United States Patent Office.

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IMPROVED FIBROUS-COMPOSITION SLAB AND PANEL FOR ROOFS, FLOORS, WALLS, TANKS, AND FOR OTHER PURPOSES.

The Schedule referred to in these Letters Patent and making part of the same.

To whom it may concern:

Be it known that I, ROBERT W. RUSSELL, of the city, county, and State of New York, have invented certain new and useful Improvements in Fibrous Composition and Fibrous Slabs and Panels for Roofs, Floors, Walls, Pavements, Tanks, and for other purposes; and I hereby declare the following to be a full, clear, and exact description of the same.

The nature of my invention consists in a new method of making and using the fibrous compositions and fibrous slabs and panels aforesaid, by more direct and simple means than heretofore employed, and by the use of a new and cheap fibre, viz, the cane of the cane-brakes, and other similar fibrous vegetable substances, disintegrated by Lyman's patent steam-gun, in combination with bituminous and other materials, as hereinafter mentioned.

First. To make slabs and panels of fibrous composition, without using sheets, or layers of felt or paper, and without reducing the fibre to pulp, I take the fibre made from the cane of the cane-brakes of the Carolinas, and other southern States, or other vegetable fibrous substance, disintegrated by the said steam-gun only, without the use of any chemicals, and without any maceration or rotting. I prefer, however, the cane-fibre. The fibre is twisted or spun into a single yarn, or strand, and several of these strands are twisted, interlaced, or intertwined together, so as to form a web-like, coarse matting; or the strands may be woven into a web. The web or matting is steeped in, or otherwise charged with a tarry or bituminous composition, or mastic or adhesive matter, with or without calcareous, mineral, earthy, or other similar substances, according to the purposes for which the material may be required. Thus, when roofing-material is required, bituminous mastic is used, or coal-tar, mixed with powdered slate, or coal-tar and cement, or other composition, water-proof and fire-proof, or water-proof only. For some purposes, it is preferable to use the alkaline silicate composition, hereinafter mentioned, or deodorized compositions of pitch, tar, bitumen, or asphaltum, as, for example, when wainscotting or panelling is required.

The fibrous matter, in combination with bitumen, bituminous composition, or mastic, may be hardened by shellac, softened by oil, made elastic by elastic gum, and made hard and dense by the addition of calcareous, mineral, earthy, and other similar matter, in the usual way, according to the uses and purposes required. Bitumen requires the addition of softening-matter, and coal-tar, the addition of matter to harden and make the fibrous composition sufficiently dense.

One or more of the coarse webs pressed hard, so as to consolidate the adhesive and other matter with the fibrous material, produce a solid slab, light, strong, and durable, and available for roofs, floors, inner and outer walls, paving, tanks, sewers, hulls and decks of vessels, and various other purposes. For some purposes a single thickness will suffice, *e. g.*, for pails, barrels, and tubs, and covering for walls, in lieu of lath and plaster; also, in many cases, for roofs.

The material can be prepared for transportation in the shape of fibrous slabs, of convenient size. I prefer the following method of covering a flat roof with the said fibrous slabs: The slabs made with rabbet-joints, or tongued and grooved, are nailed to the rafters, or sheathing-boards. These slabs are covered with another series of slabs, made in the same manner, and which are laid down so as to cover the joints of, and are fastened to the lower series with bituminous, mastic, or other composition, as aforesaid, the whole forming a light, strong, solid, water-tight roof, sufficiently fire-proof, also, when slate, cement, soapstone, plaster of Paris, or other similar substance, is mixed with the adhesive matter, and pressed into and amongst the fibres, as aforesaid. The same method may be applied to the making of water-tight floors and decks, and for other purposes. The slab, being stout and stiff, may, when required for a roof, be corrugated, whereby additional protection will be afforded against the leakage of water through the seams; and such roof may, in addition, have a covering of tin, zinc, or other metal or metallic composition, to fit into such corrugations, or to be applied to a flat surface.

For outer walls, the slabs, made to fit each other, as aforesaid, may be slid into grooves formed in the support-posts of the building, and fitted and cemented together so as to form a tight wall, without nails or screws. The slabs for outer walls may be corrugated to receive a covering of metal or metallic composition to be fitted to the same, or such metallic covering may be applied to a flat surface.

For street-pavements, the slabs may be moulded or pressed so as to present a corrugated, or grooved surface, or pins, knobs, or projecting cones, to fit into a metallic covering of such slabs, the surface of which may be corrugated, or grooved to fit the slabs. When the metallic surface preseuts pins, knobs, or cones, the spaces between them are filled with fibrous composition, as aforesaid, bituminous, mastic, or other suitable substance, and so as to make the surface of the metallic covering strong and sufficiently smooth. The slabs should be made of large size, and several inches thick, and fitting into each other, and riveted to the metallic covering, so as to make a good foundation when laid upon sand, gravel, or concrete.

By this method, a good, noiseless pavement is made, of firm and indestructible foundation, but not too hard and unyielding, and with such a surface as will prevent horses from slipping on it.

The slabs, made as aforesaid, or with a smooth surface, will serve as a good foundation for wooden pavements.

Second. The fibrous slabs and panels, for the pur-

poses aforesaid, may be made of the cane-fibre, the product of said steam-blowing process, without spinning it into strands and forming webs, as aforesaid. The steam-blown cane-fibre is immersed in, or otherwise charged with or mixed with bitumen, or other adhesive composition, as aforesaid, varying according to the uses and purposes to which it is to be applied. It is then pressed or rolled into panels or slabs, or formed in moulds or dies, into any desired form or shape. The matting-strands, or web aforesaid, with the blended composition, may also be pressed or formed in like manner.

The said cane-fibre, disintegrated as aforesaid, is especially adapted for said purposes, as it does not require any chemical treatment, is divested of silicious coating, is well disintegrated, and is very absorbent, and, therefore, well suited for forming the basis of the bituminous and other compounds, &c., as aforesaid, and also being cheap enough to warrant the free use of it for making fibrous-composition slabs of considerable thickness.

The alkaline silicate composition aforesaid is used to mix with the said fibre, or to fasten the sheets of fibre together, as aforesaid, when the fibrous-composition slabs, or panels are required for fire-proof floors, and for fire-proof linings of railway-cars, and cabins of steamboats and other vessels, and for other similar purposes.

Third. To make thin panels, slabs, wainscotting, and light mouldings of the disintegrated fibre, I take sheets or layers of felt, or paper, or pulped material, or other or fibrous matter made from cane, or other fibrous vegetable substance, disintegrated as aforesaid. The said fibrous material is mixed with clay, lime, gypsum, chalk, or other similar matter, and such mixing may be effected in the paper-maker's beating-engine. The sheets, or layers of felt, or paper are fastened together with alkaline silicate, either alone or mixed with soapstone, chalk, gypsum, or by or with any suitable adhesive matter, or composition, as aforesaid, preferably with a composition of deodorized pitch, tar, bitumen, or asphaltum, so as to make a solid fibrous panel, which should be of convenient size for transportation. These slabs or panels may be pressed or moulded into any desired shape or form. In like manner, sheets and mouldings may be made of the said fibre reduced to pulp, or fine fibre, and mixed or combined, as aforesaid, with other materials, as aforesaid, without any paper-making machinery.

The panels may be made with rabbet-joints, or tongued and grooved, so as to fit well together, and fastened on the wall or ceiling, when used as a substitute for lath and plaster. When the fibrous panel is made with alkaline silicate, it is advantageous to give both sides of the panel a coating of lime, varnish, paint, or size. A covering of wall-paper adds to the beauty and finish of this substitute for lath and plaster. The fibrous-composition panels are cheaper than lath and plaster, and do not warp, crack, peel, crumble, or decay, and they are bad conductors of heat and cold.

Having now described my invention, and the manner in which the same is or may be carried into effect,

What I claim, and desire to secure by Letters Patent, is—

1. The making and using of the said fibrous-composition slabs and panels for roofs, walls, pavements, &c., and for other suitable purposes, as and by the means aforesaid, and especially by the employment, in combination with other ingredients, as aforesaid, of the disintegrated cane-fibre, in the condition in which it is expelled from the said steam-gun, without the use of any chemicals to further disintegrate the same, and without reducing it to pulp, or making it into sheets of felt or paper, such process and new manufacture being substantially as hereinbefore specified.

2. The manufacture of said fibrous silicate composition-panels, or boards for ceilings and inner walls of houses, in lieu of lath and plaster, and for fire-proof floors and linings of railway-carriages, and cabins, floors, and decks of vessels, and for other purposes, substantially as above described.

3. The new articles of manufacture, the said fibrous-composition slabs and panels, made by the said processes, and for the purposes hereinbefore described.

In testimony whereof, I have signed my name to this specification, before two subscribing witnesses.

R. W. RUSSELL.

Witnesses:

M. BAILEY,

H. E. BAILLIERE.