

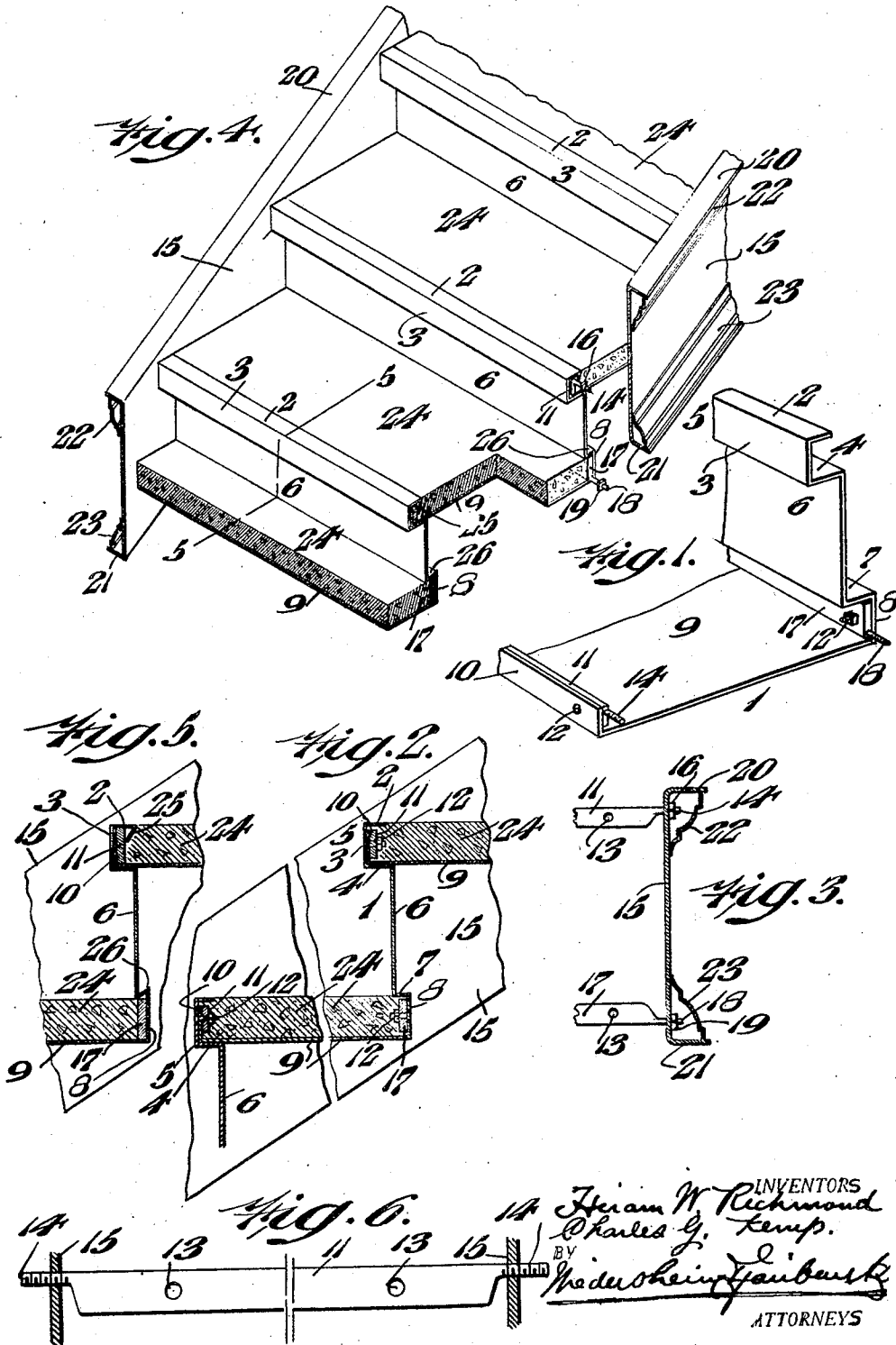
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STAIR STRUCTURE

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STAIR STRUCTURE.

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In the construction of sheet metal stairs of the pan type, the front edge of the pan is frequently badly bent after installation and during the construction of the building, previous to placing the concrete which forms the tread in the pan. In order to prevent this, we have placed a flat rod or bar across the front of the steps directly underneath the nosing, and also employ a similar lower back rod or bar which back and front flat rods support the tread or pan and riser, whereby said rods will take a total load permitting the use of very light sheet iron in the construction of the stairs, said flat rods being designed of such depth at the center of the span as to take the bending of the load, while the reduced threaded ends of said rods are of sufficient size to take the shear of the load, and said threaded ends being supported in the stringers, a very rigid, durable and effective construction is produced.

Our invention therefore relates to a novel construction of sheet metal stairs, wherein the construction is simplified, weight and the cost of production is reduced, and not only is the appearance of the stairs improved but greater strength is imparted to the construction than is present in stairs of this general type.

By our novel invention we are enabled to use very light sheet metal and to employ a plurality of stair frames which are all of one uniform or standard dimension, which can be readily assembled with a minimum number of bolts, the ends of the bolts being covered by a moulding carried by the upper and lower portions of the stringers, so that after the stair is completed no construction bolts will be visible, and the appearance of the stair case will be enhanced.

Our invention further consists of a novel construction of stair way made of thin sheet metal frames of uniform construction and dimensions which are so constructed and assembled that their contacting portions serve to stiffen and reinforce the structure at the points where it is most needed, and in conjunction with the front and rear bars or flat rods employed having their ends positioned in the upper and lower portions of the stringers produce a novel and durable

construction, which can be readily assembled and wherein the bolts or fastening devices are reduced to a minimum.

By our novel construction the stair frames comprising the risers and subtreads or pans can be assembled individually and said frames kept in stock in large quantities ready to be carried to the job and assembled in place with respect to the stair stringers, and the front and back flat rods which we employ, or said frames can be shipped assembled if desired.

Our invention further consists of other novel features of construction and advantage, all as will be hereafter fully pointed out in the specification and claims appended hereto.

For the purpose of illustrating our invention, we have shown in the accompanying drawings forms thereof which are at present preferred by us, since they will give in practice satisfactory and reliable results, although it is to be understood that the various instrumentalities of which our invention consists can be variously arranged and organized and that our invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a perspective view of a novel stair frame embodying our invention, the front and rear transverse flat rods or bars being shown in assembled position.

Figure 2 represents a vertical sectional view of a pair of the frames seen in Figure 1 in assembled position showing the concrete treads therefor.

Figure 3 represents a vertical sectional view of one of the stringers showing the upper and lower transverse flat rods or bars having their ends supported therein, and the moulding which conceals said ends.

Figure 4 represents a perspective view of a portion of a completed stair way embodying our invention, showing a slightly different construction of the top flanges of the stair frame.

Figure 5 represents a section on line 5—5 Figure 4.

Figure 6 represents on an enlarged scale a front elevation of one of the flat rods or

bars employed showing the manner of securing the threaded ends of the same with respect to the stringers.

Similar numerals of reference indicate corresponding parts in the figures. Referring to the drawings:

In carrying out our invention, we employ a plurality of light sheet metal stampings which are of uniform construction and can be cheaply produced, one of said stampings or stair frames being shown in Figure 1, and designated as 1 and comprising the top horizontal flange 2 from which depends the vertical wall 3 which is deflected horizontally and inwardly to form the ledge or supporting wall 4 which constitutes a nosing designated 5.

6 designates the riser depending from the wall 4 which is deflected horizontally and inwardly at 7, thence downwardly and vertically at 8 and thence forwardly and horizontally as at 9 to form the pan or sub-tread at the front end of which is the vertical wall or flange 10. The manner of assembling the stair frames 1 will be understood from Figure 2, wherein referring to the upper portion thereof, the forward end of the upper sub-tread 9 and its vertical flange 10 are shown as supported on the upper ledge 4 and within the upper nosing 5, the vertical members 3 and 10 being in contact. The upper front bar or flat rod 11 is secured to the inner surface of the vertical flange 10 by the bolts 12 which pass through the holes 13 and the reduced threaded ends 14 of the bars 11 pass through the upper portions of the stringers 15 and are secured in position by the nuts 16. In like manner the lower rear bar 17 is secured or bolted against the vertical wall 8 and its threaded ends 18 after being passed through the lower portions of the stringers 15 are secured in position by the nuts 19. By providing the stringers 15 with the upper and lower flanges 20 and 21 which carry the upper and lower mouldings 22 and 23 which conceal the nuts 16 and 19 it will be seen that after our novel stairway is completed no construction bolts whatever will be visible thereby enhancing the appearance of the stairway. The assembly of the lower front bar 11 seen in Figure 2 and the vertical flange 10 within the lower nosing 5 is the same as already described. The bars or flat rods 11 and 17 are duplicates and the manner of securing each threaded end thereof within the mouldings 22 and 23 is, as has already been described. After the stair frames are assembled, as seen in Figure 2, the concrete treads 24 are laid in the usual manner.

By our novel construction of sheet metal stairs of the pan type, the liability of the front edge of the pan being bent during the construction of the building previous to placing the concrete 24 in the pans is en-

tirely obviated, and the use of the front and rear flat rods or bars 11 and 17 to support the tread pans and risers permits the use of very light sheet iron, since said rods take the total load and can be designed of such depth at the center of the span as to take the bending of the load, while their threaded extremities are of sufficient size to withstand the shear of the load.

The construction seen in Figures 4 and 5 is substantially the same as that already described, except that the top flange 2 already described is provided with a downwardly and inwardly bent terminal 25, as seen at the upper portion of Figure 5, and the wall 26 seen at the lower right hand portion of Figure 5, instead of being horizontal as seen at 7 in Figures 1 and 2 is inclined or bent at an acute angle, the construction in all other respects being the same.

By our novel construction the upper front and lower rear portions of the stairway are rigidly braced and reinforced transversely, and are rigidly sususpended from the stringers as will be understood from Figures 3 and 6.

It will be understood that if desired the various elements composing our novel stair frame can be shipped assembled. It will be further apparent that if desired, bolts can be entirely omitted from the bars 11 and 17, and said bars can be spot welded if desired to their contiguous supporting surfaces.

It will now be apparent that we have devised a novel and useful stair structure which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while we have in the preset instance shown and described a preferred embodiment thereof which will give in practice satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described our invention what we claim as new and desire to secure by Letters Patent, is:—

1. In a stairway construction, a frame comprising an upper rearwardly bent horizontal flange, a vertical wall depending from the front thereof and continued to form a horizontal rear wall, a riser depending from the latter, a horizontal rear wall projecting rearwardly from said riser, a vertical pendant rear wall, and a horizontal sub-tread extending forwardly therefrom, said sub-tread terminating in a front vertical wall in combination with stringers, front and rear flattened rods positioned against the front and rear vertical walls of said sub-tread and having threaded ends passing through said stringers and bolted thereto.

2. In a stairway construction, a frame comprising an upper rearwardly bent horizontal flange, a vertical wall depending from the front thereof and continued to form a horizontal rear wall, a riser depending from the latter, a horizontal rear wall projecting rearwardly from said riser, a vertical pendant rear wall, having a horizontal sub-tread extending forwardly therefrom, said sub-tread extending forwardly therefrom, said sub-tread terminating in a front vertical wall, and front and rear flattened rods positioned against the front and rear vertical walls directly above and forming a continuation of said sub-tread, in combination with stringers supporting the ends of said rods, and means for concealing said ends.

3. In a stairway construction, a frame comprising an upper rearwardly bent horizontal flange, from which depends a vertical wall continued to form a horizontal rear wall, a riser depending from the latter, a horizontal rear wall projecting rearwardly from said riser, a vertical pendant rear wall having a horizontal sub-tread extending forwardly therefrom, said sub-tread terminating in a front vertical wall, front and rear flattened rods disposed against the front and rear vertical walls directly above said sub-tread, oppositely located stringers, said flattened rods having threaded ends passing through said stringers and nuts on said threaded ends.

4. In a stairway construction, a frame comprising an upper rearwardly bent horizontal flange from which depends a vertical wall continued to form a horizontal rear wall, a riser depending from the latter, a horizontal rear wall projecting rearwardly from said riser, a vertical pendant rear wall having a horizontal sub-tread extending forwardly therefrom, said sub-tread terminating in a front vertical wall, front and rear flattened rods disposed against the front and rear vertical walls above said sub-tread, stringers for supporting said frame, said

flattened rods having threaded ends passing through said stringers, nuts on said threaded ends, and mouldings for the upper and lower portions of said stringers for concealing the bolted ends of said flattened rods.

5. A stairway frame, composed of a horizontal pan having a vertically disposed front wall, the latter and the front end of said pan being supported in the nosing of a similar frame, a riser depending from said nosing, a horizontal pan member projecting forwardly from said riser, upper front and lower rear flattened rods, fastening devices common to said nosing, the vertical wall in proximity thereto and to the upper, front flattened rod, and fastening devices for securing the lower flattened rod to the rear lower vertical wall below said riser.

6. A stairway frame, composed of a horizontal pan having a vertically disposed front wall, the latter and the front end of said pan being supported in the nosing of a similar frame, a riser depending from said nosing and a horizontal pan member projecting forwardly from said riser, upper front and lower rear bars, fastening devices common to said nosing, the vertical wall in proximity thereto and to the upper, front flattened rod, fastening devices for securing the lower flattened rod to the lower vertical wall below said riser, said flattened rods having reduced threaded ends and stringers in which said threaded ends are supported and secured.

7. The combination of a pair of stringers, upper, front and lower, rear flattened transverse rods having their ends reduced and threaded and passing through said stringers, nuts on said threaded ends, stairway frames secured to said flattened transverse rods and supported thereby, and upper and lower longitudinally extending mouldings carried by said stringers and concealing said nuts, and the ends of said rods.

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