

[54] PREFABRICATED METAL STAIRWAY

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[51] Int. Cl. E04f 11/00

[58] Field of Search 182/115, 83; 52/185, 186, 187, 52/127

[56] References Cited

UNITED STATES PATENTS

3,092,383 6/1963 Dunn 182/115
3,052,332 9/1962 Mulitz 52/185

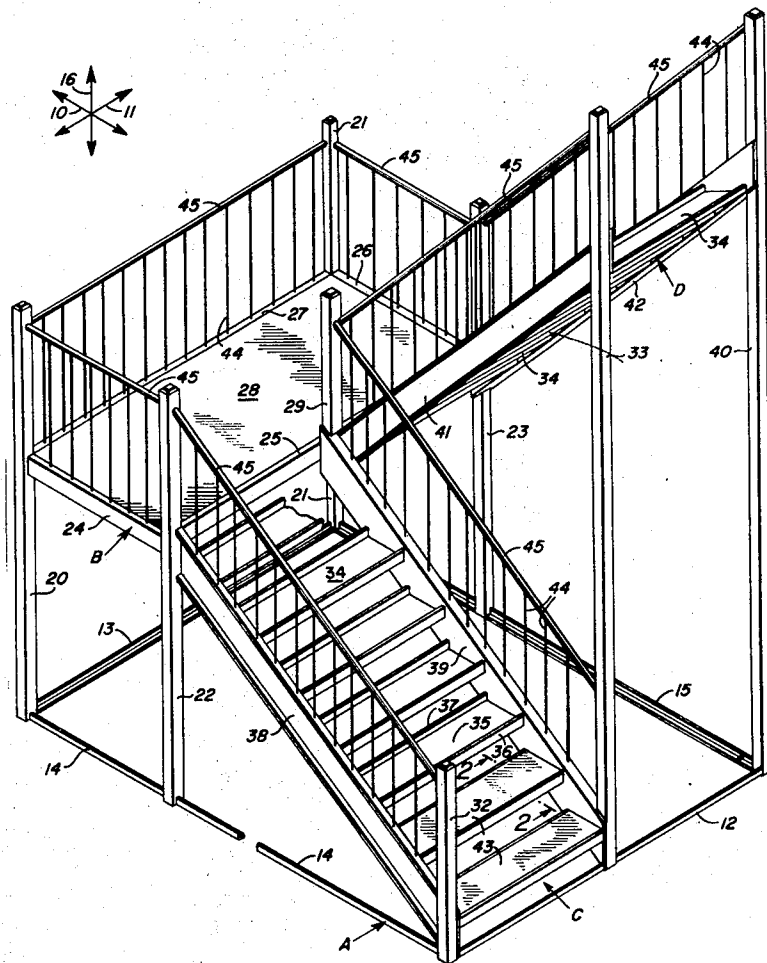
3,175,654 3/1965 Calvert 52/127
3,593,469 7/1971 Wall 52/182

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[57] ABSTRACT

A prefabricated, totally self-supporting metal exterior stairway, for use in connection with a two-story building, is built upon a rectangular load-distributing, ground-bearing frame. Two opposed runs of steps are provided. One run leads from grade to a landing, supported on a rigid box-like support, the loads from which are posted to the ground-bearing frame. The other run leads from the landing to the second floor level. Newel posts link the steps to the ground-bearing frame and internal rigidity is provided by triangulation of members. Treads are of a type which permits field installation of a permanent tread surface.

2 Claims, 2 Drawing Figures



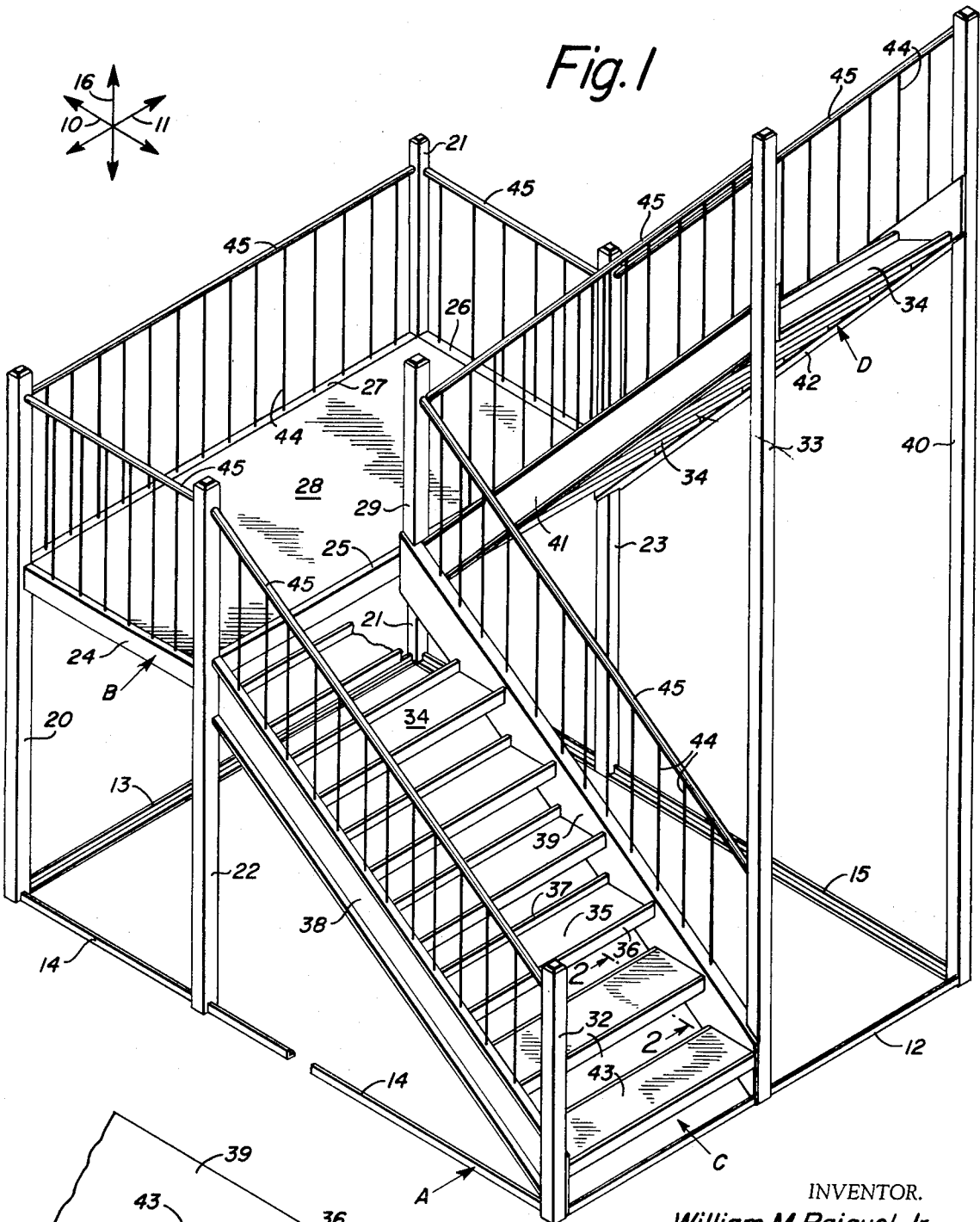


Fig. 1

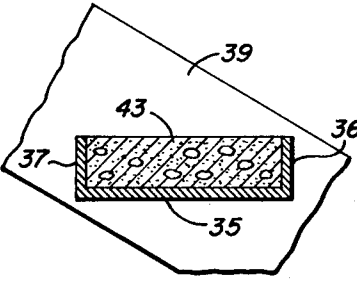


Fig. 2

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PREFABRICATED METAL STAIRWAY

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to metallic building structures. More particularly, it relates to prefabricated stairs suitable for exterior use in connection with two-story buildings.

2. Prior Art

Traditionally, stairways for multi-story buildings have been located inside stair wells. At one time, these were built in-situ by erecting the walls of the stair well followed by installation of landings and runs of steps.

In more recent times, such techniques have given way to those described and illustrated in U.S. Pat. Nos. 3,052,332 and 3,228,154. These patents utilize modular parallelepipedal frame works within which are provided sets of stairs, complete with landings. These modules are stacked to the desired height and the building erected around them while they serve as scaffolding and masonry guides. Necessary tie-in connections are made to the masonry as erection proceeds.

The parallelepipedal shape, while desirable in such applications, is not necessarily economical. Further, the size of steel members used if the modules are to be truly interchangeable, must be selected on the assumption that a given module will be on the bottom and thus be required to support the entire weight of all of the upper modules. The inherent disadvantages of this approach are discussed in column 1 of U.S. Pat. No. 3,175,654.

It has become increasingly apparent that current construction techniques, despite their alleged modernity, have not permitted growth of the housing industry consistent with our nation's need for housing. In May of 1969, HUD Secretary George Romney announced operation 'Breakthrough', a program of wide scope aimed at improving the entire process of supplying quality housing in decent living environments for all Americans. A need of that program, albeit a minor one, has been for an inexpensive exterior metal prefabricated stairway to give access to the second floor of two story buildings such as, for example, garden apartments. Desiderata for such a stairway include inherent rigidity, economic use of materials, safety, and elimination of the need for tying to foundations or masonry to insure support. Further, unlike the stairs shown in patents like U.S. Pat. No. 3,175,654, such stairs should not require the provision of a stair well nor place any heavy reliance upon crafts other than that of the metalworker.

SUMMARY OF THE INVENTION

Briefly, the invention comprises a generally rectangular ground-bearing base upon one end of which a rigid, box-like landing support structure is erected. The landing itself is at an elevation midway between grade and the second floor level. A first run of steps leads from the framework, at the end opposite the landing structure, to the landing. This run of steps, which includes stringers, serves to further brace the landing structure. A second run of steps leads from the landing to the second floor level in a direction diametrically opposed to the first run. Newel posts carry the vertical loads down to the framework from the terminus of the second run. One of these is shared by the first run to define an internal triangular truss having the common newel post as its base and coplanar edges of the two runs of steps as its sides. Conventional balustrades and hand rails are provided.

Accordingly, it is an object of the invention to provide a rigid, strong internally braced prefabricated metal stairway which meets the desiderata set forth above.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing, wherein like reference numerals designate like parts:

FIG. 1 represents an isometric view of a stairway embodying the invention with a portion of the steps cut away.

FIG. 2 is a fragmentary section taken on line 2--2 of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The metal exterior stairway shown in FIG. 1 comprises a generally rectangular ground-bearing base, generally A, at one end of which there is mounted a rigid box-like landing structure B. A first run of steps, C, extends from the other end of the base to the landing structure and a second run of steps, D, extends from said structure to the second floor level where it abuts an appropriate opening in a building (not shown). Other miscellaneous members, such as newels, which complete the structure will be discussed individually below.

Base A is generally rectangular and is made up of members which extend longitudinally (direction 10) and transversely (direction 11). These include, particularly, a front transverse member 12, a rear transverse member 13, at left longitudinal member 14 and a right longitudinal member 15. Member 14 has been broken away to reveal its angular construction, a preferred cross-section. The base may be mounted on a concrete pad or on footings.

The landing structure B includes a plurality of vertically extending (direction 16) members which partially define its box-like configuration. As shown, these include newel posts 20 and 21 which are mounted at each corner of base A. These extend down to the ground level and are welded or otherwise secured to the base. Cooperating with these newel posts are paired, transversely aligned posts 22 and 23 which are also attached to frame A. Were the landing greater in longitudinal (10) extent, other paired newel posts could be utilized. A plurality of horizontal channels connect these posts, at the desired elevation, to form an open rigid frame parallel to base A. These channels include member 24 (between posts 20 and 22), member 25 (spanning from post 22 to post 23), member 26 (spanning from post 23 to post 21) and member 27 (spanning from post 21 to post 20). A deck plate 28, mounted on the frame defined by members 24, 25, 26 and 27, acts as the landing surface and is preferably of non-skid configuration. A short newel post 29 is also provided which is affixed to member 25.

A first run of steps, generally C, extends from transverse member 12 to landing member 25. This run is provided with a short newel post 32 and a long newel post 33, which latter extends the full height of the structure. The steps themselves include a plurality of treads, generally 34, each having a base 35, a front upturned flange 36 and a rear upturned flange 37, as shown in FIG. 2. These treads are affixed to and span between parallel stringers 38 and 39.

A second run of steps, generally D, extends from landing member 25 to the second floor level and is of generally similar construction. Its terminus is supported in part by previously mentioned post 33, which it shares with run C, and in part by a newel post 40 which also extends vertically for the full height of the structure. The treads 34 of second run D are affixed to and span between parallel channels or stringers 41 and 42.

As best seen in FIG. 2, the design of the treads is unique since the generally U-shaped configuration of tread 34 and adjacent stringer portions (e.g., 38 and 39) cooperate to comprise a tray adapted to be filled with material which forms a finished permanent tread surface. For example, if concrete 43 is used it may incorporate non-skid surface material, be poured in the field after the steps are installed and renewed from time to time. Other materials including wood are obviously also suitable.

The stairway is provided, as is customary, with a plurality of balusters 44, which support related rails 45. These are connected to appropriate newels and other structural members, as shown.

Rigidity comes from the box-like nature of structure B and from internal triangulation. Member 14, post 22 and stringer 38 provide one such internal integral truss. Another, on the medial plane, is provided by stringers 39 and 41 in combination with post 33. Elements 40, 15, 23 and 42 also are similarly cooperative. The stairs thus provided are rugged, economical, rigid, easy to install and low in cost.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts exemplified in the embodiment of the invention discussed above. Accordingly, the true scope of the invention is to be determined by a reasonable interpretation of the appended claims.

I claim:

1. A prefabricated permanent metal exterior stairway for a two-story building comprising:

a generally rectangular ground-bearing base having longitudinal members and transverse members, said base being adapted to uniformly distribute a vertical load about the perimeter thereof;

a landing structure at one end of said base including vertically extending newel posts mounted at each corner of said base and paired, transversely aligned, vertically extending newel posts, one of each pair mounted on each longitudinal base member, horizontal channels connecting said newel posts intermediate their ends to define an open frame which is parallel to said base and vertically spaced intermediate the first and second floor levels, and a deck mounted on said frame to constitute a landing;

a first run of steps extending from the transverse member at the end of the base opposite said landing structure, to said landing;

a second run of steps, extending from said landing to the second floor level;

newel posts, linked to the transverse base member at which said first run originates, said posts supporting the terminus of said second run and one of said posts being common to the ground level of said first run and the top of said second run;

said stairway thus posting all of its loads to said base and having a triangulation rigidity including that attributable to the internal trussing provided by the co-planar presence of the edges of the two runs of stairs and a common newel post.

2. The stairway of claim 1 wherein each run of steps includes a pair of parallel stringers and a plurality of treads, spanning said stringers, said treads having a generally U-shaped cross-section and each of said treads and its adjacent stringer portions comprising a tray adapted to be filled with material which forms a finished, permanent tread surface.

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