(No Model.) 2 Sheets—Sheet 1.

J. WHITELEY.

TREAD, STEP, MAT, MATTING, &c

No. 344,703. Patented June 29, 1886.

FIG. 1

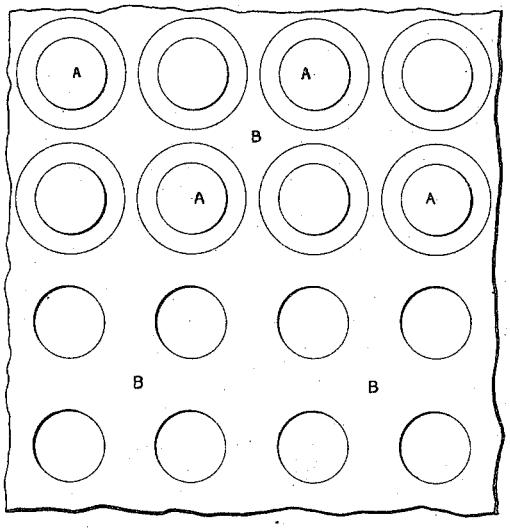


FIG. 2 FIG. 3 FIG. 4

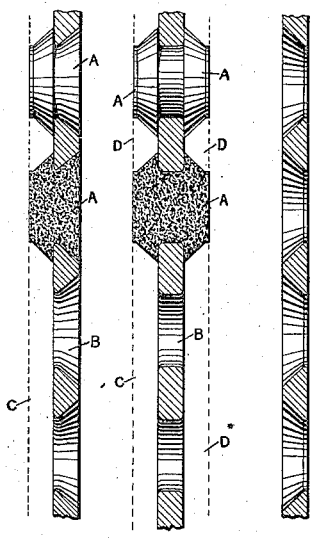


FIG. 5

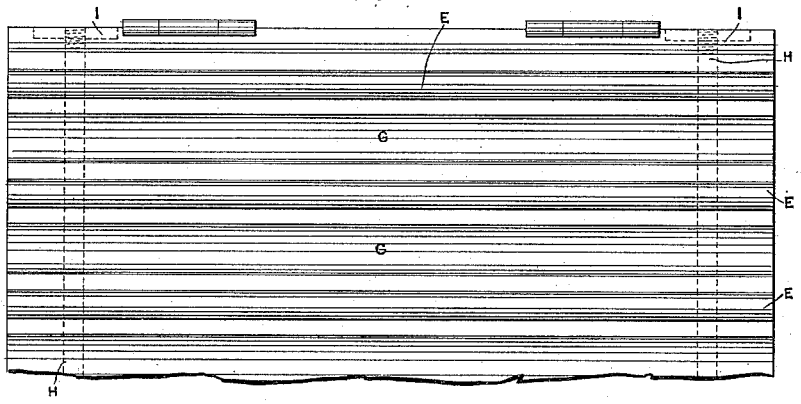
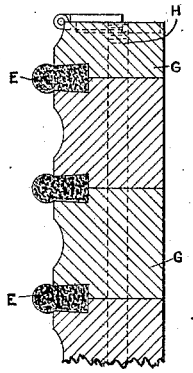
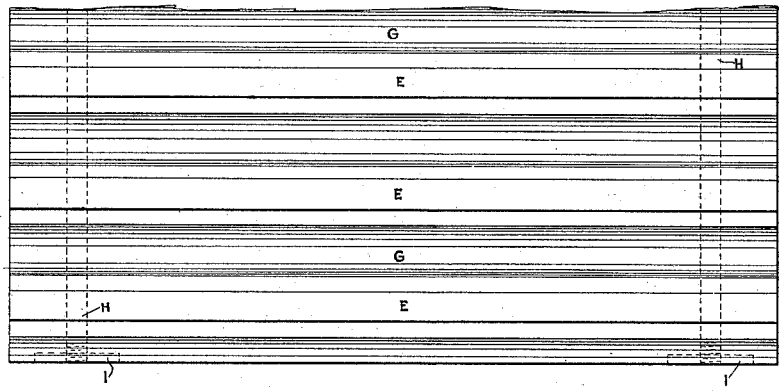
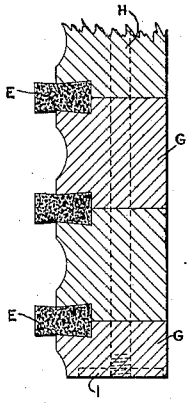


FIG. 6







Witnesses
R. S. Ferguson
Walter P. Dodge

Inventor:
Joseph Whiteley,
by Dodger Sons
Associate Atty

(No Model.) 2 Sheets—Sheet 2.

J. WHITELEY.

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FIG. 7

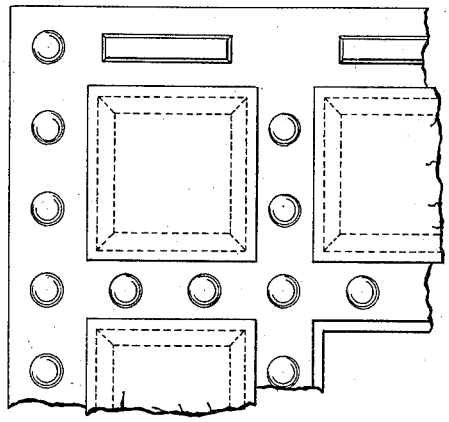


FIG. 8

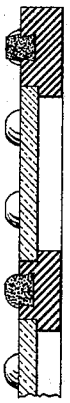
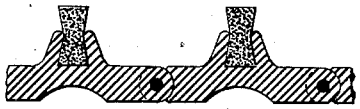


FIG. 9



Witnesses

R. S. Ferguson

Walter P. Dodge

Inventor:

Joseph Whiteley,

by Dodger & Son,

Associate Attys.

UNITED STATES PATENT OFFICE.

JOSEPH WHITELEY, OF SALFORD, COUNTY OF LANCASTER, ENGLAND.

TREAD, STEP, MAT, MATTING, &c.

SPECIFICATION forming part of Letters Patent No. 344,703, dated June 29, 1886.

Application filed February 9, 1886. Serial No. 191,342. (No model.) Patented in England June 19, 1884, No. 9,207, and October 11, 1884, No. 13,457; in France June 6, 1885, No. 169,405, and in Belgium June 6, 1885, No. 69,181.

To all whom it may concern:

Be it known that I, JOSEPH WHITELEY, a subject of the Queen of Great Britain, residing at Salford, in the county of Lancaster, England, have invented certain new and useful Improvements in Treads, Steps, Mats, Mattings, Floorings, and other Wearing-Surfaces, (for which I have received Letters Patent in England, dated June 19, 1884, No. 9,207, and October 11, 1884, No. 13,457; in France by Letters Patent dated June 6, 1885, No. 169,405, and in Belgium by Letters Patent dated June 6, 1885, No. 69,181,) of which the following is a specification.

This invention has for its object the manufacture of mats, mattings, treads, and the like of a combination of india-rubber and metal, wood, or other material.

The india-rubber mats, treads, or mattings at present in use are divided into three types:

First, unperforated or perforated mats of solid india-rubber. These are expensive and crack in time at the corners, being unsupported by other material.

Second, metallic bars sheathed in rubber tubing. These are heavy and cumbrous, and the rubber is apt to get torn off the bars unless very thick.

Third, mosaic composed of alternate bars or pieces of rubber and wood set in a frame or otherwise. This requires a very considerable depth to prevent the rubber being pulled out, and is therefore costly, and unless well bound together is apt to come to pieces.

Now, by my invention the rubber is dovetailed into the wood or metal in such manner as not to be extractable by any amount of rubbing or scraping; also, the maximum amount of india-rubber is available for rubbing or tread purposes, and the minimum used for the purpose of holding it in place, and, lastly, the rubber is so well supported by cheaper and more rigid backing material that there is little or no liability for it to break off in pieces or crack. Any tough hard material not liable to decomposition can be used for backing. I prefer as cheapest and most suitable wood, iron, brass, or zinc.

Figures 1 and 2 show a portion of a mat or floor-covering of metal and rubber. In these Fig. 1 is a plan view; Fig. 2, a section showing method of construction; Fig. 3, similar section, but showing arrangement when the mat or floor-covering is reversible. In these A is the india-rubber; B is the metal plate, which can, if desired, be made with a nosing for stair-treads, or flat, of any shape to suit its application. The mode of manufacture I prefer in this case is as follows: The metal plate B is made with dovetailed taper, beveled, or recessed holes or spaces of any desired shape, and forms the permanent support for the tread-mat or floor-covering. Over this plate B, I place temporarily the plates or molds, (shown in dotted lines at C, and in full lines in Fig. 4,) and, if the article be required to be reversible, plates D, also. These latter plates, tapered or beveled, have holes or spaces of any required shape, corresponding in position and opposite to the holes or spaces in the plate B. I now fill in these holes or spaces with masticated or soft plastic india-rubber dough, suitably prepared for vulcanizing, and in plugs or strips of the size required to fill in both or all three plates, as the case may be. The plates, with the india-rubber in, are now placed in the vulcanizing press, pan, or stove, and are vulcanized to the required point. The plate C or plates C and D are then removed, (and are available for subsequent continuous use,) leaving the india-rubber projecting and forming the permanent tread, mat, or other wearing-surface in the plate B. The india-rubber, being dovetailed or reversed in this way and vulcanized in place, cannot come out with ordinary wear. Of course vulcanized blocks or strips of india-rubber could be pressed into the holes or flanged recesses in metal plates; but this is a more troublesome operation and not nearly so secure; also, the vulcanization cannot in this latter case be carried quite to the best degree of hardness—namely, tolerably hard—but still impressionable and elastic, so that when pressed a little out of shape it shall at once regain it on the pressure being removed.

Figs. 7 and 8 show a street, cellar, or deck-light frame supplied with india-rubber blocks in this way. These prevent the feet slipping on the iron or iron and glass, as the india-rubber is very tenacious, and being raised above the glass keeps the weight off the latter. Carriage and omnibus steps and many other sur-

faces can be made non-slippery in this way. In both these last cases it is immaterial what shape the india-rubber is. I prefer to make it round in horizontal contour, as the holes are easily bored and countersunk; but, as shown in Fig. 7, some or all of the india-rubber pieces can be put in in long strips.

In the foregoing description the metallic plates may be made as gratings, allowing the dirt to fall through intervening spaces between the rows.

Figs. 5 and 6 show my invention used with wooden instead of metallic backing. In this, as the wood would char, warp, or be injured if put in the vulcanizing-oven, I prefer to make the rubber in long strips of dovetail section by putting a mouth-piece of the required section to the masticating-machine. These strips E are vulcanized, and then placed in the dovetail spaces between the wooden strips G. The latter are cut to the required size and section and molded by machinery, having the dovetail or recess prepared in the sides of each strip G. These strips are bored for the bolts H, upon which bulk they are threaded. I then insert the strips E of vulcanized india-rubber. The whole is then clamped together, and the bolts H, secured by the nuts I, bind the mat, matting, or floor-covering firmly and securely together. The projecting surfaces of the strips E prevent any wear or injury to the surface of the supporting-strips of wood G. It is obvious that at any time the worn or damaged strips E can be easily and cheaply renewed. The under side of the mat, matting, or floor-covering can be polished, so that by turning it over an elastic and polished floor is obtained for dancing or similar purposes.

I do not claim in this application the matting or floor-covering shown in Figs. 5, 6, and 9, as the same will form the subject-matter of another application, hereafter to be filed.

I claim as my invention—

1. As a new article of manufacture, a reversible mat or floor-covering consisting of a perforated plate and rubber plugs filling the perforations in said plate and projecting from each side thereof.

2. A mat, tread, or matting formed of a metallic plate, B, with rubber pieces A projecting through holes in said plate, and of larger width above and below the narrowest sections of the holes, whereby a reversible mat is formed, with rubber held from coming out on either side.

3. A mat, floor-covering, or tread formed of a metallic ground-work and projections of india-rubber pressed soft into said ground-work and vulcanized therein.

4. The method of forming mats, floor-coverings, or treads, which consists in covering the metal frame-work with a metallic plate having holes corresponding in shape to the required shape of the rubber projections to be formed, and placed opposite the holes in the frame-work, filling said holes in both the frame-work and the covering-plate with masticated rubber, and vulcanizing the same in position.

5. In combination with a metallic or other tread-surface likely to prove slippery, a series of rubber projections having shanks forced into dovetail holes in the body of the said metallic or other surface, the lateral thickness of the rubber above and below the said surface being greater than the diameter of the hole at that surface.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH WHITELEY.

Witnesses:

ALFRED GILES,

W. P. THOMPSON.