

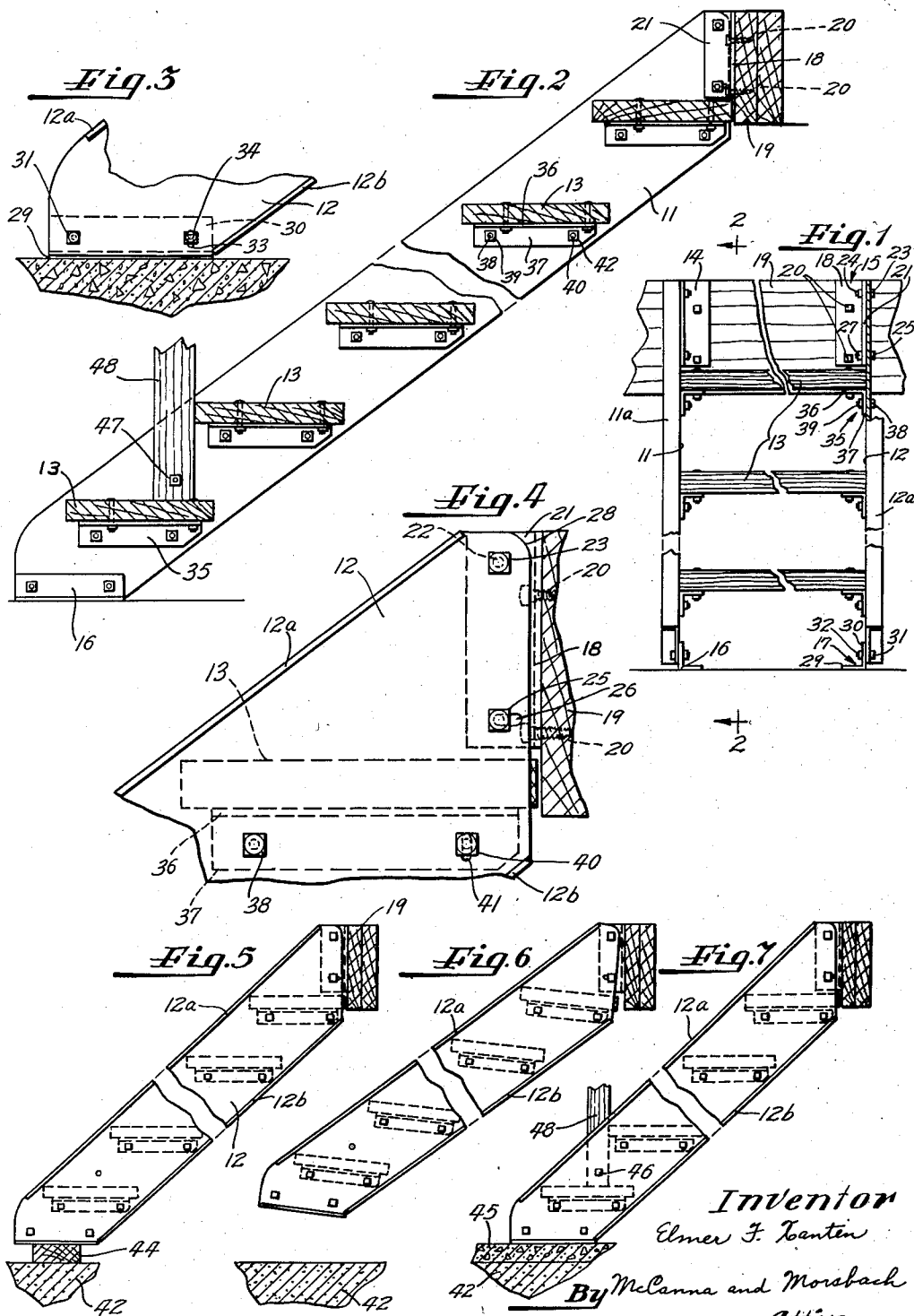
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ADJUSTABLE STAIR

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ADJUSTABLE STAIR

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This invention relates to an adjustable stair, and particularly to an adjustable stair adapted for initial installation as a basement stair before the basement floor is poured and while the construction proceeds on the rest of the house and after pouring of the basement floor serving as a permanent basement stair, all without requiring dismantling of the stair after it is initially installed.

In the usual construction of a house or other small building the common procedure is to first pour the foundation, including pouring or laying up the side walls of the basement. The pouring of the concrete basement floor is left until the house is substantially completed, and the next step after completing the basement walls is to lay the joists for the first floor on top of the basement walls, after which the sub-flooring for the first floor is laid over these joists. A stair well is provided in the first floor sub-flooring to permit access into the basement. However, a permanent basement stairway normally is not put in until after the concrete basement floor has been poured, and during this time it is common practice to provide a ladder or temporary, makeshift stairway leading down into the basement. Frequent accidents result to workmen going up and down this ladder or temporary stairway with tools and materials as the construction proceeds on the house.

These difficulties are avoided by the present invention which provides a stairway of a permanent and safe nature adapted to be installed as soon as the first floor joists and sub-flooring are put in. This stairway permits safe access into and from the basement during the further construction of the house. When it comes time for pouring the concrete basement floor, the stairway may be adjusted out of the way, so as not to interfere with the laying of the basement floor, without disassembling the stairway from its permanent mounting. After the basement floor is finished the stairway is again adjusted to bring its lower end to rest on the basement floor, the stairway thereafter serving as the permanent basement stair.

Accordingly, it is an object of the present invention to provide an adjustable basement stair of novel construction adapted to be permanently installed before the basement floor is poured and which need not be taken down to permit the basement floor to be poured.

It is also an object of the present invention to provide a novel adjustable stair having provision for adjustment to different heights and pitches.

Another object of this invention is to provide a novel adjustable stair having provision for attachment to the floor joists of the higher floor in a manner permitting ready adjustment of the height and angular inclination of the stair.

A further object of this invention is to provide a novel adjustable stair having provision for adjustment of its treads to level position irrespective of the pitch-and-run of the stair.

A still further object of this invention is to provide a

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novel adjustable stair which is angularly adjustable about its upper end and which is provided with footing means at its lower end angularly adjustable to level engagement with the lower floor for any pitch-and-run of the stair.

Other and further objects and advantages of the present invention will be apparent from the following description of a preferred embodiment thereof, which is shown in the accompanying drawing to illustrate the principles of operation of the invention.

In the drawing:

Figure 1 is a front elevation, partly broken away, of the adjustable stair of the present invention mounted on the first floor joists of a house or other building and extending down into the basement;

Figure 2 is a longitudinal section through the stair, taken along the line 2—2 in Fig. 1;

Figure 3 is an enlarged fragmentary end view showing the adjustable footing at the bottom of the stair;

Figure 4 is an enlarged fragmentary end view showing the adjustable mounting of the upper end of the stair;

Figure 5 is an end view, showing the stair in its temporary position before the basement floor has been poured;

Figure 6 is a view similar to Fig. 5 showing the stair in its retracted position while the basement floor is being poured; and

Figure 7 is a view similar to Fig. 5, showing the final, permanent position of the stair after the basement floor has been poured.

In general, the stair assembly of the present invention includes a spaced pair of stringers 11 and 12 (Fig. 1) forming the sides of the stairs, a plurality of treads 13 extending between the stringers and supported thereby, a pair of brackets 14, 15 adapted to be supported by the floor joists and supporting the stringers at their upper ends in a manner permitting limited angular adjustment of the stringers toward and away from the basement floor, and footings 16, 17 carried adjustably at the lower ends of the stringers for engagement with the basement floor.

Referring to Figs. 1 and 4 in particular, the bracket 15 is in the form of a right-angled plate having a rear leg 18 which is secured flush against the floor joist 19 by means of screws 20. Bracket 15 has an integral leg 21 which projects directly outward from the floor joist. Adjacent its upper end this leg is formed with a bolt hole 22 for receiving a bolt 23 which extends through a similar hole in the stringer 12 adjacent the latter's upper end to mount the stringer pivotally on the bracket 15. A nut 24 is threaded onto the bolt to maintain the parts in this relation. Adjacent its lower end the bracket leg 21 receives a bolt 25 which extends through an elongated slot 26 formed in the stringer 12. A nut 27 is releasably threaded onto the inner end of bolt 25 and when loosened permits the stringer 12 to be adjusted angularly about the upper bolt 23. The bolt 25 has a sufficiently loose fit in the slot 26 that this limited angular adjustment may take place even though the slot 26 is straight, as shown. Of course the slot 26 may be made arcuate, if desired. The top corner 28 of the stringer 12 is curved to permit this angular adjustment of the stringer 12 relative to its support bracket 15.

The mounting of the upper end of the other stringer 11 on its support bracket 14 is identical to that just described and hence will not be discussed in detail. Both the stringers and their mounting brackets are preferably of steel. Each of the stringers is channel shaped in cross-section, except at the forward edge at its lower end, presenting the outwardly extending upper and lower flanges 11a and 11b, and 12a and 12b, respectively. This channel shaped configuration imparts maximum strength and rigidity to the stringers.

At its lower end the stringer 12 carries a footing 17

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in the form of an angle plate having a floor-engaging leg 29 and an upstanding leg 30 attached to the stringer. As best seen in Figs. 1 and 3, a bolt 31 extends through aligned holes in the stringer 12 and the upstanding leg 30 of footing 17 and threadedly receives a nut 32 at its inner end for clamping these members together. Toward the inner edge at its lower end the stringer 12 is formed with an elongated slot 33 through which extends loosely a bolt 34, the bolt passing snugly through a hole in the upstanding leg of footing 17 and threadedly receiving a nut at its inner end. The arrangement of the bolt 34 and the slot 33 in stringer 12 enables the footing 17 to be adjusted angularly relative to the stringer to compensate for different pitches of the stringer during successive stages in the use of the stair or for different stair heights, so as to maintain the floor-engaging leg 29 of the footing 17 in level engagement with the floor no matter what the pitch of the stair. The slot 33 may be made straight, as shown, provided the bolt 34 has a loose enough fit therein to permit this angular adjustment to be effected.

The footing 16 is similarly mounted in angularly adjustable fashion on the lower end of the other stringer 11.

Each of the wood treads 13, which are arranged in step fashion from top to bottom along the stringers, is mounted on the stringers for limited angular adjustment relative to the stringers in order to maintain the treads horizontal for any pitch of the stringers. Referring to Figs. 1 and 4, at each of its ends each tread 13 is bolted to the upper, horizontal leg 36 of a right-angled bracket 35 having its depending side leg 37 bolted to the inner side of the adjacent stringer. A bolt 38 extends snugly through aligned holes in the stringer and the side leg 37 of tread bracket 35 and threadedly receives a nut 39 at its inner end to clamp these parts in place. Another bolt 40 extends snugly through a similar hole formed in the depending side leg 37 of the tread bracket 35 adjacent its rear end and loosely through an elongated slot 41 in the stringer. At its inner end a nut 42 is threaded onto the inner end of bolt 40. With this arrangement, by loosening the nuts 39 and 42 each tread bracket 35 and the corresponding tread 13 may be adjusted angularly relative to the stringers to level the treads at any pitch of the stringers, after which the nuts 39 and 42 are tightened to lock the treads in this position.

In the use of this stair in a house or other building, normally the joists 19 and the sub-flooring for the first floor are installed after the foundation 42 has been poured. In order to enable the workmen to have convenient and safe access to the basement as the construction proceeds before the basement floor is poured, the brackets 14 and 15 are attached to the floor joists, as described, and the assembly of the stringers 11 and 12, treads 13, and footings 16 and 17 are bolted to these brackets. At this time, a two-by-four or other wood block 44 (Fig. 5) of the approximate thickness of the basement floor to be poured is inserted beneath the footings 16 and 17 to support the lower end of the stair. The footings 16 and 17 are adjusted to position their lower legs horizontal and the tread brackets 35 are likewise adjusted angularly relative to the stringers to maintain the treads 13 horizontal. Thus, there is provided a stable stairway during this stage of the construction, thereby avoiding the danger and inconvenience connected with the use of make-shift ladders at this time.

When the time comes to pour the basement floor, the lower end of the stair may be lifted up out of the way, as shown in Fig. 6. This is accomplished by adjusting the stringers 11 and 12 of the stair angularly about the brackets 14 and 15 at their upper ends, which are attached to the first floor joists.

After the completion of the basement floor, the lower end of the stair may again be lowered (Fig. 7) to position its footings 16 and 17 in engagement with the floor 45. Any necessary final angular adjustment of the foot-

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ings 16 and 17 and the treads 13 may be made at this time to level these parts of the stair. Hereafter, the stair serves as a permanent stairway from the first floor to the basement in the usual manner.

After adjustment of the stair to its final, permanent position there are provided hand rails (not shown) at opposite sides of the stair. These hand rails are supported at their lower ends by posts 48, which rest at their lower ends on the bottom step and which are each attached by a threaded bolt 46 and a cooperating nut 47 to the inner faces of the stringers 11 and 12, respectively.

From the foregoing it will be seen that I have provided a basement stairway adapted for permanent installation as soon as the first floor joists and sub-flooring are in and which does not interfere with the later pouring of the basement floor. Following the completion of the basement floor, the novel stairway described above then serves as a permanent basement stair. All of the necessary adjustments of this stair involve no more than simple bolt and nut arrangements.

While in the foregoing description and in the accompanying drawing there has been disclosed a specific preferred embodiment of the present invention, it is to be understood that various modifications, omissions and refinements which depart from the illustrated form of the invention may be adopted without departing from the spirit and scope of the present invention. Furthermore, while the particular use of the stair of the present invention as a basement stairway has been discussed in detail above, it is to be understood that this stair is adapted for other and different uses where an adjustable stair having the characteristics of the present invention is desired.

I claim:

1. An adjustable stair adapted to be installed in a basement stair well of a building prior to installation of the basement floor and adjustable to accommodate different floor-to-floor spacing comprising a pair of spaced downwardly inclined stringer members, a pair of stringer member supports pivotally attached to the upper ends of said stringer members and adapted for attachment in the stair well to permit elevating and lowering of said stringer members, means for selectively clamping the stringer members to said supports to lock the stringer members in a preselected adjusted position, a pair of angle iron foot plates pivotally attached to the lower ends of said stringer members for limited angular adjustment relative thereto to level the lower face of the foot plates for engagement with the floor, means for selectively clamping said foot plates to said stringer members, a plurality of elongated angle iron tread mounting members, said tread mounting members having a pair of longitudinally spaced holes in one leg adjacent opposite ends thereof, said stringer members having a first row of spaced holes adjacent the upper edge thereof and a second row of spaced holes adjacent the lower edge thereof and each substantially horizontally aligned with one of the holes in the first row, a first set of bolts each extending through the hole adjacent the forward end of one of the bracket members and through one of said holes in said first row in the stringer members, a second set of bolts each extending through the hole adjacent the rear end of one of the bracket members and through one of the holes in the second row of holes in said stringer members, the holes in one of the members through which said second set of bolts extends being vertically elongated to permit angular adjustment of the bracket members relative to the stringer members about the first set of bolts, nuts on each of said bolts for clamping the bracket members to the stringer members in the adjusted position thereof, and treads mounted on said tread mounting brackets and extending between said stringer members.

2. An adjustable stair adapted to be installed in a basement stair well of a building prior to installation of the basement floor and adjustable to accommodate different

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floor-to-floor spacing comprising a pair of spaced downwardly inclined stringer members, a pair of stringer member supports pivotally attached to the upper ends of said stringer members and adapted for attachment in the stair well to permit elevating and lowering of said stringer members, means for selectively clamping the stringer members to said supports to lock the stringer members in a preselected adjusted position, a pair of angle iron foot plates pivotally attached to the lower ends of said stringer members for limited angular adjustment relative thereto to level the lower face of the foot plates for engagement with the floor, means for selectively clamping said foot plates to said stringer members, a plurality of elongated angle iron tread mounting members, said tread mounting members having a pair of longitudinally spaced holes in one leg adjacent opposite ends thereof, said stringer members having a first row of spaced holes adjacent the upper edge thereof and a second row of spaced holes adjacent the lower edge thereof and each substantially horizontally aligned with one of the holes in the first row, a first set of bolts each extending through the hole adjacent the forward end of one of the bracket members and through one of said holes in said first row in the stringer members,

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a second set of bolts each extending through the hole adjacent the rear end of one of the bracket members and through one of the holes in the second row of holes in said stringer members, the second row of holes in said stringer members being vertically elongated to permit angular adjustment of the bracket members relative to the stringer members about the first set of bolts, nuts on each of said bolts for clamping the bracket members to the stringer members in the adjusted position thereof, and treads mounted on said tread mounting brackets and extending between said stringer members.

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