Sept. 17, 1940. P. W. PERRY 2,214,935

STEPLADDER

Filed May 15, 1939

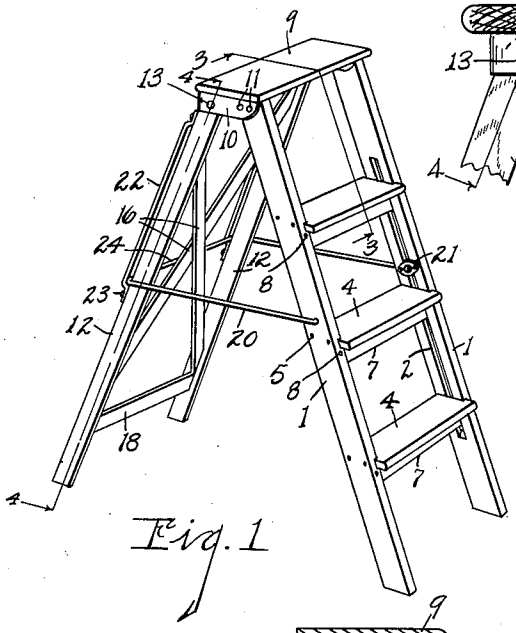


Fig. 1

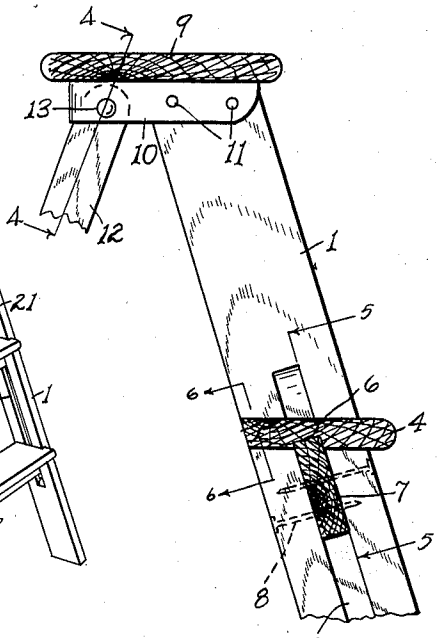


Fig. 3

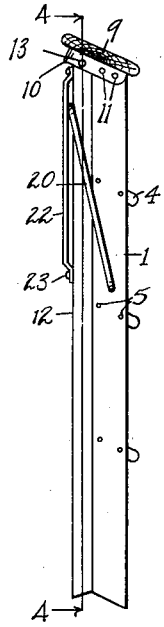


Fig. 2

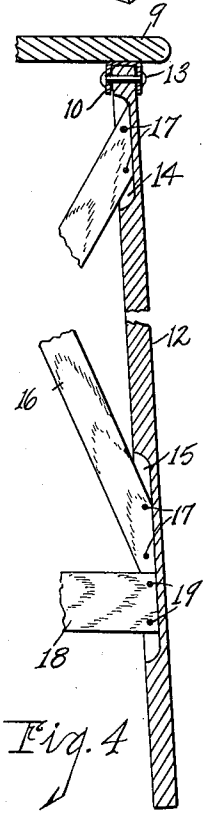


Fig. 4

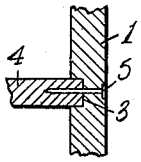


Fig. 6

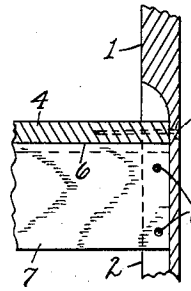


Fig. 5

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STEPLADDER

Price W. Perry, Glendale, Calif.

Application May 15, 1939, Serial No. 273,592

4 Claims. (Cl. 228—59)

This invention relates to improvements in stepladders.

The main object of this invention is to provide a stepladder which is very rigid even when made of comparatively light-weight material and one which is capable of withstanding severe wracking strains.

A further object is to provide in a stepladder an improved bracing structure which effectively prevents spreading and distortion of the struts under load and at the same time permits compact collapsing.

Objects relating to details and economies of my invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A structure which is a preferred embodiment of the invetnion is illustrated in the accompanying drawing, in which:

Fig. 1 is a front perspective view of a stepladder embodying the features of my invention.

Fig. 2 is a side view of the ladder collapsed.

Fig. 3 is a fragmentary vertical section on line 3—3 of Fig. 1.

Fig. 4 is a fragmentary vertical section on line 4—4 of Figs. 1 and 2 showing details of the strut structure.

Fig. 5 is a fragmentary vertical section on line 5—5 of Fig. 3.

Fig. 6 is a fragmentary section on line 6—6 of Fig. 3.

Referring to the drawing, the risers 1 are provided with longitudinal grooves 2 on their inner sides and transverse grooves 3, the grooves 3 extending transversely across the grooves 2.

The steps 4 are disposed with their ends in the transverse grooves 3 abutting the bottoms thereof and secured by nails 5 driven through the risers from the outside thereof and into the steps longitudinally thereof.

The steps are provided with longitudinal grooves 6 on their under sides into which the upper edges of the step supports 7 are disposed (see Fig. 3). The ends of these step supports 7 are disposed in the longitudinal grooves 2 in abutting relation to the bottom thereof and are secured to the risers by means of the nails 8 driven into the risers edgewise thereof and through the supports.

The supports thus serve as tie and bracing members for the risers as well as supports for the steps and also serve to secure the steps in place owing to the engagement of the upper edges of the supports with the grooves in the bottoms of the steps.

The top step 9 is secured on the upper ends of the risers by means of the channel-shaped brackets 10 which are secured to the under sides of the step, the securing means not here being illustrated, the risers projecting between the flanges of this channel strip and being secured thereto by the rivets 11.

The struts 12 are pivoted within this bracket by means of the pivots 13 so that the struts may collapse against the rear edges of the risers, as shown in Fig. 2. These struts have longitudinal grooves 14 at their inner sides adjacent their upper ends and longitudinal grooves 15 adjacent their lower ends.

The braces 16 are disposed in crossed relation with their upper ends in the grooves 14 and their lower ends in the grooves 15, these braces being secured by nails 17 driven edgewise into the struts and through the braces.

The cross piece 18 is arranged with its ends in the grooves 15 and secured therein by the nails 19 driven edgewise into the risers and through the cross piece.

This provides a very rigid strut structure and permits collapsing with the edges of the struts in contact with the rear edges of the risers.

To limit the opening movement of the struts and brace the same, I provide a bail-like brace 20 having journals at the ends of its arms arranged through the risers and journaled in the plates 21 secured to the inner sides of the risers. This brace braces the struts constituting a support therefor not only to limit the rearward movement of the struts but spreading movement thereof.

Straps 22 having inwardly offset ends 23 are secured to the rear edges of the struts to embrace the cross member 24 of the brace, limiting its downward movement, as shown in Fig. 1, and permitting it to swing upwardly, as shown in Fig. 2, when the ladder is collapsed.

Structures embodying the features of my invention are very rigid even when made of comparatively light material.

My improved ladders are very strong and capable of withstanding severe wracking strains. They also have the advantage of collapsing compactly.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a stepladder, the combination of risers having longitudinal grooves in their inner sides and transverse grooves in their inner sides extending across said longitudinal grooves, steps

disposed with their ends in said transverse grooves and in abutting engagement with the bottoms thereof, said steps being secured by nails driven through the risers from the outer side thereof and longitudinally into the steps, the steps having longitudinal grooves on their under sides aligned with the said longitudinal grooves of the risers, and step supports of substantial width disposed with their ends in said longitudinal grooves in said risers and in abutting engagement with the bottoms thereof and with their upper edges in said grooves in said steps, said supports being secured by a plurality of nails at each end thereof spaced longitudinally of the risers and driven into the risers edgewise thereof and into the ends of the supports disposed in the grooves.

2. In a stepladder, the combination of risers having longitudinal grooves on the inner sides thereof of less depth than the thickness of the riser and transverse grooves extending across said longitudinal grooves, steps disposed with their ends in said transverse grooves and secured therein, the steps having longitudinal grooves on their under sides aligned with the said longitudinal grooves of the risers, and step supports of substantial width disposed with their ends in said longitudinal grooves in said risers and secured therein, there being a plurality of vertically spaced securing means engaging each end of each support and extending edgewise of and through the riser.

3. In a stepladder, the combination with risers provided with steps, of a top step mounted on the upper ends of said risers, a pair of struts pivotally mounted on said top step, said struts having longitudinal grooves in their inner sides adjacent the upper and lower ends thereof, crossed braces having their ends disposed in and secured in said grooves, a cross bar having its ends disposed and secured in the bottom grooves of said risers, and a plurality of vertically spaced fastening means disposed at each end of said braces and cross bar, said fastening means extending edgewise through said struts and transversely of the length of said braces and cross bar.

4. In a stepladder, the combination of a pair of risers, and a pair of struts pivotally connected thereto, said risers and struts each having grooves extending longitudinally thereof and the risers having transverse grooves extending across said longitudinal grooves, steps disposed with their ends in said transverse grooves and secured therein, step supports of substantial width having their ends disposed in said longitudinal riser grooves and supportingly engaging said steps, crossed braces and a cross bar for said struts having their ends disposed in said strut grooves, and means for securing said step supports, braces, and bar to the risers and struts respectively, comprising a plurality of vertically spaced fastening means disposed at each end of each of said supports, braces, and bar and engaging the risers and struts respectively, said fastening means engaging said step supports, braces, and bar in a direction transverse the length thereof.

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