April 12, 1927. 1,624,569

B. E. WILLETT

STEPLADDER

Filed Sept. 12, 1924 2 Sheets-Sheet 1

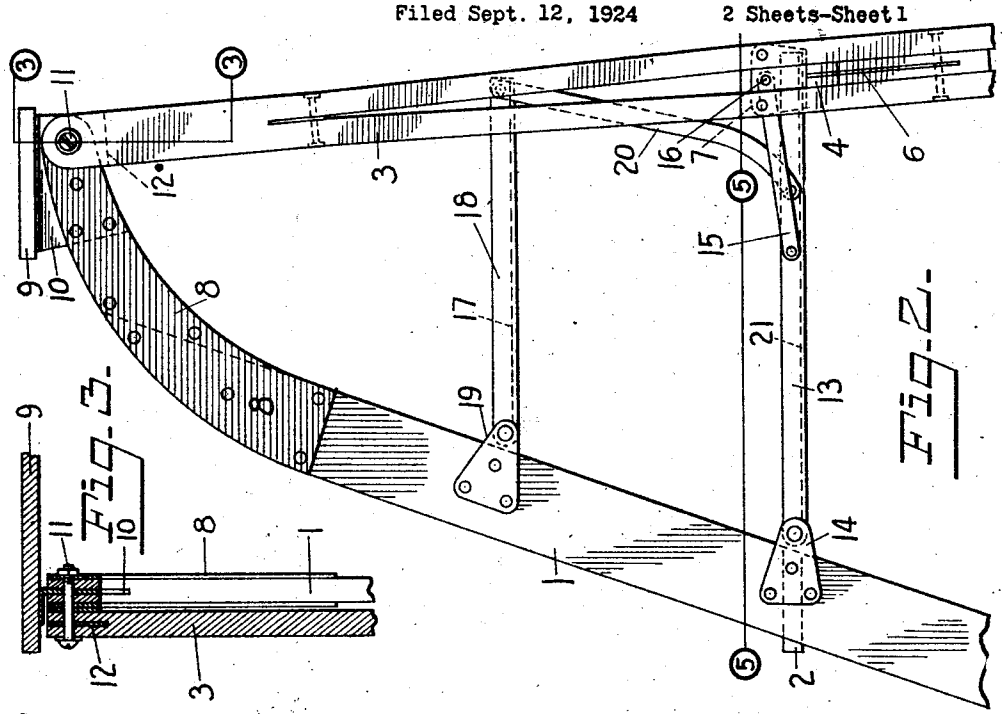


FIG. 2.

FIG. 3.

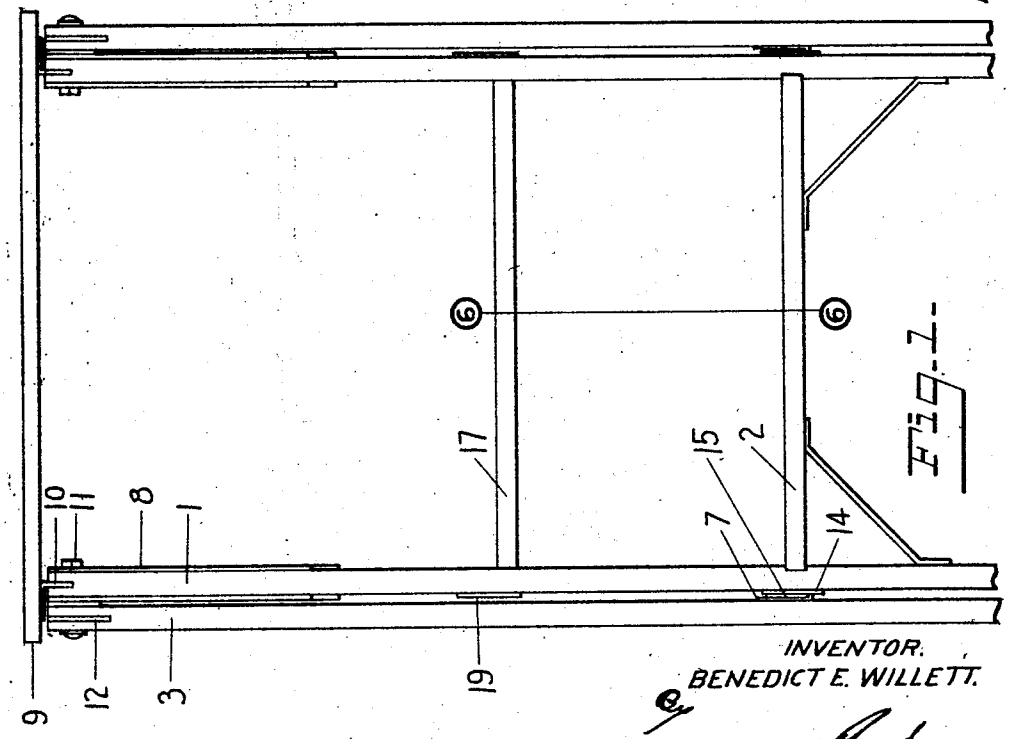


FIG. 1.

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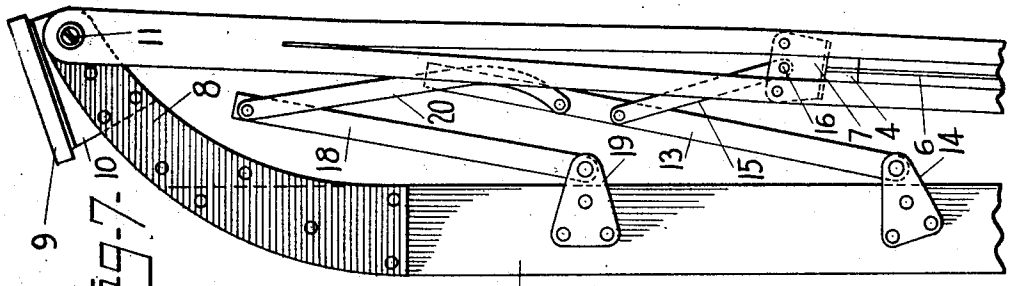


Fig. 7.

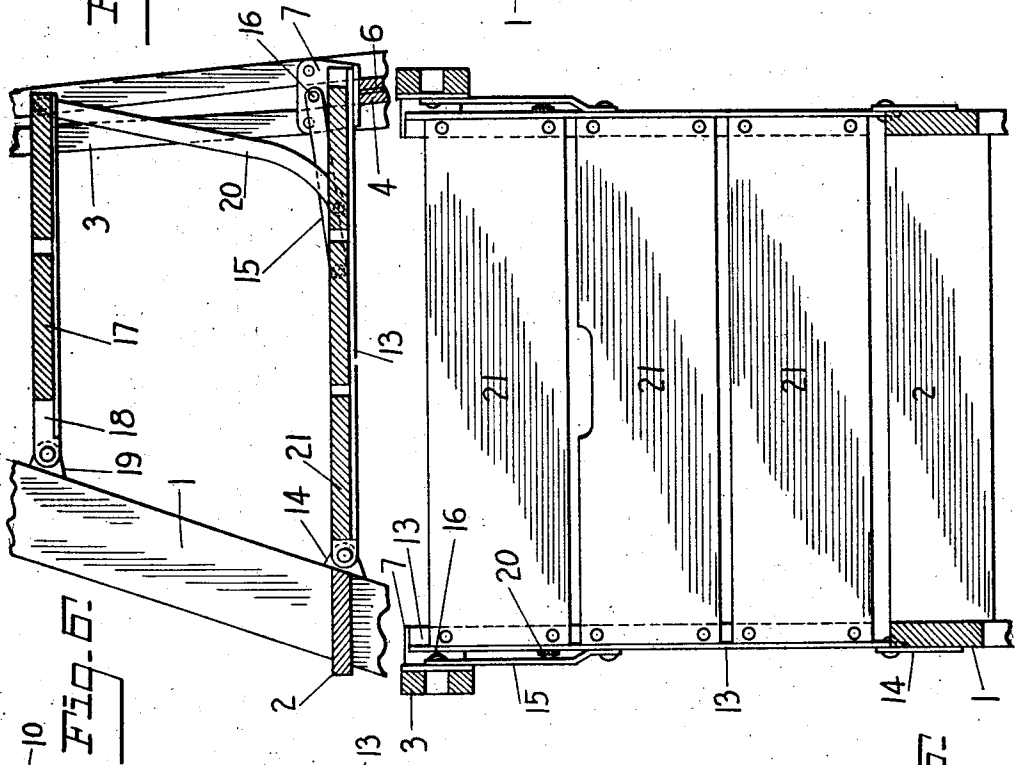


Fig. 6.

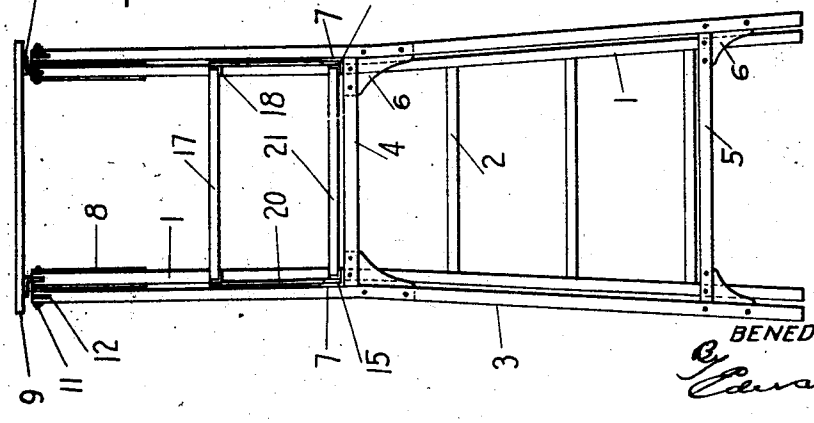


Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

BENEDICT E. WILLETT, OF DAYTON, OHIO.

STEPLADDER.

Application filed September 12, 1924. Serial No. 737,289.

This invention relates to step ladders and one object of the invention is to provide a step ladder, having a work platform, which will be of a very strong rugged construction and which can be produced at a relatively low cost.

A further object of the invention is to provide such a ladder in which the work platform will fold when the ladder is collapsed, and in which the ladder will be rigidly held in its extended position so that it cannot be accidentaly collapsed.

A further object of the invention is to provide such a ladder with a supplemental platform which will fold with the main platform when the ladder is collapsed.

Other objects of the invention will appear as the device is described in detail.

In the accompanying drawings Fig. 1 is a front elevation of the upper portion of a ladder embodying my invention; Fig. 2 is a side elevation of the same; Fig. 3 is a sectional detail view taken on the line 3—3 of Fig. 2; Fig. 4 is a rear elevation of the ladder; Fig. 5 is a transverse sectional view showing the platform in plan; Fig. 6 is a vertical sectional view taken through the main platform and the supplemental platform; and Fig. 7 is a side elevation of the upper portion of the ladder showing the same collapsed.

In these drawings I have illustrated one embodiment of my invention and have shown the ladder as comprising a front or step frame and a rear or supporting frame, the two frames being pivotally connected at their upper ends. The front frame comprises side members 1 connected one to the other by steps 2. The side members extend upwardly for some distance above the top step 2 and the upper ends thereof are curved upwardly and rearwardly. The rear frame consists of side members 3 which are connected and braced one against the other by transverse bars 4 and 5 and these rear frame members are pivotally connected at their upper ends with the upper rear ends of the side members of the front frame. The transverse brace members 4 and 5 are rigidly secured to the respective side members 3 by means of angle plates or gussets 6 which, in the present instance, are seated in slots or recesses in the respective side members and in the brace bars. The upper brace bar 4 is further connected with the respective side members by L-shaped brackets 7 having their vertical portions secured to the respective side members and their horizontal portions secured to the upper edge of the brace bar. The upper curved portions of the side members 1 of the front frame are preferably reinforced and, as here shown, each of these members has rigidly secured thereto two curved metallic plates 8 arranged on opposite sides of the curved portion thereof. The ladder may, if desired, be provided at its upper end with a cross member connecting the two side members and this member is here shown as a platform 9 and has rigidly secured thereto, near the respective ends thereof, depending brackets or plates 10 which are rigidly secured to the respective side members 1 of the front frame, each plate, in the present instance, being inserted in a slot formed in the end of the frame member and secured therein by rivets. The side members 3 of the rear frame are connected with this bracket by means of bolts 11 which extend through the adjacent side members of the front and rear frames and through the brackets 10. Preferably the upper ends of the side members 3 of the rear frame are reinforced by metal plates 12 which are inserted in slots in the upper ends thereof.

The ladder is provided with a work platform 21 on which the operator may stand and this platform is preferably arranged substantially in the plane of the top step 2 of the front frame, and pivotally connected with the front frame at its forward edge while its rear edge is arranged to rest upon a suitable support carried by the rear frame, such as the upper brace bar 4. Preferably the platform comprises rigid side members, such as angle bars 13 and these bars are pivotally connected at their forward ends with brackets 14 rigidly secured to the respective side members of the front frame and extending rearwardly therefrom so that the axis about which the platform moves is in the rear of the side members 1. The angle bars 13 of the platform are of such a length that when the ladder is in its extended position they will overlap the side members 3 of the rear frame and will rest upon the supporting member or brace bar 4, thus providing a very strong rigid support for the platform. The platform is connected with the rear frame by means of links which are so ar-

ranged with relation to the platform that they will constitute toggles which will lock the ladder in its extended position. In the present construction a link 15 is pivotally connected at its rear end with each side member of the rear frame, the connection being preferably made with the vertical portion of the L-shaped bracket 7, as shown at 16. The forward end of each link is pivotally connected with the corresponding side bar 13 of the platform at a point spaced from the rear end of that bar. It will be noted that the points of connection of the links to the rear frame are above the support for the platform and consequently the points of piovtal connection of the links with the platform will lie below a plane extending through the pivotal center of the platform and the rear pivotal connections of the links, thereby positively locking the frames in their extended positions until upward movement has been imparted to the platform. Consequently it is impossible to collapse the ladder by pushing the same over the floor or by any undue thrust or weight to which it may be subjected. At the same time the ladder may be quickly and easily collapsed by merely thrusting the platform upwardly a distance sufficient to break the toggle and then moving one frame toward the other.

I have also provided the ladder with a supplemental platform 17 which is so connected therewith that it will fold with the main platform when the ladder is collapsed. The supplemental platform also preferably comprises rigid side members, such as angle bars 18 and these bars are pivotally connected at their forward ends with brackets 19, rigidly secured to the respective side members of the front frame, on an axis just in the rear of said side members. The rear ends of the bars 18 are connected with the main platform by means of links 20 which serve to support the rear end of the supplemental platform on the main platform and which will serve to move the supplemental platform about its axis when the main platform is moved about its axis. Consequently when the main platform is elevated to break the toggle and the ladder is collapsed the supplemental platform will be folded along with the main platform, as shown in Fig. 7, without additional effort on the part of the operator. This supplemental platform is of a very strong rigid character and may be used either as a work support or as a supplemental step on which the operator may stand.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may appear to a person skilled in the art.

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

1. A step ladder comprising a front frame and a rear frame pivotally connected one to the other at their upper ends, a platform pivotally mounted on the front frame at a point below the upper end thereof, a supporting member carried by the rear frame to support the rear end of said platform, and a link connecting said platform with said rear frame and arranged to form a toggle to lock said frames in their extended positions.

2. A step ladder comprising a front frame and a rear frame pivotally connected one with the other, brackets rigidly secured to the front frame and extending rearwardly therefrom, a platform pivotally mounted on said brackets, a supporting member carried by said rear frame to engage the rear end of said platform and support the same in a substantially horizontal position when said frames are in their extended positions, links pivotally connected with said rear frame above said supporting member and pivotally connected at their forward ends with the respective lateral edges of said platform at points between the front and rear ends thereof.

3. A step ladder comprising a main frame and a rear frame pivotally connected one to the other at their upper ends, a main platform pivotally mounted on said main frame at a point below the upper end thereof, a supporting member carried by the frame to support the rear end of said platform, said rear end of said platform being vertically movable with relation to said rear frame, a supplemental platform arranged between said front and rear frames and pivotally mounted at its front end on said front frame above said main platform, and a supporting device connected with the rear end of said supplemental platform and with said main frame to support the rear end of said supplemental platform on said main platform.

4. A step ladder comprising a front frame and a rear frame pivotally connected one to the other at their upper ends, a main platform pivotally mounted on the front frame at a point below the upper end thereof, a supporting member carried by the rear frame to support the rear end of said platform, said rear end of said platform being vertically movable with relation to said rear frame, brackets rigidly secured to said front frame at points above said platform, a supplemental platform arranged between said front and rear frames, and pivotally connected at its forward end with said brackets, links pivotally connected at their upper ends with said supplemental platform and pivotally mounted at their lower ends on said

main platform and serving to support the rear end of said supplemental platform on said main platform.

5. In a step ladder, a front frame comprising side members having their upper ends extending rearwardly, a rear frame comprising side members pivotally connected at their upper ends to the respective side members of the front frame, a platform pivotally mounted on the side members of the front frame on an axis arranged in the rear of said side members, a cross bar rigidly secured to said rear frame and forming a support for the rear end of said platform, links pivotally mounted on the respective side members of the rear frame above said cross bar and pivotally connected at their forward ends with said platform between the front and rear ends thereof.

6. In a step ladder, a front frame comprising side members having their upper ends extending rearwardly, a rear frame comprising side members pivotally connected at their upper ends to the respective side members of the front frame, a platform pivotally mounted on the side members of the front frame on an axis arranged in the rear of said side members, a supporting bar extending between the side members of said rear frame, L-shaped brackets having their vertical portions secured to the respective side members of the rear frame and having their horizontal portions secured to said cross bar, said cross bar and said brackets forming a support for the rear end of said platform when the ladder is in its extended position, links pivotally mounted at their rear ends on the vertical portions of said brackets above said cross bar and pivotally connected at their forward ends with the respective lateral edges of said platform at points between the front and rear ends thereof.

7. In a step ladder, a front frame comprising side members having their upper ends extending rearwardly, a rear frame comprising side members pivotally connected at their upper ends to the respective side members of the front frame, a platform pivotally mounted on the side members of the front frame on an axis arranged in the rear of said side members, a supporting bar extending between the side members of said rear frame, L-shaped brackets having their vertical portions secured to the respective side members of the rear frame and having their horizontal portions secured to said cross bar, said cross bar and said brackets forming a support for the rear end of said platform when the ladder is in its extended position, links pivotally mounted at their rear ends on the vertical portions of said brackets above said cross bar and pivotally connected at their forward ends with the respective lateral edges of said platform at points between the front and rear ends thereof, a supplemental platform pivotally mounted on the side members of said front frame above the first mentioned platform and on an axis in the rear of said side members, links pivotally connected to the respective lateral edges of said supplemental platform near the rear end thereof and pivotally connected to the respective lateral edges of the first mentioned platform at points spaced from the rear ends thereof.

In testimony whereof, I affix my signature hereto.

BENEDICT E. WILLETT.