March 18, 1958 R. H. JOHNSON 2,827,336

LADDER STEP PLATFORM

Filed June 20, 1956 3 Sheets-Sheet 1

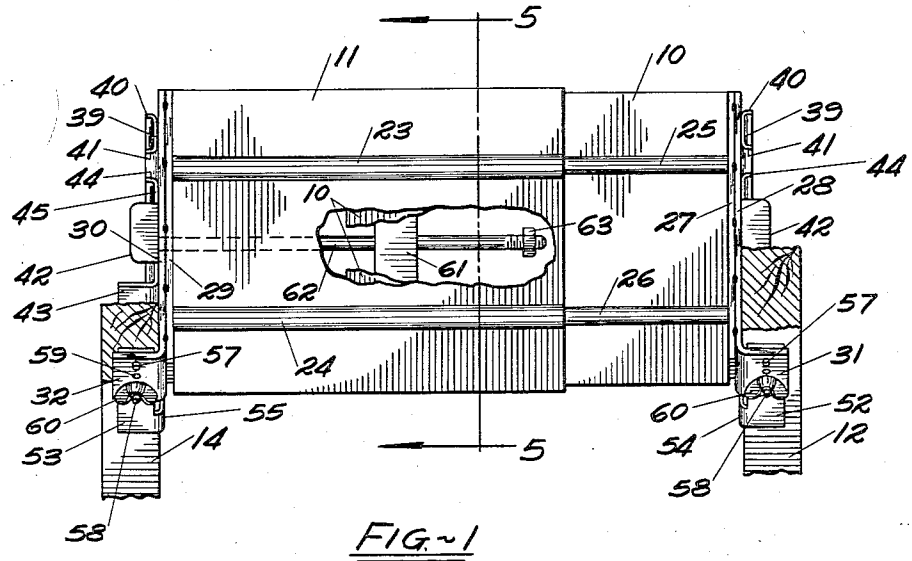


FIG.~1

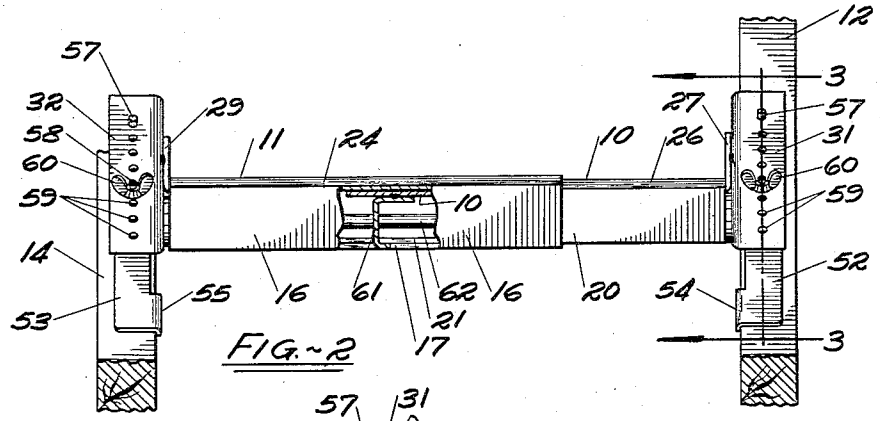


FIG.~2

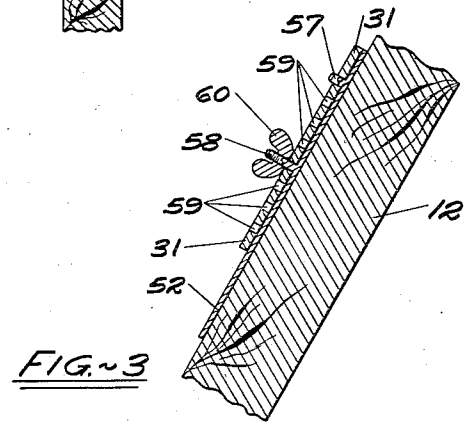


FIG.~3

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LADDER STEP PLATFORM

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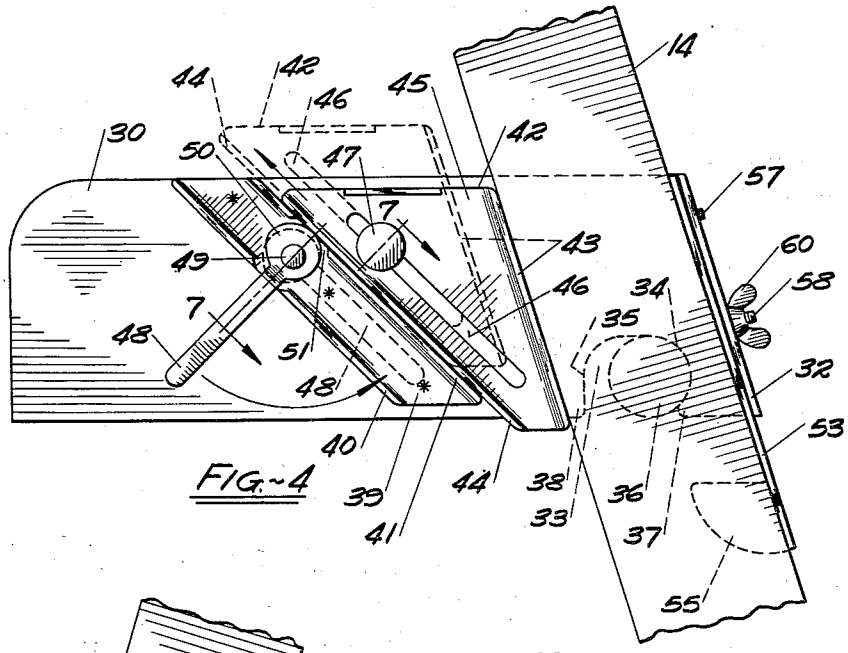


FIG.-4

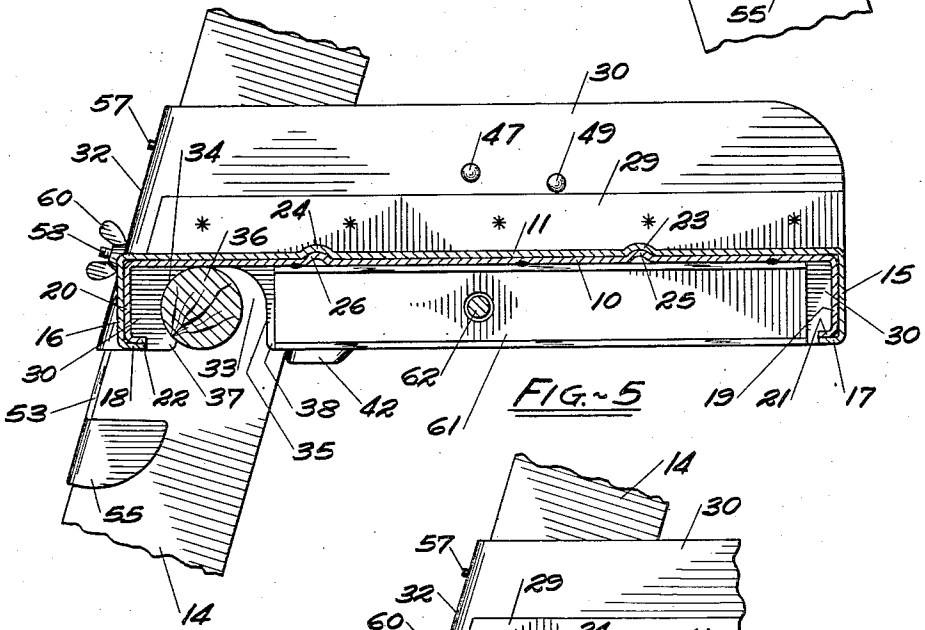


FIG.-5

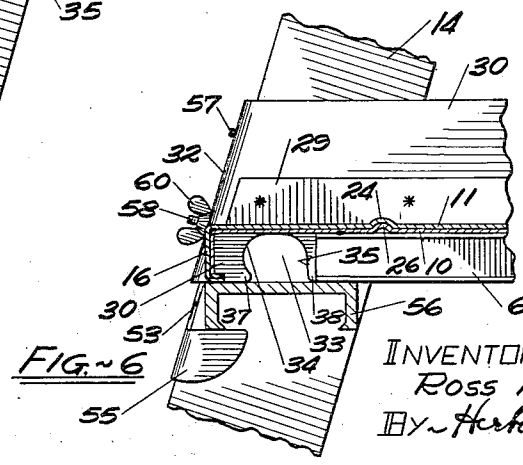


FIG.-6

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LADDER STEP PLATFORM

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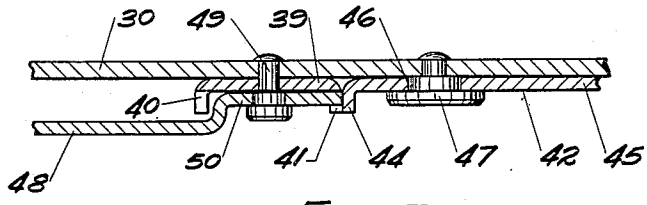


FIG. 7

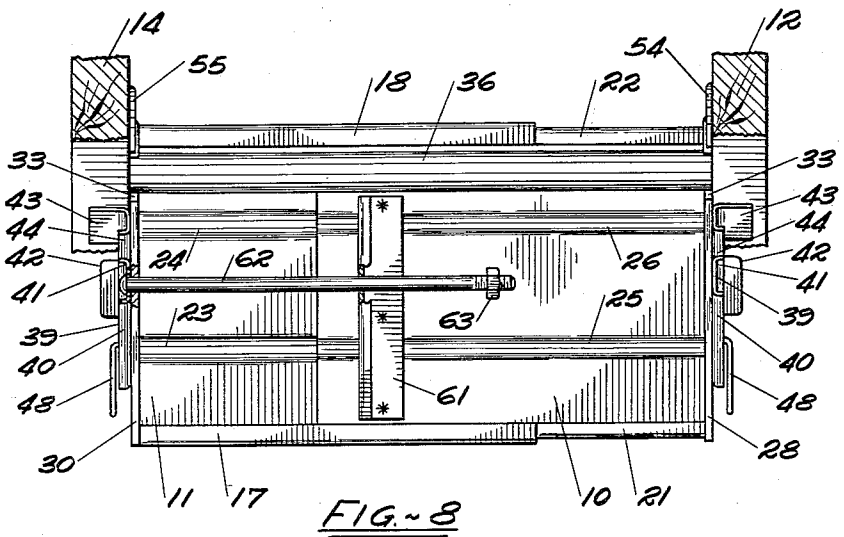


FIG. 8

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United States Patent Office

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LADDER STEP PLATFORM

Ross H. Johnson, Indianapolis, Ind.

Application June 20, 1956, Serial No. 592,669

8 Claims. (Cl. 304—31.5)

This invention relates to a device for demountably attaching to ladders both of the flat or round rung types. The invention has for its primary purpose the provision of a structure which may be readily adapted to any ladder regardless of its width and shape of rungs and secured to the ladder against accidental displacement whereby a platform is presented on which may be received the full length of the user's feet.

One of the serious problems in using ladders either of the straight type or the stepladder type is the effect of the strain on the user in using the ladder whereby the foot has a very limited area of bearing on the rung. Normally the user will adjust his foot across the rung so that the rung will fit immediately under the instep of the foot to have the heel of the shoe bear against the front side of the rung. This is particularly true where the straight, round section rung is employed. In respect to the ordinary flat steps as employed in stepladders, these steps necessarily are limited in transverse widths, that is in a fore and aft direction to but a few inches so that the user either selects the position of his foot to have the instep of the foot bearing directly on the step or will have his foot so placed as to have the ball only of the foot thereon.

In any one of these events, there is a severe leg strain set up generally including backache and other associated discomfort where the worker has to remain on the ladder for any appreciable length of time. Also in normal ladder usage, the worker has to hold onto the ladder with one hand so that he only has one hand available for the work involved. When the foot arches and legs and also the back begin to tire under the strain, then accidents are prone to happen.

The present invention solves these difficulties by providing a platform which extends entirely rearwardly of the ladder so that in use, the worker does not strike the platform with his shins, but may readily ascend the ladder even past the location of the platform when necessary, or he may use a number of these platforms involving the invention on one ladder, one above the other on different rungs or steps.

By use of the structure embodying this invention, danger of slipping or falling because of insecure footing on the heretofore presented round or narrow rung ladders, is avoided, and the more weight put on the structure, the more secure it becomes. It may be securely located over any ladder rung, regardless of the width of the ladder within limits such as from about 10½ inches to 20 inches spacing.

Also the ladder platform involving the invention adds further safety in that it eliminates the loading of the rung at its centermost position, by the foot of the worker, and distributes the weight of the worker uniformly across the rung to the ladder rails so that breakage of rungs is avoided.

Reference is made to my prior application for U. S. Letters Patent, Serial No. 480,760, filed January 10, 1955, now Patent No. 2,805,104.

These and many other objects and advantages of the

invention will become apparent to those versed in the art in the following description of the invention as illustrated in the best form now known to me in the accompanying drawings, in which—

Fig. 1 is a view in top plan of a structure embodying the invention as applied to a ladder and with portions broken away;

Fig. 2 is a view in front elevation and partial section;

Fig. 3 is a view in vertical section on the line 3—3 in Fig. 2;

Fig. 4 is a view in side elevation from the left side of the ladder;

Fig. 5 is a view in section on an enlarged scale on the line 5—5 in Fig. 1;

Fig. 6 is a view in vertical section similar to that shown in Fig. 5 with the structure applied to a flat step ladder;

Fig. 7 is a view in section on an enlarged scale on the line 7—7 in Fig. 4; and

Fig. 8 is a view in bottom plan and partial section.

The step platform is made in two panels **10** and **11** fitted together in a telescoping manner so as to be adjustable as to length between ladder rails **12** and **14**, Fig. 1.

The top panel **11** is provided with downturned legs **15** and **16**, Fig. 5, each of these legs having inturned feet **17** and **18**. The panel **10** slides under the panel **11** and has the downturned legs **19** and **20** with the respective inturned feet **21** and **22**, the lengths of these legs **19** and **20** being such that the legs may fit slidingly along the opposing sides of the legs **15** and **16** and the feet **21** and **22** ride over the top sides of the feet **17** and **18**.

As a further means for aligning the panels **10** and **11** and also to reinforce those panels, the upper panel **11** has beads **23** and **24** longitudinally thereof in spaced apart relation, and the panel **10** has beads **25** and **26** fitting upwardly into the beads **23** and **24**.

Panel **10** has an upturned end flange **27** which is secured to a rail plate **28** by any suitable means, such as by spot welding. Likewise the other panel **11** has an end, upturned flange **29** which is secured to a ladder rail plate **30** by similar means such as by spot welding. Each of these plates **28** and **30** has respectively arms **31** and **32** turned substantially at right angles to the plates and in opposite direction, one from another. Each of the rail plates **28** and **30** further is notched out as indicated in Figs. 4 and 5 by the notch **33** entering from the lower edges of the respective plates by a front arcuate margin **34** following the general contour of the ladder rung **36**. The notch **33** extends rearwardly from the upper end portion of this arcuate margin **34** substantially horizontally under the panel **10** and thence curves around and downwardly into a straight marginal edge portion **35**. The distance between the points **37** and **38** is made such that the rung **36** may be received freely between those points **37** and **38** and the plates **28** and **30** are then pushed rearwardly of the ladder to have the rung **36** seated against the arcuate margin **34**.

To insure that the platform remains in place across the ladder rung **36**, there is provided a ladder rail engaging device applied to each of the plates **28** and **30**. These devices will be made in a left and right handed manner, so therefore the description of one in reference to the plate **30** is sufficient to describe the same structure applied to the plate **28**. Referring to Fig. 4, there is a channel member **39** fixed in a diagonal manner to the outside of the plate **30** with legs **40** and **41** of the channel projecting outwardly from the plate. The member **39** is positioned on the member **30** to have its lower end portion nearer the ladder rail than is the upper portion, as indicated in Fig. 4.

A wedge member **42** is formed to have one edge **43** parallel to the arm **32** when the opposite edge **44** rides

on the leg 41 of the channel member 39. That is, the wedge member 42 is generally triangular in shape with the apex thereof turned downwardly so that the edge portion 43 will remain parallel to the arm 32 regardless of the position of sliding along the leg 41. This member 42 is formed of a generally flat plate portion 45 with the legs or edges 43 and 44 turned outwardly therefrom. The plate 45 is provided with a slot 46 therethrough parallel to the edge 44, and a rivet 47 is passed through the slot 46 by its shank to be fixed through the plate 30. The rivet 47 thus confines the member 42 to the sliding action along the leg 41.

A lever 48 is rockably mounted on the channel member 39 and is pivoted by means of a rivet 49 extending through the lever 48, the channel member 39, and the plate 30 in the present construction. The portion of the lever 48 surrounding the rivet 49 is enlarged to form a cam 50, a portion of which is exposed through the opening 51 in the leg 41 to be in the path of the wedge member leg 44. That is, by rocking the lever in the direction of the arrow, Fig. 4, to its dash line position substantially parallel with the member 39, the cam 50 is entirely removed from contact with the leg 44, and rocking the lever 48 in a reverse direction brings the cam compressibly against the leg 44 tending to retain the member 42 against travel along the leg 41, the rivet 47 limiting travel away from that leg 41 under pressure of the cam 50.

The structure thus far described is applied to a ladder of the straight type with the rungs 36 by placing the two panels 10 and 11 over the topside of the rung and then pulling apart those panels until the plates 28 and 30 bear against the inner sides of the rails 12 and 14, the arms 31 and 32 being on the front sides of the rails 12 and 14. Then the lever 48 is rocked so that the wedge member 42 may drop downwardly along the leg 41 to allow the side 43 to come into contact with the rear side of the rails 12 and 14 in each instance, and then the lever 48 is rocked upwardly to the solid line position in each instance, as indicated in Fig. 4, whereupon the platform consisting of the two panels 10 and 11 is securely retained in position and substantially horizontally depending on the angles of inclination, of course, of the rails 12 and 14, the wedge member 42 being so designed in conjunction with the arms 31 and 32 to give the horizontal position of the panels 10 and 11 for the normal inclination of the ladder when in use.

While it has been indicated that these arms 31 and 32 may be brought against the front sides of the ladder rails 12 and 14, there is provided for use primarily on flat steps of ladders a pair of retainer members 52 and 53 to fit respectively under the arms 31 and 32 and extend downwardly therefrom with inturned feet 54 and 55 to engage respectively under the flat step 56, Fig. 6. As is noted in this view, the plates 28 and 30 will rest across the topside of the step 56 and the members 54 and 55 will engage down below and under the step 56.

In order to secure these members 52 and 53 in fixed positions relative to the arms 31 and 32, each of these members 52 and 53 is provided with a stud 57 and a second screw-threaded stud 58 spaced apart that distance which may be selectively entered through holes 59 provided along the arms 31 and 32, Fig. 2. The members 52 and 53 are then secured by means of a wing nut 60 screw-threadedly engaging the stud 58 in each case. The purpose of having a series of holes 59 through these arms 31 and 32 is to permit the members 52 and 53 to be adjusted longitudinally thereof so as to bring the members 54 and 55 snugly up against the underside of the step 56 so as to prevent rocking of the platform, regardless of the thickness of the step 56.

Referring to Fig. 8, the panel 10 is provided with a reinforcing member 61 extending across its underside adjacent the free end of the panel. A bolt 62 is secured by one end to the plate 30 and extends freely slidably through the reinforcing member 61, and carries a stop

on its free end, herein shown in the form of a nut 63. The purpose of this bolt is to prevent the separation of the panel 10 from the panel 11 in their extreme extended positions one in relation to the other.

While I have herein shown and described my invention in the form as now best known to me, in minute detail, it is obvious that structural changes may be made without departing from the spirit of the invention, and I therefore do not desire to be limited to that precise form beyond the limitations which may be imposed by the following claims.

I claim:

1. For a ladder having side rails and steps interconnecting the rails at intervals therealong, a platform detachably mounted over a step comprising a pair of panels one telescoping over the other and providing a foot receiving area, said panels extending from rail to rail over said step; a plate fixed to an outermost end of each of said panels extending fore and aft along the side rails and resting across said step; an arm extending from the front end of each of said plates and over the front sides of said rails; and means mounted on said plates back of said rails releasably bearing thereagainst and urging said arms toward the front sides of the rails, said means comprising in each instance a slide member carried by said plate and a shiftable wedge member between said slide member and said rail.

2. The structure of claim 1 in which there is a cam member engaging with said wedge member retaining it in position bearing against the rail.

3. The structure of claim 1 in which there is means carried by said plate in each instance engaging about said step.

4. The structure of claim 3 in which said step is flat and said means comprises a bar interposed between each of said arms and the forward sides of said rails, there is a foot on each of said bars turned rearwardly along the rails to extend under said step, and there is means adjustably fixing the said bars up and down along said plate arms.

5. For a ladder having side rails and intervening steps, a full foot receiving platform mounted over the step and extending rearwardly therefrom in cantilever manner, comprising a pair of side plates; a platform extending between and fixed by end portions to said side plates, and having approximately a fore and aft length sufficient to receive both the heel and toe of a worker, said platform vertically positioning said plates; an arm extending substantially at right angles from the front end of each of said plates and extending across the front sides of said rails; a slide member carried on each of said plates back of said rails and sloping upwardly and rearwardly from the rails; a wedge member having an edge portion slidingly bearing on said slide member and a second edge portion substantially parallel to said plate arms; said wedge member having a slot therethrough parallel to said slide member; and a pin extending through said slot and fixed to said plate retaining the wedge member in sliding relation with said slide member.

6. The structure of claim 5 in which there is a cam member rockably carried by each of said plates adjacent said wedge member first edge portion, and a lever fixed to the cam member for rocking the cam into engagement with the wedge member holding it against travel away from the ladder rail.

7. The structure of claim 5 in which said step is round, and each of said plates is notched from its under edge with an arcuate forward marginal edge portion engaging around the step.

8. For a ladder having side rails and intervening steps, a full foot receiving platform mounted over the step and extending rearwardly therefrom in cantilever manner, comprising a pair of side plates; a platform secured by end portions to said side plates disposing the plates in substantially vertical positions; an arm extending substantial-

ly at right angles from the front end of each of said plates extending across the front sides of said rails; a slide member carried on each of said plates back of said rails and sloping upwardly and rearwardly from the rails; a wedge member having an edge portion slidingly bearing on said slide member and a second edge portion substantially parallel to said plates arm; and means slidingly retaining said wedge member along said slide member.

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