

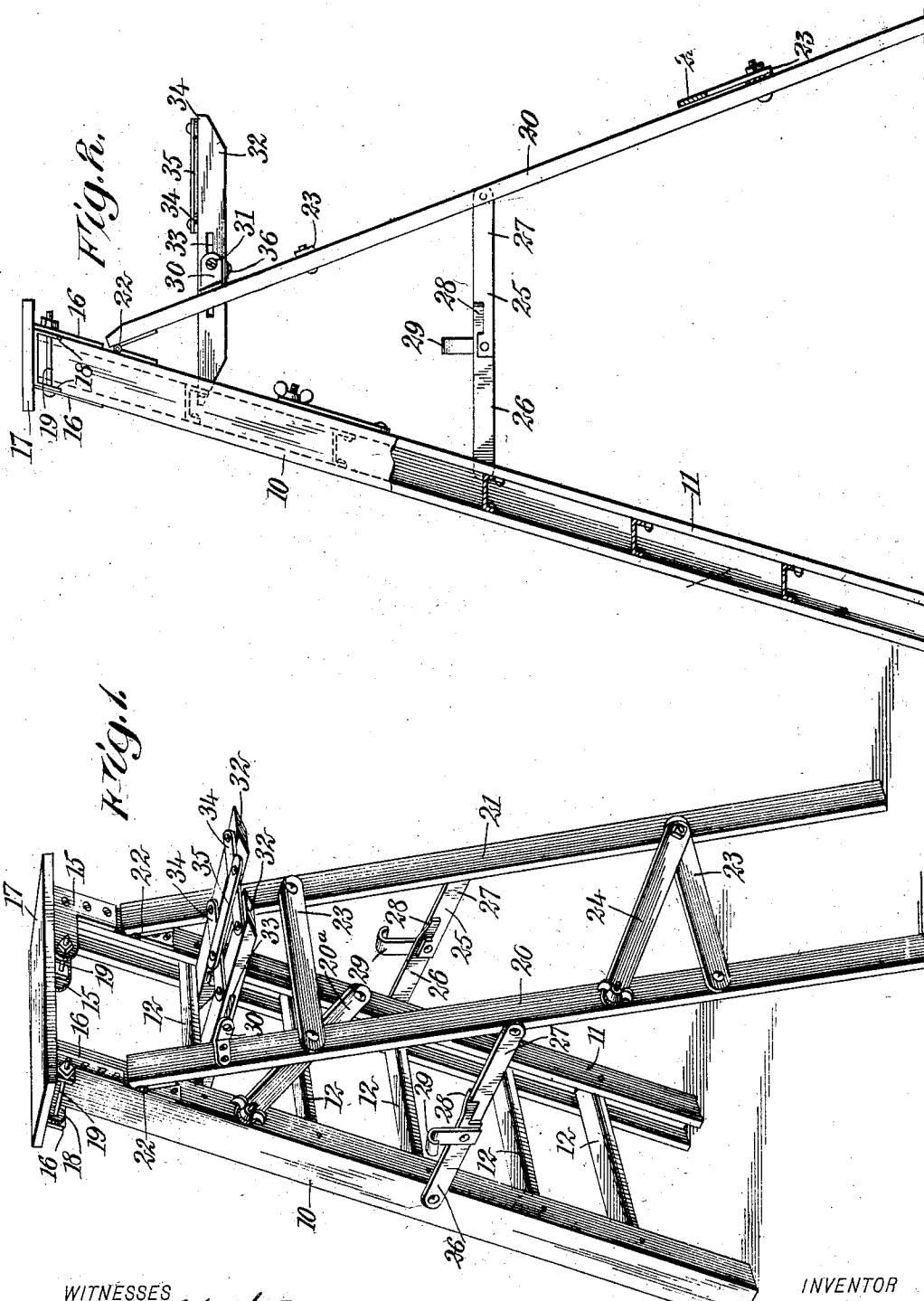
No. 878,332.

PATENTED FEB. 4, 1908.

W. J. BLUNDELL.
COLLAPSIBLE LADDER.

APPLICATION FILED MAR. 26, 1907.

2 SHEETS—SHEET 1.



WITNESSES
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INVENTOR
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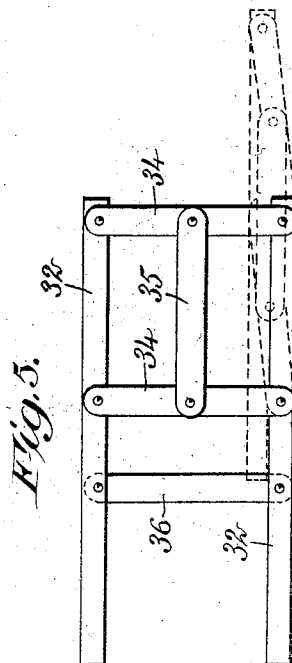
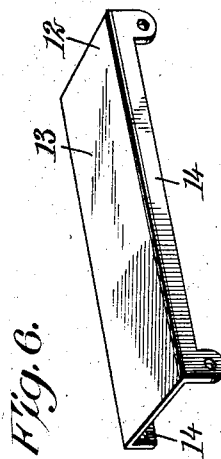
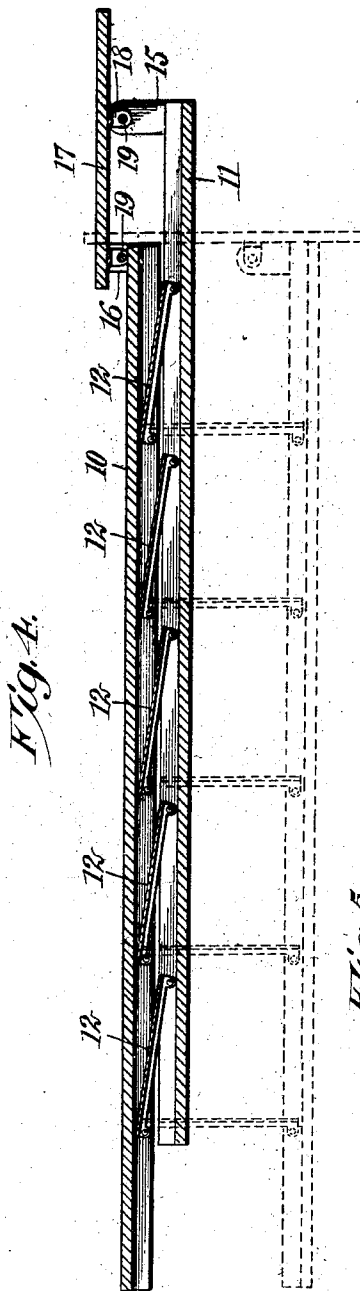
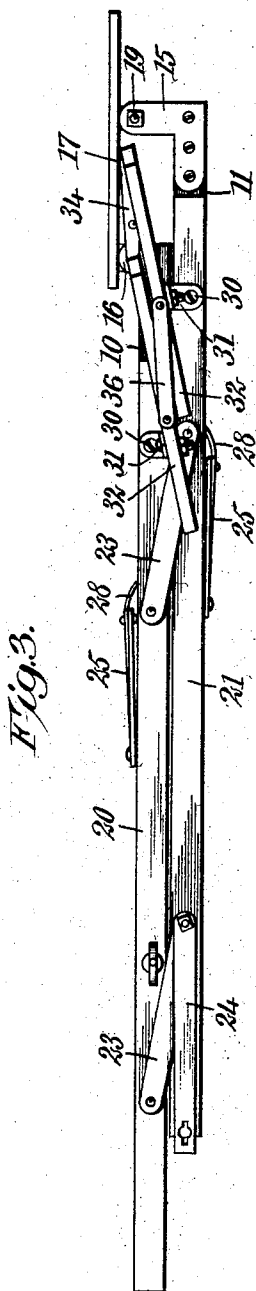
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

WILLIAM J. BLUNDELL, OF NEW YORK, N. Y.

COLLAPSIBLE LADDER.

No. 878,332.

Specification of Letters Patent.

Patented Feb. 4, 1908.

Application filed March 26, 1907. Serial No. 364,609.

To all whom it may concern:

Be it known that I, WILLIAM J. BLUNDELL, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Collapsible Ladder, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in step-ladders, and more particularly to certain improvements in means whereby the step-ladder may be folded to occupy the minimum space to facilitate storage or transportation, all of the parts remaining connected while in their folded position.

One object of the invention is to provide a ladder and a shelf or platform connected thereto and adapted to be automatically folded with the ladder.

Another object of the invention is to provide means whereby the extension braces may be more readily raised to fold the ladder.

Further objects will be hereinafter set forth and a structure embodying one form of my invention described and the novel features thereof defined in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, and in which

Figure 1 is a perspective view of one form of my improved ladder; Fig. 2 is a side view of the ladder, one portion thereof being broken away; Fig. 3 is a rear view of the ladder in its collapsible form; Fig. 4 is a longitudinal section through the parts when in the positions indicated in Fig. 3, and showing in dotted lines the position of the ladder when partially extended; Fig. 5 is a plan view of the platform or shelf, and showing in dotted lines the position occupied when the parts are folded; and Fig. 6 is a perspective view of one form of step or tread.

In the specific form of my improved ladder which I have illustrated in the accompanying drawings, I provide oppositely disposed side bars or rails 10 and 11, preferably channel shaped in cross-section and connected together by a plurality of steps or treads 12. Each tread or step is preferably of the form illustrated in Fig. 6 and comprises a piece of sheet metal having a rectangular face or wearing surface 13, and having depending flanges within its opposite longitudinal edges. The flanges are provided with perforations

adjacent their opposite ends, and the flanges 14 are disposed at such an angle in respect to the face or wearing surface that the tread or step will be held substantially horizontal when secured in place between the opposite rails or side members 10 and 11. I construct the steps of a width substantially equal to the width of the channel of the side members, and the flanges of the steps are pivotally connected to the flanges of the channels by suitable pivot bolts, whereby one rail may be raised or lowered in respect to the other, and upon raising one rail to the limiting position the steps or treads will be folded in the space within the channels and permit of the two opposite rails or side members being brought substantially in contact with each other, as indicated in Fig. 4. The top step or tread is formed somewhat different from the others and serves the additional function of limiting the movement of one side rail in one direction beyond the proper point.

As shown, the side member 11 is provided with oppositely disposed brackets 15 rigidly secured thereto and having portions extending at right angles to the side member and toward the opposite member. The side member 10 is also provided with brackets 16 somewhat similar to the brackets 15 but having the projections thereon extending outwardly and to a distance very materially less than the distance of the extension of the brackets 15. The top step 17 is adapted to rest against the top of the two side members 10 and 11, and is provided with downwardly-extending lugs 18 pivotally connected to the ends of the brackets 15 and 16 by suitable pivot bolts 19. As the extensions of both of the brackets 15 and 16 extend in the same direction, it is evident that the side rail 10 cannot be raised in respect to the side rail 11 beyond the position indicated in Fig. 1 and in dotted lines in Fig. 4, and it is also evident that the member 11 may be readily raised in respect to the side member 10 to bring the parts to the position indicated in solid lines in Fig. 4. In order to hold the parts in the proper position for use and to prevent the accidental collapsing of the ladder, I provide a suitable brace 20^a having one end thereof pivotally connected to the side member 11 and having the opposite end thereof detachably connected to the side member 10 at a materially higher or lower distance, whereby the brace 20^a is held diagonally and the collapsing of the ladder positively prevented.

For supporting the ladder and constitute what is commonly known as a "step-ladder", I provide supporting legs 20 and 21 pivotally connected to the side members 10 and 11 adjacent their upper ends by suitable hinges 22, and connected together by a plurality of cross braces 23 secured thereto by suitable pivot pins. The legs may also be provided with a connecting brace 24 similar to the braces 23 of the ladder proper, which may have one end pivotally connected to the leg 21 and the other detachably connected to the member 20. For limiting the movement of the legs in respect to the side members, I provide oppositely disposed extension braces 25, each formed of two members 26 and 27 pivotally connected together, and also pivotally connected to the corresponding rail and leg. The members 27 are preferably provided with cutaway portions adjacent their pivotal connections to the members 26, and the latter are provided with extensions 28 bent at an angle to the remaining portion and adapted to engage within said cutaway portions to limit the downward movement of the pivotal connections of the extension braces. In order to fold the legs against the opposite rails or side members, it is necessary to raise the middle portion of each extension brace, and in order to facilitate this raising, I provide loops or catches 29 adapted to be engaged by the finger. By means of these catches the center may be readily raised and all danger of pinching the finger in the joints of the extension braces is avoided.

Adjacent the upper end of the ladder and substantially upon a level with the next to the top step, I provide a platform or shelf embodying one important feature of my invention. To support the shelf or platform I provide each of the legs 20 and 21 with outwardly extending lugs 30, each bearing a suitable pivot bolt, said pivot bolts 31 being in alinement and extending toward each other. The shelf or platform comprises two oppositely disposed side members 32 supported intermediate their ends upon said pivot bolts and adapted to have the inner end of each rest beneath and in engagement with the next to the top step or tread of the ladder. One of the side members 32 is provided with a small opening for the reception of its pivot bolt, while the other side member is provided with a longitudinal slot 33, whereby it may be moved longitudinally in respect to the first mentioned side member. The members 32 are connected together at a point adjacent their outer ends and intermediate their ends by two suitable links 34 pivotally secured thereto, and these two links are connected together intermediate their ends by a suitable link 35 pivotally secured in place. The links, together with the side bars, constitute a platform for the support of a receptacle or any article to be used

by the person employing the ladder. The side members or bars 32 may also, if desired, be connected together by a link 36 on the under side thereof to additionally hold them in the proper relation to each other.

To collapse the ladder, the connecting braces 20^a and 24 are disconnected from one of the rails and one of the legs, respectively, and allowed to drop to positions substantially parallel to the opposite rail and leg. By means of the loops or hooks 29, the extension braces 25 are raised and the legs 20 and 21 brought to a position substantially parallel to the rails 10 and 11. The platform composed of the side bars 32 and the connecting links carried thereby is then raised upon the pivot bolts 31 to a substantially vertical position and in a plane substantially parallel to that occupied by the legs and rails. Then by raising the rail 11 and the leg 21 pivotally connected thereto, the parts are brought to the position indicated in Fig. 3, and the platform, as well as the ladder, is folded to occupy the minimum amount of space.

In constructing the device, the distance between the pivot bolts of each cross bar 23 is substantially the same as the distance between the pivot bolts 19 of the top step and the pivot bolts of the main steps or treads, whereby all of the vertical or substantially vertical members travel in parallel planes as they are raised or lowered, and all of the steps and the cross bars 23 remain parallel at all times. As the side bars 32 of the platform or shelf are closer together than are the opposite legs 20 and 21, or the opposite rails 10 and 11, it is necessary to provide for a slight sliding movement of one of the side bars 32 in respect to its pivot bolt, whereby these bars may also assume positions parallel to the rails and the legs when the device is in its folded position.

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

1. In combination, a ladder, including oppositely-disposed side rails and treads connecting said side rails, said ladder being collapsible in its own plane, legs connected to said side rails and movable in respect thereto, and a shelf or platform pivotally connected to said legs and collapsible in its own plane.

2. In combination, a ladder formed of oppositely-disposed side rails and treads connecting said side rails, said ladder being collapsible in its own plane, and a shelf or platform supported adjacent one end of said ladder and movable into a plane substantially parallel to the plane of the ladder and collapsible in said plane as said ladder is collapsed.

3. In a step-ladder, the combination of oppositely disposed side rails movable in respect to each other, treads connecting said side

rails, legs connected to said side rails and movable in respect thereto, and a shelf or platform adjacent the top tread collapsible laterally and in its own plane.

5 4. In a step-ladder, the combination of oppositely disposed side rails movable in respect to each other, treads connecting said side rails, legs connected to said side rails and movable in respect thereto, and a shelf or platform carried by said legs and in engagement with one of the treads said shelf or platform being collapsible laterally and in its own plane.

10 5. In a step-ladder, the combination of oppositely disposed side rails movable in respect to each other, treads connecting said side rails, legs connected to said side rails and movable in respect thereto, and a shelf or platform collapsible laterally and in its own plane pivotally connected to one of said legs

and pivotally and slidably connected to the other leg.

6. In a step-ladder, the combination of oppositely disposed side rails movable in respect to each other, treads connecting said side rails, legs connected to said side rails and movable in respect thereto, and a shelf or platform collapsible laterally and in its own plane pivotally connected to one of said legs and pivotally and slidably connected to the other leg and in engagement with the under side of one of the treads when the ladder is in its extended position.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM J. BLUNDELL.

Witnesses:

CLAIR W. FAIRBANK,
EVERARD B. MARSHALL.