

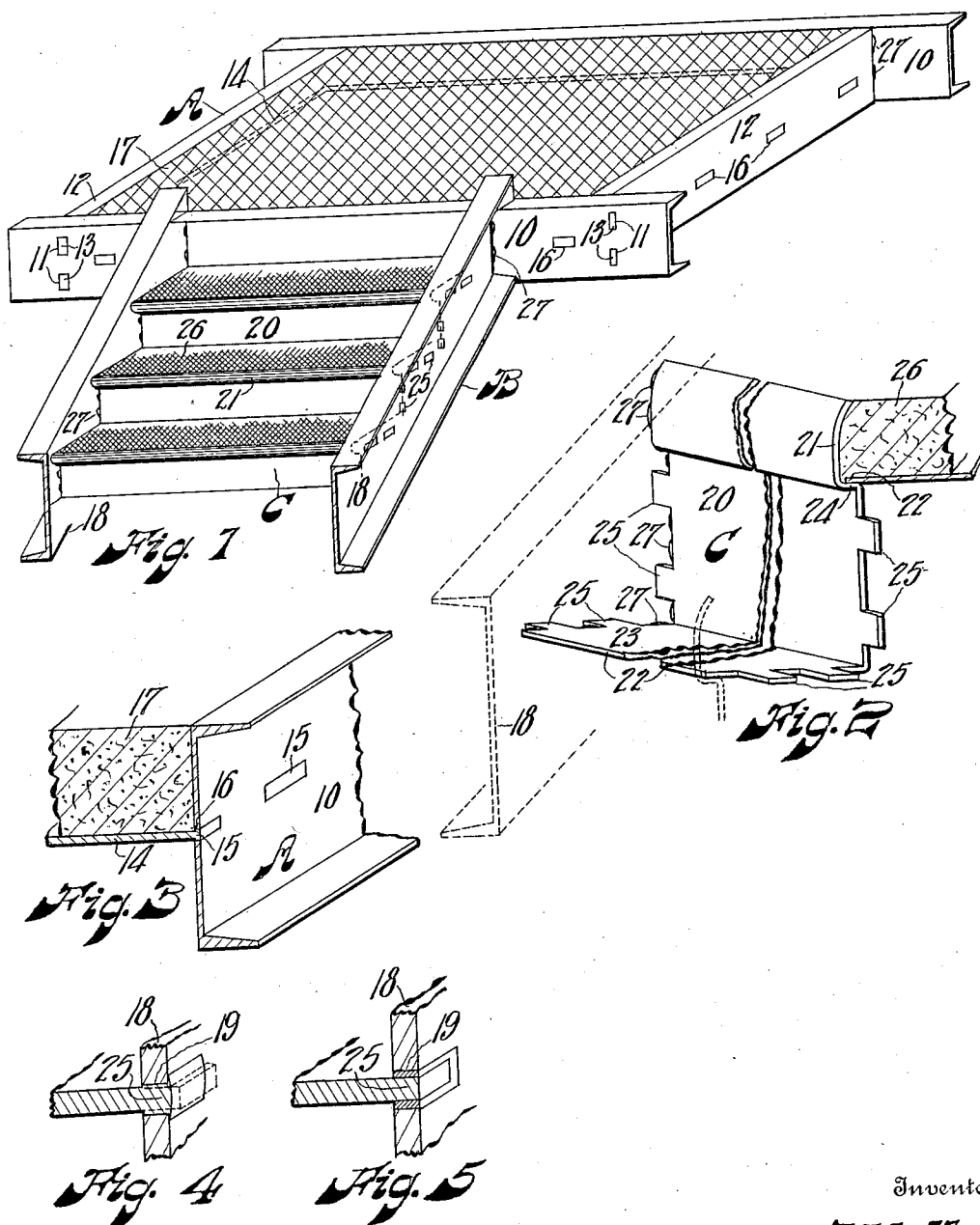
June 14, 1932.

A. J. HALL

1,862,958

STAIRWAY

Filed April 4, 1927



Inventor

A. J. Hall

By

W. F. Heinkel

Attorney

UNITED STATES PATENT OFFICE

AKOS J. HALL, OF CLEVELAND, OHIO

STAIRWAY

Application filed April 4, 1927. Serial No. 180,762.

My invention relates to structures and to methods of structure of stairways including platforms and other structures which may or may not form a necessary or convenient part of stairways.

One of the objects of my invention is to provide a stairway structure which is simple and inexpensive of structure; in which the individual members thereof can be made with a minimum of expense; in which the individual members can be assembled with a minimum of expense; in which the individual members are rigidly connected together; in which the rigid connection mentioned can be attained with a minimum of expense; and in which the stairway forms a rigid unit when the members thereof are assembled. Other objects will appear, or become apparent or obvious, or will suggest themselves during the description of the structure shown in the accompanying drawing.

In order to aid in the understanding of my invention, I have embodied the same in a certain stairway structure, selected to illustrate my invention, and have shown this particular structure in the accompanying drawing in which:—

Fig. 1 is a general perspective view of a portion of a stairway structure embodying the features of my invention and shows a portion of a stairs and a portion of a platform associated with the stairs and a poured floor on the platform and on the tread and riser elements.

Fig. 2 is a perspective view of one of the tread and riser elements or members of Fig. 1 and also shows portions of adjacent tread and riser elements as related thereto and also shows a stringer on one end of the tread and riser element and spot welded thereon.

Fig. 3 is a sectional view of a portion of the platform element of Fig. 1 and shows the lugs on the floor supporting plate extending through the frame member and the poured floor of the platform resting on the plate and confined by a frame member.

Fig. 4 is a sectional view of a typical riveted or upset joint between members of the stairway structure of Fig. 1.

Fig. 5 is a sectional view of a typical filled in joint between members of the stairway structure of Fig. 1.

Similar reference characters refer to similar parts throughout the views.

The stairway shown in the accompanying drawing has the platform element A, the stair element B, and the tread and riser elements C.

The beams or frame members 10 of the element A have the holes 11 punched through the webs thereof and the beams or floor members 12 have the lugs 13 extending longitudinally outward from the ends thereof and through the corresponding ones of the holes 11. The beam or frame elements 10 and 12 are made of channel section material in the present instance.

The floor supporting element for the element A comprises the plate 14 which has the lugs 15 on edges thereof and extending through the holes 16 provided in the webs of the beams 10 and 12. The manner of fixing the lugs in the holes and connecting the elements will appear presently.

The floor 17, a poured floor in the present instance, rests on the plate 14 and is confined laterally by the frame members 10 and 12.

The stringers 18 of the element B, of channel section material in the present instance, have the holes 19 through the webs thereof and may have any necessary or convenient means for attaching the same to the element A as well as to other elements associated with the stairway.

Each of the elements C comprises a unit including one tread and one riser portion of the stairs and is formed of one piece of sheet material in the present instance.

The upper end of each riser portion 20 is formed with the gutter or groove 21 opening inwardly of the stairs, the outer end 22 of each tread portion 23 rests on the wall 24 of the gutter 21.

Each of the tread and riser elements has the lugs 25 extending from the longitudinal ends of the tread and of the riser portions thereof and extending through the corresponding ones of the holes 19.

The floors 26, poured floors in the present

instance, rest on the tread portions of the elements C and each is confined laterally by the riser portion thereof and by the stringers and by the gutter of the next lower one of the riser portions. The gutter or groove formation on the upper end of the riser portions also confines the floors 26 on the tread portions and prevents the same from being raised off of the tread portions.

10 In order to provide a rigid stairway structure in the most economical manner without the use of bolts or rivets or equivalent means added to the essential elements of stairways and the consequent necessity of laying out
15 holes and other time consuming operations and to enhance the appearance of stairways, I provide the mentioned holes and lugs on the members and provide a rigid and complete connection between the walls of the holes and
20 the sides of the lugs as well as between other portions of members of the stairway.

Various means and methods may be employed to attain my connections mentioned.

25 One manner of rigidly connecting members of stairway structures is to upset or rivet the lugs in the holes so that the sides of the lugs contact the walls of the holes as shown in Fig. 4 for instance. This sort of joint is far superior to lugs bent against the webs or
30 against other members of stair structures not only in economy of time and expense in assembling such structures but also in providing a more rigid and more lasting and more substantial stairway structure.

35 Another manner of rigidly connecting members of stairway structures is to weld, electrically or otherwise, or otherwise molecularly uniting portions of members to portions of other members of stairway structures.
40

Although the ends 22 of the tread portions rest on the walls 24 of the riser portions and thereby support the floors 26 and the weight thereon, I weld or otherwise unite the ends
45 22 to the walls 24, by spot weld or by continuous weld, and thereby not only attain a more rigid structure but also attain such a rigid structure in the most economical manner.

50 Instead of the riveting or upsetting mentioned above, I may expand the lugs in the holes either by expanding the material of the lugs in the holes or by adding material between the lugs and the walls of the holes.
55 This can be attained economically by means of heat produced electrically or otherwise. I may apply heat and force to expand the lugs against the walls of the holes and may increase the heat sufficiently to weld the lugs
60 onto the walls of the holes. I may not expand the material of the lugs and introduce or add material into the spaces between the sides of the lugs and the walls of the holes by means of heat and force or otherwise and
35 increase the heat sufficiently to weld the

added material to the lugs and to the walls of the holes as shown in Fig. 5 for instance.

As a further expedient to attain a rigid structure in the most economical manner, I may also rigidly connect contacting portions of members by welding, electrically or otherwise, or by other means. This may be done by spot welding or other equivalent means or by a continuous weld or other continuous attaching or connecting means. In the present instance, the spot welds 27 rigidly connect the elements C to the stringers of the elements B and the spot welds 28 rigidly connect the plate 14 to the beams 10 and 12.

The structure shown and described attains 80 a rigid stairway structure in an economical manner; eliminates all bolts and rivets and analogous means; eliminates the necessity of laying out bolt or rivet or analogous holes; permits the assembling of the structure in
85 less time than previously since there are no bolts to tighten nor holes to be fitted and the welding or the equivalent operation is performed in much less time than previously; eliminates the unsightly bolt or rivet heads or
90 nuts on the outside of the stairway; and attains a more rigid and more lasting structure than a structure built in the old manner.

The structure shown and described is also very economical in the formation of the parts 95 thereof as well as in the assembling of the parts. The frame members have the necessary holes punched through them in simple punching operations and the tread and riser elements, as well as some of the frame elements, have the lugs formed thereon while the ends thereof are cut to proper lengths. When assembling the parts, it is only necessary to set the parts against each other with the lugs extending through the corresponding holes. This assembling not only
100 locates all of the parts in their proper positions but also retains them in those positions since the lugs interlock the parts. The riveting or the upsetting or the welding or other
110 similar or analogous operation can then be performed easily and conveniently and without danger of any of the parts shifting out of position and without danger of the parts not being rigidly connected in proper position.
115

I am aware that changes can be made in the structure as well as in the arrangement of the elements as shown and described as well as in the method of procedure as shown and described within the scope of the appended claims; therefore, without limiting myself to the precise structure and arrangement of the elements as shown and described nor to the precise method set forth,
120

I claim:—

1. A stairway including a stair including opposite stringers having spaced holes through the webs thereof, step elements between said stringers and having lugs on the longitudinal ends thereof, of less cross-section
125 130

5 tional size than the size of said holes, spaced
in correspondence with said holes and ex-
tending through the corresponding ones of
said holes, and filler material between sides
of said lugs and walls of the corresponding
holes.

10 2. A stairway including a stair including
opposite stringers having spaced holes
through the webs thereof, step elements be-
tween said stringers and having lugs on the
longitudinal ends thereof, of less cross-sec-
tional size than the size of said holes, spaced
15 in correspondence with said holes and ex-
tending through the corresponding ones of
said holes, and filler material between sides
of said lugs and walls of the corresponding
holes and welded thereto.

20 3. A joint structure for stairways com-
prising a member having a hole through the
same, a member having a lug of less cross-
sectional size than the size of said hole ex-
tending through said hole, and filler mate-
rial between sides of said lug and walls of
said hole.

25 4. A joint structure for stairways com-
prising a member having a hole through the
same, a member having a lug of less cross-
sectional size than the size of said hole ex-
tending through said hole, and filler mate-
30 rial between sides of said lug and walls of
said hole and welded thereto.

In testimony of the foregoing I affix my
signature.

AKOS J. HALL.

35

40

45

50

55

60

65