Sept. 16, 1941. J. M. BIEGEN 2,255,756

FOLDING STEPLADDER

Filed April 13, 1940 2 Sheets-Sheet 1

Fig. 2.

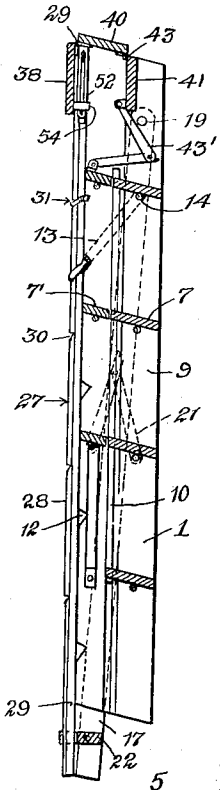


Fig. 1.

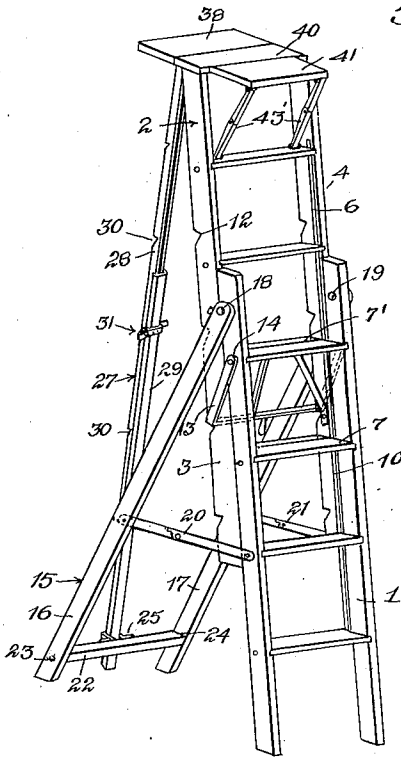


Fig. 3

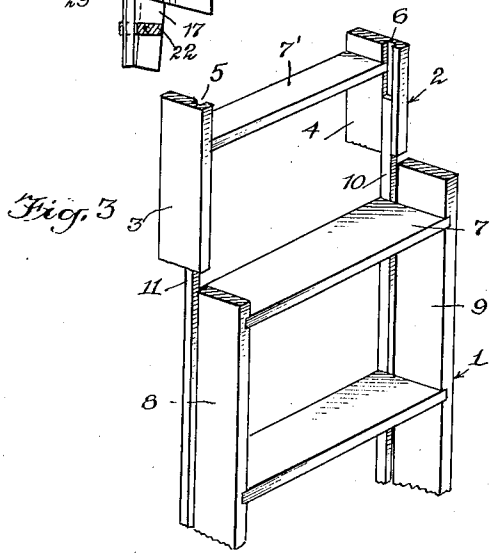


Fig. 8.

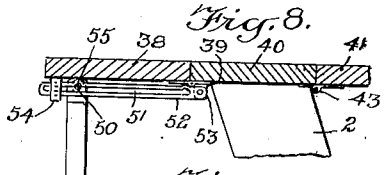
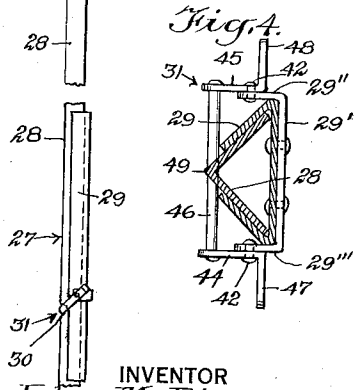


Fig. 4.



WITNESSES

George Naylor

A. L. Ritchie

INVENTOR

John M. Biegen

BY

Munn, Anderson & Liddy

ATTORNEYS

Sept. 16, 1941. J. M. BIEGEN 2,255,756

FOLDING STEPLADDER

Filed April 13, 1940 2 Sheets-Sheet 2

Fig. 7.

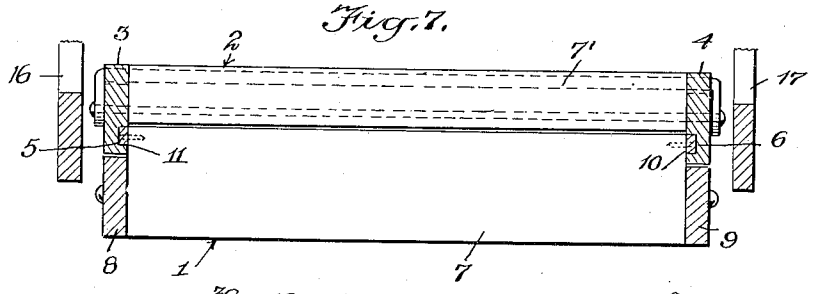


Fig. 6.

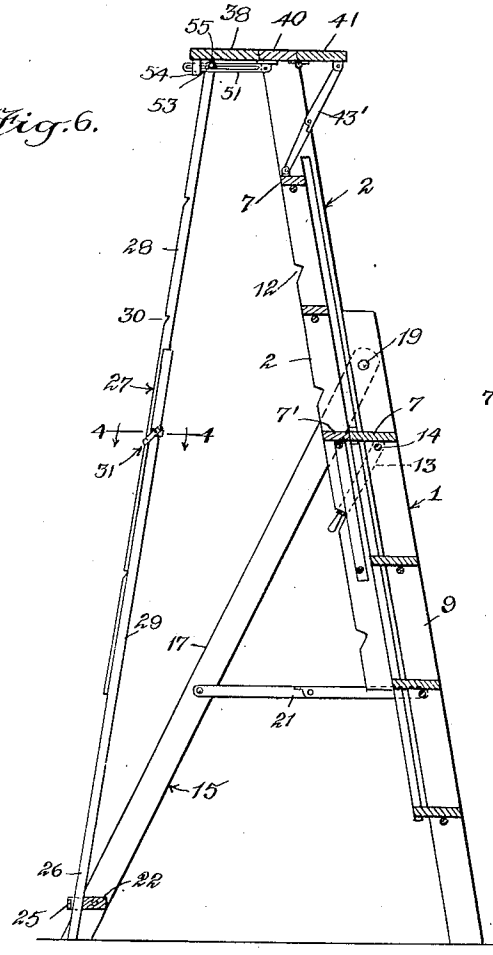
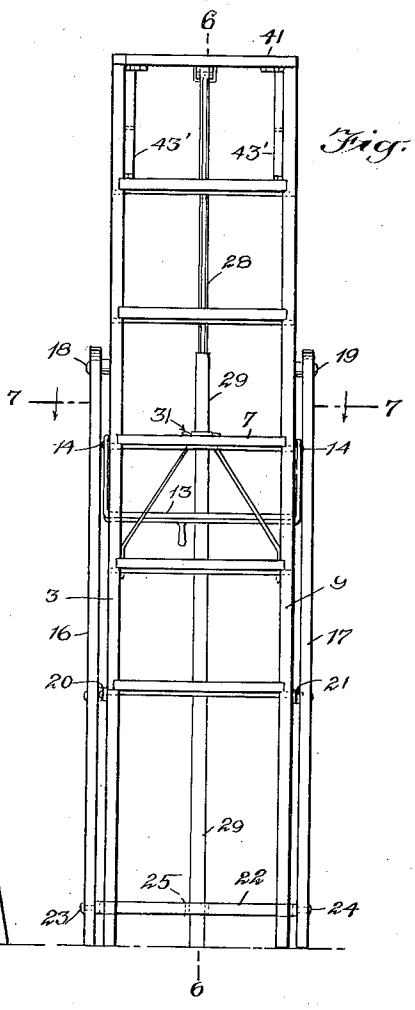


Fig. 5.



WITNESSES

George Naylor

A. L. Ritchie

INVENTOR

John M. Biegen

BY

Munn, Anderson & Liddy

ATTORNEYS

Patented Sept. 16, 1941 2,255,756

UNITED STATES PATENT OFFICE

2,255,756

FOLDING STEPLADDER

John M. Biegen, Great Neck, N. Y.

Application April 13, 1940, Serial No. 329,406

1 Claim. (Cl. 228—21)

This invention relates to step-ladders and particularly to an improved folding step-ladder wherein there is presented a pair of ladder structures telescoping in respect to each other and formed so that the auxiliary ladder structure may be moved upwardly while a person is standing on the primary step-ladder.

An additional object of the invention is to provide a folding step-ladder having a primary section and a sliding auxiliary section for increasing the effective length of the ladder structure, the auxiliary section being provided with a foldable platform.

A further object, more specifically, is to provide a step-ladder having a pair of telescoping sections with a bracing structure for each section.

In the accompanying drawings—

Fig. 1 is a perspective view of a folding ladder disclosing an embodiment of the invention, the same being illustrated extended and ready for use;

Fig. 2 is a longitudinal vertical sectional view through the ladder structure shown in Fig. 1, when the same is folded;

Fig. 3 is an enlarged fragmentary perspective view illustrating how the two sections are slidably connected together;

Fig. 4 is an enlarged fragmentary sectional view through Fig. 6 on line 4—4;

Fig. 5 is a front view of the ladder illustrated in Fig. 1;

Fig. 6 is a sectional view through Fig. 5 approximately on the line 6—6;

Fig. 7 is a transverse sectional view through Fig. 5 approximately on the line 7—7, the same being on an enlarged scale;

Fig. 8 is an enlarged fragmentary view of the upper part of the auxiliary ladder structure illustrating how a brace is associated therewith.

Referring to the accompanying drawings by numerals, 1 indicates what may be termed a primary ladder structure and 2 an auxiliary ladder structure slidable in connection with the ladder structure 1. As illustrated particularly in Figs. 3 and 7, the side bars or rails 3 and 4 of the auxiliary structure 2 are provided with grooves 5 and 6. The various treads or rungs 7 of the primary ladder structure 1 extend beyond the side bars or rails 8 and 9, as shown in Fig. 7. Guide bars or strips 10 and 11 are secured to the extending part of the treads 7 by screws, nails, or other suitable means, so that these guide bars slidingly fit in the grooves 5 and 6. By reason of this construction the primary and auxiliary ladders are held together and yet are allowed to telescope or move in respect to each other. As a matter of fact, a person may stand on any of the treads 7 of the primary ladder 1 and pull the auxiliary ladder upwardly to any desired extent within the limits of the construction. It will also be noted that the auxiliary ladder 2 is provided with a number of spaced notches 12 spaced apart an equal distance to the tread 7. A U-shaped lock 13 is pivotally mounted at 14 on the respective bars 8 and 9 and is positioned to fall into the respective notches 12 as the auxiliary ladder 2 is moved upwardly.

When it is desired to lower the auxiliary ladder, it will be necessary to manually swing the lock 13 out of engagement with the auxiliary ladder and then the auxiliary ladder may be slid down to any desired extent, as for instance to the nested position shown in Fig. 2.

It will be noted that the treads 7' of the auxiliary ladder 2 are spaced the same distance apart as the treads 7 of the primary ladder, whereby they may be brought into alignment as illustrated particularly in Figs. 2 and 6.

A brace 15 is provided for the primary ladder 1. This brace is formed with bracing bars 16 and 17 pivotally mounted at 18 and 19 to the upper edge portion of the primary ladder 1. The bars 16 and 17 extend down to the floor or other support on which the ladder is placed. Elbow braces 20 and 21 act to normally hold the brace 15 in proper functioning position when the parts are arranged as shown in Fig. 1. A bottom brace 22 is provided for the brace 15, which brace is pivotally mounted at 23 and 24 to the respective bars 16 and 17 and is adapted to be swung when necessary. A clip 25 is connected centrally to the bottom brace 22 and through this the lower end portion 26 of an auxiliary brace 27 loosely fits. The brace 27 is formed principally in two parts, namely, an upper part 28 and a lower part 29. The part 28 is provided with notches 30 so as to accommodate a pivotally mounted catch structure 31. The catch structure 31 is carried by the part or section 29. As shown in Fig. 4, the catch structure is provided with a U-shaped member 29' riveted or otherwise rigidly secured to part 29. The arms 29'' and 29''' accommodate the rivets 42, which act as pivots for the L-shaped arms 44 and 45 which are connected to the catch bar 46 which is adapted to fall by gravity into any of the notches 30 for locking the parts 28 and 29 against relative movement. The outstanding arms 47 and 48 act as handles for permitting manual movement of the

catch bar 46 to a disengaged position when the respective parts 28 and 29 are being collapsed.

The section 28 is preferably V-shaped in cross section with the apex open for permitting the notched corner 49 of the part 28 to extend therebeyond, as shown in Fig. 4. The lower part of section 29 rests on the floor, while the upper part 28 is connected with platform 38. As shown in Fig. 8, the upper end of part 28 has a pin 50 extending through a slot 51 in a pivotally mounted arm 52. Arm 52 is pivotally mounted on a bracket 53 secured in any desired way to the central fixed section 40 and has its outer end held in place by a bracket 54 so that the arm will always remain substantially parallel with the under surface of the section or platform 38. When the ladder is unfolded from the position as shown in Fig. 2, the pin 50 will slide along slot 51 until it moves into the depression 55 where it will remain until the parts are again folded. Section 38 is secured by one or more hinges 39 to the central fixed section 40 which is rigidly secured to the upper end of the auxiliary ladder 2. A second platform section 41 is connected with section 40 by one or more hinges 43 and is held in functioning position, as shown in Fig. 1, by a pair of elbow braces 43'. When this platform is not needed the same may be folded as shown in Fig. 2.

When it is desired, the braces 15 and 27 may be folded against the auxiliary ladder 2 and the auxiliary ladder 2 may be moved downwardly so that all the parts will appear as shown in Fig. 2. When all parts are being used the adjustment shown in Fig. 1 may be utilized. If the upper or auxiliary ladder 2 is raised from the position shown in Fig. 6, it will pull section 28 of brace 27 and catch 31 will merely slide over the notches 30 but will prevent any reverse movement. When it is desired to shorten the brace 27, it will be necessary to manually swing catch 31 out of engagement with the notches 30.

By reason of the construction just described, it will be seen that the primary ladder structure 1 is provided with a bracing structure 15 while the auxiliary ladder structure 2 is provided with a bracing structure 27. As the auxiliary ladder structure slides upwardly and downwardly in respect to the primary ladder 1, brace 27 must be telescoped. Brace 15 is merely pivoted to the upper end portion of the ladder structure 1.

I claim:

A folding step-ladder comprising a primary ladder, an auxiliary ladder positioned to move parallel to the primary ladder, means slidably connecting said primary and auxiliary ladders together, a brace for the primary ladder including a pair of inclined brace bars connected to the top and extending from the top portion of the primary ladder to the support upon which the step-ladder is mounted, a pivotally mounted transverse bar connecting the lower ends of the brace bars, a platform secured to the upper end of the auxiliary ladder, a section hinged to each side of the platform, means for retaining one of the sections in the same horizontal plane of the platform, a telescoping brace connected to the free edge of the other section and extending downwardly and resting on the support of the step-ladder, means for removably connecting the lower end of the telescoping brace with the pivoted brace bar, a U-shaped member having the free ends of its legs pivotally connected to the primary ladder, said auxiliary ladder having spaced notches to receive the bight of the U-shaped member for retaining the auxiliary ladder in position on the primary ladder when the auxiliary ladder has been extended or retracted on the primary ladder, the legs of the U-shaped member being located in parallel relation with the inclined brace bar, and means connecting the inclined brace bar with the primary ladder.

JOHN M. BIEGEN.