No. 844,409. PATENTED FEB. 19, 1907.

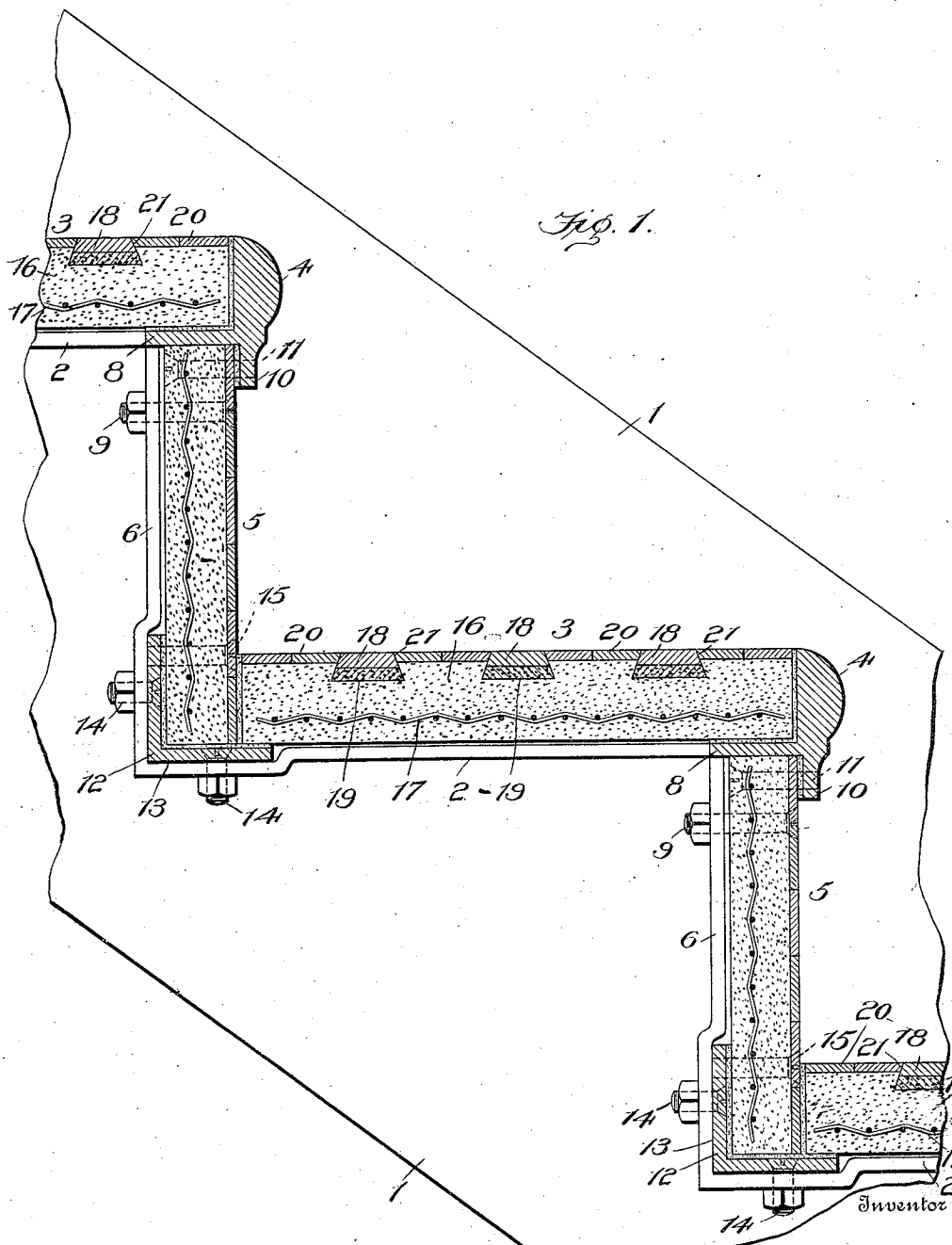
E. E. SCHACHNER.

CONSTRUCTION OF STEPS FOR STAIRCASES.

APPLICATION FILED NOV. 27, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Edwin L. Bradford
Madge E. Wells

Inventor
Edward Edgurd Schachner

By
Attorneys

No. 844,409. PATENTED FEB. 19, 1907.

E. E. SCHACHNER.

CONSTRUCTION OF STEPS FOR STAIRCASES.

APPLICATION FILED NOV. 27, 1906.

2 SHEETS—SHEET 2.

Fig. 2.

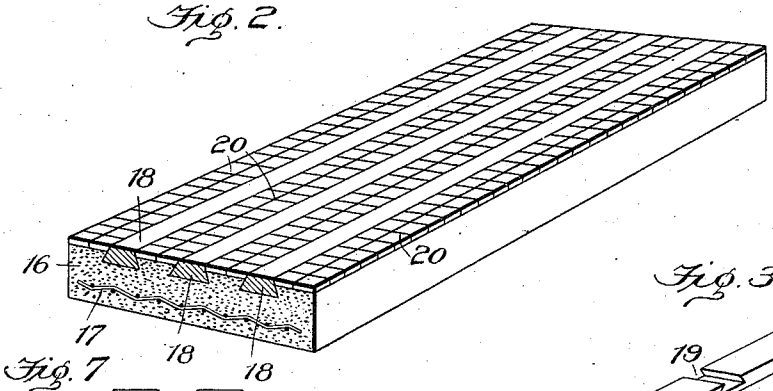


Fig. 3.

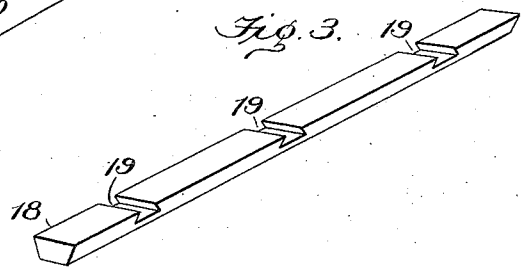


Fig. 7

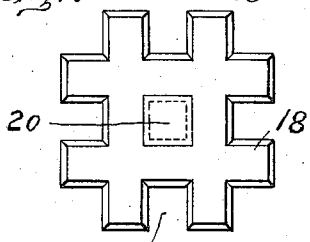


Fig. 4.

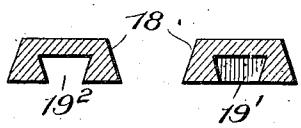


Fig. 5.

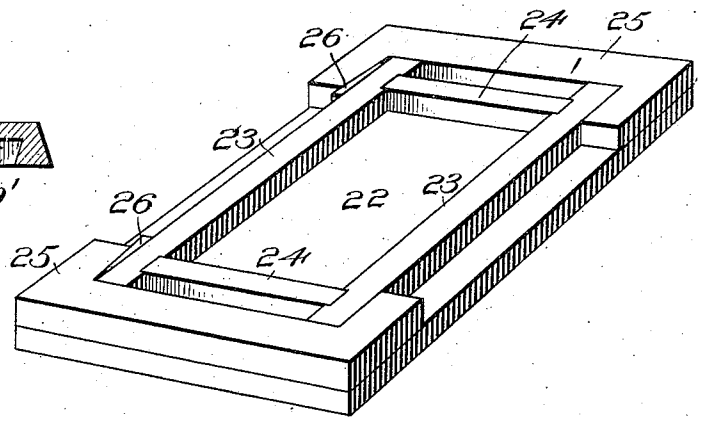
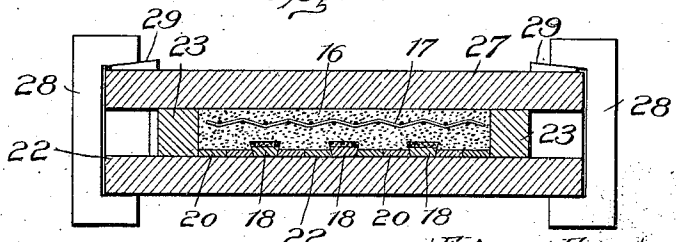


Fig. 6.



Witnesses

Edwin L. Bradford

Madge C. Wells.

Inventor

By Edward Edmund Schachner

Johnson & Johnson

Attorneys

UNITED STATES PATENT OFFICE.

EDWARD EDMUND SCHACHNER, OF DENVER, COLORADO.

CONSTRUCTION OF STEPS FOR STAIRCASES.

No. 844,409. Specification of Letters Patent. Patented Feb. 19, 1907.

Application filed November 27, 1906. Serial No. 345,278.

To all whom it may concern:

Be it known that I, EDWARD EDMUND SCHACHNER, a citizen of the United States, residing at city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Construction of Step for Staircases; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is directed to the production of a non-slipping stair-tread on a reinforced molded concrete step.

A feature of my improvement resides in the molding of a stair-step of concrete with assembled bars or blocks of lead embedded in the tread-surface in the operation of molding the step, whereby to form a non-slipping tread-surface, and by the embedded relation of the lead bodies to impart a reinforcing function to the concrete step. In such a stair-step I have combined with the assembled bodies of lead embedded in the concrete rows of encaustic tile supported upon the side walls of said bar or blocks and cemented thereto and providing thereby a cheap, durable, and ornamented and non-slipping stair-step.

Referring to the accompanying drawings, Figure 1 represents in vertical section so much of a stair structure as illustrates my improvement of a non-slipping stair-step surface on a reinforced concrete molded step. Fig. 2 shows the non-slipping molded reinforced concrete step in perspective. Fig. 3 shows a perspective view of the under side of one of the lead bars of the non-slipping step. Fig. 4 are cross-sections of lead bars having different forms of recesses on the under sides. Fig. 5 shows perspective a frame for molding the non-slipping concrete step. Fig. 6 is a cross-section of the frame, showing the concrete step molded therein. Fig. 7 shows a different form of lead bodies having an inlaying of tiles.

The stair structure shown in the drawings is of the skeleton fireproof construction, and it is only deemed necessary to particularly describe such parts as are necessary elements of the step-supporting structure and in which the metallic stringers 1 are provided with ledges or flanges 2 on their inner walls, on which the concrete steps 3 are seated in relation to an angular nose-casting 4 and the risers 5, which may also be of reinforced concrete and are secured to ribs or flanges 6, cast on the inner walls of the stringers and which form vertical extensions of the step-supporting ledges. The step-supporting ledge preferably terminates at the inner side of the upper end of the riser-supporting flange, while the latter terminates on a plane with the under side of the step-supporting ledge, and this construction provides for the proper seating of a separate angle nose-casting 4, which is formed with a horizontal plate extension 8, by which the nose-casting is seated and supported upon the upper end of the vertical flange and upon the upper end of the riser in the plane of the step-supporting ledge, whereby the nose is caused to give a firm support to the front end of the concrete step.

The upper end of the riser is secured to the vertical flange by a machine-screw 9, passing through the concrete and through an opening in the vertical flange and nutted on the inner side thereof, while an extension 10 of the nose depends in front of the riser and is secured to it by a machine-screw 11, passing through the concrete and engaging a threaded screw in said nose-depending extension, so that the separate nose-casting is thus made a fixed part of the riser, and both the vertical flange and the riser serve as the means for firmly supporting the concrete step. The lower end of the riser is supported by the vertical and horizontal flanges at their angular junction, and for this purpose an angle metallic brace-seating 12 is fitted in recesses 13 in the vertical and horizontal flanges and secured to them by machine-screws 14 14, passing through the angle-brace and both flanges and nutted to the latter, while the lower end of the riser is secured to said angle-brace by a machine-screw 15, passing through the riser and engaging a screw-threaded opening in said angle-brace, firmly supporting and securing the lower end of the riser.

The reinforced concrete step is seated upon the ledges of both stringers with its front end within the angle of the nose-casting and its back end upon the angle-casting, on which the lower end of the riser is supported. As an article of manufacture I make the step as follows:

The body of the step is molded of concrete 16 of dimensions and thickness to fit between the stringers and within the angle of the nose. A reinforcing of metallic trellis or stay 17 is embedded in the concrete in the

process of molding the step, the trellis being arranged preferably near the bottom of the concrete. In the process of molding the concrete body I form the wear-surface with a non-slipping tread by molding the body upon and between bodies 18 of a softer material, as lead, spaced apart with their wear-faces flush with the step-surface. These non-slipping bodies are preferably of dovetail form in cross-section to give them a wedge-seating hold in the concrete and maintain their wear-surface on a level with the step wear-surface. As adjuvant means for locking the lead bodies to the concrete body they may be formed on their under side with transverse recesses 19 of dovetail form, into which the concrete is forced in the process of molding the step upon and around the lead bodies. By this construction the lead bodies are by their dovetail form locked longitudinally in the concrete bed, and by the dovetail recesses on their under sides they are locked transversely to the bed, interlocking them to the concrete body at every point and forming said locks in the operation of molding the step. For ornamentation of the wear-surface of the step I fill the spaces between the non-slipping bodies or within them with encaustic tile 20, secured to the surface of the concrete in the operation of molding the step, the edges 21 of the tile being beveled and seated upon the dovetail walls of the lead bodies, as in Fig. 1, whereby the wear-surfaces of the tiles are maintained on a level with the wear-surfaces of the non-slipping bars.

The step is molded with the finished non-slipping surface and the tiles, as follows: Within a suitable mold having a smooth bottom 22 is laid thereon the lead bodies 18, and between them are laid rows of encaustic tile 20, and upon these is poured cement to unite and bind the surface parts and fill the spaces and joints between them, then a layer of plastic concrete well tamped to fill the spaces between and upon the lead and the tile, as in Fig. 6. Upon this concrete bed is laid the metallic trellis, and upon the trellis is laid plastic concrete, well tamped and leveled off at the top of the mold, which is subsequently turned bottom upward and removed from the molded step with its wear-surface upward for such finishing as it may require and when thoroughly dried is ready for use.

It will be understood that the first or binding layer of cement is applied in liquid form, so that it will run between and into the joints without disturbing the proper relation of the assembled non-slipping bars and tile.

While I have shown and prefer the transverse interlocking recesses on the under side of the lead bars, obviously a row of recesses 19′ or a single longitudinal recess 19^2 of dovetail form may be formed on the under side of the lead having interlocking functions, as shown in Fig. 4; but obviously blocks or bodies of lead of any suitable form may be used, so long as they are embedded in the concrete.

While I have described a reinforcing metallic trellis or woven stay embedded in the concrete, obviously expanded metal may be used as such reinforcement, and while I have shown and described a concrete riser obviously a metal-nosed riser may be used having the flange 8 and fitted against the end of the tread, the same as the separate nose-casting.

Any suitable mold may be provided for the manufacture of the concrete reinforced non-slipping steps by the described process, and in the drawings I have shown a cheap and simple construction of a mold which comprises a base-board or plate 22, having a smooth surface and a frame of bars, the space formed by which being the form of the step. The side bars 23 are connected by notch-joined end bars 24 and when so joined are held together by clamps 25, applied to the ends of the side bars and secured by wedges 26, so that the frame can be easily separated to remove the molded step. In Fig. 5 I have shown the frame put together ready to receive on the bottom board the lead bodies and the tile and the concrete with which they are molded, and in Fig. 6 I have shown the concrete step as having been molded in the frame.

The molding of the concrete step directly upon the under sides of the non-slipping and the tiling sections gives the advantage of uniting the elements of the step at one operation and of wholly supporting the non-slipping bodies in the concrete.

I claim—

1. A stair-step of molded concrete having in its tread-surface bodies of soft metal wholly supported in the concrete.

2. In a non-slipping stair-step, the combination with a molded concrete step, of spaced lead bars or blocks of dovetail cross-section embedded in the surface thereof, and rows of tile-sections between or within the lead bars or blocks and supported and secured on the side walls of said bars or blocks and upon the surface of the concrete.

3. A stair-step of molded concrete having in its tread-surface bodies of soft metal wholly supported therein and having interior recesses filled by the concrete forming interlocking plugs therein.

4. In a stair-step the combination with a molded concrete step, bodies of soft metal wholly supported in the concrete and having recesses on their under sides, the side walls of said tread-bodies and the side walls of said recesses having oppositely dovetail formations, whereby to form double locks to said bodies in the concrete.

5. In a non-slipping stair-step, the combi-

nation with a molded concrete step, of spaced lead bodies of dovetail cross-section embedded in the surface thereof and having recesses on their under sides interlocking with the concrete, and rows of tile-sections having beveled edges adapted to be supported and secured upon the inclined walls of said bars and upon the surface of the concrete.

6. A stair-step of molded concrete, spaced bodies of lead embedded in the surface thereof and reinforcing the same longitudinally, tile-sections between the lead and supported and secured on the side walls of said lead and upon the surface of the concrete, and a reinforcing trellis or stay embedded in the concrete beneath the lead.

7. As a new article of manufacture a molded concrete stair-step having a tread-surface of embedded lead bodies and tile-sections supported on the side walls of said bodies and on the surface of the concrete, and an embedded metallic trellis all the parts being assembled and bound together substantially as described.

8. As a new article of manufacture a molded concrete stair-step having a tread-surface of embedded soft metal and intervening tile-sections both wholly supported by the concrete, and an embedded metallic trellis, all the parts being assembled in slab form.

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

EDWARD EDMUND SCHACHNER.

Witnesses:
J. E. KENNEDY,
T. E. SCHWARZ.