

[54] STAIR TREAD AND METHOD OF PRODUCING THE SAME

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[51] Int. Cl. E04f 11/00

[58] Field of Search 182/228; 52/182, 189

[56] References Cited

UNITED STATES PATENTS

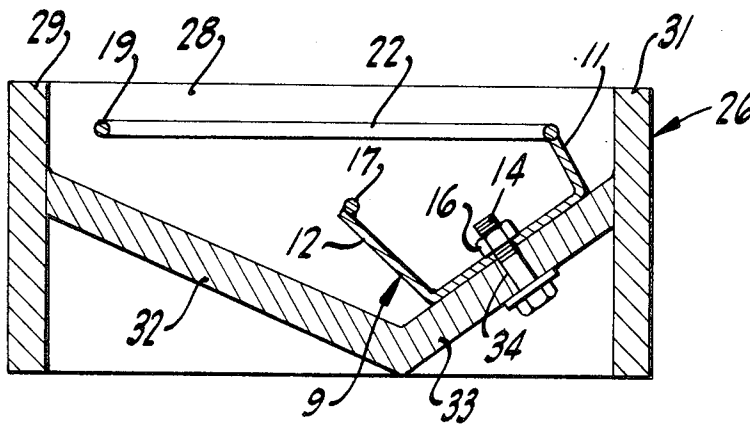
1,861,751	6/1932	Nicols	52/189
3,216,160	11/1965	Best	52/189
3,601,221	8/1971	Fuentes.....	52/189

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[57] ABSTRACT

A stair tread has a clip with a central web and a pair of edge flanges provided with a central reinforcing rod secured to one of the flanges and a rim reinforcing frame secured to the other of the flanges. The central web has an opening therein through which a bolt extends into a nut on the inside of the clip. The clip and rod and frame as well as a bolted nut are placed into a mold and the reinforcements are embedded in concrete. Prior to the final hardening of the concrete the bolt is removed leaving the nut and the reinforcements embedded. Removal is preferably accomplished by inverting the mold. There can be openings through the concrete of the tread adjacent a portion of the rim reinforcing frame to receive uprights for supporting stair rails.

2 Claims, 7 Drawing Figures



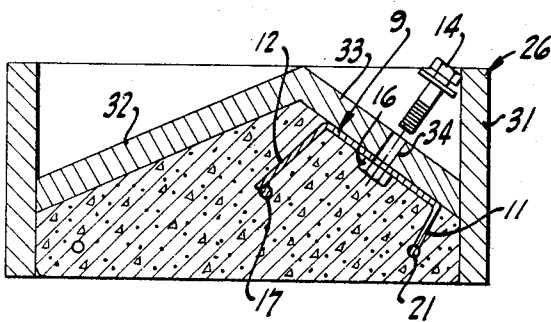
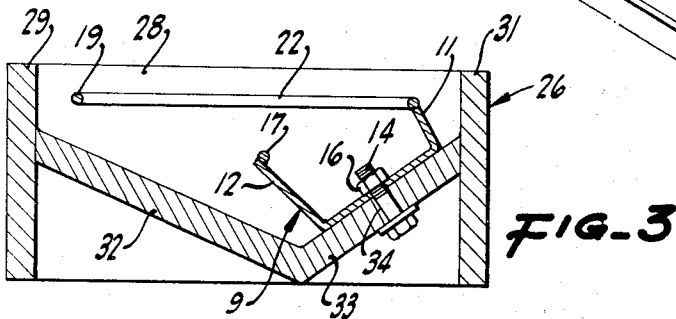
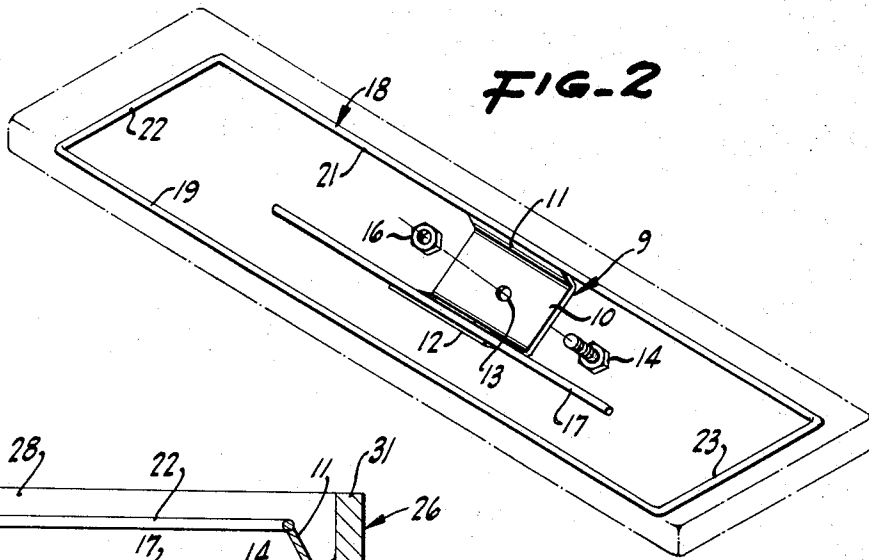


FIG-4

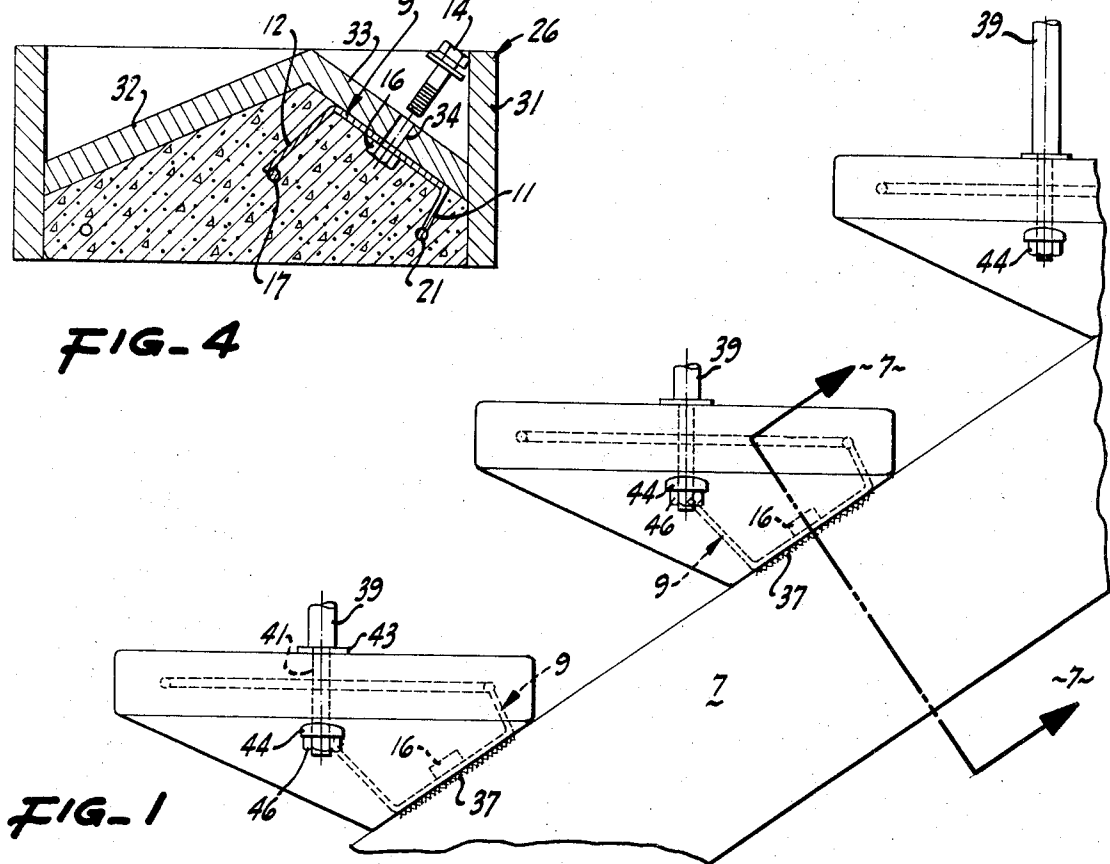


FIG-1

FIG-5

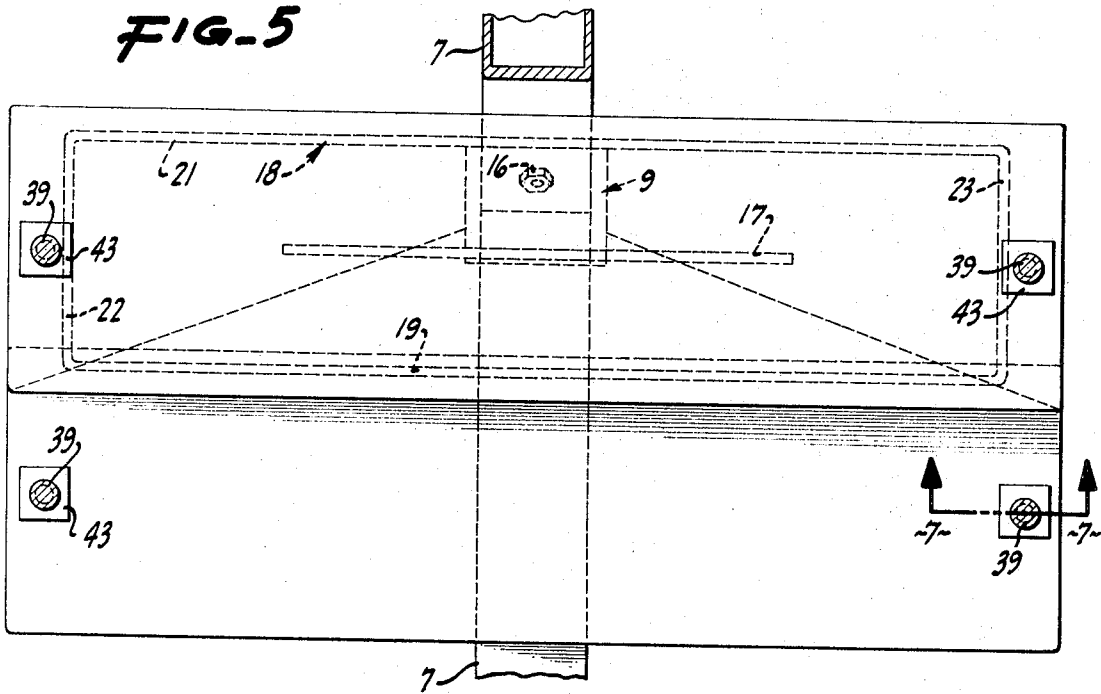


FIG-6

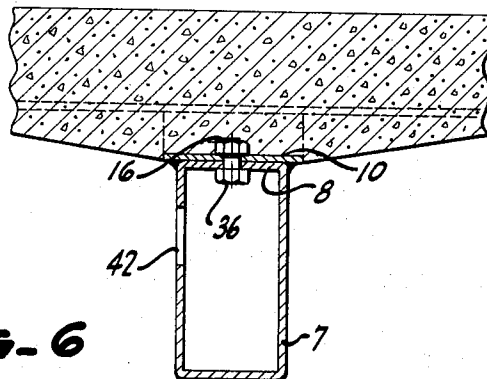
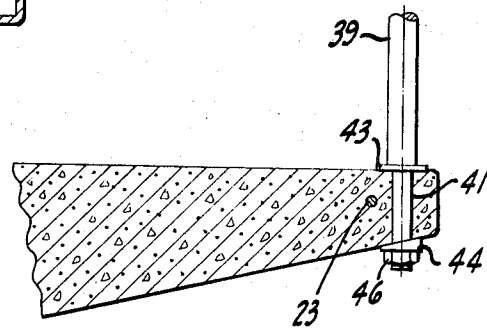


FIG-7



STAIR TREAD AND METHOD OF PRODUCING THE SAME

In the construction of buildings it is often desired to provide an inexpensive, strong, esthetically attractive and fireproof stairway. This is sometimes accomplished by affording a central metal beam such as a box beam or tube to which stair treads; for example, of metal and concrete, are attached. A representative device is shown in Best U.S. Pat. No. 3,216,160. There are still numerous problems involved in providing sufficiently inexpensive, strong and stable stair treads for this purpose and in securing the individual stair treads to the supporting beam.

It is therefore an object of this invention to provide a suitable stair tread for the indicated use and one which can readily be fabricated in a simple, economical and effective fashion.

Another object of the invention is to provide a stair tread which is relatively stiff or rigid and is well and safely supported on its beam.

Another object of the invention is to provide a stair tread which can easily be fastened precisely in place on a supporting beam.

A further object of the invention is to provide a stair tread which can appropriately support uprights to engage a stair rail.

A further object of the invention is in general to afford an improved stair tread and an improved method of providing such a tread.

Other objects, together with the foregoing, are attained in the embodiment of the invention described in the accompanying description and illustrated in the accompanying drawings, in which:

FIG. 1 is a side elevation of a portion of a stairway incorporating a supporting beam and a number of stair treads pursuant to the invention;

FIG. 2 is an isometric perspective of a reinforcing mechanism for use in the stair tread;

FIG. 3 is a cross-section through a mold in which the reinforcing is situated and designed to receive surrounding concrete;

FIG. 4 is a cross-sectional view of the mold of FIG. 3 with the completed stair tread therein and inverted for removal of the tread;

FIG. 5 is a plan of the structure as shown in FIG. 1;

FIG. 6 is a cross-section on the lines 6—6 of FIG. 1; and

FIG. 7 is a fragmentary view showing the stair tread in cross-section, the plane of section being indicated by the line 7—7 of FIG. 5.

While the stair tread pursuant to the invention can be embodied in a number of different ways and can be fabricated by various different methods, it has with some commercial success been constituted and fabricated as set forth herein. In this instance it is desired to provide a stairway resting on a supporting beam 7 which preferably is a box or tube arranged at an appropriate angle. The beam is inclusive of a top web 8 extending laterally for a small fraction of the total width of the stairway but preferably disposed in the center of the stairway.

In order to afford an appropriate tread I preferably provide a clip 9 which is conveniently a section of metal incorporating a central planar web 10 and a pair of upstanding flanges 11 and 12 which may be, but are not necessarily, at right angles to the plane of the cen-

tral web 10. The web incorporates a central aperture 13 for the reception of a threaded bolt 14 engageable with a nut 16 abutting the inside face of the web 10.

Welded to the flange 12 is a central reinforcing rod 17 disposed approximately midway of the depth of the tread and extending for a large fraction of the length of the tread (transversely of the stairway). Also, the flange 11 is connected with another reinforcement in the nature of a rim reinforcing frame 18 having a pair of parallel longitudinal members 19 and 21 connected to end members 22 and 23 thus affording a rectangular reinforcement disposed substantially parallel to the ultimate, finished plane of the tread.

For stabilizing the reinforcement and for fabricating the tread there is conveniently provided a mold 26 which is substantially a box having end walls 28 and side walls 29 and 31 as well as dihedral bottom walls 32 and 33. The bottom wall 33 is especially provided with a through aperture 34 properly positioned and designed to receive the shank of the bolt 14 and the nut 16 so as to position the clip 9 and its attached reinforcements 17 and 18.

With the mold in the position shown in FIG. 3 and with the reinforcement in place, particularly with the bolt fastened snugly in position, the frame is filled with appropriate body and tread material, such as concrete, and is screeded even with the upper edge of the frame 26. By this means the bolt 14 is accurately positioned in the mold and the clip is accurately held by the bolt and the reinforcement is stabilized in position. The poured concrete does not displace the clip and reinforcement during pouring. In solidifying around the reinforcement, the concrete secures the entire assembly in proper relationship.

When the concrete has at least partially cured and is reasonably stable, the bolt 14 is removed from the mold leaving the nut 16 embedded in the concrete. When the bolt has been removed the mold is inverted into the position shown in FIG. 4. There is then no restraint upon the removal of the poured tread from the mold. The mold can be reused. That is, the angularity of the bolt 14 prevents removal of the poured tread from the mold since the angle of the bolt is different from the release angle of the mold, but after the bolt has been removed there is no difficulty in removing the tread from the mold.

A number of similar treads are made utilizing the same or similar molds and the individual treads are then mounted on the beam 7. This is readily accomplished by putting at least a temporary bolt 36, or the bolt 14, within the predrilled beam 7 and engaging it with the embedded and so non-turning nut 16. This detachably holds the tread in proper position on the beam. Conveniently, a permanent interconnection is made by running a line 37 of welding between the beam material and the exposed metallic outside face of the clip 9, thus securely holding the parts in position. The bolt 36 can be installed and can be removed, if desired, through an opening 42 in the beam. The opening 42 can thereafter be covered, if desired. A number of treads are thus affixed to the beam 7 to complete the stairway.

In some instances, it is desired to have a railing on the stairway supported by uprights 39. When that is the case the mold 26 is provided with removable inserts (not shown). When removed after the concrete has at least partly firmed, the inserts afford a pair of through

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passages 41 near the opposite ends of the tread. The uprights 39 can then be introduced through the openings 41 where they are positioned by restraining washers 43, contoured spacers 44 and securing nuts 46. The railing (not shown) is secured in the customary fashion to the upper end of the various uprights 39.

In this way there has been provided a simple, economical, safe and readily handled stair tread for use in making a stairway.

What is claimed is:

1. A method of providing a stair tread comprising establishing a mold having walls of the configuration of

a finished stair tread except for the top surface thereof, disposing a clip within said mold, securing said clip to said mold by a bolt passing through said mold wall and said clip and a nut abutting said clip and engaging said bolt, then filling said mold with wet concrete, permitting said concrete to set, withdrawing said bolt from said nut and said mold, and then separating said set concrete and said clip and nut from said mold.

2. A method as in claim 1 in which said mold has a pair of parallel side walls and said bolt passes through said mold wall at an angle to said side walls.

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