

PATENTS FOR INVENTIONS

ABRIDGMENTS OF SPECIFICATIONS

CLASS 22

CEMENTS AND LIKE COMPOSITIONS

PERIOD—A.D. 1916-20 [100,001-155,800]



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PUBLISHED AT THE PATENT OFFICE, 25, SOUTHAMPTON BUILDINGS,
CHANCERY LANE, LONDON, W.C.2.

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EXPLANATORY NOTE

The contents of this Abridgment Class may be seen from its Subject-matter Index, which includes all index headings, subheadings, and subdivisions allotted to this Class, as well as cross-references under them, although there may be no cases affected within the period covered by this volume. For further information as to the classification of the subject-matter of inventions, reference should be made to the revised *Abridgment-Class and Index Key* now in preparation.

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

Abridgments are printed in the chronological order of the Specifications to which they refer, and this index quotes only the number of each Specification.

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

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Excepting Coking &c., [Class 55 (i)]; Emulsions, Making, [Class 81 (i)]; Grinding, crushing, &c., [Class 59]; Metals and other fusible materials, Granulating or pulverizing &c., [Class 82 (ii)]; Mixing and agitating machines &c., [Class 86]; Moulding plastic &c. substances, [Class 87 (ii)].
cauldrons, tanks, and heaters. *See* Cauldrons, Asphalt &c., [Class 107].

Bituminous, resinous, fatty, oily, and wax-like plastic compositions, (including Phenol-aldehyde and other organic-derivative plastic compositions).

This heading comprises mouldable compositions which usually set and which have bitumens, resins, fats and oils, waxes, and organic derivatives as important constituents; liquid compositions intended for coating surfaces in thin films, (e.g. in the manufacture of American cloth and tarpaulins), and solid compositions intended to be applied by friction or by liquefying either by means of vehicles or by heat, are indexed only under Coating-compositions applied melted, [Class 95]; Paints, varnishes, &c., [Class 95]; Proofing permeable materials &c., [Class 140]. Compositions which contain albuminous, gelatinous, saccharine, and starchy materials, alkaline silicates, bone, cellulose esters, fibres, horn, ivory, metals, mica or talc, oxychlorides, rubber gums, and sulphite-cellulose lye in important proportions are indexed under the provisions for those ingredients under the headings India-rubber &c. compositions, [Class 70]; Plastic compositions, [Class 70].

The subdivisions should not be regarded as furnishing in every case a complete list of Specifications mentioning particular ingredients; compositions containing bitumens as well as resins, fats and oils, and waxes are indexed under bituminous compositions only, unless the proportion of bitumens is insignificant; compositions containing resins as well as fats, oils, and waxes under resins &c. only; and compositions containing fats or oils and waxes under oils &c. only. If, in addition to bitumens, compositions contain other ingredients of interest, e.g. fillers or ballasts, these are separately indexed.

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not containing bituminous emulsions, fats, fatty oils, resins, and their derivatives. 105,352. 107,549. 123,695. 124,669. 126,472.

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fats and fatty oils and their derivatives, resin oils, and waxes, containing. 114,527. 136,355.

not containing fats, mineral and fatty oils, resins, soaps, and waxes. 122,922. 126,472.

resins and resinsates, containing. 114,527. 136,355. 151,852.

containing naturally-occurring bitumens or asphalts in addition to artificially-prepared tar or pitch—

added mineral oils and condensates from tar distillation, containing. [No cases.]

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. 107,483.

resins and resinsates, containing. [No cases.]

containing naturally-occurring bitumens or asphalts without artificially-prepared tar or pitch—

added mineral oils and condensates from tar distillation, containing. 120,961.

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- bituminous compositions—*cont.*
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 containing naturally-occurring bitumens or asphalts without artificially prepared tar or pitch—*cont.*
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 not containing fats, mineral and fatty oils, resins, soaps, and waxes. 107,613.
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 not containing special bituminous materials, but containing—
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 clay without stony materials. 105,202. 120,961.
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 grit from china clay. [No cases.]
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 pyrites or iron oxides. [No cases.]
 slag or destructor clinker. [No cases.]
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 special grits or stony materials not covered by other Key subdivisions. [No cases.]
 sulphur. 148,003. 154,152.
 titanium compounds. [No cases.]
 processes for making not dependent on particular materials. 120,961. 124,669. 124,851. 139,492.
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 added mineral oils and condensates from tar distillation, containing. [No cases.]
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 not containing fats, mineral and fatty oils, resins, soaps, and waxes. 153,089.
 resins and resinsates, containing. 151,852.
 containing naturally-occurring bitumens or asphalts in addition to artificially-prepared tar or pitch—
 added mineral oils and condensates from tar distillation, containing. [No cases.]

Bituminous &c. compositions—cont.

- bituminous compositions—*cont.*
 other than bituminous concretes &c.—*cont.*
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 not containing fats, mineral and fatty oils, resins, soaps, and waxes. [No cases.]
 resins and resinsates, containing. [No cases.]
 containing naturally-occurring bitumens or asphalts without artificially-prepared tar or pitch—
 added mineral oils and condensates from tar distillation, containing. [No cases.]
 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. [No cases.]
 resins and resinsates, containing. [No cases.]
 not containing special bituminous materials, but containing—
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 carbon, coal, and coke. [No cases.]
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 grain-mill dust. [No cases.]
 iron oxides. *See* concretes &c. above.
 litharge, powdered white lead, and zinc oxide. 125,550.
 oxidizing-agents. [No cases.]
 soluble metallic compounds. [No cases.]
 sulphur. 125,550. 148,003. 154,152.
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 phenols and aldehydes or ketones, condensation products of, containing. 14,5459 [Appx]. 102,751. 110,154. 121,301. 122,661. 128,477. 129,993. 134,565. 134,757. 136,298. 139,147. 146,159. 147,173. 148,264. 152,384.

Bituminous &c. compositions—cont.

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- oils, fats, higher fatty acids, soaps, and condensates from tar distillation, compositions containing—
- containing unspecified oils. 134,230.
 - fats and fatty oils unmodified, fatty acids, resin oils, and soaps, containing. 103,824. 116,052. 117,323. 123,695. 153,942.
 - mineral oils and condensates from tar distillation, containing. 119,878. 123,695. 124,851. 138,477. 141,755.
 - 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. 149,319. 153,942.
 - oxidized oils or heated wood oil, containing. 103,824. 111,368. 153,942.
 - sulphurized oils and sulphonated fatty acids, containing. 105,831. 119,878. 123,114. 140,781. 141,755. 142,416.
 - 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*.
 - 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, resinsates, balsams, and gums, compositions containing—
 - fats, fatty oils, and their derivatives, containing. 109,171. 136,478. 153,884. 153,942.
 - not containing fats, oils, and waxes. 115,785. 124,669. 127,824. 134,230. 148,387.
 - oils other than fatty oils, hydrocarbons, and their substitution products, containing. 136,478. 141,293.
 - waxes, containing. 109,171. - wax, paraffin wax, and ozokerit, compositions containing. [No cases.]
 - 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.**

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

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- cooling. *See* Cooling granular &c. materials, [Class 29].
- cutting and working. *See* Stone &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].
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- granulating by scattering, spraying, or running molten slag into water and other liquids. *See* Metals and other fusible materials, Granulating &c., [Class 82 (ii)].
- making otherwise than by treating slag. 100,597. 101,484. 113,785. 117,460. 128,750. 152,106.
- processes depending upon the use of special materials and compositions. *See* materials &c. below.
- materials and compositions for making. 100,597. 103,290. 110,540. 113,785. 114,743. 131,164. 132,855. 134,920. 145,569. 152,106. 154,562. 154,563.
- 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. *See* Coking &c., [Class 55 (i)].
- 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. 100,886. 104,087. 107,951. 120,918. 121,728. 121,986. 123,695. 126,646. 128,452. 131,164. 137,534. 141,113. 155,431.
- treating with various materials after burning. *See* treating after manufacture above.
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- weighing. *See* Weighing-apparatus, [Class 143].

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

- compositions. 100,886. 102,042. 104,087. 104,595. 105,054. 107,868. 107,951. 110,194. 114,641. 115,581. 115,946. 116,595. 117,504. 119,152. 119,912. 120,471. 120,918. 121,728. 121,855. 121,986. 122,546. 123,377. 126,472. 126,646. 127,931. 128,452. 129,651. 130,134. 132,247. 132,856. 132,593. 133,705. 134,230.

Concretes &c.—cont.compositions—*cont.*

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141,113. 142,487. 142,958. 143,768. 145,026.
149,789. 152,359. 152,389. 153,030. 153,433.

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].

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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. 114,641. 134,230.

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). 120,691.

albuminous and gelatinous matter, containing. 107,557. 113,839. 120,864. 143,943. 155,124.

concretes. *See* Concretes &c.

fibres, containing. 104,596. 120,864. 140,431. 142,111.

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. 110,194. 129,651. 134,230. 143,768. 154,888.

Plaster &c. compositions—cont.

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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. [No cases.]

basalt. [No cases.]

bauxite, natural and artificial corundum, and emery, (*including pure or fused alumina and alumina fused with other metallic oxides*). 100,093. 102,507. 103,232. 113,958. 124,208. 126,229. 141,351.

beryllium compounds. [No cases.]

binding-agents of general interest and not covered by other Key subdivisions. 119,101.

carbides, nitrides, silicides, and siloxicon. 103,818. 106,393. 126,192. 133,014. 147,746.

carbon, (*including carbonizable binding-agents*). '14. 24,501 [Appx]. 111,152. 126,192. 149,440.

chrome iron ore and chromium oxide. 141,351.

clay shale or schist. *See* fireclay below.

compositions consisting largely of both silica and gypsum. *See* Plaster &c. compositions.

compositions consisting largely of both silica and lime or cement. *See* Concretes &c.

fibrous compositions, (*other than those containing non-fibrous refractory materials*)

See Plastic compositions. [Class 70].

fireclay—

mixed with asbestos. [No cases.]

not mixed with asbestos. 100,093. 103,232.

103,953. 123,116. 137,419. 149,440.

fluorides. [No cases.]

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materials &c. containing—*cont.*

ganister and silica. 14, 24,501 [Appx].
108,619. 118,116. 119,966. 122,388. 123,116.
129,485. 129,505. 137,419. 144,359. 147,746.
gelatinous silica. *See* soluble silicates &c.
below.

iron ores and oxides, (*other than* titanite iron
ores). 110,147. 129,485.

limestone, magnesite, magnesite, and dolo-
mite, (*including* lime blocks and composi-
tions consisting almost wholly of lime).
102,386. 110,147. 111,853. 113,199. 119,101.
129,485. 133,753. 142,721. 144,359. 155,315.
magnesium oxychloride binding-agents. *See*
subdivisions above and below.

manganese compounds. [No cases.]

materials other than binding-agents and re-
fractory materials. [No cases.]

metals. 109,870.

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

old crucible, firebrick, and like scrap from
refractory articles. 119,966. 123,116.
133,842.

rare metals, compounds of—

other than compounds of thorium,
titanium, and zirconium. 111,152.
139,315.

thorium compounds. 111,152.

titanium compounds. 139,315.

zirconium compounds. 111,152. 113,958.
139,315.

sewage. *See* carbon above.

silica. *See* ganister &c. above.

silicon. [No cases.]

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

slags. 102,386.

soapstone, talc, and like magnesium silicates.
142,512. 142,513.

soluble silicates and gelatinous silica.
119,966. 147,746. 155,315.

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

volcanic dust. [No cases.]

processes for making, (*other than* processes de-
pendent upon use of particular materials
and compositions)—

baking or firing processes of interest apart
from particular substances treated. *See*
Pottery, Manufacture of, [Class 87 (i)].

other than simultaneous use of high tem-
peratures and pressure and rendering non-
plastic materials colloidal. 103,953. 111,355.
123,116. 142,513. 146,269. 149,440.

rendering non-plastic materials colloidal or
plastic, (*including* processes dependent
upon extremely fine grinding and upon
addition of organic materials of high mole-
cular weight). 123,116. 144,317.

simultaneous use of high temperatures and
pressure. [No cases.]

refining by fusion. *See* Glass, Manufacture of,
[Class 56].

Refractory substances &c.—cont.

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[Class 70].

treating. *See separate headings, such as* Dry-
ing systems &c., [Class 34 (ii)]; Grinding,
crushing, &c., [Class 59]; Mixing and agitat-
ing machines &c., [Class 86]; Moulding
plastic &c. substances, [Class 87 (ii)].

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&c. above.

Slags, Treatment of. 128,302. 136,818.
139,172. 139,173. 140,874. 141,390. 143,500.
145,032. 150,333. 152,642.

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 and other
fusible materials, Granulating or pulverizing,
[Class 82 (ii)]; Metals, Extracting &c.,
[Class 82 (i)]; Mixing and agitating machines
&c., [Class 86]; Moulding plastic &c. sub-
stances, [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 (ii)].

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. 122,779.
124,650. 129,324. 139,172.

Statuary, [No cases.]

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 &c., Cutting &c., [Class 124];
Stone, Natural &c., Hardening &c.; Wood,
Cutting &c., [Class 145 (i)].

**Stone, Artificial and imitation, (includ-
ing** 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]; Printing and
embossing surfaces, [Class 100 (ii)]; Slags,
Treatment of.

bricks, building and paving blocks, slabs, and
tiles, forms of. *See* Bricks &c., [Class 87
(i)].

Stone, Artificial &c.—cont.

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 &c., Cutting &c., [Class 124].
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 furnaces and kilns for. *See* Furnaces and kilns for applying &c., [Class 51 (ii)].
 hardening and preserving. *See* Stone, Natural &c., Hardening &c.
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 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)].
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ERRATA

- Page 9. Abridgment No. **114,743**. After date add *No Patent granted (Sealing fee not paid)*.
 „ 15. Abridgment No. **124,208**. Delete *Void [Published under Sect. 91 of the Act]*,
Addition to 102,507, and add *Drawings to Specification*.
 „ 15. Abridgment No. **124,851**. After date add *No Patent granted (Sealing fee not paid)*.

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 1916-20

100,093. Wrighton, W. J. Feb. 19, 1915, [Convention date]. *Drawings to Specification.*

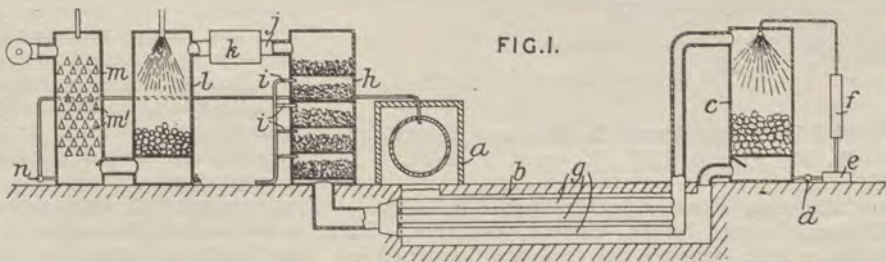
Refractory substances containing bauxite. —

Alundum powder, that is fused and ground bauxite, is mixed with a ceramic binder such as fire-clay, for use in an electric furnace.

100,597. Basset, L. P. May 31, 1915, [Convention date].

Cements, Portland, compositions and processes for making. — In the catalytic production of sulphuric acid, the collection of the sulphurous acid which escapes conversion by the catalyst, is effected

in a cement paste of clay, gypsum, and calcium carbonate or clay and calcium carbonate, which gives it up again in the cement furnace. Usually the clay and gypsum contain enough calcium carbonate to fix the sulphurous acid, but if this is not the case calcium carbonate is added. Sulphurous acid gases from a cement furnace *a* pass through a dust chamber *b* to a tower *c* where much of their steam is removed by washing with cold water circulated by a pump *d* through a filter



c and cooler *f*. The gases pass thence through pipes *g* where they are heated, to the catalytic chamber *h*. The gases leave the chamber *h* by a pipe *j* and pass through a cooler *k* and a tower *l* in which the sulphur trioxide is removed by water or sulphuric acid and the sulphurous acid remaining is absorbed in a tower *m* having baffles *m'* over which a stream of cement paste descends, the paste being passed by a pump *n* to the furnace *a*.

100,886. Morikami, Z. July 10, 1915,
[Convention date].

Cements, Portland, treating after manufacture; concretes and mortars.—A powder for mixing with cement, concrete, and mortar to make them water-tight consists of a mixture of burnt alum and calcium soap containing soluble soap. In an example, the mixed soap is made by boiling a fatty or resinous soda soap with milk of lime. The product is skimmed off, dried, and powdered, and 100 parts of this powder is mixed with 10 parts of burnt alum.

101,205. Elektro Osmose Akt.-Ges. (Graf Schwerin Ges.). Aug 18, 1915,
[Convention date].

Stone and cement surfaces, hardening and preserving.—Wood, stone, fabrics, fibrous materials, cements, straw, bandage material, &c. are impregnated with a solution of chemically pure silicic acid, which may be prepared electro-osmotically as described in Specification 9237/14, [Class 41, Electrolysis]. For fibrous material, textiles, &c., the process also provides a finish or dressing which is suitable for absorbing dye-stuffs. Fibrous material treated by the process is capable of resisting heat.

101,484. Pontoppidan, C. Sept. 15, 1915,
[Convention date]. Void [Published under Sect. 91 of the Act].

Cements, Portland, processes for making.—Slurry for making Portland cement and for other purposes is made more fluid, and its water content can therefore be reduced by the addition of chemical reagents, such as electrolytes. As examples, sodium or potassium carbonate or hydrate, sodium chloride, and potassium sulphate or nitrate are mentioned, and percentages varying from 0.05 of sodium carbonate to 0.6.

102,042. Sanders, L. A., and Sanders, A. J. Nov. 3, 1915, [Convention date].

Concretes; stone, colouring and hardening.—Natural stone, bricks, cement, concrete, lime trass mortar, &c. are coloured and hardened, so as to make them impervious to water, oil, acids, &c. by treatment, when sufficiently hardened, with a metal-salt solution or suspension. The treated articles may be galvanized usually without treatment with graphite. The cement &c. is mixed with water, moulded or applied as a plaster, and after a time treated with copper, zinc, nickel, lead, iron, or other metallic sulphate, acetate, chromate, nitrate, chloride, &c. The colours may be improved by enamelling, glazing, or varnish-

ing and by polishing. Metals such as iron filings, ores, and titanite iron sand may be mixed with the cement &c., and by employing a reducing-metal, a metallization of the surface may be obtained, for example by treating the mortar &c. with copper sulphate. The plastering may be applied to stone, bricks, wood, asbestos, cement-mortar, cement-concrete, walls, floors, ceilings, roofs, granite and terrazzo work, sculpture, stone-cutters' work, sanitary articles, ornaments, chimney-pieces, tiles, slabs, &c. Lead sulphate is stated to be employed in a state of suspension.

Reference has been directed by the Comptroller to Specifications 2048/68, 3006/68, 4101/81, 4954/83, 19395/92, 8626/97, 7836/02, and 27804/02.

102,386. Twynam, T. Jan. 3, 1916.

Refractory substances.—Refractory bricks and cement for furnace linings are made by mixing preferably 3—10 per cent. of slagwool with dolomite, magnesite, or limestone without preliminary shrinking, and then firing at a high temperature. A less porous brick is obtained by an admixture of 20—30 per cent. of highly shrunk ground magnesite to the carbonate and slagwool mixture, or by grinding the burnt bricks, remoulding, and again firing.

102,507. Lecesne, N. April 29, 1914, [Convention date].

Stone artificial; refractory substances containing corundum.—Corundum is obtained by burning with compressed air in a shaft furnace an intimate mixture of bauxite and anthracite or other fuel, so as to form and immediately burn aluminium carbide, the introduction of compressed air being continued after the fusion to burn out the carbon. A temperature such as that at which aluminio-thermic mixtures burn is attained, silica and iron being volatilized from the charge; although the product may contain some particles of silica and iron or magnetic iron oxide. The furnace operation may be limited in duration, for instance, three hours, in order to leave a small quantity of finely-divided carbon in the product. The product, after cooling, is ground, mixed with an agglomerant, for instance hydrated bauxite, or a mixture of quartz, quicklime and water, moulded and baked to form refractory bricks, crucibles, and grinding-wheels &c. The carbon remaining in the corundum may furnish sufficient additional heat during the baking to fuse the added raw bauxite, forming a solid block.

102,751. Tarassoff, K. Jan. 19, 1916.

Plastic compositions containing phenol-aldehydes.—Hard infusible products are obtained by condensing phenols with formaldehyde in the presence of sulphoaromatic fatty acids, sulphonated fats or oils, naphtha sulphonic acids or other sulphonated hydrocarbon oils, and in addition, albumens, tannins, or carbohydrates. Specifications 528/14, 6716/14, and 7560/14 are referred to.

103,232. Halkett, R. April 20, 1916
Drawings to Specification.

Refractory substances containing fire-clay and alumina.—A porous lining for a crucible furnace is made from a mixture containing 15 parts of fire-clay or ball clay and one part each of alumina and sawdust, to which is added 1 part of a solution of a silicate of soda and two parts of water.

103,290. Jungner, E. W. Jan. 7, 1916,
[Convention date].

Cements, Portland.—Relates to a process for preparing alkali carbonates, in which Portland cement also may be obtained if desired, by heating an intimate mixture of a powdered alkaliferous mineral silicate such as feldspar, or alkaliferous clays or slate, a powdered calcareous material and finely-divided carbon or carbonaceous matter in an atmosphere containing CO_2 . If Portland cement is to be produced simultaneously with the alkali, the percentage of lime should be such as to produce an hydraulic modulus CaO

$(\text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3)$ of at least 1.7. A modulus of 2.1 is preferred. The amount of carbon used is 4–10 per cent. of the weight of the raw mixture. If a large quantity of free silica is present in the raw material, small quantities of iron oxides, for example iron ore, or substances containing a large percentage of alumina, for example bauxite, are added. A temperature of 1250–1400° C. is required, and whether or not cement is desired as a product, the operation is preferably conducted in a cement furnace. If a shaft furnace is employed, the mixture is briquetted, for example by moistening with slaked lime which has been puddled in water; and if the furnace is an electric one, it is necessary to supply CO_2 , or air if the amount of carbon in the charge is sufficient. Specifications 26497/12, *[Class 1 (iii), Oxides &c., Metallic]*, and 28970/12 are referred to.

103,818. Balz, G. A. Jan. 28, 1916, *[Convention date]*.

Refractory substances.—Carborundum articles, which are refractory and resist the action of chemicals, are made by mixing powdered or granulated carborundum, for example firesand, with calcium hydrate or other alkaline-earth hydrate

and water, moulding or pressing, drying and burning at a temperature sufficient to calcine the hydrate, say 1400° C. or higher. It is preferable to heat sufficiently to frit or flux the mass. The percentage of carborundum in the finished product is preferably 98.

103,824. Cohen, E. S. Ali. Jan. 29, 1916,
[Convention date].

Compositions containing oils &c.; compositions containing bituminous materials, oils, &c.—An elastic mass, suitable for use as a rubber substitute, for example, in electric insulation, is prepared by adding an aluminium, iron, or other earth metal or heavy metal compound of a higher fatty acid to an oxidized oil heated to 200–250° C. Examples of suitable salts are aluminium, calcium, or magnesium stearate, and iron, calcium, or magnesium palmitate, and these may be dissolved in a hydrocarbon, such as ozokerit, having a high-boiling point. In an example, 1 part of aluminium stearate, dissolved in the same or a smaller quantity of ozokerit or the like, is mixed, in a solid or molten condition, with 4–10 times its quantity of oxidized linseed oil at a temperature of 200–250° C. The product may be vulcanized if desired, with the addition of rubber, asphaltum, magnesia, kieselguhr, chalk, red lead, &c.

103,953. Barrett, M., and Leeds Fire-clay Co. Aug. 13, 1916.

Refractory substances.—The surfaces of blocks of refractory material, made, for example, of 70 per cent. of Leeds fire-clay, 10 per cent. of sandstone, and 20 per cent. of calcined fire-clay, for building the walls of by-product coke ovens, gas-retorts, &c. which are to be in contact with the coal &c., are polished immediately the blocks are made; the blocks are then air-dried and kilned, and, while still incandescent, at not less than 1300° C., are treated with hot vapours of one or more alkaline chlorides for about 30 minutes. The parts not required to be treated may be coated with a wash of barium sulphate.

104,087. Plant, F. S. May 4, 1916.

Cements, Portland, treating after manufacture; concretes.—Cement and concrete are waterproofed by mixing with them a composition consisting preferably of 2 oz. each of Russian tallow, mutton fat, and lamp-black, 4 oz. of shellac spirit varnish, and 2 lb. of whiting mixed with water.

104,595. Howells, E. O. C. March 23, 1916.

Concretes.—A mixture of about 4 parts of granite and 1 part of Portland cement, to which is added about 10 per cent. of Bessemer steel slag, is used for making artificial stone.

104,596. Curtis, C. F. June 6, 1916.

Compositions containing plaster, lime, whiting, chalk, and fibres.—A plastering-material consists of lime and plaster in the proportion of about three to one, sawdust equal in quantity to the lime and plaster, and one per cent. of a mixture composed of three parts of sand and one part of whitening or powdered chalk. For outside work and for flooring, Portland cement may be used instead of the lime and plaster. The material may be coloured and may be moulded into slabs or blocks.

105,054. Howells, E. O. C. March 23, 1916.

Concretes.—A mixture of approximately 6 parts of breeze and 1 of cement, or $5\frac{1}{2}$ parts of breeze, $\frac{1}{4}$ part of granite dust, and 1 of cement is used for making slabs and other building-units.

105,202. Illemann, R. Oct. 12, 1916.

Compositions containing bituminous and argillaceous materials.—A moist and plastic cement or composition capable of being rendered fluid merely by the addition of water consists of bitumen or pitch 5 parts, an argilliferous substance such as clay 3 parts, and water 3 parts. The bitumen or pitch is rendered fluid by heat, and the clay by addition of the water, the two fluids being then mixed while heated and thoroughly stirred until emulsified. The heat is such that the moisture is not evaporated. The product may be used for coating surfaces, for example of roads, flat roofs, paths, foundations, &c., or for making blocks or slabs.

105,352. Gavin, P. Feb. 29, 1916.

Bituminous compositions.—A composition for coating decks &c. consists of mineral pitch, resin, Roman cement, Arran lime, cork dust, and light silica in the following proportions:— $11\frac{1}{4}$ cwt. of

mineral pitch is melted with 18 gall. of mineral oil, and 3 cwt. Roman cement, 28 lb. Arran lime, and 28 lb. resin are added, the mixture being boiled and cast into 1 cwt. blocks. For use three blocks are melted and 5 lb. cork dust and 14 lb. light silica are added.

105,831. Heyl, G. E. July 3, 1916.

Compositions containing vulcanized oils.—India-rubber and its compounds and substitutes, for example oil substitutes, are vulcanized by means of finely ground oil shale. The sulphur in the shale acts as vulcanizing-agent, the hydrocarbons improve the product, and the siliceous matter acts as a filler.

106,393. Carborundum Co., (Tone, F. J.). Sept. 11, 1916.

Refractory substances.—In a refractory article consisting of a mixture of silicon carbide and a vitrifiable binder which is inert towards silicon carbide such as kaolin or highly refractory fire-clay, a variety of sizes of grains of carbide is employed so as to give an apparent density to the article when pressed of not less than 2.3. The binder vitrifies at a temperature of not less than 1500° C. and is present to the extent of less than 10 per cent. The grains may vary in size from a coarse grit to a fine powder, for example a mixture of equal parts of 16, 24, 36, and 100 mesh (per lineal inch) grains may be employed and if desired with the addition of fine powder. After pressing the mixture at a pressure of about 3 tons to the square inch into the form of bricks, furnace linings, &c., it is fired at a temperature of not less than 1500° C. at which the binder softens.

107,483. Rorke, H., (Representative of Rorke, E.) Sept. 20, 1916

Compositions containing bituminous and siliceous, calcareous, and like materials.—A material for roads is made by coating and heating larger pieces of mineral aggregate with a tar or pitch binding-material, and separately coating finer aggregate with bitumen. The two are then mixed hot and laid on the road or the mixtures may be separately carried to the place where they are to be used, re-heated, and then mixed. The two classes of binders are as defined in the Engineering Standards Specification, No. 76. The aggregate includes stone, grit, sand &c. Specification 10065/07 is referred to.

107,549. McGrath, G. B. Feb. 28, 1917.

Compositions containing bituminous and siliceous materials.—A paving mixture is made by adding bituminous cement to pulverized material in such quantity as to coat and bind the powder without an excess or deficiency of the bitumen, and the filler thus obtained is added to mineral aggregate, the particles of which have been previously coated with bitumen, in such quantity as to fill the voids. This quantity is determined by ascertaining the density of the filler and the volume of the voids, which latter may be found by taking a known weight of aggregate for a test and measuring the amount of water added to cover this. The amount of bitumen to be used in making the filler also is ascertained by a preliminary test. The aggregate is preferably graded.

107,557. Tomalin, F. J. March 21, 1917.

Compositions containing plaster, whiting, gelatinous matter, &c.—A composition of (say) 40 lb. of whiting, 30 lb. of glue or size, about 1 pint of turpentine, $1\frac{1}{2}$ lb. of stearin wax and 5–10 lb. of plaster of paris or Keene's cement is employed for making picture frame and other mouldings and for other purposes. The whiting is mixed with water which is evaporated until a stiff paste results, melted glue is well mixed in and then turpentine and stearin wax. The plaster of paris or Keene's cement is mixed with water or turpentine and then added to the mixture. Specification 106,115, [Class 87 (ii), Moulding plastic &c. substances], is referred to.

107,613. Pattison, E. W., (Moniwa, T.). June 1, 1916.

Compositions containing bituminous and siliceous, calcareous, and like materials.—Glazed tiles or like smooth and non-absorbent surfaces are cemented together or to other substances by means of a mixture of asphalt or the principal ingredients thereof, namely bitumen and asphaltine and non-melting mineral matter, such as powdered quartz and asbestos. The proportion of quartz &c. is varied so that the coefficient of expansion of the cement approximates to that of the substances cemented and so to adjust the melting-point that separation and melting of the cement will take place only at temperatures which destroy one or both of the substances. The following is an example of proportions: 20–25 parts of bitumen, 14–17 parts of asphaltine, 66–58 parts of quartz &c. Bitumen is defined as that part of asphalt which is soluble in carbon bisulphide and kerosene whilst asphaltine is insoluble in kerosene.

107,868. Cook, F. Sept. 5, 1916.

Concretes; stone, hardening.—Concrete, consisting preferably of 1 part of cement and 5 parts of flying ashes as described in Specification 23541/12, is strengthened by the insertion during moulding of longitudinally-arranged flat strips of metal in one or more layers, the faces of the strips being horizontal and adjacent strips in the same or different layers being arranged so as to break joint. The ingredients are first mixed dry and then water is sprinkled on during a further process of mixing. The moulded articles, such as rail-ties, girders, and blocks may be dried on shelves in a current of cold air for a period of 28 days, the bodies being saturated with water every 7 days. Arches and floors may be made from this concrete.

107,951. Kelly, T. D. April 21, 1917.

Concretes; cements, Portland, treating after manufacture.—Hydrated Portland cement, preferably 100–300 parts, is mixed with 5–30 parts of water glass and 5–10 parts of an adhesive liquid insoluble in water, and which is not readily saponified such as oxidized or polymerized oil with or without a filler. The resulting cement may be moulded or may be used like asphalt over large areas by rolling and smoothing by means of sliding irons and may be reinforced with steel bars, wires &c. Heat accelerates setting.

108,619. Barrett, M. Dec. 2, 1916.

Refractory substances.—A porous refractory mineral product is made from a mixture of crystalline silica or vitrified siliceous material, such as sandstone, quartz, chert, porcelain, and stoneware, with a relatively small proportion of feldspar or feldspathic material combined chemically and mechanically by heat at a temperature of at least 2000° F. with or without dextrine, gum, or like adhesive, and preferably with the addition of a small proportion of tar and sodium or potassium silicate. The finely ground material is mixed with water and moulded under high pressure. An example of proportions is:—4 cwt. of silica, 1 cwt. of feldspar, 7 lb. of dextrine, and 14 lb. of tar.

Reference has been directed by the Comptroller to Specifications 4216/73, 2470/74, 22784/92, 684/98 and 4355/00.

109,171. Wheeler, J. Dec. 7, 1916.

Compositions containing resinous, fatty, oily, and wax-like materials.—A waterproof plastic composition for use as a filler in the manufacture of welted boots and shoes, and for use also in the

repair of boots and shoes, comprises beeswax, tallow, and resin in the proportions by weight of two, two, and four parts respectively. When the footwear is for use in very low temperatures one of the parts of tallow is replaced by one part of castor, colza, or other suitable oil.

109,870. Liebmann, A. J. Nov. 2, 1916.

Refractory substances containing metals.—Comprises a composition of matter consisting of a mixture of carbon, copper, and a highly refractory metal, such as metallic tungsten, molybdenum, titanium, or the like. As an example carbon powder and powdered metallic tungsten are mixed with an amalgam of copper; the mixture is ground in a mortar, moulded and exposed to a high pressure, whereby the greater part of the mercury is pressed out; the moulded cake is then heated to 300 or 400° C.; during the heating the remainder of the mercury is volatilized. Instead of mercury a cadmium—bismuth amalgam may be used, or any other binder which can be volatilized, or water alone may be employed. Alcohol, glycerine, sugar syrup, gum-tragacanth, starch and collodion are stated to be suitable organic binders. The material is applicable for the formation of electric contacts, and brushes for dynamo electric machines.

110,147. Stowe, C. B. Oct. 6, 1916, [Convention date]

Refractory substances.—Magnesite, practically free from iron, is mixed with iron oxide, for example rolling-mill scale, ground and brought to the consistency of mud with water. The mixture is moulded into bricks &c., dried, and burnt at a temperature of No. 11 to No. 19 Seger cone to expel CO₂ and cause combination between the magnesium and iron oxides. The material when crushed may be used for furnace linings or it may be mixed with new magnesite, magnesia, or iron oxide, and the process repeated. Bricks, crucibles, thermit moulding-gates &c. may be made from the crushed product of the first burning by grinding with water, spreading on a floor to allow any unslaked lime to slake, again grinding and moulding. The bricks &c. are then dried and burnt to the point of vitrefaction. The grinding and burning operations may be repeated several times.

110,154. Andresen, V. V. Sept. 30, 1916, [Convention date].

Compositions containing phenol-aldehydes.—A tooth-stopping preparation is made by heating

eugenol (or oil of cloves &c.) with formaldehyde solution or paraformaldehyde, and burnt alum, and mixing the pasty condensation product so obtained with zinc oxide.

110,194. Sabine, W. C., and Guastavino, R. Oct. 12, 1916. *Drawings to Specification.*

Compositions containing cement, lime, or plaster and sand, pumice, or crushed rock or brick.—A sound-absorbing porous composition consists of particles of sand, pumice, or crushed rock or brick graded to an approximately uniform size and mixed with just sufficient cement, lime, or plaster that the particles are bonded only at their points of contact and the pores intercommunicate and openly penetrate the exposed surface. As an example, three parts of sand which will just pass through a sieve having 12 meshes to the inch, and one part of cement may be used. It may be used for forming or facing walls and ceilings and as an alternative to the porous ceramic material described in Specification 20463/14, [Class 20 (iv), Floors &c.].

110,540. Huber, F. W., and Reath, F. F. Sept. 26, 1916, [Convention date].

Cements, Portland and Roman, materials and compositions for.—The flue dust from an ordinary cement roast or from one in which minerals such as feldspar have been employed is mixed with calcium fluoride and with such other materials as are necessary to make up its composition to that of a normal cement roast, and the charge is roasted in the usual manner to obtain a cement clinker. The dust is collected and digested with water and a calcium compound to regenerate the calcium fluoride.

The Specification as open to inspection under Sect. 91 (3) (a) is not limited to the use of calcium compounds but includes the use of alkaline-earth metal compounds. This subject-matter does not appear in the Specification as accepted.

110,663. Hubert, A. V. L. Jan. 6, 1917.

Stone, artificial.—Silica is washed, purified in an electric furnace, and, whilst molten, moulded or shaped into blocks, sheets, disks, or other form suitable for grinding, polishing, and cleaning electrical apparatus, &c.

111,152. James, R. W., (*Rietz, E.*). Nov. 14, 1916.

Refractory substances containing graphite and rare earth compounds.—A graphite crucible contains 5 to 40 per cent. of rare earth compounds, i.e. compounds of the gadolinite and thorium groups. Zirconium compounds such as the natural or artificial oxide or silicate or other salt may be used, suitable mixtures being 35 parts of zircon earth, 40 parts of graphite and 25 parts of clay, or 10 parts of zircon earth, 70 parts of graphite and 20 parts of clay. Brick, sand, crucible fragments and a flux may also be added.

111,355. Reynolds, A. Dec. 4, 1916.
Drawings to Specification.

Refractory substances.—In the manufacture of refractory bricks &c. coherence is imparted to the article by subjecting the working surface or surfaces, after the usual burning, to a temperature sufficiently high to produce incipient fusion. Bricks are bedded in the floor of a furnace with the working surface uppermost and the spaces between them are filled with a ramming of highly refractory material such as chromite, plumbago or ground carbon and tar, e.g. fine coke and tar. For ladle nozzles, the articles are mounted in the end of a revolving furnace to prevent falling-off of the incipiently-fused portions. Stoppers for ladles are treated by mounting the article upon a rod and revolving it within a horizontal passage in the furnace hearth, such passage being of slightly larger diameter than the article and communicating through slotted holes with the furnace above and the atmosphere below so that as the article is revolved its surface is subjected alternately to heating and cooling.

111,368. Pescara, G. Pateras. Dec. 20, 1916.

Compositions containing oxidized oils.—Fabrics and other porous materials are rendered impermeable by applying to them a mixture of talc and a drying oil with the optional addition of lamp black or other colouring-matter. According to the invention, the drying oil is heated and the talc mixed with it; the paste so formed is applied cold.

111,853. Kennedy, H. A. Nov. 28, 1916,
[Convention date].

Refractory substances containing lime and magnesia.—A refractory material for furnace linings &c. is made by clinkering, at a temperature higher than that employed in the manufacture of Portland cement, a finely divided and intimate

mixture containing approximately 78—92 parts of CaO and MgO, 2—13 parts of SiO₂ and alumina or iron oxide or both. To a certain extent, alumina and iron oxide may be replaced by silica or in their place basic slag, blast furnace slag, bauxite, chrome iron ore, &c. may be employed. Magnesian limestone or dolomite is preferred as the source of CaO and MgO. The limestone may be first calcined and hydrated and the materials may be mixed wet or dry. The heating is preferably effected in a rotary kiln by means of a powdered fuel flame, the kiln being inclined less or rotated more slowly than a cement kiln so that the period of burning will be greater. The product is finally cooled in a cooling-cylinder and is then ready for use.

113,199. Rollason, A. May 3, 1917.

Refractory substances containing burnt dolomite.—Bricks, blocks, &c. are made by roasting dolomite at 1050—1350° C. until it becomes semi-fused, hard, granular, and non-absorbent, crushing, and mixing with about 1—5 per cent. of finely crushed dry silica or siliceous clay. The thoroughly mixed mass is damped with water or other liquid, or is mixed with hot dehydrated tar, moulded, and heated in a kiln to the temperature of fusion of the silica or siliceous clay. The temperature is then raised and maintained slightly above that of fusion, then lowered below the fusion point, and finally slowly raised and maintained at the highest temperature attainable in the kiln.

113,731. Snodgrass, A. T. June 23, 1917.

Stone, artificial.—Artificial abrasives, for use in the manufacture of grinding-wheels, abrasive cloth or paper, &c., are produced by mixing a raw material or materials containing a high percentage of alumina, for example bauxite or finely-divided waste natural emery or corundum, with flour glass as a flux, and reducing to a molten mass by heating to not less than 1700° C., preferably in a gas furnace. When cold the mass is crushed and graded.

113,785. Borch, N. S. Feb. 24, 1917,
[Convention date].

Cement, Portland.—Portland cement is made from a raw mixture which contains a proportion of raw materials having hydraulic properties such as a mixture of slag and lime by adding to the

slurry a substance which prevents or delays the setting of the slurry, for instance, $\frac{1}{2}$ per cent. (calculated with reference to dry slag) of cane sugar, oxy-acid, oxy-aldehyde, or oxy-ketone.

113,839. Insull, M. J. March 8, 1917.
Drawings to Specification.

Compositions containing plaster and gelatinous matter.—A mixture of plaster of paris and gum arabic is employed for sealing the ends of an electric tube furnace. Where exposed to the air, the composition may be painted with "bakelite" to exclude moisture.

113,957. Norton Co., (Assignees of Saunders, L. E., and White, R. H.). Feb. 12, 1917, [Convention date].

Stone, artificial.—A crystalline aluminous abrasive, prepared by fusion in an electric furnace, is derived from raw materials containing alumina and iron oxide but substantially free from silica and titanium oxide. As raw materials, the alumina prepared from natural aluminium sulphate, the slags resulting from thermite smelting and welding processes, and products obtained from clay by means of hydrofluoric acid may be used. The product may contain 1-15 per cent of ferric oxide. The prior manufacture of an abrasive consisting of alumina substantially free from fluxing impurities is referred to.

113,958. Norton Co., (Assignees of Saunders, L. E., and White, R. H.). Feb. 12, 1917, [Convention date].

Refractory substances containing aluminium and zirconium compounds; stone, artificial.—A crystalline product having abrasive and refractory properties is prepared by fusing alumina and zirconia together in an electric furnace. Other oxides, such as those of silicon and iron, may be present in relatively minute proportions. The content of zirconia may vary up to an equimolecular proportion to the alumina. The grains may be bonded with ceramic material to form grinding-wheels and other abrading-implements. Specifications 113,957 and 113,959 are referred to.

113,959. Norton Co., (Assignees of Saunders, L. E., and White, R. H.). Feb. 12, 1917, [Convention date].

Stone, artificial.—An abrasive, containing crystalline alumina and zirconia together with the normal impurities of bauxite, namely the oxides of silicon, iron, and titanium, is obtained by fusing bauxite with zirconia in an electric furnace. In preparing a charge, bauxite is calcined, and is then mixed with zirconia, and, if desired, with a small proportion of coke to reduce the major portion of the iron oxide and silica. The zirconia may be introduced in the form of the native silicate, zircon. The grains may be bonded with ceramic material to form grinding-wheels and other abrasive implements. Specifications 11846/11 and 113,958 are referred to.

113,960. Norton Co., (Assignees of Saunders, L. E., and White, R. H.). March 2, 1917, [Convention date].

Stone, artificial.—An abrasive containing a material proportion of β -alumina (a crystalline form of alumina differing from that occurring in nature as corundum, sapphire, ruby, &c.) is prepared by fusing alumina in an electric furnace in the presence of a converting-agent such as sodium carbonate, aluminate, sulphate, and hydrate, and sodium, potassium, and lithium compounds generally. The alumina is preferably substantially free from acid oxides, such as silica and titanium oxide, which tend to inhibit the production of β alumina. The product is obtained in the form of a pig or mass, and may be crushed, and the resulting grains may be bonded with ceramic material, vulcanite, &c. The proportion of β -alumina in the product may vary from say 10 per cent of the alumina present up to practically 100 per cent, in accordance with the quantity of converting-agent used. Specifications 118,591 and 118,592 are referred to.

114,527. Scarlett, A. R. June 11, 1917.

Compositions containing bituminous, resinous and oily materials.—A cement consists of a mixture of approximately 6 parts of Swedish pitch, 3 parts of resin, 1 part of castor or other non-drying oil and $\frac{1}{2}$ part of cellulose wool, fullers' earth, pipe-clay, felt, hair, paper pulp or the like. The product may be used for uniting bodies, for sealing the stoppers or lids of bottles, jars, cans, &c., for the repair of textiles, india-rubber, leather, &c., and for stopping leaks in pipes and metal vessels. It is spread whilst warm on the warm and dry surfaces to be united and may be applied to one or both sides of a tape, which may, for instance, be used for wrapping round a leaking pipe.

114,641. Linden, L. March 6, 1917

Concretes are made from a mixture of Portland or like cement, vegetable matter, such as moss, turf, seaweed, and cork, iron or other metallic ores, (or according to the Provisional Specification, metallic particles), a binding-liquid consisting of aluminium sulphate or other soluble salt of alumina, lime, and water, and with or without gravel or stones. Fats and oils or substances such as pumice, cork, or strings of jute &c. saturated with them also may be added whilst the concrete is soft, and these may be distributed throughout the mass; for example, a sort of network may be made of the strings so that the grease will spread as the concrete dries, and so serve to make the product waterproof and to reduce shocks. The product may have a metallic reinforcement. In an example, 100 parts of cement are mixed with 5 parts of dry powdered moss or turf, 20 parts of iron ore, and with binding-liquid made by mixing 5 kilos. of quicklime and 3 kilos. of aluminium sulphate with a cubic metre of water. The product is suitable for making pipes, boats, ships, doors, frames, packing-cases, roofs, foundations, walls, fortifications, casks, pontoons, reservoirs for liquids, vehicles, railway sleepers, rail supports, and floors.

114,743. Ashcroft, E. A. July 20, 1917.

Cements, Portland and Roman, materials for.—Soda present in association with potash in natural or artificial silicates or aluminates such as feldspar or the materials mentioned in Specification 113,211, [Class 1 (ii), Inorganic compounds other than &c.], is replaced by potash by heating the material with an excess of a potassium salt such as potassium chloride sulphate or nitrate, and then washing out the soluble salts. The product, such as potash feldspar free from soda, which is suitable for ceramic purposes, may be treated at a suitable temperature and pressure with lime or magnesia or both, and water or steam, the result being a pure solution of caustic potash and a residue suitable for the production of cement.

114,794. Deckers, A. A. J. Dec. 11, 1917.

Slag cements are made by grinding granulated slag under water, mechanically drying, for instance by centrifugal means, the ground slag until its water content is reduced to 4-7 per cent, mixing with ground quick lime in the required proportions, and finally grinding the mixture.

115,581. Furniss, T. Oct. 18, 1917. *Drawings to Specification.*

Concretes, cement.—Roofing-slabs are made of 6 parts by weight of crushed granite and 2 parts of cement mixed with water, to each quart of which is added 2 oz. of magnesium chloride and 2 oz. of alum. The slabs, before being used, are hardened by immersion in a solution of sodium silicate.

115,785. Roberts, F., (Giffin, J. M.) Jan. 12, 1918. *Drawings to Specification.*

Compositions containing resinous materials.—A cement composed of powdered rock lime or caustic lime, a little water, and powdered resin or resinous matter insoluble in water, is used for securing sheet-metal capsules or covers to glass, earthenware, &c. jars, for containing preserved food.

115,946. Charlton, H. W. June 27, 1917.

Compositions containing lime and silicates.—Alkaline and other silicates are digested in water with lime, part of the alkali, if present, passing into solution and being capable of recovery, while the insoluble residue is dried and forms a cementing-material containing water of combination. According to an example, 30 to 60 parts of feldspar are digested with 60 to 80 parts of lime, in 300 to 500 parts of water at a pressure of about 200 lb. per sq. in., at a temperature of 160-200° C. for from 2 to 4 hours. The cementing-material may be mixed with sand or other rock material, moulded, and steamed to form bricks, artificial stone, electric insulators, &c.

116,052. Thompson, W. P., (Dosi, L.) Jan. 25, 1918.

Compositions containing soaps.—A mixture for sealing punctures in pneumatic tyres consists of a solution of soft-soap in alcohol to which water is added.

116,595. Phillip, R. G., and Poole, W. H. July 31, 1917.

Concretes and mortars, cement.—A floor is formed of a bottom layer composed of 14 parts of cement, 2 parts of sawdust, 1 part of saturated solution of magnesium chloride, and 4 parts of iron pyrites residue obtained in the manufacture of sulphuric acid. The composition may be coloured with any suitable oxide, for example, that ob-

tained by adding sodium ferrocyanide to a dilute solution of copperas acidified with sulphuric acid, and oxidizing the white precipitate with nitric acid. The above composition is faced with a composition of 14 parts of cement, 1 part of sawdust, 1 part of magnesium chloride solution, and 1 part of pyrites residue with oxide colouring. Oil may be added to the composition, or the surface may be finished with oil or with an acid-proof composition of 7 parts of paraffin and 10 parts of vaseline heated to about 104° F., and applied whilst warm.

117,323. Majerus, V. H., Errington, J. M., and Hammond, A. Aug. 2, 1917.

Compositions containing soaps.—A material, consisting of a metallic soap, either alone, or mixed with china clay and asbestos powder, &c., is applicable for coating and packing the joints of pipes for conveying acids. The metallic salts of oleic stearic or palmitic acids may be used, e.g. lead plaster, aluminium stearate, or calcium stearate. A soap is preferably selected which will give an insoluble salt with the acid conveyed by the pipe.

117,460. Patentaktiebolaget Jungners Kali-Cement. July 11, 1917, [Convention date]. Drawings to Specification.

Cements, Portland and Roman, processes and apparatus for making.—In the manufacture of cement and alkali from feldspar or other alkali-ferous silicate minerals and lime or substances containing lime, the mixture is first heated by means of fuel to such a temperature that the carbonic oxide is driven off and the calcined mixture is then introduced into an electric furnace in which the heating is continued until cement is formed and the alkali driven off as vapour, which is condensed and collected. The first heating may be conducted in a rotary furnace up to 900° C., and the second heating in an electric resistance or radiating furnace up to 1400° C. or higher. The deposition of alkali may take place in carbon dioxide or an atmosphere, such as the flue gases from the calcining chamber, containing carbon dioxide.

117,504. Stewart, W. J. July 25, 1917.

Concretes of low specific gravity are formed by fixing moulded elements of a shapable material such as vitreous clay, or non-vitreous clay, subsequently receiving a vitreous coating and sanding. The aggregate is prepared by moulding clay in uniform moulds, e.g. of spherical form, burning, glazing to render non-absorbent, and causing sand to adhere to the glaze before cool to produce a rough surface. Such aggregates, in differing forms and sizes, from a quarter to three-quarters

of an inch in diameter, are employed with sand and lime to constitute concretes, which, if they are to be moulded, may have the aggregate elements systematically arranged according to size in the mould. The matrix material, such as cement, is caused to flow in from below upwards preferably under pressure so as to displace air and obviate bubbles.

117,605. Hartner, F. July 18, 1917, [Convention date].

Compositions containing calcium sulphate &c.—Anhydrite is ground with alkaline materials such as oxides or hydrates of the alkalies and alkaline earths, or with materials containing lime, such as cements, slags, and waste lime or mortar, the addition of a small quantity of which is sufficient, causing the anhydrite to set like plaster of Paris. Inert or filling-materials such as sand, coke ash or coal ash, may be added. The setting of the cement may be delayed by adding a salt such as those used with gypsum, for instance, borax.

118,116. Soc. Anon. des Produits Refractaires de l'Ouest. Aug. 6, 1917, [Convention date].

Refractory substances containing silica.—Silica bricks are made from any quartz or quartzite containing an average of 95 per cent silica. After disintegrating or after cooling, the material is subjected to a first crushing, and part then reduced to a fine flour by a further crushing. Suitable proportions of the two crushings are mixed together with a binder such as lime, moulded, and burnt.

118,591. Norton Co., (Assignees of Saunders, L. E., and White, R. H.). Aug. 2, 1917, [Convention date].

Stone, artificial.—An aluminous abrasive having a weak grain and containing crystals which are perforated or cellular is obtained by fusing an aluminous material with a small proportion of a substance capable of existing in the vapour phase at the temperature at which the charge solidifies. The substances used comprise sodium, potassium, or other alkali-metal compounds, such as sodium carbonate, sulphate, or aluminate, aluminium fluoride, and zinc powder. From 1 to 5 per cent of the sodium compound, reckoned as sodium oxide, is used. The aluminous material may consist of pure alumina, alumina containing silica, or bauxite. Specifications 16714/06 and 113,960 are referred to.

118,592. Norton Co., (Assignees of *Saunders, L. E., and White, R. H.*). Aug. 2, 1917, [Convention date].

Stone, artificial.—An aluminous abrasive having a fine grain of weak structure is obtained by fusing bauxite with a small proportion, for example 2-3 per cent, of an alkali-metal compound in an electric furnace. Soda-ash is preferred, but the sulphates, carbonates, hydroxides, or aluminates of sodium or potassium may be used. The proportion of the impurities present in the bauxite, namely, silica, iron oxide, and titanium oxide, may be reduced by incorporating in the charge a quantity of coke or other form of carbon. Specification 113,960 is referred to.

119,101. Mason, H. E., and Couper, A. Sept 27, 1917.

Refractory substances.—In the manufacture of refractory magnesite bricks a salt or salts of boric and/or perboric acid in conjunction with one or more of the following fluxing agents, basic slag, iron oxide, iron ore, metallic iron or iron slag, is incorporated with a mixing of calcined or raw magnesite and water. The mixture is formed into bricks and fired. Alternatively the fluxing agent or agents and borate &c. are mixed, shaped into brick, calcined, and ground into powder before being mixed with the calcined magnesite. The average proportions in 100 parts of mixing are about one part of borate &c. to about 6 parts of each or any or all of the fluxing agents named.

119,152. Quick, A. T. O. Dec. 1, 1917.
Drawings to Specification.

Concretes, cement.—A mixture of four parts of crushed chalk as obtained from the earth, and one part of Portland or like cement is moulded into bricks, slabs, columns, foundations, &c. for military and other buildings. The materials are first mixed dry and then made into a slurry for moulding.

119,878. Bennett, F. J., and Mellows, F. W. Oct. 10, 1917.

Compositions containing fatty and oily materials.—Substitutes for india-rubber, vulcanite, &c., are made by mixing together a fatty oil, sulphur, or compound of sulphur, and stearin, or other hard fat, with or without other ingredients and then heating them. In some cases, the heating is performed in a vessel capable of resisting heat and pressure. The fatty oils employed may be lin-

seed oil or castor oil; they may be replaced in part (from 5 to 40 per cent) by a mineral oil such as petroleum oil. In one example, the following ingredients and proportions are employed: linseed oil 1 part, sulphur 1 part, stearin 1 part, oxide of iron $\frac{1}{2}$ part. A small proportion of tar, or resin or other pitch-like substances may be added. Also lime may be added. The material may be strengthened by adding sawdust, cellulose in the form of cotton, jute, and paper. The material is soluble in most of the well-known rubber solvents and then forms a varnish.

119,912. Sadgrove, E. J. Oct. 18, 1917.

Concretes &c.; stone, artificial and imitation.—Relates to the waterproofing and veneering of sheets, slabs or building units to represent solid building construction, and consists in covering or coating by spraying &c. sheets, slabs &c. of asbestos, wood, papier mâché, &c., or tiles or concrete slabs with a facing comprising ground stone, silica and suitable binding ingredients, e.g. to imitate Bath stone, a dry powdered mixture of 30 per cent. of Bath stone, 25 per cent of silica, and 15 per cent of suitable binding-ingredients such as cements or limes is mixed with a liquid composed of 10 per cent. of resin, 10 per cent. of size, and 10 per cent of water. Ornamental or decorative effects are applied to the coating before or after setting. Colouring may be afterwards applied, if not in the coating.

119,966. Chance & Hunt, Holley, A. E., and Webb, H. W. Jan. 12, 1918.

Compositions containing silica, soluble silicate, and lead carbonate.—Lead carbonate or basic lead carbonate is added to ground acid-resisting siliceous material before mixing with solution of sodium silicate. Proportions are: finely ground stoneware, 8 parts; sand, 7 parts; less finely ground blue brick, 2 parts; lead carbonate, 0.25 part; 60 Tw. sodium silicate solution, 3 parts.

120,471. Marsh, G. Dec. 3, 1917.

Compositions containing cement &c.—Ground furnace slag, slate waste, infusorial earths, and similar materials in admixture with Portland, Roman, or hydraulic cement, and, if desired, plumbago, are mixed with a solution of a proteid substance such as casein, blood, glue, gelatine. The solution may contain also sodium or

potassium silicate, with or without addition of borax, boric acid, or ammonia. The mixture, when dried, is intended for use as a refractory material. Slate dust, slate waste, marble, granite, or similar material, mixed with Portland, Roman, or hydraulic cement, is mixed also with a similar solution to form artificial slate.

120,575. Bas, W. J. de. April 2, 1917, [Convention date].

Figured artificial stone.—In the moulding of slabs veined or marbled to resemble natural stones, a pasty or moist layer is first formed and the markings produced in it by addition of colouring materials. Upon it is squirted a similar mixture mixed with colours to form the ground colour of the finished slab. The mixture in each case may be cement and sand. Upon this composite surface layer in the mould is deposited powdery mortar, and the whole subjected to several successively increasing pressures, between two of which the surface layer containing the markings is removed to a small depth by cutting or grinding in order to obtain more sharply defined markings.

120,691. Illemann, R., and Montgomerie, J. A. March 6, 1918.

Compositions containing plaster and lime or sodium silicate.—A non-heat-conducting or sound-deadening covering for boilers, steam-pipes, &c. is produced by adding calcined gypsum (plaster of paris) gradually to an excess of water, in the proportions of about 6 parts of water by measure to 1 part of gypsum, agitating the mixture until a plastic spongy mass is obtained, and then evaporating the excess water by the application of heat or under atmospheric conditions so that air enters the cells previously occupied by the excess water to form a porous insulating mass. Small proportions of slaked lime or silicate of soda or both may be added to facilitate setting, and a small proportion of mineral or vegetable fibre to strengthen the material. Specification 1289/70 is referred to.

120,864. Eaton, F. E. July 5, 1918.

Compositions containing plaster, chalk, glue, casein, fibres, &c.—A plastic composition consisting of 1 quart of water, $\frac{1}{2}$ lb. each of glue, plaster of paris, and powdered paper, 1 lb. of chalk, 2 ozs. each of casein and chrome alum, and 5 drops of formalin is used for making artificial limbs, toys, &c. The powdered paper is made by pulping paper, drying, and grinding. According to the Provisional Specification, paper is not included in the first layer poured into the mould, and in the second layer it may be replaced by hair, tow, and other fibrous materials.

120,918. Horn, A. E. Oct. 20, 1917, [Convention date].

Concretes &c.; cements, Portland, treating after manufacture.—A solution containing ammonium compounds of resinic or resinous acids with or without ammonium compounds of fatty acids is added to the water mixed with Portland cement in making concrete. The resinate may be formed from ordinary resin or colophony or from harder resins including the resin acids of Manila or other copals. Fatty acids which can be used are stearic and oleic or stearic acid mixed with palmitic acid. The stearic acid should be free from lubricating hydrocarbons. Other volatile alkalies such as some of the amines may be used in whole or part substitution for ammonia. Preferably resin acid and stearic acid are mixed in molecular proportions. The ammonia may be added in quantity to saturate the acids exactly or to leave an excess of ammonia, but preferably less ammonia is used than required to combine with the resinic and fatty acids so as to leave some uncombined resin. The proportion of resinate or of mixed resinate and stearate, reckoned as anhydrous, which is added to the cement is from half to two per cent. The solution is stated to increase the proportion of colloidal silicates in the cement.

120,961. Ross, G. Nov. 26, 1917.

Compositions containing bituminous and siliceous &c. materials and oils.—A material for surfacing roads is made by mixing preferably 100 parts of earthy material, such as loam, soil, or clay, with 35 parts of water to form a thin mud, and adding in succession 20 parts of asphalt, natural bitumen, or coal-tar pitch, or other artificially prepared pitch and 1 part of a solvent for the asphalt &c., such as dead oil, cresol, or crude carbolic acid. The bitumen may be added in a powdered state, or it may be liquefied by heat. In a modified process, the solvent is sprayed upon the mixture of bitumen &c. and mud after the mud has been spread upon the road and when substantially all the water has evaporated therefrom.

121,301. Frood, H. Sept. 8, 1917.

Compositions containing phenol-aldehydes.—Friction clutch linings and brake blocks and linings are made from one or more layers of woven or unwoven organic or inorganic fibrous materials or fibres, such as shredded, ground, or disintegrated asbestos waste, kieselguhr, wool, hair, cotton, cork, or sawdust, or mixtures thereof, mixed or impregnated with resin formed by the condensation of formaldehyde or hexamethylenetetramine

and phenol or its homologues. Fragments of metal, expanded metal, wires, or other reinforcements may be mixed with or incorporated in the material. The fibres, preferably asbestos, may be mixed with the resin in a finely powdered state, moulded under heavy pressure and melted by heat, and afterwards stoved to give the required hardness, or the material may be impregnated at atmospheric or higher or lower pressures with a varnish made by dissolving the resin in alcohol, acetone, &c., and afterwards stoved. In order that the material may subsequently be softened by heat and bent to any required shape, the stoving-temperature may be kept low. The powdered resin may be prepared by heating a mixture of formaldehyde, phenol, and a catalytic agent such as ammonium chloride or sodium sulphite or hydrate, or the resin may be formed in the body of the material by first mordanting the material with the catalytic agent and then adding the other constituents. To render the finished product non-inflammable, the powdered resin may be saponified with an alkaline solution such as sodium or potassium hydrate to which is added sodium silicate. To make the fireproofing body insoluble, lead nitrate, aluminium sulphate, or calcium chloride may be added to the solution or may be used to treat the impregnated material. A solution of aluminium sulphate is preferably added to the sodium hydrate solution or is applied to the impregnated material. In order to increase the heat conductivity of the material, the fibres or fibrous materials, preferably after mordanting, are treated with a concentrated solution of copper sulphate, aluminium sulphate, iron oxide, &c. Two or more layers of material may be united under pressure when in the saturated condition.

121,728. Baarnhielm, B. Dec. 24, 1917,
[Convention date].

Concretes; cements, Portland, treating after manufacture.—Ground ashes of burnt alum slate are mixed with Portland cement. The proportion may be equal parts or the ashes may be in greater proportion.

121,855. Curtis, C. F. Feb. 19, 1918.

Concretes &c.—The dust left after burning iron, copper or arsenical pyrites is used as an ingredient in a mixture for an acid-proof composition. The mixture is: Sawdust, 30 per cent.; Portland cement, 30 per cent.; pyrites residue, 30 per cent.; whiting, 10 per cent. The mixture is moistened and is applied as a lining or shaped by moulding.

121,986. Richards, W. E. Windsor.
Dec. 4, 1917.

Cement, Portland, treating after manufacture; compositions containing Portland cement and clay.—Clay, preferably dried and powdered, is mixed with ground Portland or like cement to form a moulding composition. The clay may be China clay, ball clay, or ordinary clay or fire-clay. The mixture may contain asbestos or other fibre. An example is: Portland cement, 30 parts; waste asbestos fibre, 15 parts; clay, 10 parts. Articles moulded from the composition may be impregnated with a bituminous liquid as described in Specification 3364/15, [Class 36, Electricity, Conducting &c.].

122,388. Sankey, C. H., and Foster, J. E. Nov. 25, 1918.

Refractory substances containing silica.—Separate portions of siliceous material, consisting chiefly of silica, one in relatively coarse powder and the other in a very finely divided condition, are mixed wet with animal or vegetable fibre, or both, to form a composition for moulding. Both materials may be flint, chert stone, silica rock, quartz, sand or stone rich in silica, calcined and the coarser is ground to pass through any sieve of mesh from 16×16 to 100×100 per sq. in. The fine material may or may not be calcined and will pass through a sieve of 250×250 per sq. in. The fibre may be straw, chaff, peat, wool, hair or the like. The mixture of the two siliceous materials and fibre is mixed with water until the fibre is finely subdivided, moulded, and the articles dried and fixed at a temperature above 1500°C .

122,533. Carborundum Co., (Urtel, H.).
March 2, 1918.

Stone, artificial.—Abrasive wheels and other articles are moulded from a mixture of aloxite or other aluminous abrasive with a binder containing silicate of soda and zinc oxide. The articles, after drying, are heated in a kiln to a temperature sufficient to fuse the silicate of soda and cause the formation of an insoluble double silicate of sodium and zinc. The firing temperature is preferably between 850° and 1100°C . Flint, clay, or other substances may be added to the mixture.

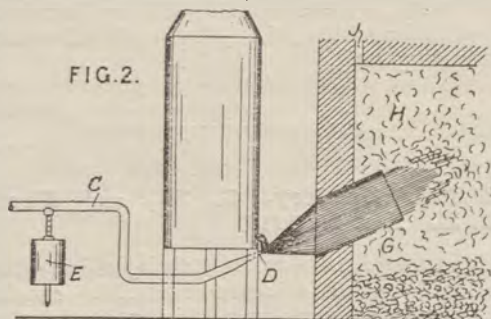
122,546. Afford, A. March 18, 1918.

Concretes, cement.—Artificial stone is made by mixing together in a wet state broken freestone, such as Bath or Weldon stone, and Portland cement, the mixture being moulded into blocks &c. A coating of cement may be applied to the blocks, which is subsequently rubbed down.

122,661. Hayhurst, W. Oct. 26, 1917.

Compositions containing phenol-aldehydes.—A plastic material for forming joints between the tiles lining a vessel for acids and other liquids is obtained by heating a product resulting from the interaction of an aldehyde with phenol, cresol, or a homologue thereof. A filler such as asbestos may also be employed.

122,779. Herdman, G. A. June 21, 1918.



Slagwool, preparation of.—In the process of making mineral wool, a dust-settling and damp-proofing fluid, preferably an oil of high boiling-point is introduced into the steam or other blast. The oil is contained in a receptacle E and after mixing with the steam in pipe C meets the stream of slag at D and directs it through an opening G into a settling-chamber H provided with two or more vents J in its upper part.

122,922. Jones, H. H. Feb. 12, 1918.

Compositions containing bituminous and siliceous, calcareous, &c. materials.—Tar which has been thickened by heating until it attains a specific gravity of 1.18 to 1.21 is mixed with sand which has been calcined at 104–120° C. A small proportion of calcined silicate of aluminium, feldspar, silica, limestone, or crushed granite may be added.

123,114. Gregory, M. Nov. 5, 1917.

Compositions containing vulcanized oils.—A composition resembling rubber is obtained by heating fish, fish scrap, or fish oil with sulphur, and afterwards heating the product under pressure. In treating fish or fish scrap containing 5 per cent. of oil, a portion of the sulphur is added and the mixture is heated to 175° C. The temperature is gradually raised to 220° C. over a period of 1-2 hours. The plastic mass so obtained is mixed with the rest of the sulphur, lead oxide being added to accelerate reaction, and is heated at 155° C. under a pressure of 20-40 lbs. per sq. in. for ½-1 hour. The product may be used as a rubber substitute or may be compounded with rubber.

123,116. Mottram, G. W. Nov. 7, 1917.

Refractory substances.—Refractory bricks and the like are made by first dry grinding the base material and saturating it with water, then wet grinding the binder or flux to the consistency of a slip varying in fineness from 30-200 meshes to the linear inch with 1-4 times its weight of the base and mixing the product with the remainder of the saturated base material. After the mixture has been allowed to stiffen and mature and excess of water is removed, it is pressed, dried, and burnt at a sintering temperature. As base material, silica, fireclay, and other old or new refractory material may be employed ground to a fineness of 8-40 meshes to the linear inch and the clay binding-material may be made more plastic by the addition of peat water or the slime deposited from the effluent from sewage purification or the refuse liquid from tanneries. Lime or other basic oxide or iron oxide or salts to the extent of 1.5 to 4 per cent. may also be added with or without 5 to 15 per cent. of fire-clay.

123,377. Barron, W. S., and Barron, G. S. Feb. 18, 1918.

Concretes.—Artificial millstones are made from a mixture of hard abrasive stone, such as emery, corundum, French burr, quartz and the like, Portland cement and calcium chloride. After the initial set, the stone is soaked in water for some three weeks and dried in a chamber through which the waste gases of a furnace pass. Limestone may be burnt with the fuel. The dried stone is impregnated with waterglass, washed, and again dried.

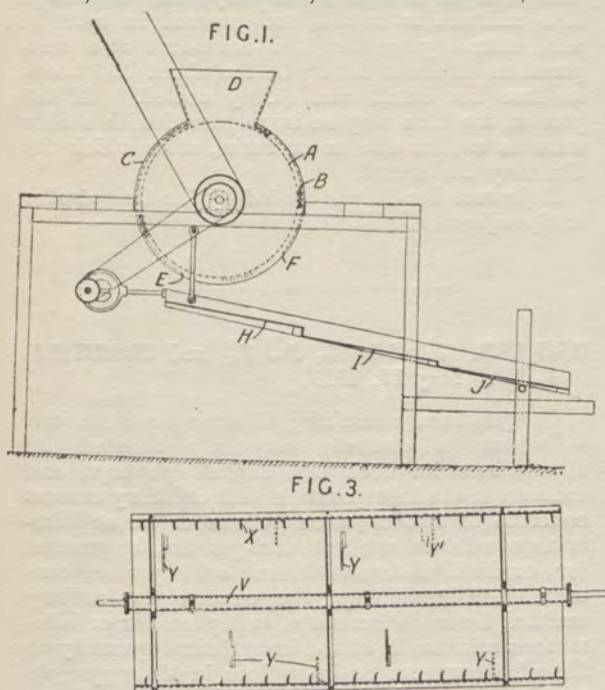
123,695. Olson, H. M., and Westell, F. J. D. Sept. 26, 1918.

Cements, Portland and Roman, treating after manufacture; compositions containing lime, gypsum, &c.—Cementitious material which sets in water and has an alkaline reaction is rendered waterproof by spraying into it, during the grinding process of its manufacture or during re-grinding, an oleaginous or bituminous substance. The cement may be Portland cement, lime, gypsum, hydraulic lime, natural cement, oxychloride of magnesium, alkaline silicate, &c. The waterproofing substance may be animal, vegetable, or mineral oil, either liquid at the ordinary temperature or solid or semi-solid, such as wax, tallow, or paraffin; or it may be natural or artificial bituminous material, viscid when heated or dissolved in a solvent such as mineral oil or any of the fatty acids. A preferred mixture is 75 parts residue mineral oil and 25 parts beef fat or stearine. The waterproofing material is added in quantity insufficient to destroy the alkaline properties of the cement. A preferred proportion is 1 per cent.

124,208. Gowen, A. V., (Representative of *Lecesse, N.*). March 25, 1916, [Convention date]. Void [Published under Sect. 91 of the Act]. Addition to 102,507.

Refractory substances containing bauxite; stone, artificial.—In the production of artificial corundum by the fusion of a charge of bauxite and anthracite in a shaft furnace as described in the parent Specification, a layer of corundum is preferably placed on the furnace grate under the charge, and an open-ended metal cylinder is stood inside the furnace to receive the charge, leaving a space between itself and the furnace walls which is filled with granulated bauxite or corundum to protect the walls, after which the metal cylinder is lifted out and the furnace is set in operation. Some porous corundum or its dust, such as the product described in the parent Specification, may be mixed with the furnace charge. If it is desired to obtain the titanium of the bauxite in the form of ferro-titanium, the blast is somewhat reduced so as not to expel the iron from the furnace. For use as an abrasive, the fused bauxite retained after grinding is subjected to a strongly oxidizing combustion with a sufficiently rapid current to expel the ash of the remaining carbonaceous matter. For making grindstones agglomerated by fusible matter, the ground material is moulded without taking any precautions as regards dust and the carbonaceous matter present, and the grindstones are roasted in an oxidizing atmosphere, the ash being expelled as above mentioned.

124,650. Herdman, G. A. June 26, 1918.



Slagwool, preparation of.—Mineral wool is deflocked or torn apart, in order to allow shot to be removed, by acting upon it with prongs on a

rotary drum and then allowing it to drop upon an inclined moving screen. In the apparatus shown in Fig. 1, the raw wool is fed through a hopper D into the space between a drum A and a casing C each provided with teeth or prongs B. The wool falls through an opening EF upon a series of shaking sieves H, I, J. Fig. 3 shows a modified form of apparatus in which prongs X and baffles YY' are mounted internally of an inclined sieve which rotates on a shaft V. Specification 122,779 is referred to.

124,669. British Westinghouse Electric & Manufacturing Co., (*Westinghouse Electric & Manufacturing Co.*). Sept. 10, 1918.

Compositions containing bituminous or resinous and calcareous and like materials.—Moulded articles are made from a mixture of a cement which hardens by admixture with water and a fusible material such as resin or pitch. The resin is preferably one or more of the cumaron resins from coal-tar, namely para-cumaron and para-indene; or varnish resins may be used. The cement, e.g. Portland cement, and the resin or pitch are mixed dry. A fibrous binder such as asbestos and inert filling material such as barytes may be added. The mixture is wetted, moulded, and the articles heated to melt the fusible material distributed in the mass.

124,851. Baker, J. Dec. 7, 1917.

Compositions containing bituminous or oily materials.—Relates to processes for waterproofing granular road-making materials and of the kind in which the materials are first heated to remove moisture and then mixed in a heated vacuum with hot waterproofing liquid, a final mixing taking place under pressure. The invention consists in introducing steam into the chamber to heat the materials during the mixing operation, the materials being treated throughout in one vessel. The materials used are stated to be dirt, dust, earthy matter, soil, clay, stone, or gravel, in the natural state, the waterproofing agent being tar, asphalt, or oil products such as paraffin.

125,550. Vittori, V., and Vallecoccia, A. July 29, 1918.

Compositions containing bituminous materials.—A composition consisting of 500 grammes of pure bitumen, 60 grammes of sulphur, and 5 grammes of litharge, is made by melting the ingredients together and used to cement layers of rubber and cork employed as a protective coating for petrol tanks.

Reference has been directed by the Comptroller to Specifications 124,401, 126,087, and 127,001, [all in Class 69 (i), Hydraulic apparatus &c.].

125,979. Andouard, P. J. A., (Representative of Andouard, A. P.). Nov 27, 1913, [Convention date].

Cement &c. surfaces, treating with liquids.—Cement and like surfaces are prepared for painting by coating the dried surface first with an acid solution to neutralize the basic elements in the cement and then with a resinous varnish to isolate on the surface the salts produced by the acid. The acid solution may consist of 300 c.c. of phosphoric acid of a density of 1.349, mixed with the white of twenty eggs and a sufficient quantity of water to make 1 litre. If this liquid is required to be kept indefinitely, 1 gm. of sodium fluoride is dissolved in it. For the resinous varnish, 250 grains of colophony are dissolved in sufficient benzine to produce 1 litre.

126,192. Wade, H., (Carborundum Co.). June 5, 1918.

Refractory substances containing silicon carbide and graphite.—Silicon carbide, natural graphite in flake or granular form, and a binding material such as clay, are ground with water to form a mouldable mixture. The silicon carbide may be added in quantity sufficient to lessen or prevent the formation of cleavages in the moulded mass. The moulded articles are fired. In an example, the proportions by weight are: Graphite 43 parts, silicon carbide 43 parts, and fire-clay 14 parts.

126,229. Kraus, L. P. Sept. 6, 1918.

Refractory substances containing bauxite.—Relates to refractory products, either in loose granular form or in moulded kiln-burned shapes, for withstanding high furnace temperatures, and consists in reducing raw refractory material of a non-plastic character to a fine powder, mixing therewith a considerable proportion of ground combustible material such as ground wood, and water or bonding liquids such as glucose, moulding into blocks of the desired size and drying. The blocks are then roasted at a temperature sufficient to produce clinkered material in the form of spongy grains with the cleavage planes destroyed, preferably about 300 degrees F. below the melting point of the material, and above roasting or calcining temperature, and are subsequently crushed if the material is required in granular form. The invention also consists generally in the production of refractory materials having the above-mentioned characteristics. If bauxite is employed as the raw material, the resulting product can be compressed and moulded dry without bonding material and may be formed into bricks by burning in kilns at a high temperature. The roasting of the mixture may be effected in any suitable furnace, and the material may either be in cakes or loose. Fluxes may be added, if desired, and if binders are employed in moulding the material, any ceramic bond such as plastic clay may be chosen.

126,285. Norton Co., (Assignees of Dodge, H. K.) April 29, 1918, [Convention date]. Drawings to Specification.

Stone, artificial.—Non-slipping tiles or treads are composed of granules of material having a hardness of 9 or more, e.g. fused alumina, bonded by ceramic material, e.g. a vitrifiable material composed of feldspar, slip clay, and ball clay. The materials are mixed dry, for example in the proportion of 23 per cent. of bond and 77 per cent. alumina, wetted, pressed, and fired slowly for 100 hours at a temperature of about 1300° C., and allowed to cool slowly for a similar period. A suitable size for the granular material is such as will pass through a 60-mesh or finer sieve.

Reference has been directed by the Comptroller to Specifications 4355/00 and 12796/02.

126,287. Norton Co., (Assignees of Jeppson, G. N., and Dietz, C. F.). April 29, 1918, [Convention date].

Stone, artificial.—Non-slipping tiles or treads are formed of particles of granular material of a hardness of 9 or more, e.g. fused alumina or silicon carbide, bonded together by a vitrifiable ceramic material, the tile containing coarse grains to prevent slipping, and fine grains to render the body dense and compact. The coarse grain may be of a size to pass through a 36-mesh sieve, and the fine grains a 120-mesh or finer sieve, intermediate grades being also employed to obtain a compact body. A specific example is given of the use of grains of 20, 60, and 180 mesh sizes. The ceramic material may consist of a fusible material composed of feldspar, ball clay, and slip clay. The mixture is wetted and pressed in moulds, and, after drying, the tiles are burnt at a temperature of about 1300° C. for about 100 hours to fuse the bond, and slowly cooled. If too porous, the tiles may be impregnated with a filler such as molten shellac or resin, after which the tile may be heated.

Reference has been directed by the Comptroller to Specification 12796/02.

126,472. Hadfield, A. J., and Hadfield, J. W. May 11, 1918.

Compositions containing bituminous materials.—Relates to concrete especially adapted for foundations for rock and asphalt pavings, and consists in the incorporation with ordinary cement concrete of two or more gallons of tar or bituminous mixture such as coal-gas tar, by-product tar, or distilled tar, with each cubic yard of concrete. Alternatively, the cement is entirely omitted from the concrete, and pitch tar or bituminous mixture is added in sufficient quantity to fill all the spaces or interstices in the aggregate so that the whole forms a solid bond.

Reference has been directed by the Comptroller to Specifications 15993/06, 8275/07, 9024/07, 24948/07, and 28745/07.

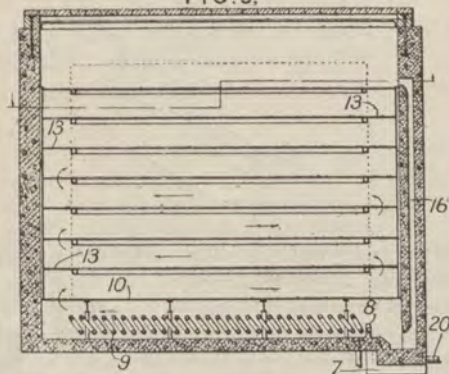
126,646. Catlett, C. May 9, 1918, [Convention date].

Cement, Portland, treating after manufacture; compositions containing lime and salts; concretes and mortars.—Calcium oxychlorides are produced by combining calcium chloride and oxide in such proportions and under such conditions that the material sets and can be pulverized and stored, but on the addition of excess of water, dissociates into its constituents. In an example, to 100 parts of quick-lime are added 60 parts of commercial calcium chloride dissolved in 50 parts of water. The mixture sets to a substantially dry, friable mass which is ground and can be stored. The proportion of chloride may be varied, but preferably lies between 25 and 35 per cent of the mixture, although the percentage may be as low as about 2, and as high as will combine with all the lime. The presence of magnesium salts in the lime and chloride is not objectionable. The powder is added to Portland cement, or lime concretes, usually in the proportion of $1\frac{1}{2}$ —5 per cent, but proportions up to 10 per cent may be added. The oxychloride may also be added to hydrated dolomitic lime in such proportions that the calcium chloride is about 1 per cent. of the whole, and the powder thus obtained can be stored until required.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the use of oxysalts in general. It also states that a hydrate and chloride may be added separately to cement, and that calcium chloride may be added to hydrated magnesian limes to produce a cement. This subject-matter does not appear in the Specification as accepted.

126,813. Bellonby, L. A. May 21, 1918.

FIG. 3.



Concrete, hardening.—A concrete mixture is rapidly hardened while in its mould by treatment in an apparatus in which it is successively subjected to the action of dry steam, hot water, and heated air. The apparatus consists of a series of chambers, one of which is shown in Fig. 3. Shelves 13 support the moulds or trays containing the plastic material, a hole in each shelf being

disposed alternately at opposite ends of the chamber so that fluid delivered through the perforated plate 10 traverses the series of moulds. The chamber is drained by the gutter 7, the pipes 20 serving for the removal and re-admission of water. The rib 8, running the length of the chamber, keeps a shallow layer of water in the chamber, the steam coil 9 being placed with about half its thickness above the water. The apparatus is used by first admitting steam to the half-immersed coil, whereby the surrounding water is vaporized and passes over the shelves, after partial drying by the part of the coil above the water. Hot water is next pumped into the chamber, is further heated by the steam coil, and circulates through the side passage 16. The water is then completely drained off and hot air delivered to the shelves by the continued operation of the coil.

127,824. Mantle Lamp Co., (Assignees of Simonson, W. W., and Blair, L. van D.). June 1, 1918, [Convention date]. Drawings to Specification.

Compositions containing resinous materials.—A fusible adhesive jointing compound for uniting parts of glass, metal, or fibre is prepared from lac or shellac. In some cases, a metallic substitution derivative may be used. Instead of lac an organic equivalent thereof may be similarly employed. The joint is subjected to a heat treatment to convert the compound into a hardened product having a higher fusion temperature than the initial compound. The material is applicable especially for uniting the inner wall of a vacuum-insulated vessel to the outer wall. Shellac is freed from fatty and waxy substances by dissolving it in a warm weak solution of caustic soda, the impurities being removed after cooling of the solution, which is then clarified by the addition of an agent such as powdered kaolin. The metal constituent of the final compound may be lead, calcium, barium, zinc, or other metal. In the case of a lead compound, a clarified solution of the shellac-sodium compound is mixed with lead acetate and a sufficient quantity of water to produce a flaky precipitate, which is dried. The compound may be used in the form of a gasket placed between the parts to be united, or may be applied as a solution in alcohol or acetone. The whole is then heated to fuse the compound, without, however, causing the glass or other parts to fuse. Preferably the parts are heated to a temperature above that at which fusion of the compound takes place, but the parts may be subjected to a prolonged heat treatment in an oven at the temperature of fusion. A shellac-lead compound may be mixed with a wax-free shellac obtained by treating the shellac-sodium compound with hydrochloric or other acid, the mixture being applied in the same way as the lead compound. The temperature of fusion may be varied by altering the proportions, or by employing one metal in place of another, or in some cases a non-metallic shellac compound may be used. Powdered charcoal may be added to the compound to prevent bubbling.

- 127,931. François, A.** April 10, 1918.
Drawing to Specification.

Concretes and mortars, cement.—A concrete or mortar for use with centrifugal pumps in filling interstices or cavities consists of one part by weight of cement and up to four parts by weight of finely ground and sieved material of approximately the same specific gravity as the cement powder, for example furnace ashes, clinker, or fire-brick.

- 128,302. Morgan, J. S.** July 27, 1917.

Slags, treatment of.—Nitric cake is heated in a closed chamber to produce neutral sulphate, and this while still hot is further heated in the closed chamber with a material such as slag which will drive out the combined acid. The particular process described consists in placing the nitric cake on the surface of molten basic slag which drives off the free acid, and then breaking the crust and stirring the residue into the body of the molten slag. This removes the combined acid and leaves the slag in a form more suitable for setts. Specifications 14780/85, [Class 2, Acids and salts, Organic &c.], and 1844/07 and 273/08, [both in Class 1, Acids, alkalies, &c.] are referred to.

- 128,452. Mulligan, F. D.** July 31, 1918.

Cements, Portland &c., treating after manufacture; concretes.—A compound to be added to ordinary cement to strengthen it and render it waterproof consists of thoroughly slaked lime and raw linseed or equivalent oil of the class known as drying oils. An example of proportions is: 3 oz. of oil to 20 oz. of lime added in the proportion of $\frac{1}{2}$ oz. of the compound to one pound of sand and ordinary cement. The ingredients may be mixed with water to make a wet form of the cement, or they may be dried and made into a dry powder.

- 128,477. Scott, G. L.** Sept. 23, 1918.

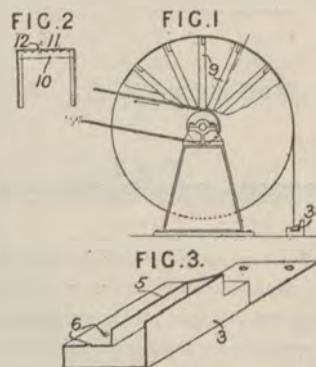
Compositions containing phenol-aldehydes.—Lime is used in admixture with phenol-formaldehyde resins to form plastic compositions. Filling components of the mixtures are fuller's earth, steatite, china-clays, clays, wood flour meal and pulp, waste cotton material, jute and other fibres. India-rubber, gutta-percha, or the like may be incorporated with the resin before addition of the calcium oxide and filling material. The mixture is moulded, dried at about 75–80° F., and heated to 350–400° F. In an example, 5–10 per cent of

rubber dissolved in naphtha is added to an alcoholic solution of a synthetic resin and then, after stirring, 5–20 per cent of the powdered calcium oxide, the fillers, if used, being afterwards stirred in gradually.

- 128,750. Akerman, W. S.** July 2, 1918.

Cements, Portland &c., processes for making.—Raw meal composed of limestone and shales, with which may be mixed a portion of the fuel used in the second part of the process, is heated in a closed chamber so as to drive off carbonic acid and other gases and the oil and tar constituents, and then introduced into a vitrifying chamber or kiln, the oil &c. driven off from the calcining-chamber being recovered, and the gases from the calcining-chamber being collected for further use, such as for supplementing the heat for vitrifying, or to assist the waste heat from the vitrifying-kiln which passes to the walls of the calcining-chamber. The calcining-chamber may be in the form of a pipe, which is situated in a continuous kiln of the type having oscillatory shafts, and is provided with means for excluding the air while the contents are automatically discharged by gravitation.

- 129,324. Holmes, A. R.** Oct. 17, 1917.



Slagwool, preparation of.—Relates to apparatus for drawing glass for making glass wool. The glass is melted in a crucible 3, Fig. 3, composed of a tungsten &c. alloy of high resistance so that it can be heated by the passage of an electric current through it. The glass is introduced through the opening 5 and, when sufficiently heated, is drawn out through holes 6 by a drum, Fig. 1. The drum is formed with a series of recessed bridge-pieces 10, Figs. 1 and 2, which are carried by the spokes 9. Reinforcing-wires 11 are wound round the drum in the recesses and are covered by a sheet of canvas 12. The periphery of the drum is sufficiently flexible to yield as the glass contracts.

129,485. Brooke, F. H., and Twynam, T. Aug. 7, 1918.

Refractory substances.—A small percentage of fine flue dust from the downcomers of blast furnaces, containing a high percentage of magnetic oxide of iron, is added to the material used in the manufacture of acid or basic refractory bricks or blocks. For example, for making magnesite bricks, $2\frac{1}{2}$ –10 per cent of flue dust is added, and for making silica bricks $\frac{1}{2}$ –3 per cent, the amount of lime which is usually added being less than that ordinarily used. The bricks are burnt in the usual way.

129,505. Olson, H. M., and Becker, H. W. Aug. 30, 1918.

Refractory substances containing silica.—A heat-insulating material which may be rendered abrasive by calcining consists of infusorial earth or non-crystalline silica in a finely-divided state and a binder including aluminium sulphate or equivalent and an alkaline sulphate or a double sulphate of alumina or its equivalent and alkali. The composition may vary from 75 to 90 per cent of infusorial earth and from 5 to 25 per cent of binder. A preferable mixture consists of 88 per cent of dry pulverized infusorial earth, 1 per cent sodium sulphate, 1 per cent aluminium sulphate, and 10 per cent lime. A suitable metallic sulphate equivalent may replace the aluminium sulphate and other alkaline sulphate can be used instead of sodium sulphate; or a double sulphate of an alkali and alumina or equivalent may replace the two separate salts. The mixture is gauged or wet with water and moulded into bricks &c. The mixture may be dried and calcined at from 800 to 2700° F., forming a hard crystalline substance having abrasive qualities.

129,651. Decroue, W. Oct. 30, 1915, [Convention date]. Void [Published under Sect. 91 of the Act]. Drawings to Specification.

Concretes.—Building blocks, slabs, and the like are made from a mixture of Portland cement, gypsum, lime, and pumice or the like. In an example, to 75 parts Portland cement and 2 parts calcined gypsum are added 100 parts pumice, and then 3 parts of lime in the form of paste. The blocks &c. are moulded and hardened in the air. Hollow blocks are moulded with V-shaped or semi-octagonal grooves on their contacting surfaces, to receive cement, reinforced if desired, to form a joint. Water-pipes and the like are placed in the recesses of the blocks, which register on assembling. Floors are moulded from the composition, reinforced girders being first cast, and then slabs, concave on their lower surface and provided with notches on their edges for filling with cement, are fitted between the girders. To the underside of the girders are attached ceiling slabs,

129,993. 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 traces of alkaline catalysts; this liquid product is converted into the final insoluble infusible product by addition of liquid organic acids (lactic, acetic, formic, &c.) or solid organic acids such as oxalic, tartaric, citric, gallic, or tannic acid, dissolved in a liquid organic acid; preferably traces of a mineral acid (hydrochloric, oxyacids of sulphur or phosphorus, boric, &c.) are added also; 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.

130,134. Roberts, J., Thomas, J., and Williams, I. July 20, 1918.

Concretes; stone, artificial.—Tiles, bricks, sanitary ware, &c. are made from slate or shale dust, chippings, or fragments mixed with a lightening-material in the form of magnesia, talc, or steatite, e.g. in the proportions of 85–70 per cent of slate or shale and 15–30 per cent of lightening-material. The materials may be mixed with water, moulded, and baked; or they may be fused, in which case 10 per cent or more of a flux such as sodium carbonate or fluorspar may be added.

130,135. Gastaldo, V., and Mino, M. July 22, 1918.

Figured and ornamented stone.—Crushed oyster and like shells forming mother-of-pearl are mixed with a cement and moulded to form slabs, bricks or tiles. The surface is then polished and finished with a coat of white dammar. The shells may be placed on the surface only and may be so arranged that they form concentric rings in a mottled ground work.

131,164. Moncrieff, Sir G. K. Scott-, and Hines, J. Aug. 21, 1918.

Cements, Portland.—About 40 parts of oil shale residue and 40 parts of Norfolk chalk are ground together and clinkered for the manufacture of cement, which is then ground and mixed with 20 parts of raw oil shale to form a waterproof cement. The product may be used for making roads, flooring, roofing, walls, or for constructing culverts &c. When used for making roads it is laid as a foundation which may be sprinkled with a bituminous liquid to facilitate its adhesion to a coating layer.

132,247. Bayer, E. C. Sept. 6, 1918, [Convention date]. Void [Published under Sect. 91 of the Act].

Concretes &c.—An aggregate for a concrete for use in ship-building, and for other purposes, consists of "moler" diatomite, pumice, or like light porous materials, the surfaces of the particles of which are glazed. The porous material is crushed or may be in the form of chippings, or in moulded pieces. The glazing is carried out in a rotary or stationary furnace.

132,356. Waine, I. Sept. 12, 1918.

Composition containing Portland cement and sodium silicate.—Powdered hard stone, such as trap, granite, quartz, or limestone, is mixed with the following, in volume proportions: Powdered stone 100 parts, Portland cement 15 to 30 parts, sodium silicate 25 parts, water 75 parts. The mixture is worked into a stiff paste, left to stand for 48 hours, and moulded.

132,593. Olsen, O. Sept. 13, 1918.

Concretes.—Shale for use in concrete is sintered or subjected to a temperature of 2000° F. or over, without thoroughly melting, and is then crushed. In making concrete, a mixture of coarse and fine pieces of treated shale is used, for instance 4 parts of coarse shale, 2 parts of fine shale, 1 part of Portland cement, with or without 10 per cent of magnesia cement added to the Portland cement, the water used being preferably boiling hot and free from salt or alkali. The proportions may be varied and other ingredients such as Keene's cement, plaster of paris, or lime may be added.

132,855. Auden, A. C. Sept. 23, 1918.

Cements, Portland and Roman.—A residue left after extracting potassium salts from minerals such as feldspar, mica, micaceous schist, muscovite, pegmatite, China-stone, glauconite, and zeolites such as those found in a basalt matrix, by roasting with lime and salt and leaching the product, is converted into white cement by mixing with ground, preferably unslaked, lime, and preferably with a small proportion of alum or aluminium sulphate, kneaded, dried, and burnt by increasing the heat gradually up to 1100° C., the mass being firmly but not too tightly packed in the furnace. The mass is spread out to cool, raked with wooden rakes, sifted, and the coarser material ground. This cement is somewhat sensitive, and is therefore mixed with a small quantity of ground gypsum, the mixture being spread on a floor, left for about a week, and then turned and mixed. Specification 21697/11 is referred to.

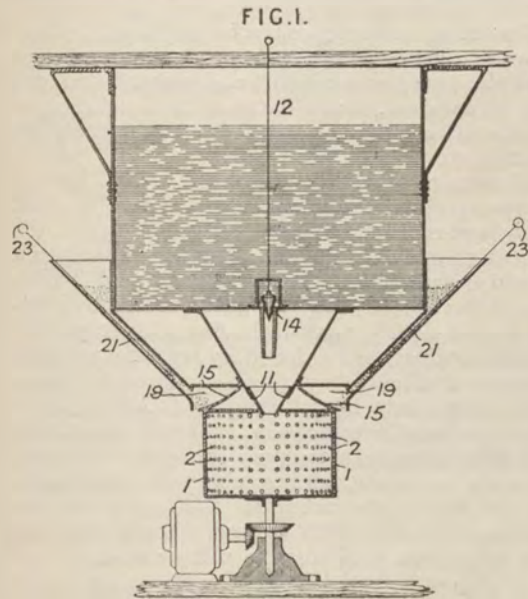
133,014. Carborundum Co., (Assignees of *Tone, F. J.*). Sept. 27, 1918, [Convention date].

Refractory substances containing carborundum.—Bats, saggars, and like refractory articles are made of a mixture of fire-clay and carborundum grit, the major portion of which is coarser than No. 60 (60 meshes to the linear inch) and finer than No. 16 and constituting less than 60 per cent of the mixture. Clay grog may also be added. In a typical example, 40 per cent each of crystalline carborundum and plastic sagger clay are mixed with 20 per cent of clay grog obtained by crushing old saggars or calcined flint, fire-clay, or the like. The articles are burnt at about cone 11 (1370° C.).

133,466. Wade, H., (*Barrett Co.*). Oct. 15, 1918.

Asphalts.—Hard or soft coal-tar pitch, asphalt, or other solid and fusible bituminous substances or mixtures thereof are moulded into filaments which are used as such or caused to form a matted mass by superficial fusion of the filaments. A non-adherent coating, such as fine soapstone or talc powder, may be applied to the filaments. The moulding-apparatus consists of a rotating receptacle 1 for the molten bitumen, through the perforations 2 in which the molten material is extruded into air or other cooling-medium. Material is fed to the receptacle by a funnel 11 which receives the molten material from a reservoir 12 through a valve 14. The receptacle 1 is provided with an annular chamber 15 which rotates with it.

and receives powdered non-adherent material from the annular chamber 19, wherein it is contained



in tubes 21. When choked therein, it is disengaged by the rods 23; or the tubes may be used for spraying the extruded filaments with water.

133,705. Iwersen, M. R., (Assignee of Jorgensen, C.). May 29, 1918, [Convention date]. Void [Published under Sect. 91 of the Act].

Concretes.—Artificial marble is made from a mixture of cement, crushed or pulverized marble, fragments of marble, olive or other soft oil, and colours. The product is dried by air or heat.

133,745. Alexander, H. Oct. 11, 1918.

Bricks, hardening.—Sand-lime bricks, blocks, tiles, &c. are hardened by exposing them to superheated steam at a pressure of 5–10 lb. per sq. in. above atmospheric pressure in hardening-chambers made of ferro-concrete or the like, which may be erected in situ. The blocks, after moulding, are placed in small wagons and wheeled into the hardening-chambers, and are subjected to the action of saturated low-pressure steam to effect a preliminary drying. The temperature of the steam is then raised to about the temperature of saturated steam at a pressure of 120 lb. per sq. in., the initial low pressure being maintained, to complete the hardening. The steam is preferably superheated by waste gases from a furnace or from the smoke-stack of the boiler generating the steam. The invention is distinguished from a process in which artificial stone is hardened by treatment with superheated steam at atmospheric pressure.

133,753. Pike, R. D. Oct. 14, 1918.

Refractory substances containing magnesia.—Magnesite is mixed with a small quantity of a deoxidizer in the form of an iron alloy, such as ferro-manganese or ferro-silicon, and then heated to a temperature such as to cause a reaction reducing the total quantity of oxygen associated with the iron and more or less liberating the metallic iron. The magnesite is ground with water and with the powdered alloy and ferric oxide, and the moulded composition fired to form refractory articles. The oxide of iron may be omitted in cases where it exists in sufficient quantity in the natural magnesite. Calcined magnesite can be used instead of the raw material, preferably with addition of the latter when making the mixture for moulding and firing.

133,842. Sankey, C. H. Dec. 19, 1918.

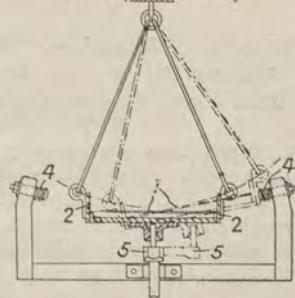
Refractory substances.—Waste refractory articles, such as fire-bricks, tiles, saggars, retorts, or the refractory lining of furnaces, kilns, flues, retorts, or coke ovens, which have been calcined in manufacture or use, are ground and mixed with silicate of soda and water, moulded or worked by hand to the required shapes and fired. The refractory material may be cleaned or washed before being ground.

Reference has been directed by the Comptroller to Specification 376/83, [Class 56, Glass].

134,230. Fried, A. Nov. 19, 1915, [Convention date].

Stone, artificial; concretes; compositions containing oils, resins, &c; stone, colouring; stone, hardening.—An aggregate for making artificial stone is made from fine waste materials such as slag, infusorial earth, earths, ground stone, sand, ashes, fibres, sawdust, and a binding-material, such as lime, cement, gypsum, glue, oil, resin and lyes from paper or soap making or from the extraction of dyewoods, and is formed into particles of any desired shape or size. The particles, before drying or after being dried and coated with a binding-material, are placed loosely together in layers so as to form blocks or stones, having a cellular structure and containing air cavities. Spherical forms produce the maximum volume of cells. Colours may be added. Pieces

FIG. 3 (cancelled)



of aggregate of different colours may be employed to obtain a variegated product. The outer cavities may be filled with substances to vary the colour, surface hardness, &c. The aggregate pieces may be produced by shaking, by extrusion or other presses, by two grooved plates working at any angle to one another, by knives &c., or the material may be passed through a vibrating sieve in the form of grains.

The Specification as open to inspection under Sect. 91 (3) (a) states also that the cells may be filled with coloured or other substances. Pieces of aggregate which do not bind well may be treated with gypsum, cement, water-glass and the like to make them firmer or to increase their speed of drying, or hot air, steam, or gas may be employed for this purpose. The aggregate pieces of the finished product may be heated to any desired degree and may even be melted or "coagulated." The cellular nature may be increased by the use of materials which are gasified at a high temperature. Ores may be treated in the manner described prior to their further treatment, in which case the additional materials for the further treatment may be employed as binding agents for the aggregate pieces. The particles formed by passage through a vibrating sieve may thence be fed to a conveyer which may be in the form of a swinging shoot on which the pieces roll and are made to assume a more or less spherical form, or if a vertically vibrating conveyer band be used the pieces are flattened. The pieces may be roughened by the use of roughened shoots which are oscillated, jerked, or otherwise moved. Fig. 3 (*Cancelled*) shows in cross-section a shaking-device in which the aggregate are made to assume a round or granular form. The materials are placed upon a sieve-like surface 1 fixed in a frame 2 which is suspended or otherwise supported and is oscillated by a crank 5 and is shaken by contact with buffers 4. This subject-matter does not appear in the Specification as accepted.

134,565. Bindley, W. T. Robinson-, Weller, A. W., and Dulcken, E. Feb. 27, 1918.

Compositions containing phenol-formaldehyde condensation products.—Substitutes for celluloid, vulcanite, &c. are composed of phenol- (or cresol-) formaldehyde condensation products, camphene, and nitrocellulose, cellulose acetate, or celluloid. The composition may be made by dissolving celluloid or cellulose acetate in acetone, adding camphene and the phenolic condensation product, and drying. If the phenolic condensation product used is soluble in spirit, the composition is soluble in spirit. Specifications 134,563 and 134,564, [both in Class 2 (iii), Dyes &c.], are referred to.

134,598. Harland & Wolff, and Marks, A. Nov. 1, 1918.

Concretes, cement; concrete surfaces, hardening.—A concrete is made from a mixture of, for example, two parts of Portland cement and one part of sawdust, made damp with a solution of sodium silicate and then wetted by adding calcium chloride solution in such quantity as to leave a small amount of sodium silicate in excess. Hydrochloric or other easily ionized acid may be used in place of calcium chloride; but, in this case, the cement should contain free lime, or lime should be added as a filler. The surface of such a mixture, when spread, may be waterproofed by coating with a similar mixture having a lower proportion of sawdust, or hardened by treatment with a solution of silica in hydrofluoric acid or by treatment with dilute hydrofluoric acid. According to the Provisional Specification, concretes containing light porous aggregates, such as sawdust or cork, are made by forming an insoluble waterproof binding-medium in the pores of the aggregate by treating the latter with sodium silicate and then with a solution of a suitable salt or acid.

134,665. Bury, E., Ollander, O., Smith, T., and Bainbridge, F. Dec. 3, 1918.
Drawings to Specification.

Slag cements.—Cements are made from the slag which remains after the potassium content of blast furnace slag has been removed, by adding calcium chloride and volatilizing away the potassium chloride produced.

134,757. Andresen, V. V. J. April 9, 1919.

Compositions containing phenol aldehyde condensation products.—A dental cement consists of zinc oxide, alum, and a suitable liquid such as water. Eugenol, oil of cloves, zinc sulphate or chloride, copper sulphate, phosphoric acid, or a condensation product of eugenol and formaldehyde may be added to increase the depth of the anæsthetizing effect. Suitable proportions are 45 parts of zinc oxide, 15 parts of burnt alum, 15 parts of concentrated solution of zinc sulphate or other substance above-mentioned.

134,920. Mond, A., (International Precipitation Co.). Nov. 13, 1918.

Cements, Portland and Roman.—In the production of Portland cement sodium chloride or an alkaline earth (including magnesium) chloride is added to the mix or to the powdered fuel or both and the burning is effected in the usual manner to effect clinkering but not fusion. The mix may

consist of shale and limestone, with or without materials such as feldspar to increase the potassium content, and may be dry or wet ground. The fume is leached to extract the potassium chloride, the residue being returned to the next mix, and the solution is evaporated to crystallize the potassium chloride, the mother liquor being used as an addition to the next wet ground mix or for leaching the next lot of fume.

135,476. Bayer, E. C. Nov. 16, 1918, [Convention date].

Concretes.—Pumice stone is rendered suitable for use in the manufacture of a light concrete for ship-building &c. by crushing and heating to a temperature at which a superficial melting of the particles takes place and the outer pores become closed. The pumice may be heated before it is crushed.

136,075. Dale, D. April 16, 1919.

Concretes.—A concrete is made by mixing together cement, sand, water, and feathers, preferably in the proportions of 1 part of cement and 3 parts of sand, the feathers being added in small quantities at frequent intervals.

136,298. Robinson, F. J., and Damard Lacquer Co. Dec. 20, 1918.

Compositions containing phenol-aldehydes.—In the production of insoluble condensation products from phenol or its homologues and formaldehyde or its polymers in the presence of an alkaline accelerator, from 6 to 20 per cent (reckoned on the phenol used) of a vegetable fatty oil (castor, linseed, rape, cottonseed, &c.) or camphor oil is added, either to the initial mixture or after the first stage of the reaction; the product is finally hardened in the usual manner. The product so obtained is flexible when hot. Specifications 8875/05 and 2122/08, [both in Class 2, Acids and salts, Organic &c.], and 104,887, [Class 2 (iii), Dyes &c.], are referred to.

136,355. Scarlett, A. R. Jan. 28, 1919.

Compositions containing bituminous, resinous, and fatty or oily materials.—A cement consists of 50 parts of Swedish pitch, 24.5 parts of resin or colophony, 9.5 parts of cotton-seed oil or other oil or fat; 14 parts of paper pulp, paper, felt, hair, sand, or other filler, and two parts of calcic hydrate. It is particularly suitable for hermetically sealing bottles, jars, &c. Specification 114,527 is referred to.

136,478. Scott, W., Scott, W., and Scott, A. Jan. 17, 1919.

Compositions containing resinous, oily, &c. materials.—A mixture consisting of 4 oz. of resin, $1\frac{1}{4}$ gills of water, 1 oz. of Venice turpentine, $\frac{1}{4}$ gill of boiled linseed oil, 2 gills of gelatine, and six drops of nitric acid is used as a cement, for example for attaching leather covers to the metal rollers in textile machinery.

136,580. Jones, H. Sefton-, (White Heat Products Co.). March 18, 1918.

Stone, artificial, is prepared by mixing with glass a crystalline mineral body which has been subjected to a temperature exceeding 1500° F., and forming, pressing, and heating the mixture to fusion of the glass binder. The mineral body may be a natural substance such as silica, corundum, or a mixture of bauxite and rutile, or an artificial substance such as carborundum or alundum, and temporary binders such as silicate of soda, molasses, and stale beer may be used.

136,742. Millard, C. C., Robertson, R. A., and Cooper, C. J. March 28, 1919.

Compositions containing cement &c. and furnace clinker &c.—A composition for the manufacture of building-blocks and the like consists of 4 parts of clinker and/or furnace ashes of which an amount up to 1 part may be replaced by brick rubble, 1 part of burnt yellow clay, 1 part of Portland cement, all by volume, and 15 per cent of the above-mentioned 6 parts of a paste consisting of 1 volume of lime to 3 of water. The clinker, ashes, and clay are finely ground and mixed with the Portland cement, after which the lime paste is added, and sufficient water to render the composition moist, but not soft nor slimy. The blocks are moulded and air-dried.

136,818. Norske Aktieselskab for Elektrokemisk Industri Norsk Industri-Hypotekbank. Dec. 16, 1918, [Convention date].

Slag, treatment of.—Water, with or without steam or other gases, is poured or forced into or upon molten slag so as to form a foam sufficiently liquid to be poured into moulds in which it is cooled so as to form porous bricks or insulating material. The product may be crushed and used as a filling for walls and the like. In an example, slag is heated in an electric furnace to a temperature of 1400° C. and poured in a continuous stream into a container lined with refractory material through an inlet formed in the lower part of the container. Above this inlet, one or more tuyeres are provided, through which water is ad-

mitted, preferably under pressure, when the slag is on a level with or above the tuyeres. The water is added in a continuous stream and is intimately mixed by means of a rotary stirrer mounted in the container, the stirrer being so constructed as to prevent an accumulation of solid slag on the tuyeres. The supply of water is regulated so that the temperature of the foam will be about 1000° C. At this temperature, it is liquid and may be led through an overflow into moulds.

137,330. Smidth & Co., F. L. May 1, 1918, [Convention date].

Concretes.—Ground "moler" is sintered and mixed with Portland cement for the manufacture of a concrete adapted more particularly for the construction of floating structures, such as ships, or for ferro-concrete.

137,419. McMinn, S. A. Feb. 28, 1919.

Refractory substances containing clay or silica and glass.—A mixture containing 30 per cent or more of powdered glass together with fire-clay, such as Stourbridge or China clay, or a clay containing over 90 per cent of silica, is used as a glazing-cement for lining retorts or furnaces. A mixture of China-clay with silica clay and ground glass in equal proportions may be employed.

137,534. Smidth & Co., F. L. Jan. 8, 1919, [Convention date].

Compositions containing cement and siliceous earths &c.—"Moler," siliceous earth, diatomite or infusorial earth &c. is burnt and ground and added to Portland cement to produce a mortar. By the employment of burnt material, larger quantities, e.g. up to 50 per cent by weight of the whole, may be added to the cement, than heretofore.

138,477. Buckley, E. J. March 24, 1919.

Compositions containing oils.—Finely ground unburnt argillaceous matter is mixed with petroleum jelly or similar hydrocarbon in about the proportions of 10 to 4 for the manufacture of a permanently plastic body which may be made hard by firing. The product is particularly designed for modelling purposes. The following materials may, for example, be used as the base of the composition : (1) China or ball clay capable of

sintering under heat, (2) a mixture of ball clay, China clay, flint and stone, (3) a mixture of China clay, stone, felspar and bone, (4) Parian composed of felspar and China clay, and (5) a mixture of red clay and ball clay. A glaze and flux may be added.

138,605. Norton Co., (Assignees of Jeppson, G. N.). Feb. 1, 1919, [Convention date]. Drawings to Specification.

Stone, artificial and imitation.—A non-slipping and wear-resisting tread or tile for footways and floors is formed by embedding in a plastic cementitious base or foundation, chips composed of fused alumina or silicon carbide granules bonded by a vitrified ceramic material. The granules are of a hardness of 9 or more. The ceramic material may consist of 44 parts by weight of slip clay, 44 parts of feldspar, and 12 parts of ball clay; these materials are crushed and mixed dry with the crystalline granules, the mixture is damped, pressed into lumps, fired at about 1300° C. for 50 to 100 hours, then cooled slowly and crushed to chips varying in size from one inch to one-eighth of an inch. The face of the tread or tile may be coated with wax to fill the pores.

138,799. Gronroos, H. June 4, 1919.

Stone, artificial.—Nearly equal parts of porcelain or faience refuse, powdered pipe clay, and crushed glass are mixed together with a little water and poured into a mould the bottom of which is covered with crushed glass. Pressure of about 2850 lb. per square inch is applied, and the material is then exposed to a temperature of 900—1200° C. to produce an artificial stone or marble-like slab having a glazed surface. Variegated effects are produced by using glass of various colours.

139,147. Jaloustre, L. A., Kheifetz, Z., and Warchavsky, M. Sept. 23, 1919. Addition to 138,061, [Class 2 (iii), Dyes &c.]. No Patent granted (Sealing fee not paid).

Compositions containing phenol-aldehyde condensation products.—Soluble condensation products are first obtained from phenols and aldehydes by heating with alkali salicylates or ammonium sulphocyanide, and are then converted into insoluble products by adding an alkali cyanide and heating to 95—100° C. at atmospheric pressure. An example is given of the treatment of phenol and formaldehyde.

The Specification as open to inspection under Sect. 91 (3) (a) is not confined to the use of the condensing-agents or conditions mentioned above, and specifies also ammonium chloride as an agent for effecting the final condensation; it also states

that the products may be used in the manufacture of varnishes, enamels, plastic compositions, insulating-materials, combs, phonograph disks and cylinders, &c.; they may be mixed with cellulose esters, sugars, albumens, triacetin, tartaric esters, eugenol, camphor, colouring matters, &c. This subject-matter does not appear in the Specification as accepted.

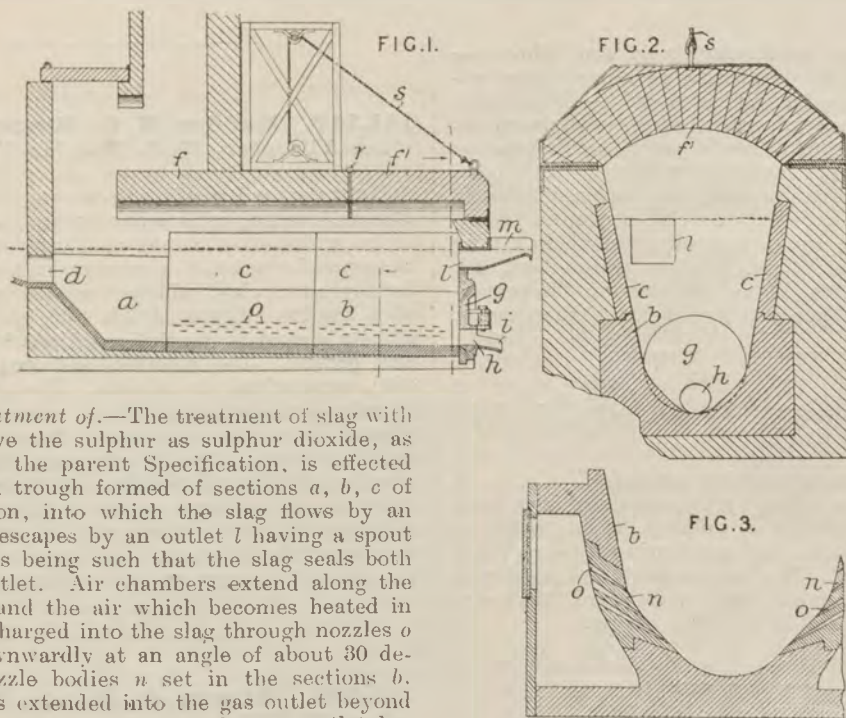
139,172. Diehl, L. H. Jan. 16, 1917, [*Convention date*].

Slags, treatment of.—Sulphur dioxide sufficiently concentrated for the production of sulphuric acid is obtained by oxidizing the sulphides in liquid blast-furnace slag by passing a limited amount of air or oxygenated air over or through the slag, or both, or by adding an oxidizing-agent such as calcium or magnesium sulphate to the slag, or by both adding such an agent and treating

with air. The oxidizing-agent may be preheated and may be used in molten condition. For this purpose, calcium sulphate may be fused with a small proportion of a flux such as sodium chloride or calcium fluoride. The treatment of the slag is such as not to cause solidification; for instance, the air may be blown through the slag, and the hot air arising therefrom may be passed over the slag as it runs along a covered channel in counter-current. The liberation of the sulphur dioxide may be facilitated by stirring or by blowing in heated air, but the quantity of air should not in any case be such as to yield a product containing less than 4 per cent of sulphur dioxide by volume. The slag may be treated in a slag-pan provided with a hood, dip-pipe, and gas outlet, or in one or several covered slag sumps disposed in the slag-run. The treated slag is suitable for the manufacture of slag cement, slag wool, &c.

Reference has been directed by the Comptroller to Specifications 11544/99 and 2405/08.

139,173. Diehl, L. H. Sept. 24, 1917, [*Convention date*]. *Addition to 139,172.*



Slags, treatment of.—The treatment of slag with air to remove the sulphur as sulphur dioxide, as described in the parent Specification, is effected in a covered trough formed of sections *a*, *b*, *c* of hematite iron, into which the slag flows by an inlet *d* and escapes by an outlet *l* having a spout *m*, the levels being such that the slag seals both inlet and outlet. Air chambers extend along the side walls, and the air which becomes heated in them is discharged into the slag through nozzles *o* directed downwardly at an angle of about 30 degrees in nozzle bodies *n* set in the sections *b*. The roof *f* is extended into the gas outlet beyond the blast openings to prevent the gas outlet becoming choked with sprayed slag. The forward section *f'* of the roof is hinged at *r* and can be raised by a rope *s*. A door *g* is provided in the

front wall having a tapping-hole *h* with a spout *i* through which crusts of slag may be cleared out.

139,315. British Thomson-Houston Co., (General Electric Co.). March 13, 1919.

Refractory substances containing rare earth oxides.—Oxides of rare-earth metals are used in place of some or all of the free silica in the manufacture of porcelain. Suitable oxides are those of

zirconium and titanium. Zircite cement, a compound containing about 81 per cent zirconia, 14 per cent silica, and small quantities of other oxides, may also be employed. A typical example contains 35 per cent feldspar, 45 per cent clay, and 15 per cent zirconia.

139,492. Fraser, W. M. Oct. 25, 1917, [Convention date].

Emulsified bituminous compositions.—Semi-liquid asphaltic residuum, such as the residue of Mexican, Venezuelan, or California petroleum remaining after the light oils have been removed, is emulsified with a watery solution of resin or resin oil soap, to produce a binding agent for stone, sand, or the like, or a coating for felts and fabrics. 74.5 gal. of residuum of Mexican petroleum and 43 gal. of a solution of resin oil soap are passed together through a pump, the mixture being circulated through the pump until the emulsion is complete. The emulsion does not separate into its components within thirty days, and when tested with a drop of fresh water, is stained a light brown colour.

140,431. Fabriks Aktiebolaget Kronsten, (Assignees of Eklund, T. A., and Lofveberg, C. G.). March 19, 1919, [Convention date].

Compositions containing marl and fibres.—Fresh-water marl consisting of almost pure calcium carbonate has added to it 1—15 per cent of cellulose free of incrustating substances, for example paper pulp, waste paper, &c. to produce an insulating or building material. The composition is mixed wet and may be used at once, or dried and ground. To obtain greater resistance to water, and to minimize shrinking during drying, cement, lime, plaster, water-glass, &c. may be added to the composition, in the proportions of 10—20 per cent by weight of the material.

140,781. Hager, F. A. April 11, 1918, [Convention date].

Compositions containing vulcanized oils.—A composition for filling tyres consists of soya bean oil, 24 lb.; chloride of sulphur, 6 lb.; oxide of magnesia, 17½ oz.; and a colouring-matter (Venezian red) 3 oz. The ingredients are mixed and poured into moulds, and, when hard, the composition is placed in the tyre casing.

140,874. Hoare, T. F. Feb. 12, 1919.

Slags, treatment of; stone, artificial.—Relates to the utilization of blast-furnace slag in the manufacture of bricks, blocks, tiles, slabs, door and window frames, baths, sinks, pipes, conduits, and other parts of workmen's dwellings, garages, bungalows, outbuildings &c., also electric insulators, electric main conduits, the bed plates of electric generators, kerbing, tanks &c. The slag is broken up, graded and filled into moulds, which are then filled with molten slag so as to bind the particles of graded slag together. The graded

slag may be heated and the molten slag may be mixed with from 10—15 per cent of silica, lime or other binding agent, and also metallic oxides for colouring purposes; or the metallic oxides may be applied to the inner faces of the moulds. The moulds may also be heated and gradually cooled for the purpose of annealing the product. Instead of using molten slag direct from the blast furnace, the moulds may be filled with the graded slag mixed or not with other materials such as soda ash, cryolite, crushed waste glass, iron silicate &c. having a lower melting point than the slag and afterwards heated to a temperature which is above the melting point of the slag. A mould having a double wall may be used, the space between the walls being filled with asbestos or other heat-insulating material. Or the graded slag may be placed in an inner mould surrounded by an outer mould into which the molten slag is poured while the inner mould is simultaneously removed, so that a layer of solid slag is formed around the mass of granulated slag; also molten slag may previously or simultaneously be poured among the granulated slag so as to bind the whole together.

141,113. Badder, H. C., Burrows, S. F., and Allender, H. L. P. Jan. 3, 1919.

Concretes and mortars; cements, Portland and Roman, treating after manufacture.—A substance to be added to concrete or mortar to render it waterproof consists of a mixture of a silicate, preferably burnt clay, which is soaked in a solution of a soluble silicate, dried, and ground, and a silicate soaked in a solution of a chloride, dried, and ground. The chloride preferred is that of zinc, magnesium, or calcium. The powders may be mixed in equal proportions; or there may be a greater proportion of the powder carrying the soluble silicate. 2½—10 per cent of a sulphate may be added to the powder. Aluminium silicate (clay) is the preferred carrier medium, but other silicates, such as pumice, may be employed. The amount of the substance used may be from 5—25 per cent of the cement in the concrete.

141,293. Heaton, A. H., and Dorrell, J. Nov. 17, 1919.

Compositions containing resinous and oily materials.—A paste for preserving and promoting adhesion in straps, belts and the like is composed of plaster of Paris, resin, and mineral oil. The oil is preferably thick cylinder oil, and a suitable composition consists of 14 parts plaster of Paris, 1½ parts resin, and 7 parts oil. A deodorizer, perfume, or colouring matter may be added.

141,351. Assié, E. Aug. 9, 1917, [Convention date].

Refractory substances containing aluminium oxide.—A refractory and abrasive product is made by heating bauxite with sufficient carbon to reduce all oxides other than alumina, and a proportion of chromium oxide. The mixture on fusion gives a slag chiefly consisting of alumina crystals joined together by a chromium oxide cement, and an iron alloy separable by hand or magnetically. The quantity of chromium oxide should be sufficient to enable the whole of the iron oxide to be reduced, but not so much as to produce a non-magnetic alloy.

141,390. Hoare, T. F. Feb. 1, 1919. *Drawings to Specification.*

Slags, treatment of.—Slags containing an excess of lime are run into a large receptacle and mixed with 10–15 per cent of silica prior to casting.

141,755. Villa, V. March 20, 1919, [Convention date].

Compositions containing vulcanized oils.—Artificial rubber to be forced under pressure into the air-tube of an ordinary pneumatic tyre consists of 5 parts mineral oil to 1 part protochloride of sulphur.

141,769. Henderson, G. A. Nov. 21, 1918. *Drawing to Specification.*

Compositions containing bituminous and calcareous and like materials.—Heated bitumen is mixed with dust which may be obtained in part from a scarified macadam road, and also with fine aggregate such as stone or wood particles which have been partially dried so that they contain from 10 to 15 per cent of residual moisture. The dust is colloiddally suspended in the bitumen. No specific proportions are stated. The composition may be moulded into blocks, for example, by the apparatus described in Specification 8341/12, [Class 70, India-rubber &c.], or it may be rolled into a scarified macadam road.

142,111. Fabriks Aktiebolaget Kronsten, (Assignees of Eklund, T. A., and Lofberg, C. G.). April 24, 1919, [Convention date]. *Addition to 140,431.*

Compositions containing marl and fibres.—In the composition described in the parent Specification, the cellulose free from incrustating substances is wholly or partly replaced by cellulose not free from "incrustating substances" such as

moss-litter, peat fibre, kelp, straw, chaff, hemp, flax, wood-pulp, and the like. A small quantity of fibre not containing cellulose, such as asbestos, slag-wool, cow-hair, may also be added.

142,416. Wright, W. G. Dec. 17, 1919.

Compositions containing vulcanized oils.—A tyre-filling which is moulded in cylindrical form and used to replace the ordinary inflated inner tube is formed by adding sulphur chloride (6 lb. 9 oz.) to a mixture of soya bean oil (25½ lb.), magnesia (2 lb.) and venetian red (5 oz.). The oil is cooled, before admixture, to 20–32° F. to moderate the reaction. The composition is poured into cylindrical moulds. To ensure uniform cooling, the moulds are provided with tubular metal cores which are withdrawn when the composition has set and the central space is filled with a fresh quantity of composition.

142,487. Bassmann, H. Nov. 30, 1917, [Convention date].

Concretes and mortars.—Highly resistant porous concrete pipes for drainage &c. purposes are made from a mixture of sharp-edged gravel or the like with cement and water, without sand, being stamped in moulds by means of tamping tools having knife-like or other pointed projections, such as are shown at B in Fig. 1, which penetrate the material, whereby the gravel particles are rearranged with their flat surfaces relatively superposed.



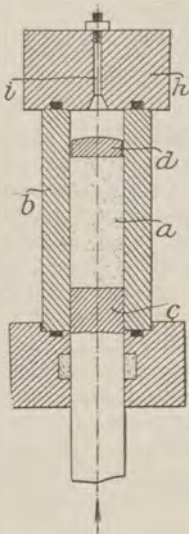
142,512. Dimitri, G. L., and Delaunay, J. E. Nov. 21, 1916, [Convention date].

Refractory substances containing magnesium silicates.—Natural magnesium silicates such as talc, steatite, are mixed in a powdered state with a flux consisting of natural or artificial multiple silicates such as feldspars, orthoclase, mica, pyroxene, or the like, or with rocks containing them, such as granite gneiss, porphyry or pegmatite without the addition of other materials. The mixture is prepared moist or in powder form, dried, shaped, and burnt at a temperature of about 1450° C. to produce refractory and electrical insulating-articles.

The Specification as open to inspection under Sect. 91 (3) (a) includes Briancon chalk as a suitable substitute for talc &c. This subject-matter does not appear in the Specification as accepted.

142,513. Dimitri, G. L., and Delaunay, J. E. July 16, 1918, [Convention date].

Refractory substances.—In a process for the production of refractory and insulating articles by the compression and subsequent baking of mixtures of powdered materials such as natural magnesium silicates and a silicate flux, the compression is effected in a vacuum. The Figure shows suitable apparatus for carrying out the process. Powdered material *a* is placed in a cylinder *b* with air-tight piston *c*, and a head *h* with passage *i* through which air can be exhausted. Placed above the powder is a loose-fitting washer *d* which prevents the powder from being drawn up the tube *i*.



142,721. British Thomson-Houston Co., (General Electric Co.). Aug. 19, 1919.

Refractory substances containing magnesia.—A refractory substance is formed of a mixture of magnesia which has been fused, crystallized, and crushed, and magnesia which has been heated to a lower temperature and will further shrink on heating, and which may be obtained by heating a magnesium compound such as magnesium carbonate or hydrate to about 700° C. A binding agent such as magnesium sulphate or chloride, or ferrous sulphate is added. The composition, moistened with water, is pressed into position as a furnace lining or moulded to form bricks, crucibles, &c., which are heated up slowly to decompose the binding agent, and ultimately to 1700–1900° C. or higher.

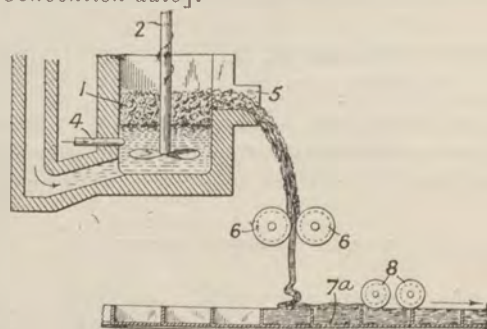
142,958. Bravin, G. A. March 1, 1919.

Concretes and mortars.—A concrete for making building blocks or slabs consists of cement (or lime) 1 measure, breeze or furnace residue, clinker, ashes, &c. 3 to 4 measures, lime (or lime putty) 1 measure, with or without wood sawdust $\frac{1}{2}$ –1 measure. To produce a dry powder, the breeze &c. and lime putty are ground together wet and then dried, and the resulting lumps are ground with the cement (or lime), with or without the sawdust. For immediate use, the breeze and lime putty are ground together wet, and the cement mixed with water is ground in. Preferably, the breeze and lime mixture is allowed to stand 2 or 3 days before grinding in the cement, or the wet concrete should be kept for a like period before use. Slabs &c. of the composition may be reinforced.

143,243. Wennerström, K. G. Feb. 10, 1919, [Convention date].

Slag cements.—Slag is melted in an electric furnace and the required amount of lime or limestone placed on the surface of the molten slag and melted by the heat imparted by the slag. Free lime is thus kept out of contact with the carbon electrodes and the formation of carbides prevented.

143,500. Norske Aktieselskab for Elektrokemisk Industri Norsk Industri-Hypotekbank. May 16, 1919, [Convention date].



Slags, treatment of.—Molten slag is converted into foam by blowing steam or other gas through it, and this foam is rapidly cooled to a temperature at which the slag is still plastic, but the porosity becomes stable, the resulting material being moulded into bricks or the like and allowed to solidify. In an example, a slag having the composition 50 per cent silica, 15 per cent alumina, 30 per cent lime, and 5 per cent magnesia is introduced into a vessel 1 provided with a stirrer 2, at a temperature of about 1400° C. Water or steam and other gas is introduced through an opening 4, and, on stirring, a foam is produced at a temperature of about 1000° C. which flows through a conduit 5 on to water-cooled rollers 6, whence it emerges as a ribbon at about 800° C., which falls into cast-iron moulds on a conveyor 7^a which moves in the direction of the arrow. Rollers 8 level the surface and remove any excess of foam. The foam may be further cooled by an air or like blast between the rollers 6 and the moulds. If objectionable gases are produced during the conversion into foam, the operation should be carried out in an oxidizing atmosphere. Specification 136,818 is referred to.

143,768. Bas, W. J. de. June 4, 1919, [Convention date].

Concretes; compositions containing plaster.—Micaceous iron ore is added to cement, lime, or plaster in a moist condition to produce a composition of pleasing appearance. Colouring-matter may also be added. The analysis of a suitable ore is given in the Specification. The amount of ore added may vary from one part ore to 10 parts cement &c., to one part ore to one part cement &c.

143,943. Motta, D., Rugiu, E., and Villain, A. Jan. 2, 1919.

Compositions containing chalk, silicate of magnesia, and gum.—A plastic composition for use as a printing-surface or stereotype matrix consists of carbonate of lime and silicate of magnesia in equal parts and an agglutinant of organic nature such as gum.

144,317. Walter, A. Aug. 13, 1917, [Convention date].

Rendering non-plastic materials plastic.—Small quantities of neutral or alkaline vegetable extracts are added with alkalies, to clay or kaolin masses, or non-plastic materials which are liquefied with difficulty by the addition of alkali alone. Neutral, water-soluble saponines or extracts of saponine-bearing plants such as seatwort, cook weed, sow breads, ivy, chestnut-capsules are especially suitable. Alkaline cellulose waste lyes and "cellular pitch" can also be used.

144,359. Denis, L. March 5, 1919.

Refractory substances containing silica &c.—A refractory substance suitable for use in surface combustion is made by burning a mixture of pure rich refractory earth containing 70—80 per cent of sand, magnesia, a poor light earth containing over 80 per cent of sand, and sawdust. Suitable proportions are 30 parts rich earth, 30 parts magnesia, 25 parts poor earth, and 5 parts of sawdust. The product is heated to at least the temperature it will be subjected to in use.

144,706. Schol, C. H. Feb. 15, 1918, [Convention date].

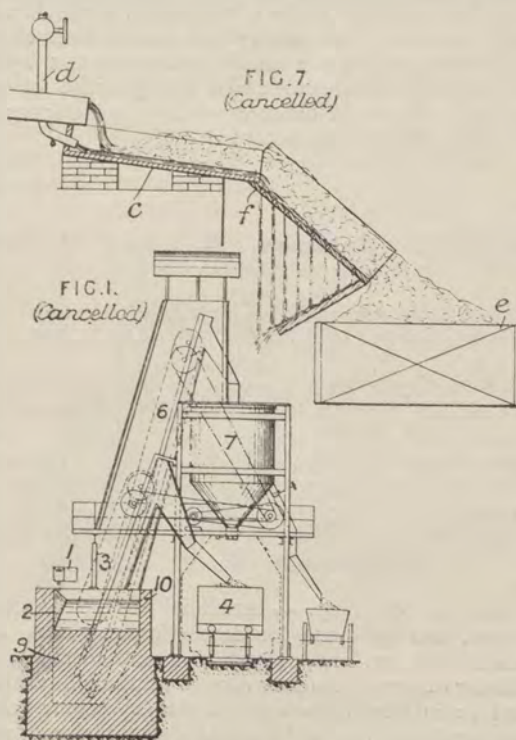
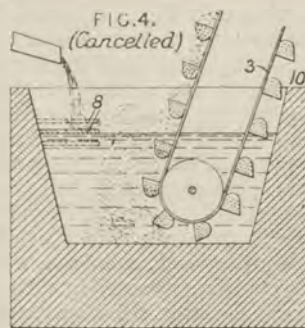
Artificial stone, hardening.—Artificial stone made from porous slag &c. of the type described in Specification 28642/12 is set and hardened by treatment with low-pressure steam which effects the preliminary set of the cement. The hardening may be completed in low or high pressure steam. The stones may also be set by exposing them to the air and subsequently hardened in high-pressure steam.

In the Specification as open to inspection under Sect. 91 (3) (a) the hardening process is applied also to artificial stone other than that made from porous slag &c. of the type above-mentioned. This subject-matter does not appear in the Specification as accepted.

145,026. Porzellanfabrik Kahla. Oct. 6, 1917, [Convention date].

Concretes &c.—A substance having a smaller coefficient of expansion than porcelain, e.g. quartz glass, is added to cement to produce a composition for cementing porcelain. Any known cement may be used such as Portland cement, magnesium cement, gypsum, or glue.

145,032. Schol, C. H. Aug. 29, 1914, [Convention date].

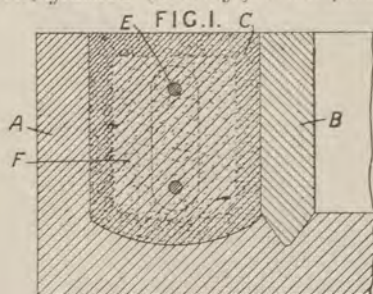


Slags, treatment of.—In the preparation of porous lumps of slag, the formation of a glassy surface to the lumps is prevented as far as possible by introducing the slag into heated water at as near the water level as possible.

The Specification as open to inspection under Sect. 91 (3) (a) describes several other methods, and also apparatus for effecting this object. As shown in Fig. 1 (Cancelled), molten slag is conveyed by a shoot 1 to an inclined or horizontal surface 2 which may form an extension of the shoot 1, situated at about the level of the water which is heated in a vessel 10. The slag swells up and floats on the surface of the water, from which it is immediately removed by an elevator 3, which dips slightly below the surface of the water, and delivered to trucks 4. Fine particles sink into a sump 9, whence they are removed by an elevator 6 into a silo 7. The shoot 1 may have two outlets opening respectively opposite the elevators 3, 6, so that by directing the slag to one or other

of these outlets, it may be converted at will into porous lumps or sand. Existing plant may be modified as shown in Fig. 4 (*Cancelled*) by placing a plate *s* at or near the surface of the water, on to which the slag falls, and from which it flows horizontally on to the surface of the water. In another method for producing the same result, the molten slag is allowed to flow over an inclined perforated surface, through the perforations of which steam passes upwards through the slag. In another method, shown in Fig. 7 (*Cancelled*), molten slag is led to a shoot *c* which widens towards its delivery end, and down which a stream of water flows from a pipe *d*. The heat of the slag vaporizes the water, which permeates the slag, and causes it to froth up. The lumps thus formed are delivered to trucks *e* by a shoot *f* which may be perforated to allow surplus water to drain away. If the shoot *f* has a small inclination it may be caused to vibrate to assist the passage of the lumps. This subject-matter does not appear in the Specification as accepted.

145,195. Johnson, R. April 15, 1919.
No Patent granted (Sealing fee not paid).



Stone, colouring. — Artificial-marble fenders, curbs, and ash-pans for domestic fire-places are made with an outer layer of parian cement or plaster of paris, an inner core of reinforced plaster, and an intermediate layer of plaster, colour being produced by the addition of dry powdered pigments. The mould *A*, which has a removable side *B*, is lined with a layer *C* of parian cement or plaster of paris in a moist state, which is veined by applying the pigment by dabbing or by means of a brush. The pigment is absorbed by the cement, and penetrates through it to the outside. The articles are then dried and polished.

145,569. Link, E. July 9, 1917, [*Convention date*].

Compositions containing blast furnace slag and silica.—Blast-furnace slag is mixed with burnt clays rich in silica such as brick-dust, clinker, chamotte, stones or other burnt clay, and the mixture is finely ground to produce a substance similar to trass for use in mortar. The proportions used are from one-half to two-thirds of slag to from one-half to one-third of burnt clay.

145,806. Sanders, L. A., and Sanders, A. J. April 26, 1916. *Addition to 102,042.*

Stone and cement, colouring and hardening.—The articles or plastering treated according to the process set out in the parent Specification are heated, for example by means of a Bunsen flame, in order to vary or develop the colour or metallic lustre. By local heating, designs may be produced.

Reference has been directed by the Comptroller to Specifications 1832/80, 16553/90, 11766/92, 8626/97, 24612/99, 7836/02, and 15753/05.

146,159. Redmanol Chemical Products Co., (Assignees of *Redman, L. F., Weith, A. J., and Brock, F. P.*). June 6, 1918, [*Convention date*].

Compositions containing phenol-aldehydes. — A moulded composition is prepared by mixing a fibrous filler such as asbestos, with a binding agent consisting of an anhydrous fusible phenol-aldehyde resin, a phenol, and a methylene substance such as hexamethylene-tetramine, in suitable proportions, moulding this mixture under pressure in the cold, or at a higher temperature for a brief period, and converting the product after removal from the mould, into the final hard infusible material by prolonged heat treatment. In the example, specified proportions of a fusible resin prepared in various ways from cresol and hexamethylenetetramine with or without formaldehyde or creosote oil, are mixed with cresol, hexamethylenetetramine, asbestos pulp and asbestos fibre, with or without solvents such as alcohol, acetone &c.; the mass is kneaded until homogeneous, then quickly pressed in a mould, and finally baked. Instead of asbestos, other fillers such as wood-pulp, mica, &c. may be used; a moulded product containing over 60 per cent of asbestos is flame proof.

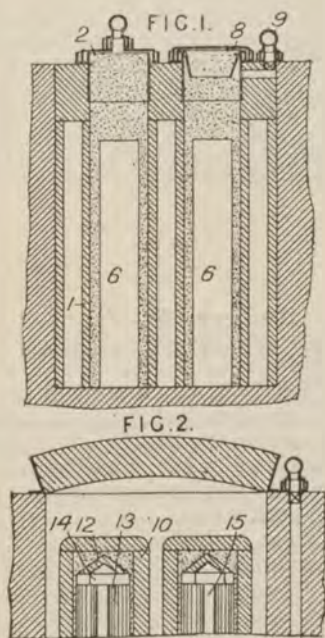
The Specification as open to inspection under Sect. 91 (3) (a) describes also a modification of the process in which the prepared phenolic resin is omitted, and the moulding mixture is compounded of hexamethylenetetramine, cresol, asbestos pulp and fibre, with or without addition of resins, asphalt, or pitch, dissolved in solvents. This subject-matter does not appear in the Specification as accepted.

Reference has been directed by the Comptroller to Specifications 9291/14, and 119,252 and 119,253, [both in Class 2 (iii), Dyes &c.].

146,269. Meiser, F. K. March 22, 1915, [*Convention date*]. *Void [Published under Sect. 91 of the Act].*

Refractory substances.—A process for the burning of electrodes, carbons, and like "tar-containing bodies" in "annular" or tunnel furnaces consists in "making the collecting-spaces for the tarry gases tight by means of powdered substances or liquid seals." In the "annular" furnace

shown in Fig. 1, the electrodes &c. 6 are contained in sagger or muffles 1, each having its own iron head-piece 2, and are surrounded by a "filling-powder" such as powdered coke, which prevents admission of air or combustion gases to the muffle. A sufficient depth of powder is filled in above the electrode to ensure protection even if the electrode should shrink during burning. Two forms of head-piece are shown, the one on the right-hand side having a funnel-shaped fitting 8, and a lateral outlet 9 for the gases evolved during burning. In a modification, Fig. 2, lidded recep-



tacles 10 are used, and a collecting-space 14 for the gases is formed by a cap 12 resting on the electrodes 13. The space above the cap is filled with powder and the gases escape downwards through pipes 15. In tunnel furnaces, the lower ends of pipes leading downwards from the muffles on the trucks are sealed in water troughs, which may be open-topped where the gases are easily condensed. If oxygen-containing gases should obtain admission to the muffles they are "rendered harmless by means of glowing coals in generators or ovens."

146,288. Weithaler, A. April 24, 1919, [Convention date].

Stone, colouring.—Thin slabs of artificial stone for facing blocks of stone &c. are made by subjecting thin layers of cement &c. to pressure while setting. Powdered metal may be applied to the face of the slab before pressing, or the surface may be covered in the same way with powdered graphite and afterwards electroplated. Other forms of ornamental surface can be produced in similar ways.

147,173. Filhol, J. June 26, 1919, [Convention date].

Compositions containing phenol-aldehyde condensation products.—In the production of insoluble infusible condensation products from phenols and formaldehyde or its polymers, the phenol is first condensed with the formaldehyde in the presence of ammonium carbonate or basic ammonium phenate, and the product is heated at 75–80° C. until its viscosity has considerably increased; it is then mixed with ethyl hydrogen sulphate dissolved in alcohol, and converted into the final product at ordinary or only slightly raised temperature.

The Specification as open to inspection under Sect. 91 (3) (a) states also that the product of the first stage of the process may be acetylated by treatment with acetic anhydride, and the acetylated product then treated with ethyl hydrogen sulphate; the acetylated products may be mixed with acetone solutions of cellulose acetate. This subject-matter does not appear in the Specification as accepted.

147,746. Bleriot, Ltd., (Assignees of Nadaud, J.) Nov. 8, 1917, [Convention date].

Refractory substances.—A composition for electric insulation, especially designed for use with electric heating and cooking apparatus, consists of carborundum with a solution of potassium or sodium silicate as a binding-medium, with or without the addition of washed sand, powdered quartz or glass. The mixture is slowly dried and then baked at a temperature of 400–500° C.

148,003. Henderson, G. A. April 30, 1919.

Vulcanized bituminous compositions.—Water, petroleum, and sulphur are added to bitumen, or bituminous compositions, and the mass is submitted to sufficient heat to dehydrate it and evaporate the added petroleum, with the simultaneous injection of chlorine. Several modifications are described. Bitumen or pitch is heated to above 212° F., 10–15 per cent of water is added, and about 10 per cent by volume of petroleum premixed with 10 per cent by weight of the bitumen &c. of sulphur is added to the mass during ebullition. The mass is agitated and heated under suction to evaporate the water and petroleum, and as much chlorine is simultaneously injected as will combine with the sulphur, (about 33 per cent of the sulphur). In a modification, sulphur is heated with bitumen, petroleum is added, and the mass is mixed with a moist vegetable or mineral aggregate. This is heated and agitated, and chlorine is injected as before. In a further

modification, chlorine is passed over heated sulphur to form sulphur chloride, which is mixed with petroleum and water, added to bitumen, and the mass is heated to dehydrate it and volatilize the petroleum. Specification 141,769 is referred to.

148,264. Soc. Coralex. July 19, 1919, [Convention date]. Void [Published under Sect. 91 of the Act].

Compositions containing phenol-aldehyde condensation products.—Purified phenolic resins are obtained from the crude condensation products of phenols and aldehydes by successive washing with hot water, dilute mineral acid, and cold water. The purified phenolic resins combine with bases, such as lime, baryta, iron oxide, &c. or with polyvalent alcohols such as glycerine, or with mixtures of bases and glycerine; the resulting products are hardened by heating to 100° C. Examples are given of mixtures of the purified resin with aluminium hydrate, or with glycerine and ferrous hydrate.

148,387. Norton Co., (Assignees of King, C. R.). July 5, 1917, [Convention date].

Compositions containing resinous materials.—Abrasive materials, such as aluminium oxide, and silicon carbide are bonded with a mixture of shellac and plaster-of-paris or like material. In an example the finished grinding wheel or other tool contains 3—20 per cent of plaster-of-paris and 12—30 per cent of shellac. The product is heated so as to melt the shellac and the whole may then be subjected to pressure and the wheel baked at a temperature of 300—350° F.

148,579. Sudfeldt & Co. March 14, 1919, [Convention date].

Composition containing organic sulphur derivatives.—A product which may be employed as a substitute for asphalt is obtained by precipitating with a small amount of common salt the solution or emulsion of the acid resins produced in refining mineral oils or tar oils with fuming sulphuric acid.

149,033. Kershaw, J. B. C. Oct. 11, 1919.

Stone, artificial.—Slag containing 40 per cent of silica and 15 per cent of lime and magnesia is obtained by burning refuse in a refuse destructor with lime-containing material such as limestone

chemical waste or road sweepings, 100 tons of refuse being mixed with 8 tons of limestone or its equivalent of lime-containing material before being charged into the destructor. Low grade carbonaceous material such as slack, coke breeze, peat or wood refuse may also be added to the refuse. The slag produced may be run from the destructor into moulds to form building-blocks and slabs or articles of any desired shape. Preferably the slag is run into a series of iron moulds formed by moulding-pieces placed on edge on the ground, the moulding-pieces having thickened ribs at the corners to strengthen them and leave air spaces between the adjacent sides when placed in rows. The slag may be treated in its molten condition with superheated steam by allowing a steam jet to play on the slag and thus reduce it to a fine amorphous powder ready for use in the mixing of cement or mortar. The slag may be also granulated by passing it into a jet of cold water.

149,120. Steiger, E. June 26, 1919.

Stone, hardening and preserving.—In the manufacture of tiles, flags, &c. from a mixture of cement and asbestos or other fibre, wherein carbon dioxide is caused to act on the tiles &c., a feature is made of having the tiles in the condition of not being saturated with water but containing more than 2 per cent thereof.

Reference has been directed by the Comptroller to Specification 23559/12.

149,319. Lilienfeld, L. Aug. 1, 1919, [Convention date].

Compositions containing modified oils.—Plastic and elastic compositions are obtained by mixing alkyl, or aralkyl ethers of cellulose, starch, dextrin or other carbohydrates having the empirical formula $(C_6H_{10}O_5)_n$ or of their derivatives or conversion products, with the viscous oily liquids prepared according to Specification 149,317, [Class 91, Oils &c.], obtained when acetylene reacts in the presence of aluminium chloride with the hydrocarbons occurring in tar oils and possessing a boiling point above 140° C. Mixing may be effected with or without the aid of a volatile solvent such as benzene, benzene-alcohol, carbon tetrachloride, chloroform, chloroform-alcohol, acetone, or acetone-alcohol; and to the mixture may be added other plastic substances or agglutinants such as cellulose nitrate, acetate or other esters, and other colloidizing or softening agents such as camphor, phosphoric esters of phenols, or animal and vegetable oils, as well as dyes, filling materials, and inorganic or organic pigments. The products obtained may be used as substitutes for india-rubber &c. and in the manufacture of artificial leather, films, photographic articles and

coatings, electric insulating material, and cements. In examples, a celluloid is prepared from a viscous liquid as above mentioned and a water-insoluble ethyl—or benzyl-cellulose or—starch, with or without the aid of a solvent for the ether; an artificial leather from a solution containing ethyl cellulose, the viscous liquid in question, and benzene or benzene-alcohol, the solution being applied in one or several layers to fabric or paper; an artificial leather by applying a mixture of ethyl—or benzyl-cellulose or—starch and the viscous liquid with or without a small proportion of solvent; and the last mentioned composition is also used for the insulation of cables &c. Specifications 6035/13 and 6387/13, [both in Class 2 (ii), Cellulose &c.], and 3370/14, [Class 70, India-rubber &c.], are referred to.

The Specification as open to inspection under Sect. 91 (3) (a) includes also the use of the aryl ethers of cellulose, &c. This subject-matter does not appear in the Specification as accepted.

149,440. Smith, W. May 13, 1919.

Refractory compositions containing clay and carbon.—In the production of articles capable of withstanding a temperature of 1700° C., from clay, the clay is heated together with a material containing volatile carbon compounds such as bituminous or oil shale with the exclusion of air, the excess carbon being thus left within the mass. Articles formed of clay and oil-shale are embedded in powdered coke or oil shale so that on burning, obstruction is offered to the escape of the gases. In a modification, articles are formed of clay and biscuit, and the biscuit is impregnated with liquid or gaseous carbon compounds and burnt without access to air. The temperature of firing may be between 700° C. and 1600° C.

149,789. Beatoon, J. A. May 26, 1919.
Drawings to Specification.

Concretes and mortars.—An insulating covering for floors, walls, bulkheads, and the like comprises a layer of agglomerated cork, covered with a metallic reinforcement to which is directly applied a facing of waterproof cement. The cork composition consists preferably of three cubic feet of cork of a quarter-inch grade, one cubic foot of cement, and one and a quarter pounds of granulated soda. A layer of this composition is covered with expanded metal or the like and a facing composed of 5 cubic feet of granite, 4 cubic feet of cement, and a gallon of a waterproofing-composition, such as that described in Specification 25833/08 and known as "Prufit" or "Ceresit," is applied directly to the reinforcement.

149,989. Boverouille, R. Aug. 7, 1919,
[Convention date].

Slag cements.—In making cement from slag by the cold process, lime dross, consisting of the residue of the lime which has passed through the grids beneath the kilns together with ashes of the fuel employed, is mixed with granulated slag.

150,116. Carborundum Co., (Hutchins, O.). June 18, 1919.

Stone, artificial and imitation.—A fused alumina for abrasive purposes, containing from 0.2 to 1.3 per cent of titanium oxide and less than 0.8 per cent each of iron oxide and silica is obtained by fusing in an electric furnace a mixture of aluminous material such as bauxite, clay, emery &c. with enough carbon to obtain a product containing 90 per cent of alumina, cooling, crushing, separating metallic particles, and again fusing the product with a small quantity of carbon sufficient to obtain the further reduction of impurities necessary to obtain the product of the above-stated composition. Instead of using for the second fusion the product obtained by the first described treatment, waste or dust from alumina which has been fused for abrasive purposes may be used, but in all cases carbon is employed in the final fusion. The product is used for abrasive purposes such as grinding wheels, and is preferably agglomerated by ceramic material. A suitable composition is abrasive grains 80 per cent, alabany clay or other fusible clay 14 per cent, stone ware clay 5 per cent, and feldspar 1 per cent. This mixture is burnt at 1350° C.

150,333. Krupp Akt.-Ges. Grusonwerk, F. Aug. 26, 1919, [Convention date].

Slags, treatment of.—Relates to a process for separating coke and incompletely burnt coal from the burnt out residues of boiler ash-pits, furnaces, &c. The non-combustible slag &c. possesses magnetic properties due to the presence of certain iron compounds such as pyrites &c. which are converted into protoxide or sesquioxide or peroxide of iron upon combustion and appear in the ashes as silicates by fusion with silica. Hence, by passing these ashes through a highly-concentrated magnetic field, the coal is recovered as a non-magnetic product and separated from the slag which contains the iron and is retained in the magnetic field.

151,016. John, H. May 16, 1918, [Convention date].

Compositions containing organic nitrogen derivatives.—Condensation products are obtained from aliphatic aldehydes, particularly formaldehyde, and urea, urea derivatives, or thiourea, by reaction of the components under application of heat in the absence of any condensing agent. Reaction for a short period gives a water-soluble product, which may be employed as an adhesive for cementing glass, metal, &c., or as a stopping for teeth; when dried it is insoluble. Reaction for a longer period gives a gelatinous elastic product insoluble in water or alcohol, which may be used as a rubber substitute. Heating this product to 80° C. gives a hard inert substance, which may be used as a substitute for ebonite, horn, or celluloid. Examples are given of the preparation of these several products from formaldehyde and urea, acetylurea, benzoylurea, or thiourea.

151,639. Barber Asphalt Paving Co., (Assignees of Wiederhold, H.). Jan. 2, 1915, [Convention date].

Compositions containing bituminous and siliceous materials.—Crushed quartz, granite, trap or other igneous rock, sand or clay composed of particles varying in size from dust to grit, is incorporated with melted asphaltum free from calcareous substances to form an anti-corrosive composition for lining tanks. In an example, 15–35 parts of asphaltum, 25–50 parts of rock &c. not coarser than $\frac{1}{10}$ in. and 30–45 parts of rock &c. between $\frac{1}{10}$ – $\frac{1}{4}$ in. are used.

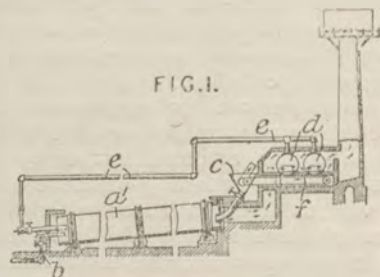
151,852. Honda, C. Nov. 15, 1919.

Compositions containing bituminous &c. materials &c., resins, &c.—A road-making or paving material applicable as an asphalt substitute is prepared by mixing tarry matter with common salt, and adding resin which has been saponified and sulphuretted by fusion with slaked lime and sulphur. Clay may be added.

152,106. Lesley, R. W. July 4, 1919.

Cements, Portland.—The hot waste gases from a rotary cement kiln *a*¹ are used to heat retorts *d* containing low-grade carboniferous material such as oil shale, lignite, low-grade bituminous or cannel coal &c. The volatile products from the retorts may be passed along a pipe *e* and burned in the kilns or may be used for other purposes, and the ash or residue is added to the calcareous or other ingredients and submitted to the clinkering process, the carbon in the residue forming a part

at least of the fuel required in the process. The ash or residue from the retorts is carried by a conveyer *f* to a hopper *c* to which the cement-



making materials are supplied, and the mixture is passed therefrom into the kilns. The kilns are heated initially by fuel supplied by a pipe *b*. Specification 11618/91 is referred to.

152,359. Jager, D. Oct. 14, 1919, [Convention date].

Figured artificial stone; concretes and mortars.—Artificial marble is produced by making several separate mixtures of different colours and consistency, superimposing the mixtures in layers, and stirring them together with or without shaking in such a manner as to avoid complete mixing. A dry mixture of 1 part Portland cement, $\frac{1}{2}$ part silver sand, and $\frac{1}{2}$ part pulverized marble is moistened with water to which is added colouring matter free from sulphuric acid to form a comparatively thick mortar. "Flame markings" are produced by mixing a similar composition of different colour with a larger proportion of water, and the composition for veins, with less water. These mixtures are superimposed, and turned over with a trowel or the like to mingle the colours. The mass is then shaken in moulds without compression, and after drying, the face layer is ground off. For reinforced concrete, the marble mass is placed in the mould, and while still moist, the moist reinforced concrete block &c. is superimposed.

152,384. Weller, A. W., and Bindley, W. T. Robinson. June 10, 1919

Compositions containing phenol-aldehyde condensation products.—The condensation of phenols with formaldehyde or its equivalents is effected in the presence of a very small proportion of nitrocellulose or cellulose acetate; the maximum amount of cellulose ester used is about 0.8 per cent reckoned on the phenol. The use of nitrocellulose renders the product odourless, while cellulose acetate also confers increased toughness. In an example, cresylic acid, formaldehyde, caustic soda, and cellulose acetate (0.00025 per cent) are employed; the liquid product is boiled down, baked at atmospheric pressure, and may be further treated in an autoclave.

152,389. Thörig, W. June 25, 1919. *Drawings to Specification.*

Concretes.—Reinforced concrete for safes is strengthened in known manner by the addition of metal dust or filings, glass, asbestos fibre, or zinc oxide.

152,642. Krupp Akt.-Ges. Grusonwerk, F. Oct. 11, 1919, [*Convention date*]. *Addition to 150,333.*

Slags, treatment of.—The slag obtained by the process described in the parent Specification is ground up and subjected again to the same treatment, whereby the fuel still enclosed in the slag is obtained as a non-magnetic material. The slag meal is used as building sand or it may be briquetted to form building stones.

152,780. Crossley, P. B. July 22, 1919.

Stone, artificial and imitation. — Non-fragile glass, which can be rolled, forged, extruded, cast, &c. is made by dissolving in the dry state such silicates as micaceous or asbestos minerals in molten glass, or similar silicate. The glass &c. is chosen so as to melt at a temperature below the temperature at which the mica &c. effloresce. If the product is to be machined, an excess of mica &c. should be present over the amount required to form a saturated solution.

152,857. Alexander, A. E., (*Foreign Willite Road Construction Co.*) Oct. 10, 1919.

Compositions containing bituminous and siliceous materials.—Sand, soil, stone, clay, or other finely-divided earthy matter is mixed preferably in vacuo with a mineral asphaltic binder, other than tar, which has been previously treated under heat with soluble mineral salts, other than chlorides, such as sulphates or selenates of aluminium, chromium, manganese, iron, indium, gallium, sodium, potassium, rubidium, caesium, ammonium, silver, gold, platinum or thallium, which temper or harden the binder. The binder is employed to the extent of 8—17 per cent of the mass. The product is used for road paving or as a base upon which the ordinary wearing-course may be laid, or the foundation and wearing courses may have the same composition and may be laid separately and connected whilst the composition of one course is in a highly heated condition so that the two will be united.

153,030. Boynton, C. W., and Wig, R. J. April 16, 1919.

Concretes and mortars.—A cellular product which is of low apparent specific gravity, a non-conductor of heat and electricity, free from laminations, and substantially impervious to water is obtained by reducing a suitable clay or shale to a uniform fine condition, and heating it in a dry plastic or slimy state under gradually increasing temperature until the mass softens and swells owing to the generation of gas from some of its constituents. A suitable clay contains silica 49 parts, alumina 21 parts, iron oxide 10 parts, carbon 2 parts, lime 4 parts, while a suitable shale contains silica 54 parts, alumina 25 parts, iron oxide 11 parts, carbon 2 parts, and negligible quantities of lime and magnesia. Generally, the clay or shale should be rich in metallic oxides, compounds of carbon, sulphur, sodium, potassium or the like, the nature and proportions of flux and gas generating ingredients being preferably such that the material softens at the same temperature as the gas is generated. Additions or subtractions may be made to ensure this. Excess of iron, lime, and magnesia should be avoided. The material is ground and may be used dry, or as slurry, or it may be made into a plastic mass and moulded, in which case it is advisable to preheat the articles to drive off superfluous water. The temperature of burning varies and may be as low as 1040° C. If the product is to be used for insulation or as an aggregate for concrete, oxidation of the surface during burning should be avoided. The product may be preformed into slabs, tiles or the like, or crushed and added to cement. The invention is distinguished from those in which clays, shales, slates, and the like are heated to produce porous masses.

153,089. Curtis, C. F., and Johns, W. July 29, 1919.

Compositions containing bituminous materials.—A composition made by melting the solid residue of coal-tar distillation after all separately valuable constituents have been removed with an approximately equal volume of coal-tar pitch, and adding a smaller quantity of an absorptive granular substance such as sawdust with or without a small proportion of short-fibred asbestos, is suitable for roofing, damp courses, and the like. In an example, 7 parts by weight of residue are melted and 5 parts of tar are stirred in. 3 parts by weight of wood dust are gradually added, and, if desired, 1 part of asbestos. The composition may be poured over the surface and trowelled, or it may be run out in sheet form and stored.

153,433. Ward, J. Sept. 25, 1919.

Concretes.—Artificial stone is made from a mixture of cement, Bath stone, and slag with a water-proofing-agent consisting of lime, fat, and an alkaline carbonate or bicarbonate, and with or without bitumen, for example, that described in Specification 17119/08.

153,884. Herrmann, H. Nov. 7, 1919, [Convention date].

Compositions containing resinous and oily materials.—Resin and a fatty oil such as linseed, poppy, castor or colza oil, are mixed with a refractory earth such as kaolin, an inert insulating substance such as mica, and an oxidizing agent such as zinc oxide. The mixture is maintained at a temperature of 250° C. for an hour, after which it can be moulded to form insulators.

153,942. Scobel, B. Aug. 5, 1919.

Compositions containing modified and oxidized oils.—Tung oil or Chinese wood oil is solidified by the action of haloid salts, particularly chlorides, uniformly disseminated through the oil. To secure this dissemination, the chlorides are first ground up with an indifferent oil, such as resin oil or linseed oil, or dissolved in an anhydrous organic solvent and the liquid produced mixed with the Tung oil. Suitable combinations of salts and solvents are anhydrous ferric chloride in anhydrous acetone, anhydrous aluminium chloride in anhydrous acetone, anhydrous stannic chloride in acetone, anhydrous zinc chloride in amyl acetate or alcohol, and antimony or bismuth chloride in acetone; the use of ferric bromide is also mentioned, and mixtures of various salts may be employed. Fuming chlorides, such as antimony chloride or stannic chloride, may be dissolved in benzine or the like and mixed with an indifferent oil and the mixture added to the Tung oil, or they may be changed into hydrated chlorides and dissolved in an hydrous solvent and used directly. Filling and colouring matters, fibrous or otherwise, may also be added, a number of suitable and unsuitable substances are mentioned. Resin gums, ester gums or other gums easily soluble in oil may be added to the Tung oil, as may Tung-oil fatty acids. Either raw or blown Tung oil may be employed, but oil that has been partly polymerized by heat is unsuitable.

154,152. Barrie, W. S., and Chadwick, L. May 27, 1918, [Convention date].

Compositions containing organic sulphur derivatives.—Pitch, tar, or other substance consisting mainly of aromatic hydrocarbons, and having a

specific gravity of not less than 1.1, is heated to 120° C.—180° C., and a powdered inorganic sulphate is stirred in to produce a cement for general building, road-making &c. purposes. The sulphates may be hydrated or anhydrous, chemically prepared or as found in nature, for example gypsum, anhydrite, alunite, barytes. The amount of sulphate added may vary between one and four volumes to one volume of tar &c. The powdered sulphate is added gradually with stirring, and the stirring is continued until foaming ceases. In a modification, the tar &c. and sulphate are placed in a vessel and heated between the same temperature limits under pressure. The cement is applied at the temperature above stated. The material may also be used as a binder for sand, gravel, broken stone, sawdust, or the like. A list of applications is given in the Specification.

154,236. Friedrich, K. March 27, 1918.

Asphalt.—A bituminous substance, such as asphaltum, free from oils boiling below 270° C., is oxidized by forming an emulsion with sodium carbonate solution and adding barium peroxide.

154,562. Soc. d'Etudes Chimiques pour l'Industrie. Nov. 25, 1919, [Convention date]. Addition to 151,597, [Class 2 (iii), Dyes &c.].

Cements, Portland, materials for.—The Specification as open to inspection under Sect. 91 (3) (a) states that the mixture of calcium carbonate and carbon, which remains from the decomposition of calcium cyanamide in aqueous suspension by carbon dioxide, may be used in the manufacture of Portland cement. This subject-matter does not appear in the Specification as accepted.

154,563. Soc. d'Etudes Chimiques pour l'Industrie. Nov. 25, 1919, [Convention date].

Cements, Portland, materials for.—The mixture of calcium carbonate and carbon, which remains from the decomposition of calcium cyanamide in aqueous suspension by carbon dioxide, may be used in the manufacture of Portland cement.

154,888. Hartner, F. Nov. 25, 1919, [Convention date].

Compositions containing calcium sulphate.—Anhydrite or anhydrite-bearing rock is converted into a self-setting cement by being ground in a ball-mill or similar apparatus to a powder having particles about 0.006 mm. in diameter.

155,124. Cox, G. H. Jan. 3, 1920.

Compositions containing gelatinous matter, gypsum, whiting, &c.—A grained coloured product resembling wood, ivory, &c., is made by applying layers of a coloured composition in a mould in combination with layers of paper, fabric, &c., the layers next the mould being worked by a graining tool. An example of a suitable composition contains 1 part of gum tragacanth, 3 parts of gum arabic, 60 parts of water, 2 parts of linseed meal, 4 parts of whiting, 2 parts of baked flour, and 32 parts of plaster of paris. Layers of canvas, wire netting or gauze or strips of metal or wood may be introduced between the layers of paper &c.

155,315. Cumpsty, J. H. June 20, 1919.
Drawings to Specification.

Refractory substances containing magnesia, soluble silicates.—A refractory furnace structure or lining is composed of a metal reinforcement set in a cement of magnesia and silicate of soda or

equivalent silicate binding material mixed, if desired, with lumps of old magnesite bricks or broken magnesite.

155,431. Baylor, H. D. Nov. 8, 1919.

Cements, Portland &c.; treating after manufacture.—Cement is rendered slow-setting, plastic, and waterproof by adding quick lime and sufficient water to hydrate the aluminates and the calcium oxide formed by the decomposition of the aluminates, and also the lime added, and incorporating an unsaponifiable oily or waxy material during the hydration, and grinding the mixture. During the reaction, the mixture is mechanically agitated. In an example, with 1620 lb. of cement is ground 200 lb. of quick-lime. Sufficient water is added to hydrate the added lime and to decompose and hydrate the aluminates in the cement. At the same time, 30 lb. of "slops," the residue of petroleum distillation or similar material, is added, and the mixture is stirred until a dry mass results. This is ground. Specification 158,390 is referred to.

APPENDIX

The following two abridgments should be added to those appearing in the volume of this Class for the period A.D. 1909-15.

A.D. 1914

5459. Regal, A. March 7, 1913, [*Convention date*]. Void [*Published under Sect. 91 of the Act*].

Compositions containing phenol-aldehydes.—Plastic masses, more particularly for insulating, are made by condensing phenol and formaldehyde in the presence of soluble salts which, during the condensation, produce mineral deposits which are at once absorbed as filling-substances by the condensate. The following is given as an example, namely, 2 parts of phenol, 1 part of formaldehyde, 0.2 parts of soda, and 0.5 to 1 part of waterglass. The reaction mass is heated with waterglass until

homogeneous, then preferably boiled with water and left to settle in cold water.

24,501. Garros, F. Dec. 22, 1913, [*Convention date*]. Void [*Published under Sect. 91 of the Act*].

Refractory substances containing carbon or other combustible substance are protected from rapid combustion by mixing with a vitrifiable material, e.g. porcelain paste, which forms an enamel covering on the article.

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ABRIDGMENTS OF SPECIFICATIONS

(A.)—Illustrated Abridgments classified in 146 volumes for each of nine consecutive periods, dealing completely with all Specifications published from 1855 to 1908. The price of each volume is 2s. per period, including inland postage. Postage to Colonies and foreign Countries extra.

List of Periods.

1855—1866.
1867—1876.
1877—1883.
1884—1888.
1889—1892.
1893—1896.
1897—1900.
1901—1904.
1905—1908.

List of Classes.

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. Fastenings, 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.
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- 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, Stopping 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 like 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).

1909—1915.
1916—1920.

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- 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, compressed-air, hot-air, and vacuum 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, stop ping, 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 organised 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 acces-sories 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 sani-tary appliances.
- 27, Coin-freed apparatus and the like.
- 28 (i), Bread-making, confectionery, and cooking-appliances.
- 28 (ii), Kitchen and like appliances other than cook-ing-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, concentrating, evaporating, and con-densing liquids.
- 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, (includ-ing Frictional and influence machines, mag-nets, 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 thar electro-magnetic and thermal.
- 38 (ii), Electric currents, Converting and transform-ing 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 electro-magnetic and thermal cut-outs, (other than Motor and like controllers).

LIST OF CLASSES

- 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 Electro-deposition and Electro-plating).
- 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 strong-rooms).
- 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 connexion therewith).
- 51 (ii), Furnaces and kilns for applying and utilizing heat of combustion, (other than Combustion apparatus and details in connexion 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, gas-producers, and retorts.
- 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.
- 59, 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).
- 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, 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 (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, 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, churning, 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, nautical, and astronomical instruments.
- 97 (iii), Thermometers, photometers, meteorological and mathematical instruments, and miscellaneous philosophical instruments.
- 98 (i), Photographic cameras and auxiliary appliances 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).

LIST OF CLASSES

- 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 liquid, 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.
- 110 (iii), Turbines and reaction-wheels.
- 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 manoeuvring.
- 115, Ships, boats, and rafts, Rigging, sails, and spars for, (*including* Boat raising, lowering, and disengaging gear).
- 116, Shop, public-house, and warehouse fittings and accessories.
- 117, Sifting and separating.
- 118 (i), Indicators and burglar and like alarms.
- 118 (ii), Signals, (*including* Marine signals).
- 119, Small-arms.
- 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 or adhesive materials.
- 122 (i), Engine and like cylinders, connecting-rods, cross-heads and guides, fly-wheels, 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 bottles, jars, and like 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 the 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 walking-sticks.
- 135, Valves and cocks.
- 136 (i), Velocipede, cycle, and like vehicle brakes, steering-mechanism, and miscellaneous accessories.
- 136 (ii), Velocipede, cycle, and like vehicle driving-mechanism, (*including* Hand and foot driving-mechanism for apparatus other than vehicles).
- 136 (iii), Velocipedes, cycles, and like vehicles, Kinds or types and structural details of.
- 137, Ventilation.
- 138 (i), Washing and cleaning buildings and domestic articles other than clothes.
- 138 (ii), Washing, mangle 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 papers and documents.
- 146 (ii), Stationery, wafers and seals, educational appliances, and ciphers and codes.
- 146 (iii), Writing-instruments, ink, receptacles for writing-materials, pads, and blotters.

FIFTY YEARS SUBJECT INDEX, 1861-1910.

A subject index of all complete specifications for the period 1861-1910 has now been published in 271 volumes corresponding to the new series of Illustrated Abridgment Classes (List B above). The classification is in accordance with the "Abridgment Class and Index Key," as amended up to date. 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.

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