April 22, 1952 G. W. LYONS 2,593,683

PREFABRICATED STAIR

Filed July 20, 1949

Fig. 1

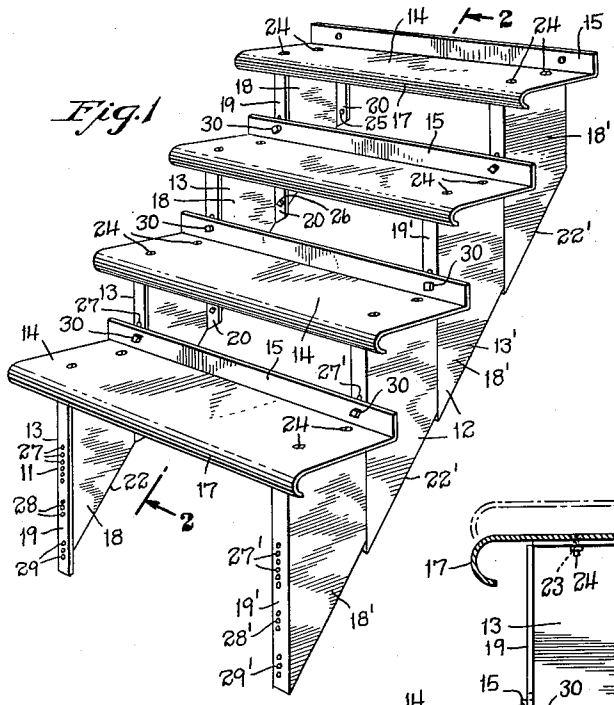
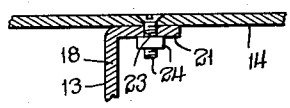


Fig. 4.



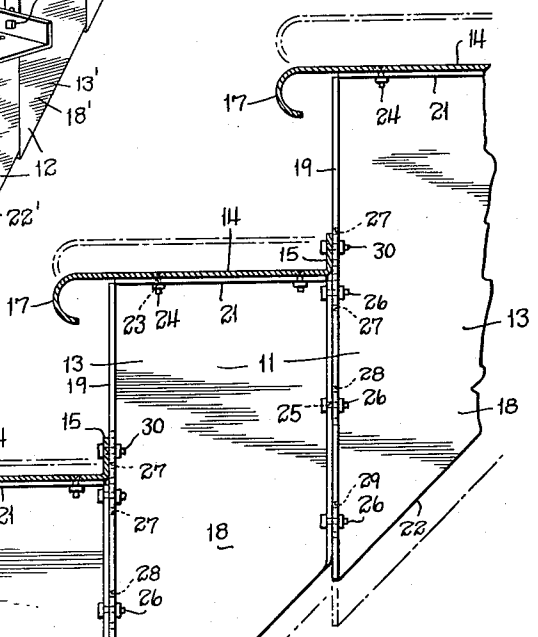


Fig. 2.

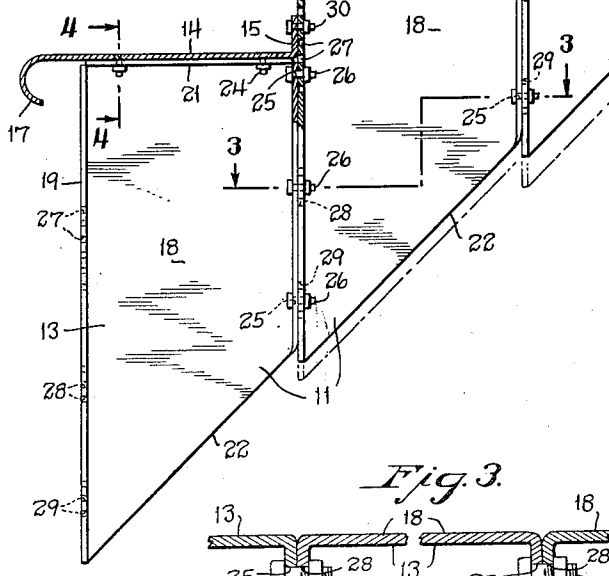


Fig. 5.

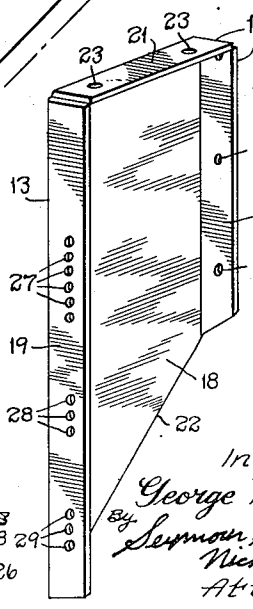


Fig. 3.

Inventor
George W. Lyons
By Seymour, Earle & Nichols
Attorneys

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PREFABRICATED STAIR

George W. Lyons, North Guilford, Conn.

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3 Claims. (Cl. 189—43)

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The present invention relates in general to staircases and more especially to a flight of stairs adjustable vertically for meeting the requirements of a given installation.

An object of the invention is to provide a superior prefabricated flight of stairs of durable, economical and relatively-simple construction.

A further object of the invention is to provide a superior flight of stairs embodying sectional-stringers formed of prefabricated tread-supporting plates adjustable vertically with respect to each other for adapting the flight of stairs to a given installation.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art.

In the accompanying drawings, in which certain modes of carrying out the present invention are shown for illustrative purposes:

Fig. 1 is a perspective view of a flight of stairs formed of the prefabricated tread-supporting plates of this invention;

Fig. 2 is a broken side elevation in section of a portion of a flight of stairs formed of the prefabricated tread-supporting plates of this invention, the vertical adjustment of the tread-supporting plates with respect to each other being indicated by broken lines;

Fig. 3 is a plan view in section on line 3—3 of Fig. 2 showing the fastening-means for securing the adjacent tread-supporting plates of the sectional-stringers together and for adjustment vertically with respect to each other;

Fig. 4 is a fragmentary front elevation in section on line 4—4 of Fig. 2 showing fastening-means for securing one edge of the tread to the corresponding tread-supporting plate; and

Fig. 5 is a perspective view of one of the improved prefabricated flanged tread-supporting plates of this invention.

Referring to Fig. 1, the superior flight of stairs of this invention comprises a pair of sectional-stringers, indicated generally at 11 and 12 respectively, each stringer comprising a plurality of adjoining prefabricated tread-supporting plates 13 and 13' respectively and treads 14 joining corresponding pairs of tread-supporting plates; the treads 14 being provided with integral toe-guards 15, each of which extends longitudinally of and is bent upwardly at substantially right angles to the rear of its respective tread. The forward edge of each tread is rolled under to provide a rounded front flange 17.

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Referring to Fig. 5, the latter shows a prefabricated tread-supporting plate 13 adapted, in particular, for use in forming the left-hand sectional-stringer 11 of the flight of stairs shown in Fig. 1, the tread-supporting plates 13' for the sectional-stringer 12 of the flight of stairs being substantially identical to those of the sectional-stringer 11, except for such obvious reversal of parts as may be necessary to adapt the tread-supporting plates for use on the right-hand side of the flight of stairs. The tread-supporting plates of the sectional-stringer 12 have, therefore, similar reference characters applied thereto, plus a prime (').

Each prefabricated tread-supporting plate 13 of the sectional-stringer 11 comprises a substantially-rigid channel-shaped member formed of relatively-heavy-gauge sheet metal and embodying a polygonal body-portion 18 having two straight rectangular substantially-parallel longitudinal flanges 19 and 20 respectively bent up substantially perpendicular to the plane of the body-portion 18; a straight substantially-rectangular top flange 21 at substantially right angles to the corresponding flanges 19 and 20 and bent up substantially perpendicular to the plane of the body-portion 18, the top flange 21 being on the same side thereof as the flanges 19 and 20; and a straight bottom edge 22. The latter may be at right angles to the respective side flanges of the tread-supporting plate, but is preferably struck off at an angle with respect to the top flange 21 of the tread-supporting plate, as shown especially well in Fig. 5. Although it is not essential to the successful use of the tread-supporting plate, the ends of the top flange 21 may be secured to the corresponding ends of the side flanges by welded joints or equivalent fastening-means.

A pair of laterally-spaced apertures 23 are provided in the top flange of the tread-supporting plate for accommodating fastening-means such as, for example, a bolt-and-nut assembly indicated generally at 24 in Fig. 4, by which the corresponding end of a stair-tread 14 may be secured to the top flange of the tread-supporting plate. The flange 20 along the back edge of the tread-supporting plate is provided with three longitudinally-spaced apertures 25, each of which is adapted to accommodate fastening-means such as, for example, a bolt-and-nut assembly 26, for securing the back flange 20 of the tread-supporting plate to the front flange 19 of the next-succeeding tread-supporting plate immediately to

the rear thereof, in the manner hereinafter described.

In this connection, the flange 19 on the front edge of each tread-supporting plate is provided with a plurality of sets of apertures 27, 28 and 29 respectively, the upper set 27 being made up preferably of six apertures and the two lower sets 28 and 29 respectively being made up of three apertures each. Although the specified number of apertures for the sets of apertures 27, 28 and 29 has been found satisfactory for the purposes prescribed below, it will be appreciated that it is within the purview of the invention to provide more or less apertures per set. These respective sets of apertures constitute adjusting-means by which the individual tread-supporting plates of the sectional-stringers of the flight of stairs may be adjusted vertically with respect to each other, as indicated by the broken lines in Fig. 2, and for the purpose described below.

In the preferred construction, the over-all adjustment of one tread-supporting plate with respect to the other, obtained by means of the aforesaid sets of adjusting-apertures in the front flanges 19 of the tread-supporting plates, is substantially one and one-quarter inches and, consequently, assuming, for example, seven tread-supporting plates are used in a flight of stairs, the range of adjustment vertically of the flight of stairs will be eight and three-quarters inches. Consequently, a given flight of stairs may be adjusted to have substantially uniformly high tread-supporting plates between successive steps in stair-openings which vary in height by as much as eight and three-quarters inches.

To form a flight of stairs such as shown in Figs. 1 and 2, a prescribed number of prefabricated left- and right-side flanged tread-supporting plates, including the proper number of treads, are taken from stock and assembled as follows. The rear flange 20 of the foremost tread-supporting plate of the flight of stairs and the front flange 17 of the tread-supporting plate immediately to the rear thereof are brought together, as shown especially well in Fig. 3, and rigidly secured by means of the bolt-and-nut assemblies 26. The latter engage in the three apertures 25 of the flange 20 and in corresponding axially-aligned apertures of the three sets of apertures 27, 28 and 29 in the front flange 19. It will be clear that by engaging the fastening-means 26 in the lowermost apertures of the three sets of apertures in the flange 19, the foremost tread-supporting plate will be secured to the next-succeeding tread-supporting plate immediately rearwardly thereof in its lowermost position vertically relative thereto, and that by engaging the fastening-means in successively higher apertures of the three sets of apertures in the front flange 19, the vertical distance between the top flanges of the respective tread-supporting plates will be progressively lessened, that is to say, the two tread-supporting plates may be adjusted vertically with respect to each other so as to vary the height of the rise between successive steps, as indicated by the broken lines in Fig. 2. By joining a plurality of tread-supporting plates in the manner described above, one may quickly fabricate two sectional-stringers of a flight of stairs such as, for example, the sectional-stringers 11 and 12 respectively, of substantially any length.

A tread 14 is then secured to the top flanges of the corresponding pairs of tread-supporting plates of the sectional-stringers 11 and 12 by means of the bolt-and-nut assemblies 24. Moreover, in order to make the connection between successive tread-supporting plates more rigid, the toe-guard 15 of each tread is provided with apertures adjacent the outer ends thereof respectively, adapted to lie substantially opposite the front flanges 19 of the corresponding pair of tread-supporting plates immediately rearwardly thereof, and more especially to be in axial alignment with corresponding apertures of the upper sets of apertures 27 therein, whereby fastening-means comprising bolt-and-nut assemblies 30 may be engaged therein, thereby connecting the tread of one tread-supporting plate with the front flanges of the tread-supporting plates immediately rearwardly thereof.

It will be appreciated that by securing together a predetermined number of prefabricated channeled tread-supporting plates in the manner hereinabove described, a flight of stairs may be constructed to fit the stair-openings which vary widely in height, and without the use of stringers or other conventional framing-members, the flight of stairs being relatively-simple to fabricate, inexpensive and of durable construction.

Although the flanged tread-supporting plates and treads are designed in particular for use as components of a flight of stairs, it will be appreciated that it is within the purview of the invention to employ the tread-supporting plates and treads as shown and described herein, or obvious modifications thereof, in other capacities such as, for example, components of a display stand, shelf, table and the like.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. A sectional stringer for a flight of stairs comprising a plurality of similar flanged tread-supporting plates, said plates each having a tread-supporting flange along its upper edge and parallel side flanges along its side edges; adjusting-means on the side flanges of said tread-supporting plates; and fastening-means in engagement with the adjusting-means of the abutting side flanges of successive tread-supporting plates and securing the latter together substantially rigidly and in vertically-adjusted position with respect to each other.

2. A prefabricated flight of stairs, including in combination two sectional stringers, each stringer being constructed of a plurality of similar flanged tread-supporting plates, said plates each having a tread-supporting flange along its upper edge and parallel side flanges along its side edges; fastening-means securing the abutting side flanges of successive tread-supporting plates substantially rigidly together; and treads secured to the tread-supporting flanges of the corresponding pairs of tread-supporting plates of said two sectional stringers, each of said treads having an integral toe-guard fastened to the flanges of the next-succeeding pairs of tread-supporting plates.

3. A prefabricated flight of stairs comprising two sectional stringers, each stringer being constructed of a plurality of similar flanged tread-supporting plates, said plates each having a tread-supporting flange along its upper edges

and parallel side flanges along its side edges; adjusting-means on the side flanges of said tread-supporting plates; fastening-means in engagement with the adjusting-means of the abutting side flanges of successive tread-supporting plates and securing the latter substantially rigidly together in vertically-adjusted position with respect to each other; treads on the tread-supporting flanges of the corresponding pairs of tread-supporting plates of said two sectional stringers; and fastening-means securing said treads to the tread-supporting flanges of the corresponding pairs of tread-supporting plates and to the corresponding side flanges of the next-succeeding pair of tread-supporting plates of said two sectional stringers.

GEORGE W. LYONS.

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