

G. E. BEHRENS & J. VEIT.
 LAMINATED FIREPROOF MATERIAL.
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1,063,939.

Patented June 3, 1913.

Fig. 1.

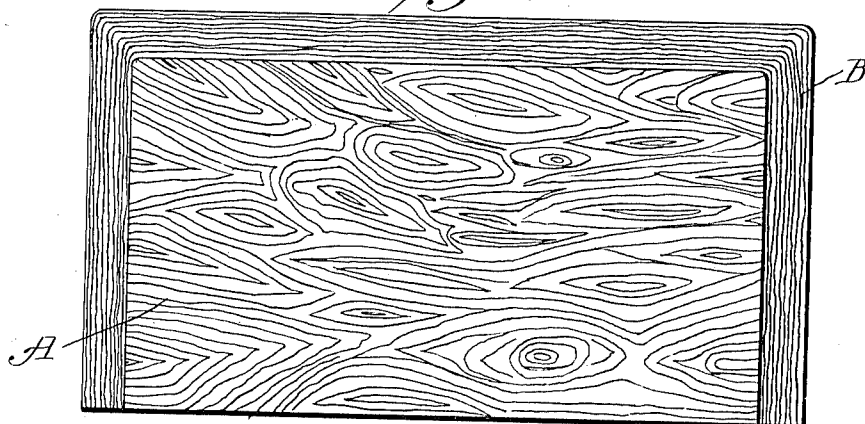


Fig. 2.

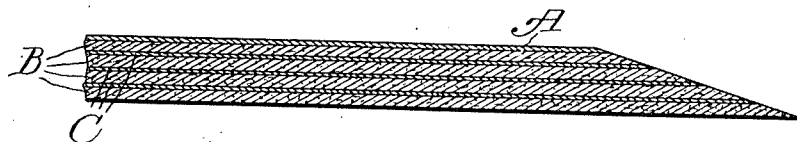
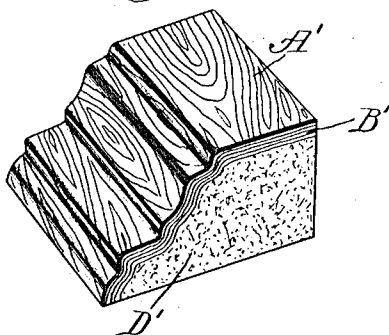


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE E. BEHRENS, OF IVORYTON, CONNECTICUT, AND JOSEF VEIT, OF NEW YORK, N. Y.

LAMINATED FIREPROOF MATERIAL.

1,063,939.

Specification of Letters Patent.

Patented June 3, 1913.

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To all whom it may concern:

Be it known that we, (1) GEORGE E. BEHRENS and (2) JOSEF VEIT, citizens of the United States, residing at (1) Ivoryton and (2) New York, in the counties of (1) Middlesex and (2) New York, and States of (1) Connecticut and (2) New York, have invented certain new and useful Improvements in Laminated Fireproof Material, of which the following is a specification.

This invention is a fire- and water-proof material simulating wood, capable of being cut and shaped by ordinary wood-working tools and especially suited for the interior trim of fireproof buildings. The material consists of superposed sheets of uncolored or colored asbestos paper, the surface of each sheet in some cases being grained to imitate wood, with interposed layers of a fireproof binder, which may also be colored, the product being either in flat sheets or corrugated, fluted, or molded into any desired contour. Where an especially light material is desired, burnt porous clay is mixed with the binder. A solid volatile material, such as naphthalene may also be mixed with the binder and evaporated in finishing the product, leaving cells in the binder-layers.

The binder essentially comprises: silicate of zinc; silicate of calcium, or magnesium; and fluorid of sodium. It is made by mixing: 1 part by weight of fluorid of calcium, or 1.64 parts of fluorid of magnesium; 3 parts of oxid of zinc; and 19 parts of a 40 per cent. aqueous solution of silicate of sodium. These constituents begin to react as soon as they are mixed, the fluorin leaving the calcium or magnesium and combining with the sodium to give insoluble fluorid of sodium, and the silica leaving the sodium and combining with the oxids of zinc and calcium, or magnesium, to produce their silicates. These silicates serve as an efficient binder while the fluorid of sodium acts as a filler.

We have found that the silicates of zinc and calcium or magnesium not only serve to coact in binding together the asbestos sheets, but that the presence of the zinc silicate, which is relatively soft and of comparatively tough consistency, modifies the hardness and brittleness which would result if silicate of calcium alone were used. As a result of the combination, a product is

produced which can be worked with tools like wood.

In manufacturing the product, asbestos paper of variable thickness, usually having a weight of about ten pounds per hundred square feet, is coated on one or both sides with the binder, a liquid mixture having the consistency of cream, for example by a brush or by running the web of paper from a roll through a trough containing the liquid binder. A number of the coated sheets, for example ten or twelve, are then superposed and the pile is compressed, preferably by hydraulic pressure. The platens of the press may be flat, or may be shaped to give the product such contours as are usual for interior woodwork. The compressed material is then dried, preferably *in vacuo*, and is ready for use. When it is shaped into hollow moldings, the back may be filled with any suitable light fireproof plastic composition such as a mixture of infusorial earth and oxychlorid of magnesium, plaster of Paris, or other quick-setting mixtures which can be worked by tools when set.

When it is desired that the product should have the appearance of wood, both superficially and at cut portions, the asbestos paper and binder may be colored to imitate the natural colors of the wood. Suitable colors which may be mixed with the binder are, for instance: For a yellow product, yellow ochre; for a red one, red chalk; for walnut, a mixture of burnt umber and Vandyke brown; and for black, gas lampblack. While the asbestos paper and binder may be given the same color, especially where surface graining or decorating only is important, it is in many cases preferable to give the binder a contrasting color, to imitate the natural wood grain. The surface of each of the superposed sheets may also be grained to imitate wood.

When a lighter material is desired, 3 parts of clay and 1 part of sawdust are mixed with water to give a plastic mass. This mixture is then finely granulated by rubbing it through a sieve of the required degree of fineness, and the granules are dried and burned on an open hearth, at a red heat, shrinking somewhat. From 2 to 25% by weight of the porous burnt clay granules are then mixed with the binder specified above, according to the lightness desired. The

binder may also be given lightness and porosity by mixing with it two or more per cent. by weight of granulated naphthalene, which is evaporated or distilled out during the final drying of the product, leaving pores or cells in the binder; and light infusorial earth may be used as a filler.

The term "alkaline-earth metal" in the claims is intended to include magnesium.

10 The applicants' invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan of a block of material having its edges beveled to show the grain-like appearance of the material when cut;

15 Fig. 2 is a cross-section, on an enlarged scale, on the plane 2—2 of Fig. 1; and Fig. 3 is a perspective view of a molding.

Referring to the drawings, A represents the upper surface of the block grained to have the appearance of a wood surface, B are the layers of asbestos paper and C are the layers of binding material between the asbestos sheets.

25 Fig. 3 shows the material pressed into the shape of a molding, A' representing the grained upper surface, B' the layers of asbestos and D' a filling of any suitable water-proof, fire-proof plastic composition of the character above described.

30 We claim:

1. As a new product, a rigid sheet comprising superposed and compacted sheets of asbestos paper with intermediate layers of a fireproof binder comprising silicon-oxygen compounds of zinc and an alkaline-earth metal.

2. As a new product, a rigid sheet comprising superposed and compacted sheets of asbestos paper with intermediate layers of a fireproof binder comprising oxysilicates of zinc and an alkaline-earth metal.

3. As a new product, superposed sheets of asbestos paper with intermediate layers of a fireproof binder comprising oxysilicates of zinc and calcium and sodium fluorid.

4. As a new product, superposed sheets of asbestos paper with intermediate layers of a fireproof binder comprising the reaction-products of zinc oxid, an alkaline-earth metal fluorid, and an alkali-metal silicate.

5. As a new product, superposed sheets of asbestos paper with intermediate layers of a fireproof binder comprising the reaction-products of zinc oxid, calcium fluorid and sodium silicate.

6. As a new product, a rigid sheet comprising superposed and compacted sheets of colored asbestos paper with interposed layers of a fireproof binder of contrasting color.

7. As a new product, a rigid sheet comprising a plurality of superposed and compacted sheets united by a binder, the surface of each sheet being colored and grained to imitate wood.

8. As a new product, superposed sheets of asbestos with interposed layers of a cellular binder.

9. As a new product, superposed sheets of asbestos with interposed layers of a cellular binder containing porous particles of burnt clay.

10. As a new product, the combination of a veneer of superposed and compacted sheets of asbestos paper with intermediate layers of a fireproof binder comprising silicon-oxygen compounds of zinc and an alkaline earth metal, and a fireproof backing.

11. As a new product, a molding consisting of a fluted or curved hollow veneer of superposed and compacted sheets of asbestos paper with intermediate layers of a fireproof binder comprising silicon-oxygen compounds of zinc and an alkaline-earth metal, and a fireproof backing.

12. As a new product, a solid, fire-proof, water-proof material comprising silicon-oxygen compounds of zinc and an alkaline-earth metal and sodium fluorid.

13. As a new product, a solid, fire-proof, water-proof material comprising the reaction-products of zinc oxid, the fluorid of an alkaline-earth metal and an alkaline metal silicate.

In testimony whereof, we affix our signatures in presence of two witnesses.

GEORGE E. BEHRENS.
JOSEF VEIT.

Witnesses:

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