Sept. 3, 1957 R. H. JOHNSON 2,805,104

LADDER STEP STAND

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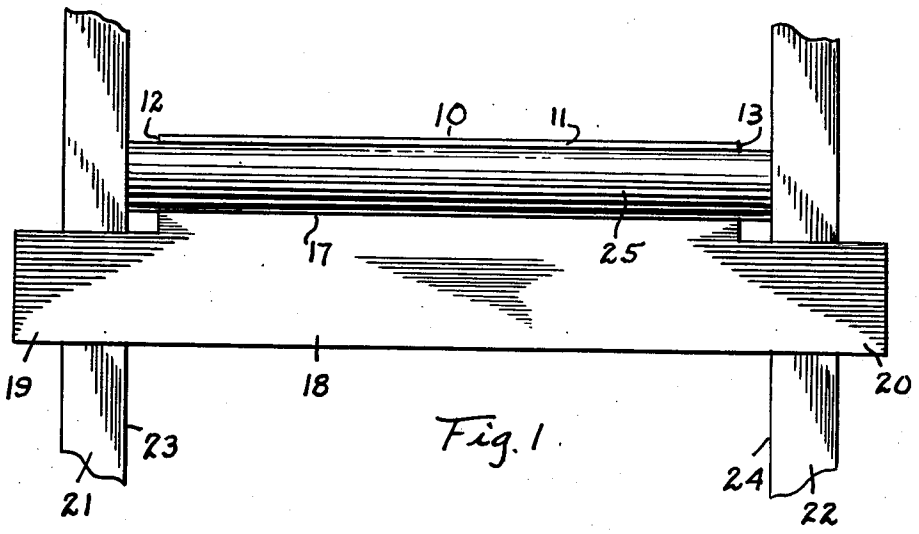


Fig. 1

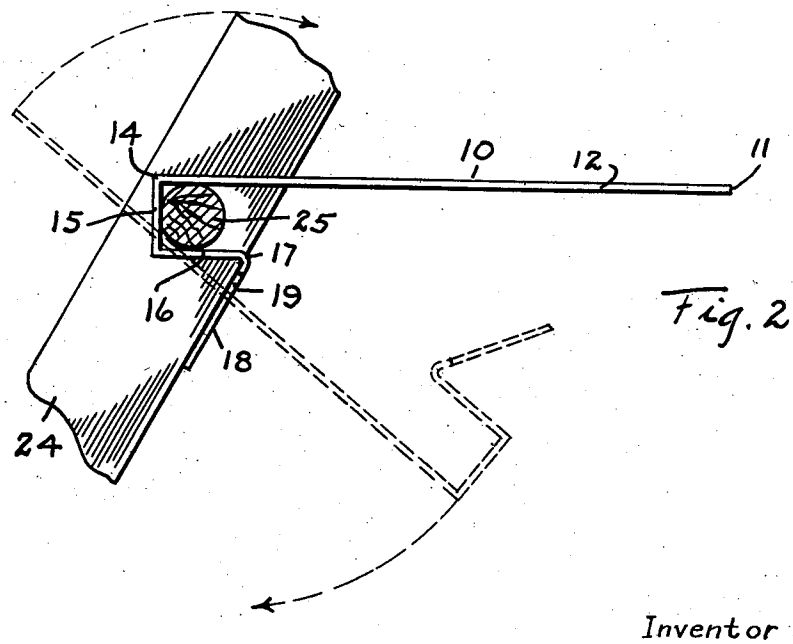


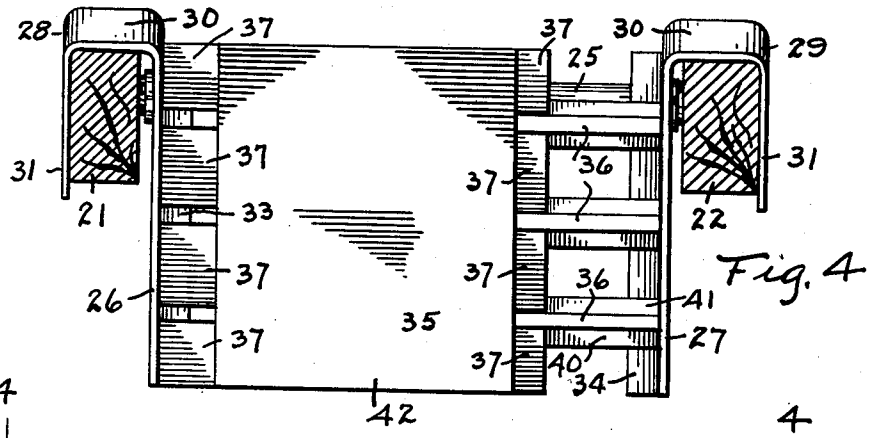
Fig. 2

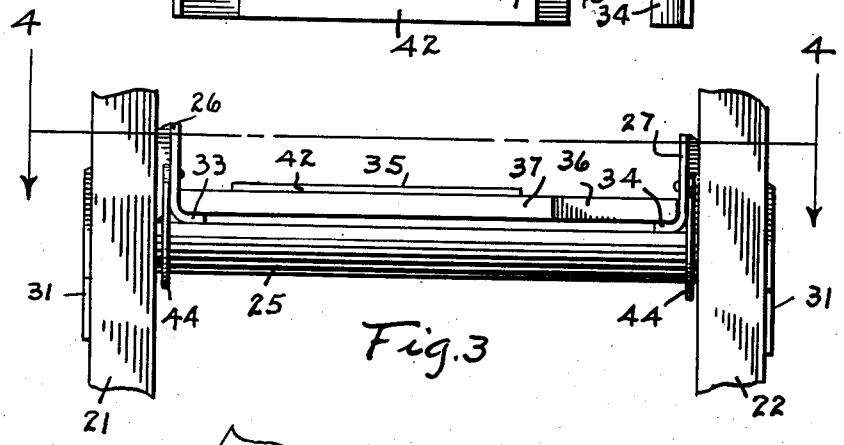
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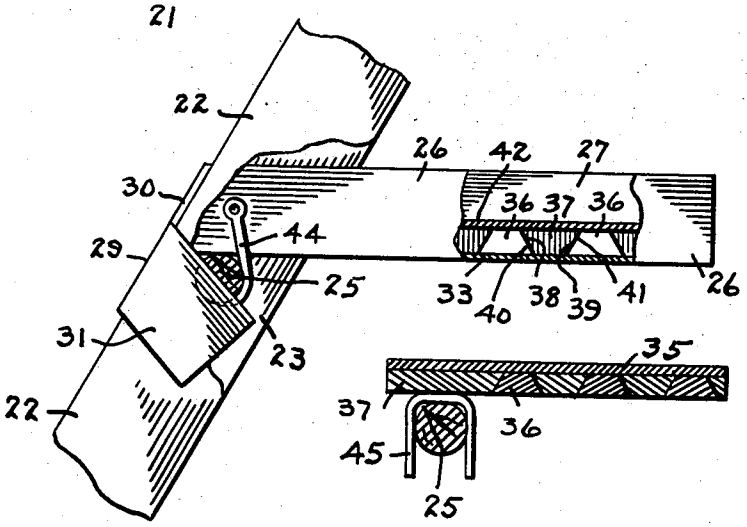
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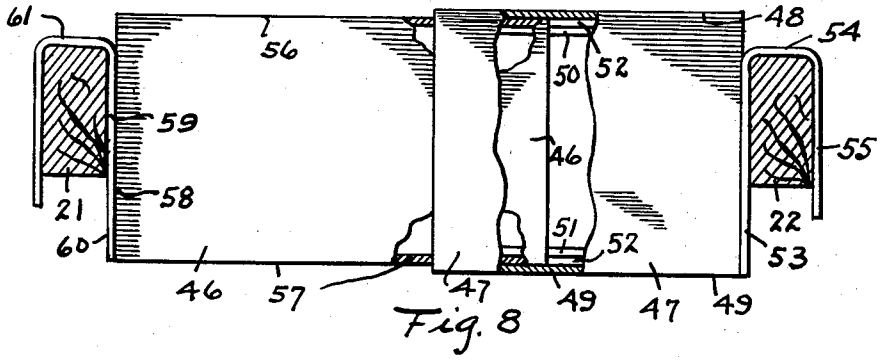


Fig. 8

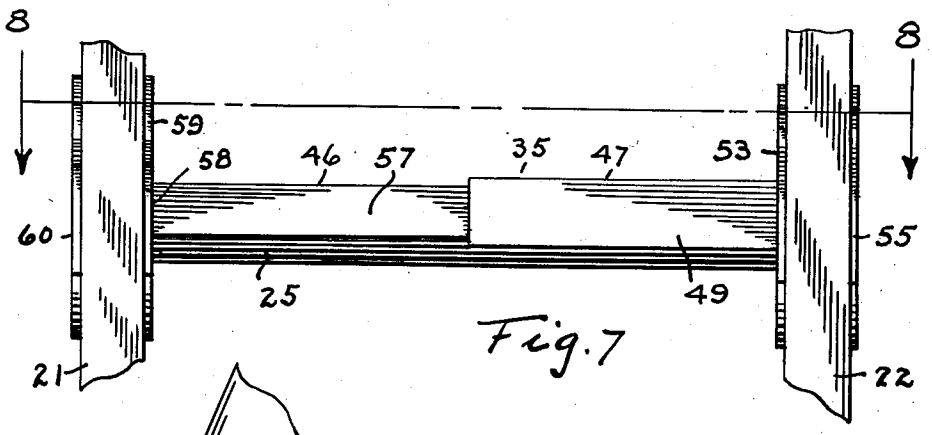


Fig. 7

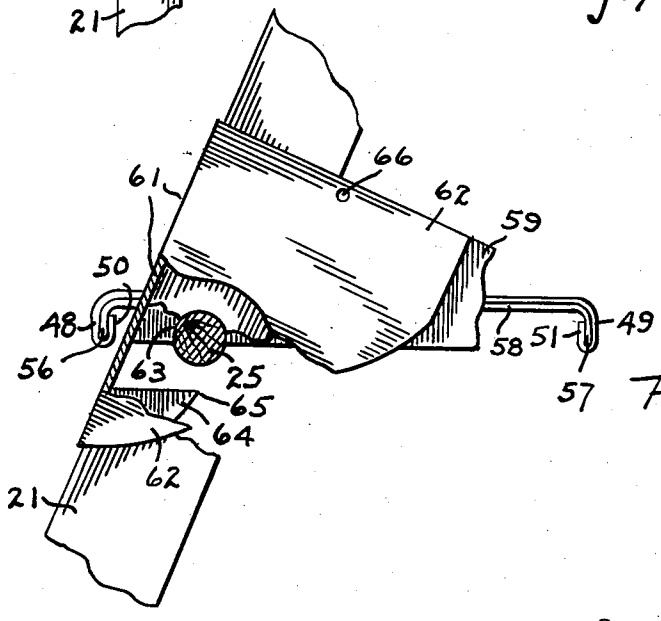


Fig. 9

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LADDER STEP STAND

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Application January 10, 1955, Serial No. 480,760

4 Claims. (Cl. 304—31.5)

This invention relates to a construction to be applied equally as well to ladders with cross rounds or rungs, and to flat step ladders wherein the steps are commonly formed as flat treads as in the ordinary step-ladder. The structure is a unit in itself to be detachably applied to the ladder at various heights therealong in accordance with the rounds presented. It may be left on the ladder as the ladder may be moved about, or quickly detached.

The structure presents in effect a flat platform extending from the round behind the ladder so that the foot of the user may be supported entirely thereon and thus avoid the customarily encountered arch-strain, leg-ache, and even backache as is found to exist among those workmen who commonly employ ladders such as carpenters, painters, fruit-pickers, tinners, etc.

Also the structure provides a factor of safety since the user may stand erect on the platform thus provided by the construction and have both hands free whereas in the past structures, the user has been obliged to use one hand to hold onto the ladder particularly where the ladder employs the usual rounds.

Two of the structures embodying the invention may be employed, one to stand upon, and one placed thereabove to support buckets or the like for convenient placement for usage.

These and many other objects and advantages of the invention will become apparent to those versed in the art in the following description which is made in reference to the accompanying drawings, in which

Figure 1 is a view in rear elevation of a simplified form of structure embodying the invention applied to a ladder round;

Fig. 2 is a view in side elevation of the structure;

Fig. 3 is a view in rear elevation of a modified form of the stand embodying the invention as applied to a fragmentary length of a ladder;

Fig. 4 is a view in transverse section on the line 4—4 in Fig. 3;

Fig. 5 is a view in side elevation and partial section of that form shown in Figs. 3 and 4;

Fig. 6 is a detail in central vertical section through the form of stand as illustrated in Figs. 3 and 4 with a modified round engagement;

Fig. 7 is a view in rear elevation of a further modified form of the stand as applied to a fragmentary length of a ladder;

Fig. 8 is a view in transverse section on the line 8—8 in Fig. 7; and

Fig. 9 is a view in side elevation and partial section with fragments of the structure broken away.

Referring first to that form of the stand as illustrated in Figs. 1 and 2, a unitary sheet of metal is formed to have in its normal usage a platform 10 generally rectangular in form free along one relatively rear edge 11 and both sides 12 and 13. The platform 10 merges through a bend 14 into a round encircling length 15 from

which length 15, there is turned rearwardly an under length 16. From the rear portion 17 of this length 16, there is a downwardly and diagonally extending apron 18 which in turn has wings 19 and 20 extending laterally therefrom sufficient in length to bear against the rear sides 23 and 24 of the ladder rails 21 and 22 respectively.

To apply the structure thus far described, the platform 10 is turned upside down and brought around the under side of the ladder round 25, Fig. 2, and then revolved as indicated by the arrows from the dash line position to bring the wings 19 and 20 around against the back sides of the ladder rails 21 and 22 and to have the platform 10 then extend rearwardly from over the top side of the ladder round 25 when the structure will then be positioned as indicated in Fig. 2 to have the platform 10 extend by its greater area rearwardly of the round 25. In the normal angle of the ladder rails 21 and 22 when in usage, the platform 10 will be substantially positioned horizontally by reason of the angularity of the wings 19 and 20 in respect to the plane of the platform 10.

In this position, the user may climb up the ladder in the normal manner, and when he comes to the platform 10, he may stop with his feet thereon. The heel of the user will rest substantially on or rearwardly of the round 25 on the platform 10, while the sole of the foot will extend rearwardly therefrom and be supported by the platform 10 whereby the feet of the operator may be fully supported without the operator having to balance around on the round 25 either on his toes or through his arches intermediate the ball and heel of his feet. The platform 10 is made out of sufficiently rigid material to resist any substantial bending, and in fact by turning the platform 10 at substantially right angles from the top of the length 15, the tendency to bend at the junction between the platform and the length 15 is avoided so that in effect there is a certain amount of stiffening obtained by effecting this right angle bend. The same thing is true of the juncture between the lengths 15 and 16.

The structure may be removed from the ladder round 25 by reversing the operation above described, turning the structure in the direction opposite to that indicated by the arrows in Fig. 2. Thus it is to be seen that the structure may be quickly applied to any selected round of the ladder and moved upwardly or downwardly therealong at will. There will be no tendency for this structure to slip laterally of the ladder round 25 since the platform 10 extends between the two rails 21 and 22, and need not fit snugly thereagainst. In fact there may be considerable clearance between the side edges 12 and 13 of the platform 10 as is indicated in Fig. 1. Also by leaving this clearance, the same structure may be equally well applied to ladders of differing lengths, and particularly to tapering ladders which are narrower at the top than they are at the lower portion. Neither can the structure slip horizontally forwardly of the ladder because of the bearing of the wings 19 and 20 against the rear sides of the rails. This form of the structure is exceedingly light in weight and yet is found to be quite serviceable.

Where a heavier type of stand is desired and a stand which may be accommodated to a wider range of ladder widths is required, the form of the invention as illustrated in Figs. 4–6 is provided.

In this form, there are provided right and left hand brackets 26 and 27 respectively which have hooks 28 and 29 formed at their ends to engage around the forward sides of the ladder rails 21 and 22. Each of these hooks 28 and 29 has a length 30 to extend across the front side of the rail and from which length 30, there is a rearwardly and downwardly turned foot 31 to bear along the outside face of each rail.

Each of these brackets 26 and 27 has turned one toward

the other a lower flange 33 and 34 respectively. A platform generally designated by the numeral 35 is carried on these two flanges 33 and 34 in such manner that the flanges 26 and 27 may be spread apart or pulled in one toward the other depending upon the spacing apart of the ladder rails 21 and 22. For the sake of clearness, the structure shown in Fig. 4 is purposely spread apart to a greater width than would normally be encountered between the rails 21 and 22.

This platform 35 is constructed by having a number of interengaging slide members, so interengaging such as by dovetailing, or by tongue and groove matching edges, herein illustrated, Figs. 3–6, as having these slide members beveled. The object of the interengagement between the slide members is to hold the platform in a substantially horizontally aligned position at any position of extension or retraction desired. Specifically, as illustrated in the drawings, the platform 35 is herein shown as being built up from a number of slide members 36, herein shown as three in number and having one set of common ends fixed to the flange 34 such as by welding, these three members 36 being equally spaced apart. On the flange 33 there are secured the slide members 37, shown to be four in number, and these slide members have oppositely sloped side edges 38 and 39 conforming to the slopes of the side edges 40 and 41 of the members 36.

A floor piece 42 is placed over the top edges of the members 36 and secured thereto by any suitable means such as by welding. The slide members 37 are free from any connection with the floor piece 42 and slide relatively thereunder and along the beveled edges 40 and 41 of the members 36, whereby these members 37 cannot drop downwardly from the members 36, and neither can the members 37 be lifted upwardly by reason of the floor 42 being secured to the members 36.

To use this structure shown in Figs. 3–6, the platform 35 is placed over the top side of the step herein shown as the round 25 and the platform 35 is spread apart or retracted to that condition whereby the hooks 28 and 29 will engage around the ladder rails 21 and 22 from their forward sides to bring the structure into that position as indicated in Figs. 3 and 5 particularly. To retain the structure in position, some sort of a latching device is employed to interengage the platform 35 with the round 25. In the form herein shown, this engaging means consists simply of a hook 44, one attached to the outer sides of the members 26 and 27 respectively to swing downwardly and around under the round 25 adjacent the insides of the ladder rails 21 and 22. By such means, the platform 35 is held against horizontal travel as well as rocking about the round 25.

The hooks 44 are mounted on the sides of the brackets 26 and 27 in those positions as indicated in Fig. 5 wherein the hook comes down on the back side of the round 25 and thereunder so that when the platform 35 has a tendency to drop down by its rearmost end, the rail engaging portions 30 of the bracket hooks 28 and 29 compressibly bear by their upper edges particularly against the forward sides of the rails 21 and 22 and the under side of the platform 35 tends to kick forwardly across the top side of the round 25, the result being that the hooks 44 prevent that forward travel and thus hold the platform 35 in the desired rearwardly extending, approximately horizontally disposed position, this position of course depending upon the angularity of the ladder rails 21 and 22.

As a further means for preventing horizontal travel of the platform 35, an inverted U bracket 45 may be secured to one of the slide members 37 to hang downwardly from its under side and straddle the ladder round 25.

A modified form of that structure of platform 35 as illustrated in Figs. 3–6, is illustrated in Figs. 7–9. In this last modified form, there are a pair of floor members 46 and 47 telescoping one with another in order to provide the desired width of platform between the

ladder rails 21 and 22, that is the width which is found between the ladder rails 21 and 22 at any one of the ladder rounds 25 where the platform is desired to be installed.

The floor member 47 has its fore and aft edges 48 and 49 respectively turned downwardly and thence around and upwardly to terminate in a flange 50 and 51 respectively so as to leave a channel designated by the numeral 52 in each instance. The floor member 47 has one end secured to a ladder rail bracket 53. This bracket 53 is formed to extend around the forward side of the ladder rail 22 by a portion 54 and by a subsequent portion 55 extending along the outer face of the rail 22.

The other floor member 46 has its opposite fore and aft edges 56 and 57 turned downwardly to enter and slide along within the groove 52 with the upper side of the member 46 substantially in sliding contact with the under side of the floor member 47. In this manner, the total exposed floor area of the combined pieces 46 and 47 may be lengthened or shortened within the limits of the lengths of the individual pieces.

The floor member 46 has its end 58 secured to the vertically disposed member 59 of the ladder rail bracket 60 which engages around the ladder rail 21, this bracket 60 being a duplicate of the bracket 53 with the exception that one is right-handed and the other is left-handed.

Therefore a detailed description of the bracket 60 will be sufficient to describe the bracket 53 also. The bracket 60 consists of the vertically disposed plate 59 which extends above and below the floor member 57 to which it is secured. As indicated in Fig. 9, the upper edge of the plate 59 slopes diagonally upwardly and merges into the cross member 61 which bears against the forward side of the rail 21 and then continues by an integral portion into the outside wing 62 which extends a distance rearwardly of the rail 21 and by its lower edge slopes around and down to a lower portion of the member 61 which is spaced well below the under sides of the floor members 46 and 47. The under side of the plate 59 is notched as at 63 to receive substantially the entire upper half of the ladder round 25 therein with a rather snug fit. As an aid to positioning the bracket 60 to rest on the round 25, there is a guide member 64 fixed to the lower end portion of the member 61 to extend rearwardly below the lower edge of the plate 59 a distance which will just permit the ladder round 25 to enter between the top edge of the member 64 and the under edge of the member 59, the rear end 65 of this member 64 terminating on substantially the vertical center line through the round 25.

Since the two brackets 53 and 60 are thus seated on the ladder round 25, there is no tendency for the structure to kick forwardly by reason of the engagement over the round 25. The rear end portion of the structure would tend to rock down in any event, with weight thereon, pulling the bracket member 61 rearwardly against the front side of the ladder rail in each instance. As a matter of safety, to prevent accidental lifting of the structure from engagement with the ladder round 25, a securing means may be provided, herein suggested as by providing a hole 66 through the bracket members back of the ladder rail so that a nail or a cotter pin (not shown) may be inserted therethrough temporarily.

Therefore it is to be seen that I have provided a substantial, yet simplified structure for the purposes intended as above set forth, and while I have herein shown the invention in the several forms as described, I do not desire to be limited to the precise structure of those forms beyond the limitations of the following claims since it is obvious that structural deviations may be employed.

I claim:

1. A detachable ladder step stand for mounting over a rung and between the ladder side rails comprising a platform inserted over and by its major length extending rearwardly in cantilever fashion from said rung; said

platform extending downwardly by a length on the forward side of said rung, then rearwardly by a length under said rung, and finally turned downwardly by a portion having wing extensions laterally therefrom extending across and urged against the rearward sides of the ladder side rails.

2. A detachable ladder step stand for mounting over a ladder rung and between the ladder side rails comprising a platform inserted over and by its major length extending rearwardly from said rung; said platform having a portion extending downwardly on the forward side of said rung from which extends a second portion rearwardly under the rung, and from the rear of which second portion extends downwardly, a third portion; and a wing extending laterally from each side of said third portion across and urged against the back sides of the ladder rails by weight of the platform fulcruming over the rung and rocking the wings thereagainst.

3. For a ladder having side rails between which are step elements of either steps or rungs, a stand detachably mountable over a step element comprising: a platform inserted between said rails and over one of said elements and extending by a major area to the rear of the element; a member extending from the forward portion of said

stand downwardly across the front side of said element and around rearwardly under said element and between said rails; a second member extending downwardly from the rear portion of the said member; and a wing extending laterally from end portions respectively of said second member across the rear sides of said rails retaining the platform against rocking downwardly over said step element and retaining the stand against forward travel thereover.

4. The structure of claim 3 in which the width of said platform limits travel of the platform longitudinally of the step element to within bearing length of said wings on the rails.

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