

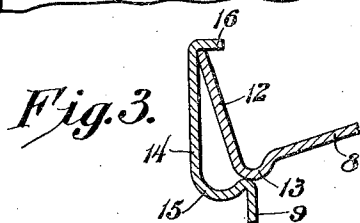
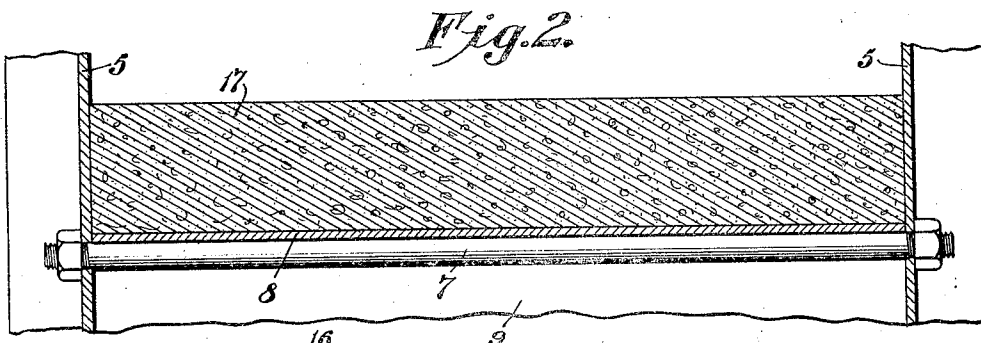
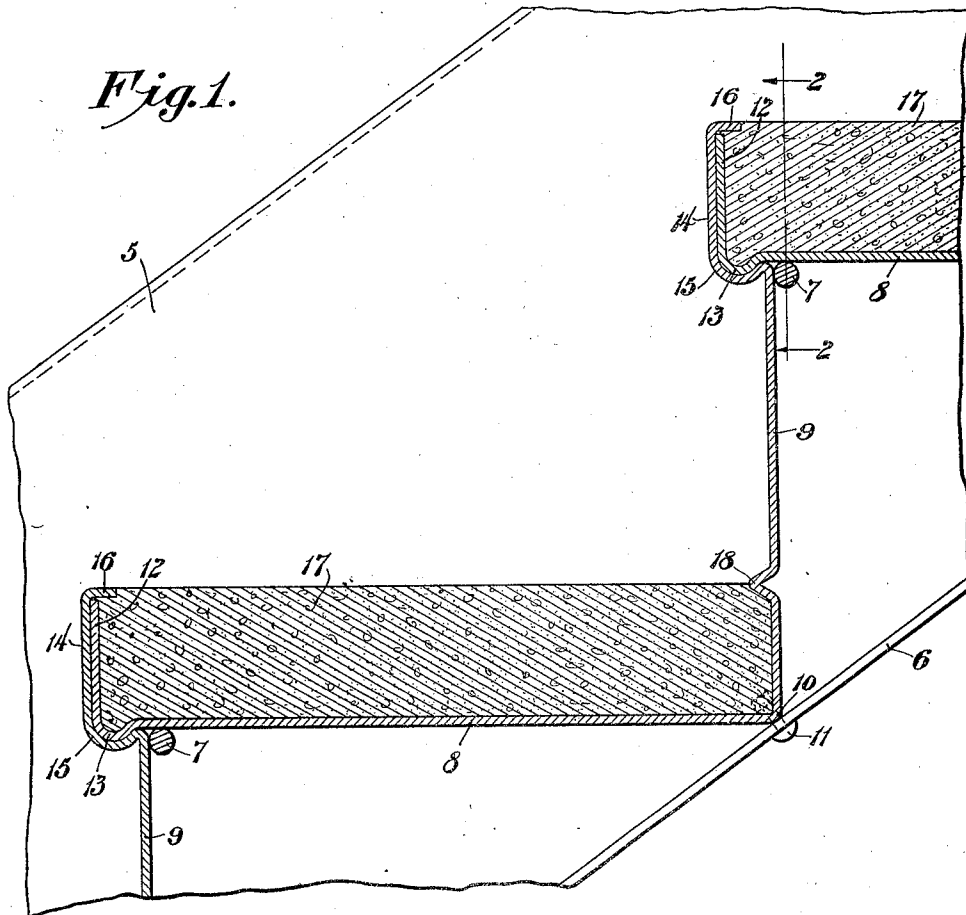
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STAIR CONSTRUCTION

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UNITED STATES PATENT OFFICE.

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STAIR CONSTRUCTION.

Application filed July 18, 1927. Serial No. 206,601.

This invention relates to stair constructions, and aims to provide an extremely simple and economical, but strong and durable, construction especially useful for the stairways of public buildings.

In the accompanying drawings forming a part of this application there is shown a preferred embodiment of the invention.

In said drawings:

Fig. 1 is a vertical sectional elevation of a portion of a stairway;

Fig. 2 is a vertical section substantially on line 2—2 of Fig. 1; and

Fig. 3 is a detail showing one step in the assembly of the stairs.

Referring more specifically to the drawings, there is shown a pair of stringers 5 supporting the steps, each stringer being preferably of sheet steel and having an turned flange 6 along its underside. The steps proper, which embody the improvements, rest partly on the two flanges 6 and partly on tie rods 7 passing through the stringers, as will be described later in more detail.

The steps are built up from a series of interlocked sheet metal elements each having a length equal to the distance between the stringers and each being bent at right angles to provide a horizontal tread-supporting portion 8 and a vertical riser portion 9, with the corner or angle 10 secured at opposite ends by bolts or screws 11 to the flanges 6. The sheet metal step elements are interlocked at the front of each tread, the interlocking being accomplished at the time the stairway is installed, and preventing any relative lateral or up and down movement of the step elements. Longitudinal movement is prevented by the stringers. The interlocking of the parts arises from their shape and the way they are put together, and is accomplished without any welding, bolts, screws, or other movable fastening parts, and hence is accomplished without any labor other than the inevitable labor of bringing the parts together. The elimination of this extra labor results in a rapid building of the stairway, thus increasing the profit of the contractor, and facilitating the completion of his contract within the period specified.

As shown, each tread supporting portion 8 is substantially plane except at the forward edge, where an upstanding flange 12 is provided by bending. Between the flange 12 and the tread support 8 the metal is bowed or

beaded, as at 13, and the bowing or beading is preferably, but not necessarily, arcuate to facilitate assembly of the parts, as will be understood from Fig. 3. The upper end of each riser portion 9 is bent to provide a flange 14, which is vertical and offset relative to the riser portion, and has a bowed or beaded part 15 shaped complementarily to the bowed or beaded part 13, so that the outer surface of part 13 rests snugly upon the ledge or shoulder provided by the inner surface of part 15. At its upper edge, each riser flange 14 is bent rearwardly substantially at right angles, as at 16, not only to enclose the flange 12 of the adjacent tread portion 8, but also to protect the corner of the tread and to aid in holding the tread.

The treads 17 may be of any material, as marble, tile, hardwood or cement, and as shown, are placed so as to be supported by the tread supporting portions 8, and to be confined between the two stringers, the riser and the rigid wall of double thickness provided by the adjacent flanges 12, 14. The treads, according to convenience, may be positioned either before or after the stairs are erected, and in either event, serve to reinforce the tread supports 8 as well as strengthen the interlocking joints between the step elements.

Any stress tending to separate or move angularly any two interlocked step elements will be resisted by the interfitting bends or beads 13, 15, and by the contact of the upper edge of each flange 12 with the underside of the right angular flange or lip 16. However, as each step element is secured at its corner to the flanges 6 of the stringers, and rests directly on a tie rod 7 which is carried by the stringers and which, when tightened, subjects the step element to a compressive stress, it will be clear that all the parts are substantially immovable. The tie rods are best placed at the inside corner between the tread base of one step and the riser of the next lower step, thereby not only supporting each tread base, but also contributing to the strength of the joint between the step elements.

Cooperating with lips 16 to prevent upward movement of the treads are beads 18 formed in each riser about on a level with the top of the treads, and projecting over the treads, as shown. The beads 18 are also advantageous in that they round off the corner between each tread and the adjacent riser, fa-

cilitating cleaning. The lips 16 are of minimum width, thus economizing in material, and yet adequately protect the corners of the treads, where the greatest wear occurs, making a nosing insert entirely unnecessary.

It will be clear from Figs. 1 and 3 that the preferred embodiment of the invention is so constructed and arranged that the step elements are sprung together when first assembled. This springing or snapping together insures rigidity in an assembly of several step elements even after considerable handling, and causes the tread of each step element to be at right angles to the riser of the next lower element without hammering or adjustment of the parts. The tight fit of the parts and their inherent stiffness also prevent springing out of the flanges 14 responsive to the stresses of heavy traffic.

Obviously the present invention is not restricted to the particular embodiment thereof herein shown and described. Moreover, it is not indispensable that all the features of the invention be used conjointly, since they may be employed advantageously in various combinations and subcombinations.

What I claim is:—

1. A stair construction comprising, in combination, a metallic sheet shaped to provide the base of the tread of one step, and the riser leading to the next higher step; said sheet having an upstanding flange along one side bordering the tread and rising nearly as high as the upper surface of the tread; the same sheet having an upstanding side flange formed by bending the same out from the upper portion of the riser so as to provide a ledge or shoulder upon which may rest the tread base of the next higher step; the upper edge of the sheet being bent over substantially at right angles to protect the corner of tread of the next higher step, thereby eliminating the necessity of a nosing insert, and assisting in holding said tread; the sheet be-

ing rounded between the lower flange and the base of the tread and also between the upper flange and the riser, so that the rounded ledge or shoulder will receive a complementarily shaped portion of one adjacent sheet, and the other rounded portion will be received within the shallow recess provided by the next lower sheet, whereby each sheet is interlocked with those immediately adjacent, to prevent separation in a direction transverse relative to the treads, while permitting easy assembly of a series of sheets to form the foundation for a flight of steps.

2. A stair construction comprising, in combination, a series of interlocked sheet metal step elements each providing a horizontal support for the tread of a step and the riser above said tread; each riser having a bead projecting over the tread below and also having an inturned flange projecting over the tread next above; and a tread placed upon each sheet metal step element and locked mechanically in position by engagement with the bead on the riser of the supporting step element and with the inturned flange of the step element immediately beneath.

3. A stair construction comprising, in combination, a series of step elements formed from sheet metal, each element interlocking at its upper and lower ends with other elements, and each element providing a tread and a riser; the outer edge of each tread being provided with a bowed portion and with a flange; the upper end of each riser having a bowed portion and a flange; the parts being constructed and arranged so that the outer edge of each tread may be snapped into interlocked connection with the upper end of the adjacent riser.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature.

ELMER HEDEEN.