintain the requisite temperature during the reaction and while a new charge is introduced. Non-volatile residues containing silicates may be worked up with suitable additions into cement without removal from the furnace and while at elevated temperature.

236,050. Radcliffe, J. Jan. 2, 1924.

Compositions containing bituminous materials.—A process for the construction of macadamized roads consists in coating the aggregate with a liquid or semi-liquid binder of low melting point and then applying to the coated aggregate a powdered bituminous binder of high melting point with or without a powdered mineral or organic substance to act as a filler. In the example given, stone of $\frac{1}{4}''$ to $1\frac{1}{2}''$ gauge is coated with fuel oil and, before or after laying, the second binder is added this consisting of powdered oil-pitch having a melting point for example of 230° F. alone or mixed with sand. In the case of large aggregate, part of the powdered pitch may be dissolved in the oil to thicken it. The pitch is preferably ground with sand in an impact mill and can be transported without caking. The process is preferably a cold one, but a moderate degree of heat may be applied.

236,063. Bell, B., and **Illingworth, W. H.** Aug. 13, 1924. *Drawings to Specification. Samples furnished.*

Refractory substances.— Refractory hard clay bodies such as cores for mercury cut-outs, of the kind described in Specifications 121,305, 172,446, and 200,268, [all in *Class* 38 (v), Electric switches &c.], and bodies for electrical and other purposes are made from a purified clay containing 50 per cent or more of silica. Such a clay is found in Creech, Dorsetshire. China, ball, or fireclay is excluded. The dried, refined, and finely disintegrated clay is made into a slip, surplus water is removed, and the slip is die-pressed to shape under heavy pressure. The product is then drilled if holes are necessary, and is next fired at a low temperature, 400° to 750° C. and finally at

a high temperature not less than 1300° C. The low-firing temperature is gradually raised 1° C. per minute to 400° C., which temperature is maintained for about an hour and then raised to 750° C. at the same rate. The final firing temperature is raised from normal to 1000° C. in about two hours and then increased to 1300° C. in a further three hours, the temperature being maintained at 1300° C. for about four hours. The raw material is dried for a week at 35° to 40° C., and then rubbed through a fine sieve. The slip is made with water at 100° F., passed through a fine mesh lawn and allowed to settle for a week. After drilling, the bodies are placed for ten hours in a temperature of 32° F., and then fired as described above.

236,255. Silva, F. A. de. March 6, 1924.

Refractory substances; slags, treatment of. — Hard, refractory bricks, tiles, crucibles, furnace linings and other cast or moulded articles are produced simultaneously with high grade steel of low carbon content directly from iron sand or titaniferous ores in an electric furnace, the slag being run direct from the furnace into moulds. According to one method, a layer of carbon, charcoal or graphite, together with a carbide, is spread over the titaniferous ore in an electric furnace such as described in Specification 239,249, [*Class* 39 (iii), Heating by electricity], and an electric current passed through the mixture so as to produce upon the surface of the material an intensely hot mantle composed of electric arcs. Alternatively the carbon &c. may be disposed round the walls of the furnace in the form of plugs or a number of electrodes. Another process consists in first subjecting the titaniferous ores to magnetic or other separation, fusing the concentrate in an electric arc furnace, and then adding the carbon, charcoal or graphite together with calcium carbide. The slag, consisting principally of titanic acid and other refractory materials such as titanium carbide, is preferably concentrated by known methods such as rotation of the furnace and is then cast direct into moulds where it may be subjected to heavy pressure to extrude air bubbles or spongy substances. One or more layers of powdered or sheet asbestos may be contained in the mould so that the slag either covers both sides of the asbestos sheet or may be located between two sheets of asbestos, the material so produced being suitable for roofing, walls, partitions, tiles or linings.

236,345. Everitt, W., (*trading as* British Chemical Products). May 24, 1924.

Compositions containing resinous materials and sand, &c. — A plaster composition for hard tennis courts, paths &c. consists of sand, powdered granite, flints or sandstone, mixed without heat with a binder comprising water-insoluble gums or like material dissolved in a volatile organic solvent, the mass being rendered porous when the solvent evaporates after formation of the surface. Resin and solvent naphtha are usually employed, together with oils, such as petroleum, and if desired, an oxidizing agent such as terebene. Two suitable mixtures are (*a*), 1120 lbs. of silver sand, 56 lbs. of resin, 65 lbs. of solvent naphtha, 18 lbs. of heavy petroleum, 1 lb. of terebene, and 86 lbs. of pale zinc green, and (*b*), 1120 lbs. of coarse pit sand, 50 lbs. of resin, 60 lbs. of solvent naphtha, 14 lbs. of heavy petroleum, 1 lb. of terebene, and 30 lbs. of iron oxide.

236,450. Novocretes, Ltd., Case, G. O., and **Garrow, J. R.** March 27, 1924.

Concretes consisting of mineralized fibres and cement are obtained and utilized by completely saturating the fibrous material (e.g. sawdust, ground peat, wood pulp, coir refuse, ground cork, &c.) with a liquid, mixing the saturated material with a substance which reacts with the liquid to produce an insoluble compound in and on the material without initiating setting, then adding cement to the mineralized material, and finally expressing from the material the remaining liquid, which reacts with the cement and causes setting. The mineralising liquid may be highly basic solution of a metallic salt as described in Specification 225,912, [*Class* 87 (i), Bricks &c.], a normal solution of metallic salt, or water (which absorbs carbon dioxide from the atmosphere). Metallic chlorides and nitrates, e.g. calcium chloride, magnesium chloride, ferric chloride or nitrate, and salts of aluminium and chromium are mentioned as examples. The reacting substance, which may be in dry granular form, may be calcium hydrate or carbonate, magnesium carbonate or oxide, sodium carbonate &c. Specification 159,979, [*Class* 87 (i), Bricks &c.], is referred to.

236,591. British Thomson-Houston Co., Ltd., (Assignees of *Wright, J. G. E.*). July 5, 1924, [*Convention date*].

Compositions containing organic condensation products.—The hardening of the resins, produced by condensation and polymerization of polyhydric alcohols such as glycerine and polybasic acids or their anhydrides such as phthalic anhydride, is accelerated by admixing with the initial resin a "dehydration catalyst," for example oxide of calcium, magnesium or zinc or certain finely divided metals such as zinc or iron obtained from a finely divided oxide by hydrogen. In an example a cement, which admits of curing in a short time, is prepared by mixing

"glyptal" (the resin from glycerine and phthalic anhydride), marble dust as filler, finely divided iron as a catalyst, and acetone with or without alcohol as solvent.

236,695. Lefebure, V. May 8, 1924.

Compositions containing anhydrite and salts of alkali metals are used as plasters. The salts, which may be, for example, sodium or potassium sulphate or carbonate or alum, are added to the ground anhydrite in proportions varying from ⅛ to 2 per cent.

236,827. Ohlsen, J. U. A. Jan. 16, 1925.

Concrete.—Infusorial earth, kieselguhr, moler, &c. is impregnated with a bituminous or resinous substance for use as an aggregate in concrete wherein hydraulic binding agents e.g. Sorel cement, are used. Other fillers such as asbestos or slag-wool may be added. The mixture is moulded under pressure. Suitable proportions are 3 parts of diatomic earth, 1 of impregnating-agent, 2 of other filling-materials, and 1 of cement.

237,010. Prodor Soc. Anon., and **Levy, M.** April 16, 1924. *Drawings to Specification.*

Bituminous concretes of the type described in Specifications 201,650; 202,248, [*Class* 87 (ii), Moulding plastic &c. substances]; 202,598, [*Class* 87 (i), Bricks &c.]; and 228,257 consist of a graded filling material and a pitch specially selected or prepared to exhibit suitable hardness under a penetrometer test as described in Specification 228,257. The penetration-temperature curve obtained by this test should not diverge appreciably from a straight line within the range of temperature which the concrete is required to withstand. The invention is particularly applicable to oil pitches, which are increased in hardness either by distillation or by admixture of harder bodies such as coal tar pitch or gilsonite. For example, a concrete may consist of 450 parts by weight of broken stone, 380 parts of sand, 300 parts of powdered mineral, and 100 parts of oil pitch which has been steam-distilled at about 340° C. under a pressure of 20 mms. of mercury. The pitch content of the concrete may be as low as 7 per cent. Hard coke may be employed as the filling ingredient.

237,182. Hendrickx, J. J., and **Etablissements Poliet et Chausson.** Feb. 23, 1925.

Cements, Portland, processes for making.—The fuel supplied to a rotary kiln is mixed with sufficient lime or limestone to convert its ash into a cement corresponding in composition to that produced in the kiln, with the result that a homogeneous product is obtained.

237,320. Lefebure, V. Feb. 6, 1924.

Compositions containing organic condensation products.—A composition to be applied to sheets of asbestos-cement &c. and hardened by the application of heat and pressure consists of 6lbs or synthetic resin, 4 lb. of wood-meal, 2½ lb. of calcium sulphate, and 1½ lb. of chrome green pigment.

237,515. Sindic, L. Feb. 20, 1925.

Cements, Portland, treating after manufacture.—Calcium chloride in proportions suitable for promoting hardening (e.g. 2½—3 per cent) is added to dry cement either before, during, or after the grinding of the clinker. If added before grinding it may be employed in solution.

237,779. Eckel, E. C. Nov. 17, 1924.

Aluminous cements; slag cements.—A mixture of iron ore low in silica, aluminous material such as bauxite, and limestone is fused, and after sufficient time has elapsed for the separation of the reduced metallic iron and the slag these are separately and intermittently withdrawn and the slag ground up to produce alumina cement. The fusion is effected in a high furnace resembling an iron blast-furnace and having the ratio of height to diameter between 5 and 8. The aluminous content of the charge may be furnished by the use of aluminous iron ore. The charge after the loss of its volatile constituents should contain 25—55 per cent lime (including magnesia), 25—50 per cent of alumina, not more than 10 per cent of silica and not less than 10 per cent of iron oxide.

237,885. Krupp Akt.-Ges., F. July 30, 1924, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*].

Compositions containing mineral oil.—A non-liquid mixture of ground insulating materials and mineral oil is used for filling hollow spaces in castings containing electric conductors. A typi-

cal composition consists of 65 parts of roasted chalk and 35 parts of viscous mineral oil mixed while hot to render it less hygroscopic.

238,219. Swan, C. Aug. 8, 1924, [*Convention date*].

Compositions containing bituminous and silicious materials.—Diatomaceous earth is added to the usual compositions of bituminous and stony materials for road making. The diatomaceous earth may be added to the hot bituminous binder, or to the filler, or it may be divided between them. Suitable quantities are 10—35 per cent of diatomaceous earth, 55—85 per cent of asphalt, and 5—10 per cent of crude petroleum oil, mixed with crushed stone grading from three inches down, and sand. A top dressing consists of the bituminous mixture and sand. The sand may be partially or wholly replaced by coarse hair.

238,340. Cuylits, G. E. A. July 2, 1924.

Cements, Portland and Roman, processes for making; slag cements.—Slags employed for making cements alone or with other raw materials are prepared by the addition of small quantities of contact materials having or requiring a higher sintering or melting temperature than the resulting burnt product. These substances may be identical with or have components in common with the resulting product. The sintering may be carried out in a reducing atmosphere or intermittently in a reducing and an oxidizing atmosphere.

238,586. Lutyens, L. C., and **Child, R. O.** April 11, 1924.

Compositions containing bitumen and casein, starch, albuminoids, or alginates.—A tough flexible material for roofing, road surfacing, electrical insulation, and like purposes is prepared by adding to bitumen at a temperature of about 212° F. a small quantity of either partly coagulated casein, starch, albuminoid such as egg albumen or blood, or alginate such as Irish moss. Other ingredients such as mineral fillers, fibres, metal filings, and fireproofing agents may also be added. A typical composition consists of 12 parts of bitumen, 4 parts of Trinidad asphalt, 4 parts of ammonium sulphate, 3 parts of ammonium phosphate, 2 parts of heavy mineral oil, 6 parts of calcareous filler, 5 parts of asbestos fibre, and 1 part of casein which has been dissolved in sulphonated oil and partly coagulated by means of formaldehyde.

238,690. Ekert, F. M. Aug. 5, 1924.

Stone, artificial.—A process of producing porcelain and vitreous ware consists in adding to silica or aluminium silicate, or both, a fluid consisting of aluminium fluoride or silicon-aluminium fluoride. To produce ware of a more stone-like character, magnesium fluoride and silicon-magnesium fluoride are used.

238,904. Pollak, F. Aug. 25, 1924, [*Convention date*].

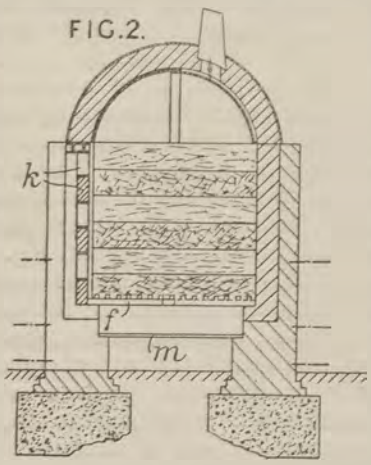
Compositions containing urea-aldehyde condensation products. — In the manufacture of condensation products of urea or its derivatives or substances yielding urea with formaldehyde, the water contained in the products is wholly or partly replaced by the addition of organic sugstances either to the starting materials or during the process of condensation, the organic substances employed being such as are capable of forming transparent solutions of or in the condensation product and have a higher boiling point than water. Benzyl alcohol is specifically mentioned as a suitable organic substance. Preferably the bulk of the water is first removed in known manner, then an organic liquid which is volatile with steam is added to the aqueous solution of the initial condensation product and the mixture distilled, in order to expel wholly or in part the water present; such organic liquid may comprise an alcohol, hydrocarbon, ester, aldehyde or ketone. Before or during the distillation, the organic substance is added which is to enter into the structure of the final product. If a high-boiling liquid is employed for this purpose, it is advisable to use only a small quantity and to make up the remaining liquid necessary to keep the mass fluid with a liquid of lower boiling-point. The invention is applicable also to mixtures of urea-formaldehyde condensation products with other plastic substances or with plastifying agents, e.g. camphor and borneol. The products can be used for the manufacture of glass substitutes, lacquers, films, plates, rods, tubes, buttons, combs, &c. According to the examples, (1) a hydrophobe urea-formaldehyde condensation product is dissolved in ethyl alcohol and amyl acetate then added; after concentration, benzyl alcohol is admixed and the further concentrated mass then hardened to a glassy product; (2) a solution of acetyl cellulose in benzyl alcohol is mixed with a solution of a hydrophile urea-formaldehyde product in excess of methyl alcohol; (3) ethyl alcohol is mixed with a hydrophobe urea-formaldehyde condensation product, the mixture evaporated, napthalene dissolved in benzyl alcohol then added, and the concentrated product hardened in moulds to a glassy mass.

The Specification as open to inspection under Sect. 91 (3) (a) describes (1) the use of glacial acetic acid, glycerine, concentrated formic acid and sugar as suitable organic substances for the replacement of the water, (2) the application of

the invention to condensation products of aldehydes in general with urea, &c. (3) the addition of cellulose, cellulose derivatives and products of decomposition or transformation of cellulose, as well as colouring matters and filling bodies of all kinds as additive materials. The following examples are also included, (1) benzyl alcohol and amyl acetate are mixed with a hydrophile condensation product of urea and formaldehyde, and the concentrated mass hardened in moulds to a glass-like product; (2) glacial acetic acid, collodion, amyl acetate, acetic ether and toluol are added to a urea-formaldehyde hydrosol to produce a lacquer or a solution which can be concentrated and hardened in moulds; (3) a dough formed by mixing a hydrophile urea-formaldehyde condensation product with benzyl alcohol and camphor is used for making transparent objects; (4) glycerin is mixed with a hydrophile urea-formaldehyde condensation product; the mass sets when ammonium phosphate is added; (5) an aqueous solution of acetenalide is added to a syrupy hydrophile urea-formaldehyde condensation product, then distilled, poured into moulds and hardened; (6) a solution of benzanilide in benzyl alcohol is added to a hydrophobe condensation product, and after distillation, is hardened in moulds to a glassy mass. This subject-matter does not appear in the Specification as accepted.

238,949. Mulligan, F. May 28, 1924.

FIG.2.



Plaster cements, processes for making. — Gypsum is subjected to slow calcination in a kiln until it reachs the stage when the loss of its crystalline structure (as indicated by the appearance of efflorescence on the surface of the lumps of gypsum) is imminent; it is then cooled and pulverized, forming a hydraulic cement or plaster. The calcined product may be aerated or hydrated in the known manner, or a small quantity of alum, nitre, or the like may be added at any stage. The gypsum and fuel are preferably stacked in alternate layers in the kiln, about 1 part of fuel being used to 8 parts of gypsum. Fig. 2 shows a suitable kiln, which is cylindrical with a domed top, and is provided at one side with a narrow charging aperture, which is closed after charging with blocks *k*. The starting fire is placed on a grate *m* below the floor grate *f*.

239,264. Campbell, A. F., and **Hardman & Holden, Ltd.** May 29, 1924.

Asphalts.—Bituminous materials such as pitch, tar, asphalts, bitumens, petroleum residues, &c. are dehydrogenated by heating with sulphur until all the sulphur has been driven off as hydrogen sulphide. The material before treatment is converted by distillation to a pitch-like consistency, if not already in that form.

239,364. Rekord-Zement Industrie Ges., and **Tetens, O.** Sept. 16, 1924. *Drawings to Specification.*

Cements, Portland and Roman, materials and compositions for.—Steam is obtained from a boiler surrounding a furnace or kiln in which oilshale, mixed with limestone, lime marl or like material, is burnt. The proportion of limestone &c. to oilshale, of which examples are given, varies with the mean diameter of the furnace tubes and with the calorific value of the oilshale, but is such that sintering of the fuel is avoided. The residues from the furnace are worked either directly by milling, with or without the addition of other materials and a second burning, or the burnt shale separated from the residue is used for the manufacture of cement by the well known processes.

239,404. Haglund, T. R. Nov. 26, 1924.

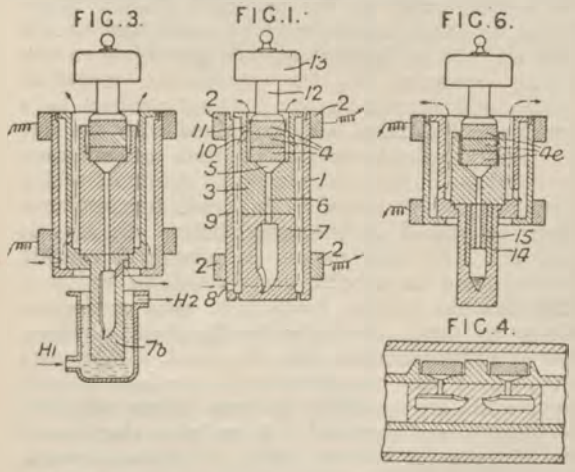
Slag cements. — Slag suitable for use in the production of lime cement, lime-alumina cement, or alumina cement is obtained in a process for the production of metals or alloys, which comprises the indirect reduction of the ore by means of a reducing agent which is itself formed during the operation from oxides and carbonaceous reducing agents. The ore is charged into a furnace along with briquettes or lumps of a mixture of carbon and one or more oxides or oxidized compounds of aluminium, magnesium, barium calcium, silicon, manganese boron, chromium, zinc &c., and with slag-forming or other ingredients such as lime, silica, fluor-spar, sulphides of calcium, aluminium, magnesium, &c. The composition of the charge may be such that the slag formed contains considerable proportions of lime, magnesia or alumina.

239,497. Sundell, F. R. A. Sept. 6, 1924, [*Convention date*].

Compositions containing plaster, lime, and glue for making artificial stone are prepared by mixing 8—12 parts of a dilute aqueous solution of glue with 1 part of a suspension of lime in water, and adding gypsum in quantity sufficient to produce a plastic mass. The mixture is moulded upon a glass plate, and hot sand, ashes, or like substance is then applied to the upper surface of the slab to facilitate its removal from the mould.

The Specification as open to inspection under Sect. 91 (3) (a) states also that "silexite (a preparation similar to lime)" may be used instead of lime. This subject-matter does not appear in the Specification as accepted.

239,499. Gewerkschaft Wallram, (*Abteilung Metallwerke*). Sept. 8, 1924, [*Convention date*].



Refractory substances. — Hard difficultly melting bodies are obtained by a single melting of the raw materials in an electric carbon or graphite tube furnace having carbon or graphite current supply terminals, and immediately passing the molten mass into casting moulds. By using a mixture of a difficultly melting metal with carbon as starting material, carbides of tungsten, uranium, titanium, molybdenum, chromium or zirconium, mixtures thereof or mixtures of the carbides with excess of carbon or the free metal may be obtained. Boron and silicon carbides may also be produced, the latter being suitable as an electric resistance. Fluxes such as aluminium, magnesium, or sodium and contact substances which facilitate the production of carbides and which may subsequently be evaporated, for example iron, nickel, chromium or vanadium may also be added. The starting materials are first pressed so as to form moulded bodies and when melting has taken place or the mass has become sufficiently soft to enable it to be forced into the mould steps are taken to prevent excessive absorption of carbon from the casting and melting moulds which causes reduced hardness. Because of this absorption, the metals alone may be used as starting material and it must be allowed for when the lower metallic carbides are produced. The absorption of carbon facilitates the casting process since it tends to cause the mass to expand and also to remain liquid. A non-yielding casing is therefore provided. The moulded bodies may consist of concentric layers having different compositions, the outer layers which are more liable to absorb carbon containing more free metal. The molten mass may be subjected to centrifugal force whereby the lower carbides may be separated from the lower melting carbides containing larger quantities of carbon. The carbon or graphite tube furnace shown in Fig. 1, having terminals 2 and a liner 3 of the same materials comprises a melting mould which terminates in a funnel-shaped recess 5 leading to a casting channel 6. The latter leads to a casting mould 7, also of carbon or graphite. An inert or reducing gas, for example hydrogen introduced through the opening 8 passes from the annular space 9 through slots 10 to the annular space 11 surrounding the moulded bodies. A carbon or graphite plunger 12 presses on the uppermost moulded body 4. It may be loaded with a weight 13 or be pressed down by gas, liquid or spring pressure. As soon as the position of the plunger indicates that the mass has left the melting mould the current is interrupted. Alternatively the current may be continued for some time by means of a time relay, the breaking of the current simultaneously causing the introduction of cooling means. In a modification the annular space 9 is formed with the liner 3 which is separated from the casing 1 by a second annular space as shown in Fig. 3. The casting mould 7*b*, Fig. 3, is situated outside the melting furnace and is provided with a cooling device, the cooling medium entering at HI and leaving at H2. The apparatus may also be disposed horizontally as shown in Fig. 4, in which the casting mould is situated within the furnace. In a further modification the casting mould is disposed outside the horizontal furnace. In order to produce a tool having a ductile shank the apparatus shown in Fig. 6 may be used. The moulded bodies 4*e*, after melting are cast into the end of a steel tube 14 in order to form a hard cutting edge. The tube is preferably provided with a graphite lining 15 which may subsequently be replaced by metal. A similar tool may be produced without using a metal tube, the hard cutting edge and the ductile shank being formed by using moulded bodies of appropriate composition.

According to the Specification as open to inspection under Sect. 91 (3) (a) tungstic anhydride or tungsten carbide may be used as the starting material. This subject-matter does not appear in the Specification as accepted.

239,504. Fink, G. J., (Assignee of *McCormick, J. A., and Cabell, C. A.*). Sept. 5, 1924, [*Convention date*].

Compositions containing lime, aluminous substances, sulphates, or carbonates. — A quick-

setting composition for use as mortar or plaster or for making blocks, &c. consists chiefly of hydrated lime, with additions of aluminous matter, substances supplying a sulphate radical, and small amounts of substances supplying a carbonate radical. The aluminous ingredient is preferably calcium aluminate, but may be sodium aluminate, clay, &c. The sulphate radical may be supplied in the form of ferrous, ferric, sodium, aluminium, manganese, magnesium, or potassium sulphate, or potassium bisulphate. The carbonate radical is preferably added in a relatively slightly soluble form, such as zinc, iron, lead, strontium, magnesium, calcium, or barium carbonate, but sodium, potassium, and ammonium carbonates may be used. Instead of adding carbonates, the lime may be slightly carbonated, e.g. by air slaking. A typical composition consists of 90.5 per cent of hydrate lime, 4 per cent of aluminate cement, 5 per cent of a carbonate, and 0.5 per cent of aluminium sulphate. Small quantities of sugar may be added to the composition to retard setting.

239,590. Boorne, W. H., and **Budde, C. C. L. G.** June 10, 1924.

Compositions containing fibres, resins, phenol aldehydes.—Mixtures of fibres and esparto resin are subjected to pressure and heat preferably at a temperature above the softening point of the resin. This temperature may be reduced by dissolving the resin in a suitable solvent such as an alkali, borax, phenols and cresols, acetic acid, acetone, aldehydes, alcohols, and other resins. According to examples, 3 parts of sawdust, 1 part of esparto resin and 1 part of carbolic acid, or 2 parts of waste paper, 2 parts of esparto resin and 1 part of furfurol, are mixed in a heated mixer, and after evaporation of the solvent a mouldable powder remains. Or sheets, blocks &c. of fibrous materials may be impregnated with a solution of the resin, and hot pressed after removal of the solvent. The resin may be dissolved in phenolaldehyde mixtures which are subsequently condensed. Fillers, abrasive powders, sand &c. may be incorporated in the compositions.

239,633. Wythes, F. V., and **Siluminite Insulator Co., Ltd.** June 27, 1924.

Concretes; stone, treating with liquids.—Electric insulating materials and electric insulators are manufactured from Portland or like cement, and the salts of the higher fatty acids, which salts are previously heated to approximately their melting points. Asbestos may also be added. In one method of carrying out the process ordinary soap is turned into an insoluble soap with magnesium chloride and after purifying and drying is heated until it forms a sticky brown substance when hot. This substance which is substantially insoluble in water and acids may be dissolved in benzene toluene naphtha and the like and used for impregnating. The article to be made may be moulded from Portland or like cement and then impregnated. The impregnation process may be repeated several times. The soap may be reduced to powder and incorporated with the cement before moulding. For impregnation by plunging, the article is heated to a temperature from 150° C. to 200° C. and plunged whilst hot. The article may be painted with the impregnating solution.

239,765. Pope, H. E. Dec. 29, 1924.

Stone, artificial. — Buildings are cast in situ from a slag of relatively low melting temperature by running the melted material in metal or other non-combustible moulds. The moulds may be water jacketed to reduce the temperature quickly but if a smooth face is required the mould may be heated prior to the casting. Broken brick, stone or other matrix may be used, and should the slag be of higher specific gravity than the filling material, lighter granulated materials which will remain in the finished product as a mechanical mixture may be mixed with the slag or readily volatile substances such as carbonate or sulphate of lime, carbonate of ammonia which give or produce gases at moderate temperatures may be placed in the ladle before the slag is run in. By this means the slag will contain bubbles and its specific gravity will be reduced. The moulds may be faced with sand or decorations to produce effects on finished surfaces. Metal reinforcements may be used. The slag may be of such materials as to produce a body approximating to glass for use where windows and lights are required. A suitable slag would be 35 parts of ferrous oxide, 40 parts of sand, 15 parts of carbonate of lime, 10 parts of carbonate of soda. The ferrous oxide may be replaced by ferric or inorganic oxides or metallic silicates or omitted where translucent effects are desired.

240,041. Nielsen, S. T. Dec. 23, 1924. *No Patent granted (Sealing fee not paid).*

Concretes and mortars.—Magnesium chloride solution is added to concretes and mortars to render them frostproof. Suitable proportions are 3 volumes of 18 per cent solution to 100 volumes of concrete or mortar.

240,277. Youngman, R. H. Aug. 25, 1924.

Refractory substances containing chrome iron ore.—A neutral refractory composition comprises an intimate mixture of powdered chrome ore,

powdered sodium silicate and a powdered aluminous or organic binder. As binders, beauxite, diaspore or dextrine may be used. The composition may be packed for transport in sealed waterproof paper-lined burlap bags or in rubber coated burlap bags or in moisture-proof metal cans.

240,386. Carey, C. H. May 9, 1925.

Concretes and mortars. — A composition to be added to cement compositions for waterproofing purposes is made by heating together resin, tallow, a vegetable or animal oil such as coconut oil, an alkaline carbonate or hydroxide such as soda and water, adding to the resulting solution a soluble metallic salt, such as alum, which causes precipitation, and washing the precipitate. The product may be moulded into balls which are softened with boiling water when required for use, or it may be disintegrated, mixed with sand, thoroughly dried and sieved, a little French chalk being optionally added to the resulting powder.

240,840. Pollak, F. Oct. 1, 1924, [*Convention date*].

Compositions containing organic condensation products.—The Specification as open to inspection under Sect. 91 (3) (a) states that the powder obtained by cooling an acid solution of a condensation product of urea or a derivative thereof with an aldehyde such as formaldehyde can be used as a filler for caoutchouc, phenol-formaldehyde condensation products and natural resins. This subject-matter does not appear in the Specification as accepted.

241,576. Siemens & Halske Akt.-Ges. Oct. 17, 1924, [*Convention date*].

Stone, artificial. — A hard body is obtained from asbestos by heating it to a point near to, but below the fusing point, and then subjecting it to a high pressure for example by passing it through rollers.

241,724. Shellard, I. F. Nov. 12, 1924.

Concretes which can be rammed into temporary moulds and left to set after the mould is dismantled consist of limestone or other stone dust or sand, clay, stone chippings, and Portland cement, mixed together dry and then rendered just plastic with water. 1 part of cement and 1½ parts of stone chippings passing ¼" mesh are added to 6 parts of aggregate consisting of sand passing $^1/_{10}$" mesh with an addition of 5 per cent of clay.

241,807. Hough, T. April 20, 1925.

Compositions containing resinous materials.— An ingredient for thermoplastic composition is prepared by mixing two or more copals, gums and resins with shellac and heating the mixture under pressure to 200 — 350° C. for 30 to 60 minutes. Suitable proportions are 40 parts Kauri copal, 20 parts Dammer, 25 parts resin and 15 parts shellac. Fillers, such as ground slate, Kieselguhr, barytes, asbestos and cotton flock, and colouring matter, such as aniline dye or carbon black are added. The material is softened by heat and moulded in a press.

242,267. Soc. Bournisien, Beau, et Cie. Oct. 29, 1924, [*Convention date*].

Refractory substances containing zirconium compounds.—Zirconium ores such as zircon are embodied in the walls of safes, &c., to resist attack by the oxy-acetylene blow-pipe. They may be used either in the natural state or agglomerated by a binder such as magnesium cement.

242,345. Kirkpatrick, S. M. Aug. 6, 1924.

Concretes and mortars.—A paste for mixing with concretes and mortars for waterproofing or strengthening purposes consists of raw or vulcanized rubber latex, a preservative such as hexamine, silicate of soda, potash, soap, and water, with or without a stiffening agent such as gum arabic.

242,446. Hoogewerff, J. J., (*Naamlooze Vennootschap Nederlandsche Betonbouw Onderneming, v. h. P. Kossel & Co.*). Nov. 19, 1924. *Drawings to Specification.*

Concretes.—A porous concrete used in building construction is formed by mixing one part by volume of cement with 3½ parts of each of coarse sand or gravel, clinker breeze, blast furnace breeze and pumice gravel.

242,951. Gewerkschaft Wallram. Nov. 14, 1924, [*Convention date*]. *Addition to* 239,499.

FIG.1.

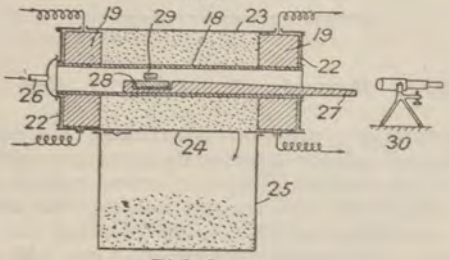
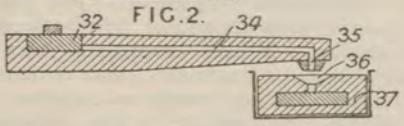


FIG.2.



Refractory substances.—Materials to be fused are introduced into a crucible formed by a cavity 28, Fig. 1, in a carbon rod 27 which is inserted into a carbon tube 18 forming the heating element of an electric furnace. A check block 29 pressed from the material to be melted is placed loosely on the material in the cavity. The rod 27 is wedge-shaped to allow observation by an optical pyrometer 30 of the check block. The rod 27 is left in the furnace for an empirically determined period after melting has been observed to begin and is then removed with asbestos gloves and emptied into a casting mould outside the furnace. The carbon tube 18 is mounted between carbon or graphite terminal blocks 19 mounted in a sheet-iron container 22 filled with an incombustible non-conducting loose mass such as carbon granules. The container is provided with a detachable cover 23 and a valve 24 in the bottom by means of which the contents may be emptied into a lower container 25 when it is desired to replace a consumed resistance tube. Hydrogen, ammonia, or other neutral gas may be admitted by a pipe 26. In a crucible for large castings, the cavity 32, Fig. 2, is connected by a channel 34 having a slight gradient to an outlet 35 situated above the funnel 36 of a mould 37. The outlet 35 may be closed for a predetermined period after melting has begun. The mould 37 may be at first heated and afterwards cooled in such a way as to control the crystalline form and texture of the product. The process and apparatus are particularly applicable to the production of tungsten and other heavy metal carbides. The charge may consist of highly reduced metallic tungsten mixed with powdered carbon. Absorption of carbon may take place from the melting crubicle or by evaporation from the walls of the furnace. The period during which the crucible is left after melting has been observed to start should be chosen so as to preclude excessive absorption of carbon as the resulting compound could not then be cast. Powdered molybdenum, titanium uranium, chromium and vanadium, either alone or with powdered carbon may be treated instead of tungsten. Silicon and boron may be also treated for the production of carbides. Catalytic agents may be added to the charge. Carbon alloys of metal may be produced instead of carbides.

According to the Specification as open to inspection under Sect. 91 (3) (a), carbides or oxides of the metals may be used as raw materials. This subject-matter does not appear in the Specification as accepted.

243,015. Lambert Frères et Cie. Nov. 13, 1924, [*Convention date*].

Plaster compositions.—A slow-setting plaster is obtained by calcining gypsum at a temperature of 500—800° C. until it is completely dehydrated and acquires a specific gravity of 2.7—2.8. It is used as an addition to ordinary plaster.

243,410. Rigby, T. July 28, 1924.

FIG.1.

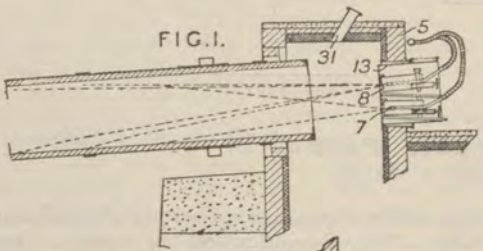
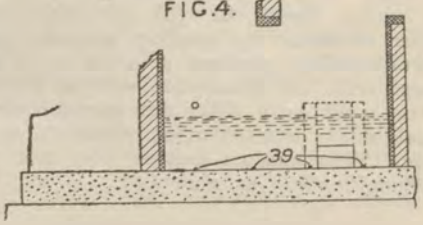


FIG.4.



Cements, Portland, processes and apparatus for making.—The invention relates to processes and apparatus of the kind wherein the slurry is dispersed in the upper part of the rotary kiln so that it is partly dried before coming into contact with the kiln wall. One feature of the invention consists in distributing the dispersed slurry over a considerable area of the kiln wall, by means of either a single spraying device or a number of spraying devices 7, 8, as shown in Fig. 1. The distribution is preferably controlled so that the slurry deposited nearest the end of the kiln undergoes the least drying. A second feature consists in placing the spraying apparatus outside the kiln, e.g. in a chamber 13 adjustable axially within an aperture in the back wall 5 of the kiln head, as shown in Fig. 1. A third feature consists in providing an alternative feed pipe which can be inserted through an aperture 31 in the top of the kiln head when the sprays are out of action. According to a further feature of the invention the gases leaving the kiln are

brought into contact with slurry, whereby the latter is concentrated before being dispersed in the kiln and also the gases are freed from particles of raw material which they may have carried out of the kiln. This may be effected either by dispersing slurry in the gases outside the kiln, or by filling the base of the kiln head with slurry, which is agitated by air blown through pipes 39, as shown in Fig. 4. Specification 199,056 is referred to.

243,831. Batten, G. B. Sept. 12, 1924.

Compositions containing bitumen and siliceous, calcareous, and like materials.— A composition to be added to liquified asphalt, pitch, &c. consists of 6—9 parts of Portland cement or other powdered filler, 0.5—2 parts of chalk or cockle shell, 0.5—1 parts of breeze, 0.65—1.7 parts of bitumen, 0.1—0.3 parts of asbestos, and 0.1—0.25 parts of soda. The bituminous material to which the composition has been added may be used either as a binder for the usual aggregates used in making roads, as a surface dressing for existing roads, or as a filling between sets or paving blocks. When it is used as a surface dressing a light-coloured material such as chalk may be subsequently applied.

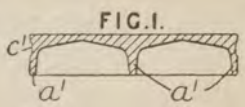
243,876. Voisin, U. B. Oct. 30, 1924.

Aluminous cements. — Alumino-calcareous cements are obtained by heating a mixture of bauxite and calcareous material during a long period (e.g. 9—12 hours) at a temperature well below its melting point, suitable temperatures being 900—1100° C. The proportions of the ingredients are such that when the contents of lime, silica, and alumina are expressed as percentages of the whole, the expression $Ca\,O - (2\,Si\,O_2 + \frac{1}{2}\,Al_2\,O_3)$ is between + 15 and − 15, and is preferably zero.

244,078. Rhenania Verein Chemischer Fabriken Akt.-Ges. Dec. 2, 1924, [*Convention date*].

Cements, Portland and Roman, materials and compositions for.— Calcium sulphate is heated with a siliceous material such as argillaceous shale, in a stream of heating gases of neutral or oxidizing character containing at least 15 per cent of steam, to a temperature of 1100° C. or more in such proportions as to obtain sulphur dioxide and cement, i.e. so as to give a final product containing two parts of calcium oxide to one part of silica, alumina, and iron oxide taken together. The heating may be effected with a fuel containing a large proportion of hydrogen such as oil or producer-gas from lignite, in which case steam from a separate source is unnecessary.

244,142. Burney, C. D. July 12, 1924.



Concretes. — Bricks, building blocks, wall sections, and other articles of large size are produced by impregnating a loose fibrous material such as sawdust with a solution of a metallic salt, mixing the impregnated material with cement, concrete, mortar, &c., with or without a previous treatment with a precipitating agent, and subjecting the mixture to considerable pressure in a mould. The impregnating agent may be a highly basic solution of a salt such as ferric chloride; the precipitating agent may be an alkaline hydrate, carbonate, phosphate, oxalate, or aluminate. Other suitable impregnating and precipitating agents are those referred to in Specifications 244,178 and 249,899. Before impregnation the fibrous material may receive a preliminary treatment, such as one of those described in Specification 253,007, to reduce its tendency to change in volume due to absorption of moisture. Details of the moulding process may be as described in Specification 245,812, [*Class* 87 (ii), Moulding plastic &c. substances]. The articles produced may be large sections of buildings of the kind described in Specification 238,948, [*Class* 87 (i), Bricks &c.], or they may be large slabs of hollow section provided with strengthening ribs a^1 (Fig. 1), the outer ribs being grooved at c^1 to receive the mortar. They may be reinforced with thin strips of a rustless metal, e.g. as described in Specification 240,561, [*Class* 87 (i), Bricks &c.]. The proportions of cement and sawdust may be varied so that one part of the article resembles stone while another part resembles wood. Specification 159,979, [*Class* 87 (i), Bricks &c.], also is referred to. One of the Provisional Specifications describes also the manufacture of hollow bricks of large size from any composition such as clay, cement, concrete, mineralized wood, &c., containing thin strips or pieces of loose metal as a reinforcement.

244,178. Burney, C. D. Sept. 12, 1924.

Concretes.— Loose organic material such as sawdust, wood waste, cork, coir, hemp, sizal, paper pulp, &c. is impregnated with a solution (not highly basic) of a compound of iron, aluminium, calcium, cobalt, nickel, chromium, copper, zinc, or tin, and an insoluble precipitate is produced by treatment with an alkali, alkaline carbonate, phosphate, oxalate, or aluminate, or carbon dioxide, or by heating, by exposure to air or in some cases by reaction with the cellulosic material itself. The precipitating agent may be mixed with the fibrous material before the impregnation with the metallic salt solution takes place. Numerous examples of suitable reagents are mentioned, of which the following are typical: (1) ferrous chloride precipitated by sodium carbonate (2) zinc chloride precipitated by sodium carbonate, phosphate, hydrate, or aluminate or lime (3) aluminium acetate precipitated

by ammonia gas, or alkali, or the action of heat, (4) sodium aluminate precipitated by carbon dioxide, (5) lime water precipitated by ferrous chloride, sodium aluminate, oxalic acid, or carbon dioxide, (6) chromate of iron precipitated by reaction with the fibrous material itself. When the mineralized material is to be mixed with cement, the free lime in the latter may serve as precipitating agent. The metallic salts may be selected to give coloured precipitates, or to serve as fungicides or insecticides. The mineralized material may be combined with cement, &c. with or without a proportion of larger pieces of wood also mineralized by the same process. The mixture may be moulded under pressure and may be reinforced. The product may resemble either wood or stone according to the proportion of organic material used. Specifications 238,948 and 240,561, [both in *Class* 87 (i), Bricks &c.]; 244,142; and 245,812, [*Class* 87 (ii), Moulding plastic &c. materials], are referred to. According to the Provisional Specification, any suitable solution of a metallic salt (other than a highly basic solution) may serve as impregnating agent, and any precipitating agent may be used.

244,312. Dufton, W. J. S., Obank, T., Obank, W. J., and **Obank, L. S.,** (*trading as* Dufbank Tile Co.). March 27, 1925.

Concretes. — A glazing or facing material adapted to be sprayed upon tiles, concrete, slabs, asbestos sheeting, and other articles consists of water colours, lime or cement, or both, and polymerized oils treated with slightly alkaline water. If infusorial earth is added, the mixture may also be used in making plastic ornaments for facing objects.

244,358. Grote, A. July 16, 1925.

Stone, artificial.—A process for the utilization of domestic and industrial refuse consists in sintering the siliceous material separated from the refuse by screening, and melting the sintered material with the clinker obtained by combustion of the coarse screening.

244,391. United States Metals Refining Co., (Assignees of *Marks, A.*). Dec. 10, 1924, [*Convention date*].

Refractory substances containing oil. — A refractory material such as magnesite is mixed with an animal or vegetable oil, preferably a drying oil, such as linseed, cotton-seed, fish, or fat-rendering oil, and the plastic mass is moulded, dried, and burned in the usual manner. The product is stated to be more compact than ordinary refractories and to have a lower coefficient of expansion.

244,603. Simon, O. Jan. 22, 1925.

Cements, Portland, treating after manufacture; concretes and mortars.—Cement and mortar are rendered waterproof by adding to them, either before, during, or after the grinding, a substance more finely ground than ordinary Portland cement. The added substance may be either cementitious or inert; suitable substances are cement, sand, slag, ash, slate, clay, raw cement, slate ash, bituminous rock, gypsum, kieselguhr, coal, and pyrolusite. The action of the finely divided substance may be improved, and its distribution throughout the cement facilitated, by the addition of other substances such as alkalis, salts such as calcium or magnesium chlorides, acids, bituminous substances, oils, and cellulose lye, or by passing an electric current through the substance during its preparation.

244,671. Billner, K. P. July 22, 1925.

Concretes are composed of a coarse aggregate from which small particles have been removed by screening and a liquid cement grout containing powdered zinc or aluminium and preferably also lime, with or without a fine aggregate such as sand. The liquid grout may be poured into moulds or shuttering previously filled with the coarse aggregate, or alternatively the moulds may be filled with grout and the aggregate subsequently added. The aggregate is preferably from 1 to 3 inches in size and may form 60 per cent of the concrete.

244,720. Soc. Bournisien, Beau, et Cie. Dec. 16, 1924, [*Convention date*]. *Addition to* 242,267.

Refractory materials containing rare earth oxides having a low heat conductivity and a high luminosity at high temperatures are used for making the walls of safes, strong rooms, &c., in order to resist attack by the blow-pipe flame. Suitable oxides are those of thorium, zirconium, cerium, yttrium, and glucinium.

244,724. Jakob, J. Dec. 22, 1924, [*Convention date*].

Artificial stone. — Artificial forsterite (magnesium olivine) is obtained by fusing a less basic magnesium silicate, e.g. serpentine, or silica itself with magnesium sulphate, or with materials such as magnesium carbonate and ammonium sulphate which react to produce magnesium sulphate.

The Specification, as open to inspection under Sect. 91 (3) (a), comprises also the production of silicates of other divalent and trivalent metals by corresponding methods. This subject-matter does not appear in the Specification as accepted.

244,756. Spackman, H. S. Dec. 17, 1924, [*Convention date*].

Cements, Portland, processes for making.—In the manufacture of hydraulic cements having a low lime content and a high content of acidic oxides by melting a charge consisting of a basic material such as lime and an acidic component such as alumina, iron oxide, silica, or titanium, oxidizing conditions are maintained in the furnace to prevent reduction of iron compounds to the metallic or ferrous states. A rotary kiln is preferably used and the oxidizing conditions are obtained by control of the air blast. The raw material may consist of equal parts of bauxite and limestone. Specification 222,151 is referred to.

The Specification, as open to inspection under Sect. 91 (3) (a), comprises also the manufacture of hydraulic cements other than those defined above. This subject-matter does not appear in the Specification as accepted.

APPENDIX

The following abridgment should be inserted in place in the present volume.

161,797. Roux, E. V. March 4, 1920.

Concretes.—A building element or block suitable for the walls of refrigerating-chambers is formed of chopped-up tubular or pithed vegetable substances such as reeds, bamboo or the like E, bound together by a binding-agent F such as cement, either pure or mixed with clay, wood, sawdust, or powdered cork. A reinforcement of metal or vegetable material may be used. Crossed rows of vegetable tubes or stems C are shown.

LONDON
PRINTED UNDER THE AUTHORITY OF HIS MAJESTY'S STATIONERY OFFICE
By the COURIER PRESS, Bedford Street, Leamington Spa
Published at the PATENT OFFICE, 25, Southampton Buildings,
Chancery Lane, London, W.C.2.

1927

ILLUSTRATED ABRIDGMENTS OF SPECIFICATIONS

2s. each volume for each period (including inland postage).

(A.)—Classified in 146 volumes for each of the following periods dealing with all published specifications of the years 1855 to 1908 :—

1855-1866.	1884-1888.	1897-1900.
1867-1876.	1889 1892.	1901-1904.
1877-1883.	1893-1896.	1905-1908.

(B.)—Classified in 271 volumes for each of the following periods dealing with all specifications published during the years 1909 to 1925 :—

1909-1915.	1916-1920.	1921-1925 (*in course of Publication.*)

NOTICE.—The volumes for the periods 1921-1925, *now in course of publication, can be obtained sheet by sheet, as printed, by payment in advance of a subscription of* 5*s. for each volume including inland postage, or* 7*s.* 6*d. including postage abroad.*

(A.)—List of Classes, 1855 to 1908 (9 periods as above).

1, Acids, alkalies, oxides, and salts, Inorganic.
2, Acids and salts, Organic and other carbon compounds, (*including* Dyes).
3, Advertising and displaying.
4, Aeronautics.
5, Agricultural appliances, Farmyard and like, (*including* the housing, feeding, and treatment of animals).
6, Agricultural appliances for the treatment of land and crops, (*including* Gardening appliances).
7, Air and gas engines.
8, Air and gases, Compressing, exhausting, moving, and otherwise treating.
9, Ammunition, torpedoes, explosives, and pyrotechnics.
10, Animal-power engines and miscellaneous motors.
11, Artists' instruments and materials.
12, Bearings and lubricating-apparatus.
13, Bells, gongs, foghorns, sirens, and whistles.
14, Beverages, (*excepting* Tea, coffee, cocoa, and like beverages).
15, Bleaching, dyeing, and washing textile materials, yarns, fabrics, and the like, (*excepting* Dyes).
16, Books, (*including* Cards and card cases and the like).
17, Boots and shoes.
18, Boxes and cases, (*excepting* Trunks, portmanteaux, hand and like travelling bags, baskets, hampers, and other wickerwork).
19, Brushing and sweeping.
20, Buildings and structures.
21, Casks and barrels.
22, Cements and like compositions.
23, Centrifugal drying, separating, and mixing machines and apparatus.
24, Chains, chain cables, shackles, and swivels.
25, Chimneys and flues, (*including* Ventilating-shaft tops).
26, Closets, urinals, baths, lavatories, and like sanitary appliances.
27, Coin-freed apparatus and the like.
28, Cooking and kitchen appliances, bread-making, and confectionery.
29, Cooling and ice-making, (*including* Refrigerators *and* Ice-storing).
30, Cutlery.
31, Cutting, punching, and perforating paper, leather, and fabrics, (*including* the general treatment of paper after its manufacture).
32, Distilling, concentrating, evaporating, and condensing liquids, (*excepting* Steam-engine condensers).
33, Drains and sewers.
34, Drying.
35, Dynamo-electric generators and motors, (*including* Frictional and influence machines, magnets, and the like).
36, Electricity, Conducting and insulating.
37, Electricity, Measuring and testing.
38, Electricity, Regulating and distributing.
39, Electric lamps and furnaces.
40, Electric telegraphs and telephones.
41, Electrolysis, (*including* Electro-deposition *and* Electro-plating).
42, Fabrics, Dressing and finishing woven and manufacturing felted, (*including* Folding, Winding, Measuring, *and* Packing).
43, Fastenings, Dress, (*including* Jewellery).
44, Fatenings, Lock, latch, bolt, and other, (*including* Safes and strong-rooms).
45, Fencing, trellis, and wire netting.
46, Filtering and otherwise purifying liquids.
47, Fire, Extinction and prevention of.
48, Fish and fishing.
49, Food preparations and food-preserving.
50, Fuel, Manufacture of.
51, Furnaces and kilns, (*including* Blowpipes and blowpipe burners; Smiths' forges and rivet hearths; *and* Smoke and fumes, Treating).
52, Furniture and upholstery.
53, Galvanic batteries.
54, Gas distribution.
55, Gas manufacture.
56, Glass.
57, Governors, Speed-regulating, for engines and machinery.
58, Grain and seeds, Treating, (*including* Flour and meal).
59, Grinding, crushing, pulverizing, and the like.
60, Grinding or abrading, and burnishing.
61, Hand tools and benches for the use of metal, wood, and stone workers.
62, Harness and saddlery.
63, Hats and other head coverings.
64, Heating, (*excepting* Furnaces and kilns; *and* Stoves, ranges, and fireplaces).
65, Hinges, hinge-joints, and door and gate furniture and accessories, (*excepting* Fastenings, Lock, latch, bolt, and other).
66, Hollow-ware, (*including* Buckets, Pans, Kettles, Saucepans, *and* Water-cans).
67, Horseshoes.
68, Hydraulic engineering.
69, Hydraulic machinery and apparatus, (*excepting* Pumps and other means for raising and forcing liquids).
70, India-rubber and gutta-percha, (*including* Plastic compositions *and* Materials of constructive utility, other than metals and stone).
71, Injectors and ejectors.
72, Iron and steel manufacture.
73, Labels, badges, coins, tokens and tickets.
74, Lace-making, knitting, netting, braiding, and plaiting.
75, Lamps, candlesticks, gasaliers, and other illuminating-apparatus, (*excepting* Electric lamps).
76, Leather, (*including* Treatment of hides and skins).
77, Life-saving, (Marine), and swimming and bathing appliances.
78, Lifting, hauling, and loading, (*including* Lowering, winding, and unloading).
79, Locomotives and motor vehicles for road and rail, (*including* Portable and semi-portable engines).
80, Mechanism and mill gearing.
81, Medicine, surgery, and dentistry.
82, Metals and alloys, (*excepting* Iron and steel manufacture).
83, Metals, Cutting and working.
84, Milking, churning, and cheese-making.
85, Mining, quarrying, tunnelling, and well-sinking.
86, Mixing and agitating machines and appliances, (*excepting* Centrifugal machines and apparatus).
87, Moulding plastic and powdered substances, (*including* Bricks, building and paving blocks, and tiles, *and* Pottery).
88, Music and musical instruments.
89, Nails, rivets, bolts and nuts, screws, and like fastenings.
90, Non-metallic elements.
91, Oils, fats, lubricants, candles, and soaps.
92, Ordnance and machine guns.
93, Ornamenting.
94, Packing and baling goods.
95, Paints, colours, and varnishes.
96, Paper, pasteboard, and papier mâché.
97, Philosophical instruments, (*including* Optical, nautical, surveying, mathematical, and meteorological instruments).
98, Photography.
99, Pipes, tubes, and hose.
100, Printing, Letterpress and lithographic.

101, Printing other than letterpress or lithographic.
102, Pumps and other means for raising and forcing liquids, (*excepting* Rotary Pumps).
103, Railway and tramway vehicles.
104, Railways and tramways.
105, Railway signals and communicating-apparatus.
106, Registering, indicating, measuring, and calculating, (*excepting* Signalling and indicating by signals).
107, Roads and ways.
108, Road vehicles.
109, Ropes and cords.
110, Rotary engines, pumps, blowers, exhausters, and meters.
111, Sewage, Treatment of, (*including* Manure).
112, Sewing and embroidering
113, Ships, boats, and rafts, Div. I.
114, ——————————— Div. II.
115, ——————————— Div. III.
116, Shop, public-house, and warehouse fittings and accessories.
117, Sifting and separating.
118, Signalling and indicating by signals, (*excepting* Railway signals and communicating-apparatus).
119, Small-arms.
120, Spinning, (*including* the preparation of fibrous materials *and* the doubling of yarns and threads).
121, Starch, gum, size, glue, and other stiffening and adhesive materials.
122, Steam-engines, (*including* Details common to fluid-pressure engines generally).
123, Steam generators, (*excepting* Furnaces).
124, Stone, marble, and the like, Cutting and working.
125, Stoppering and bottling, (*including* Bottles, jars, and like vessels).
126, Stoves, ranges, and fireplaces.
127, Sugar.
128, Table articles and appliances.
129, Tea, coffee, cocoa, and like beverages.
130, Tobacco.
131, Toilet and hairdressing articles, and perfumery.
132, Toys, games, and exercises.
133, Trunks, portmanteaux, hand and like travelling bags, baskets, hampers, and other wickerwork.
134, Umbrellas, parasols, and walking-sticks.
135, Valves and cocks.
136, Velocipedes.
137, Ventilation.
138, Washing and cleaning clothes, domestic articles, and buildings.
139, Watches, clocks, and other timekeepers.
140, Waterproof and similar fabrics.
141, Wearing-apparel.
142, Weaving and woven fabrics.
143, Weighing-apparatus.
144, Wheels for vehicles, (*excepting wheels for* Locomotives and tramway and traction engines; Railway and tramway vehicles; *and* Toys).
145, Wood and wood-working machinery.
146. Writing-instruments and stationery, and writing-accessories, (*including* Educational appliances).

(B.)—List of Classes, 1909 to 1925 (3 periods as above).

1 (i), Chemical processes and apparatus.
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).
2 (i), Acetylene.
2 (ii), Cellulose, Non-fibrous, and cellulose derivatives, (*including* Artificial filaments, sheets, and the like containing same).
2 (iii), Dyes and hydrocarbons and heterocyclic compounds and their substitution derivatives.
3 (i), Advertising and displaying apparatus, Moving and changing.
3 (ii), Advertising and displaying other than by moving and changing apparatus.
4, Aeronautics.
5 (i), Farmyard and like appliances, (*other than* Housing and feeding animals).
5 (ii), Housing and feeding animals, (*other than* Chaff and vegetable cutters).
6 (i), Cultivating implements and systems.
6 (ii), Gardening and like appliances, (*including* Miscellaneous agricultural appliances).
6 (iii), Harvesting appliances.
7 (i), Combustion-product and hot-air engines.
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).
8 (i), Air and gases, Compressing, exhausting, and moving, (*including* Bellows *and* Vacuum and like dusting and cleaning apparatus).
8 (ii), Air and gases, Treating otherwise than by compressing, exhausting, and moving.
9 (i), Ammunition and ammunition receptacles.
9 (ii), Torpedoes, explosives, and pyrotechnics.
10, Animal-power engines and miscellaneous motors.
11, Artists' instruments and materials.
12 (i), Bearings and bearing-surfaces.
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.
14 (i), Aerating liquids, and gazogenes, seltzogenes, and siphon bottles.
14 (ii), Beverages, malt products, and organized ferments, (*other than* Aerating beverages).
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).
15 (ii), Dyeing, Processes and materials for.
16, Books, mercantile forms, and the like.
17 (i), Boots and shoes, Apparatus for making and repairing.
17 (ii), Boots and shoes, Construction of.
17 (iii), Boots and shoes, Protectors and trees and other accessories for.
18. Boxes and cases.
19, Brushing and sweeping.
20 (i), Buildings and structures, Kinds or types of.
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.
22, Cements and like compositions.
23, Centrifugal machines and apparatus, (*other than* Centrifugal fans, pumps, and reels).
24, Chains, chain cables, shackles, and swivels.
25, Chimneys and flues, (*including* Ventilating-shaft tops).
26, Closets, urinals, baths, lavatories, and like sanitary appliances.
27, Coin-freed apparatus and the like.
28 (i), Bread-making, confectionery, and cooking-appliances.
28 (ii), Kitchen and like appliances other than cooking-appliances.
29, Cooling and ice-making, (*including* Refrigerators *and* Ice-storing).
30, Cutlery.
31 (i), Cutting and severing machines for paper, leather, fabrics, and the like.
31 (ii), Punching and perforating machines and hand tools for cutting, punching, perforating, and tearing paper, leather, fabrics, and the like.
32, Distilling and evaporating liquids, (*including* Condensing vapours *and* Crystallizing).
33, Drains and sewers.
34 (i), Drying gases, clothes, and materials in long lengths.
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).
36, Electricity, Conducting and insulating.
37, Electricity, Measuring and testing, (*including* Electric resistances and inductances).
38 (i), Electric couplings, and cut-outs other than electromagnetic and thermal.
38 (ii), Electric currents, Converting and transforming other than by rotary converters and rotary transformers, and condensers.
38 (iii), Electric motor control systems and motor and like controllers.
38 (iv), Electric supply and transmission systems and apparatus not otherwise provided for.
38 (v), Electric switches and electromagnetic and thermal cut-outs, (*other than* Motor and like controllers).
39 (i), Electric lamps, Arc and incandescent-arc, and vacuum or low-pressure apparatus for electric discharges through gases or vapours.
39 (ii). Electric lamps, Incandescent.

39 (iii), Heating by electricity, (*including* Electric furnaces and ovens).
40 (i), Electric signalling systems and apparatus, (*other than* Telegraphs *and* Telephones).
40 (ii), Phonographs, gramophones, and like sound transmitting and reproducing instruments.
40 (iii), Telegraphs, Electric.
40 (iv), Telephones and telephone systems and apparatus, Electric.
40 (v), Wireless signalling and controlling.
41, Electrolysis, (*including* Electrodeposition *and* Electroplating).
42 (i), Fabrics, Finishing and dressing.
42 (ii), Fabrics, Treating otherwise than by finishing and dressing.
43, Fastenings, Dress, (*comprising* Buckles, Buttons, Jewellery, *and certain other fastenings specially applicable to wearing-apparel*).
44, Fastenings, Lock, latch, bolt, and other, (*including* Safes and strongrooms)..
45, Fencing, trellis, and wire-netting.
46, Filtering and otherwise purifying liquids.
47 (i), Fire-escapes and fire and temperature alarms.
47 (ii), Fire-extinguishing and fire preventing and minimizing.
48, Fish and fishing.
49, Food preparations, food-preserving, and the like.
50, Fuel, Manufacture of.
51 (i), Furnaces and kilns, Combustion apparatus of, (*including* Details in connection therewith).
51 (ii), Furnaces and kilns for applying and utilizing heat of combustion, (*other than* Combustion apparatus and details in connection therewith).
52 (i), Furniture, Fittings and details applicable generally to, and articles of furniture not otherwise provided for.
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.
54, Gas distribution.
55 (i), Coking and gas-producers.
55 (ii), Gas manufacture other than gas-producers and retorts.
56, Glass.
57, Governors, Speed-regulating, for engines and machinery.
58, Grain and seeds, Treating, (*including* Flour and meal).
59, Grinding, crushing, pulverizing, and the like.
60, Grinding or abrading, and burnishing.
61 (i), Hand-tool, brush, mop, and like handles.
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.
63, Hats and other head coverings.
64 (i), Heating liquids and gases.
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 (i), Door and gate operating-appliances, furniture, and accessories, (*other than* Fastenings, Lock, latch, bolt, and other *and* Hinges and pivots).
65 (ii), Hinges and pivots.
66, Hollow-ware, (*including* Buckets, Pans, Kettles, Saucepans, *and* Water cans).
67, Horseshoes.
68 (i), Excavating earth and rock, booms, buoys, canals and rivers, ferries, and water supply.
68 (ii), Subaqueous buildings and structures, diving, and raising sunken ships and objects.
69 (i), Hydraulic apparatus not otherwise provided for.
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, Indiarubber and guttapercha, (*including* Plastic compositions *and* Materials of constructive utility other than metals and stone).
71, Injectors and ejectors.
72, Iron and steel manufacture.
73, Labels, badges, coins, tokens, and tickets.
74 (i), Braid and braiding-machines, crochet, lace and lace-making, and net-making machines.
74 (ii), Knitting and knitted fabrics.
75 (i), Burners and burner fittings.
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).
77, Life-saving, (Marine), and swimming and bathing appliances.
78 (i), Conveyers and elevators for dealing continuously with articles and materials in bulk.
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 (i), Locomotives and tramway, traction, portable, and semi-portable engines.
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 undercarriage work of.
79 (v), Motor vehicles and locomotives, Steering and controlling.
80 (i), Gearing, Belt, rope, chain, toothed, and friction, and gearing for converting and conveying rotary or reciprocating motion.
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 (i), Disinfecting and deodorizing, and medical and like preparations.
81 (ii), Medical, surgical, and dental appliances.
82 (i), Metals, Extracting and refining, and alloys.
82 (ii), Washing granular, powdered, and like materials, and amalgamating, cleaning, coating, and granulating metals.
83 (i), Casting and moulding metals.
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, butter-making, and cheese-making.
85, Mining, quarrying, tunnelling, and well-sinking.
86, Mixing and agitating machines and appliances.
87 (i), Bricks, building and paving blocks, slabs, tiles, and pottery.
87 (ii), Moulding plastic and powdered substances, (*including* Casting substances other than metals *and* Presses, Mechanical).
88 (i), Musical instruments, Automatic.
88 (ii), Music and musical instruments other than automatic.
89 (i), Bolts, studs, nuts, washers, and rivets.
89 (ii), Hooks, nails, cotters, pins, staples, wedges, and wood-screws.
89 (iii), Nailing and stapling and wire-stitching.
90, Non-metallic elements.
91, Oils, fats, lubricants, candles, and soaps.
92 (i), Ordnance and machine-gun carriages and mountings.
92 (ii), Ordnance and machine guns.
93, Ornamenting.
94 (i), Packing and wrapping-up for transit and storage, (*including* Baling).
94 (ii), Paper bags, sacks, wrappers, and the like, (*including* Making envelopes).
95, Paints, painting, and the like.
96, Paper, pasteboard, and papier mâché.
97 (i), Optical systems and apparatus.
97 (ii), Surveying, navigational, and astronomical instruments.
97 (iii), Thermometers, meteorological and mathematical instruments, and miscellaneous philosophical instruments.
98 (i), Photographic cameras and auxiliary apparatus therefor.
98 (ii), Photographic processes and apparatus other than for taking photographs, (*including* Photographic plates, films, and papers).
99 (i), Pipes and tubes, Joints and couplings for, (*including* Joints for tubular framework *and like* Wire and rod couplings and joints).
99 (ii), Pipes, tubes, and hose, (*other than* Joints and couplings for).
100 (i), Feeding and delivering webs and sheets.
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.
102 (i), Pumps, Reciprocating, for liquids, (*including* Steam-engine air-pumps *and* Combined pumps for liquids and gases).
102 (ii), Water and other liquids, and semi-liquids, Raising and forcing otherwise than by pumps.
103 (i), Brakes and retarding-apparatus.
103 (ii), Rail and road vehicles, Details applicable generally to.
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 (i), Railway and tramway crossings and points and switches.
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.
106 (i), Calculating, counting, and cash-registering apparatus.
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.
107, Roads and ways.
108 (i), Road vehicles, Body details and kinds or types of.
108 (ii), Road vehicles, Undercarriage details and draught appliances for.
108 (iii), Springs and vibration-dampers.
109, Ropes and cords.
110 (i), Centrifugal and screw fans and pumps.
110 (ii), Rotary engines, pumps, blowers, exhausters, and meters, (*including* Rotary pump plant).
110 (iii), Turbines and reactionwheels and motor power plant.
111, Sewage, Treatment of, (*including* Manure).
112, Sewing and embroidering.
113 (i), Ship and boat fittings and accessories, and pontoons and rafts.
113 (ii), Ships and boats, Kinds or types and structural details of.
114, Ships, boats, and rafts, Propelling, steering, and manœuvring.
115, Ships, boats, and rafts, Rigging, sails, and spars for, (*including* Boat raising, lowering, and disengaging gear).
116, Shop, publichouse, and warehouse fittings and accessories.
117, Sifting and separating.
118 (i), Indicators and burglar and like alarms.
118 (ii), Signals, (*including* Marine signals).
119, Smallarms.
120 (i), Spinning, Preparation of fibrous materials for, (*including* Obtaining, opening, carding, and like treatment of fibres in general).
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.
121, Starch, gum, size, glue, and other stiffening and adhesive materials.
122 (i), Engine and like cylinders, connecting-rods, crossheads and guides, flywheels, piston-rods, and pistons.
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 (i), Liquid-level regulating, indicating, and registering, incrustation and corrosion preventing and removing, and door lids and covers for resisting fluid pressure.
123 (ii), Steam generators.
123 (iii), Steam separators and superheaters.
124, Stone, marble, and the like, Cutting and working.
125 (i), Bottles, jars, and like vessels, (*including* Non-refillable bottle, jars, and vessels).
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 fire-places.
127, Sugar.
128, Table articles and appliances.
129, Tea, coffee, cocoa, and like beverages.
130, Tobacco.
131, Toilet and hairdressing articles, and perfumery.
132 (i), Amusement and exercising apparatus other than games and toys.
132 (ii), Games.
132 (iii), Toys.
133, Trunks, portmanteaux, hand and like travelling bags, baskets, hampers, and other wicker-work.
134, Umbrellas, parasols, and walkingsticks.
135, Valves and cocks.
136 (i), Cycle, velocipede, and like vehicle brakes, steering-mechanism, and miscellaneous accessories.
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.
138 (i), Washing and cleaning buildings and domestic articles other than clothes and dry cleaning clothes and other absorbent materials.
138 (ii), Washing, mangling and wringing, ironing, and starching clothes.
139, Watches, clocks, and other timekeepers.
140, Waterproof and like fabrics.
141, Wearing-apparel.
142 (i), Looms, Driving, reversing, stopping, and starting, and loom shedding-mechanism and pattern cards, chains, surfaces, and the like.
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.
144 (i), Wheels for vehicles, (*other than* Wheel tyres, Pneumatic and other elastic, and rims for use therewith).
144 (ii), Wheel tyres, Pneumatic and other elastic, and rims for use therewith.
145 (i), Wood, Cutting, (*other than* Sawing).
145 (ii), Wood, Working, (*including* Sawing).
146 (i), Filing paper and like sheets.
146 (ii), Stationery, wafers and seals, educational appliances, and ciphers and codes.
146 (iii), Writing-instruments, ink, and receptacles for writing materials.

FIFTY YEARS SUBJECT INDEX, 1861–1910.

A subject index of all complete specifications for the period 1861–1910 is published in 271 volumes corresponding to the new series of Illustrated Abridgment Classes (List B above). To some extent the headings in the "Fifty Years Subject Index" may be regarded merely 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 headings represent an improved and extended 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 Abridgment Volumes for the periods 1909–15 and 1916–20 and the annual and quarterly indexes from 1921 onwards.

The volumes are issued at sixpence each, post free.

(475—11C) Wt. 11718—792 162,300 10/27 H. St. G. 3