D. B. HAMPTON.

STEP LADDER.

APPLICATION FILED SEPT. 22, 1916.

1,258,332.

Patented Mar. 5, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

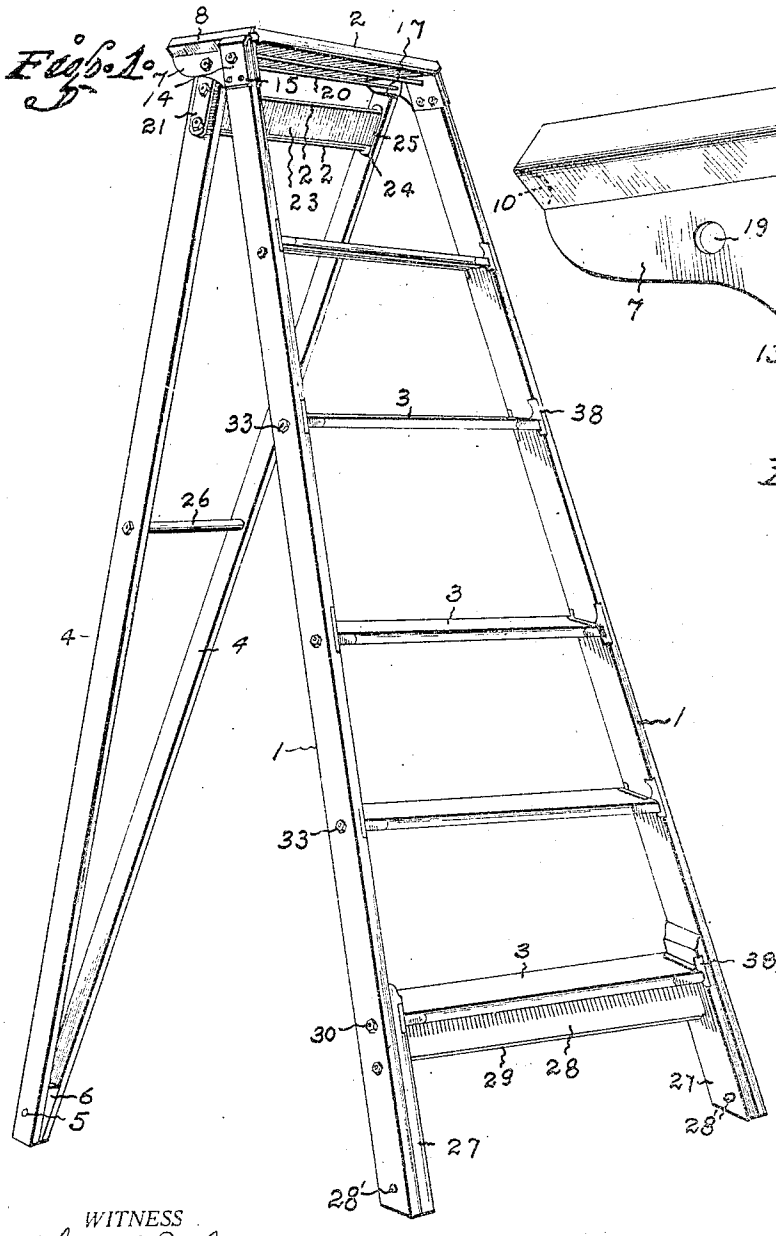


Fig. 2.

WITNESS

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2 SHEETS—SHEET 2.

Fig. 3.

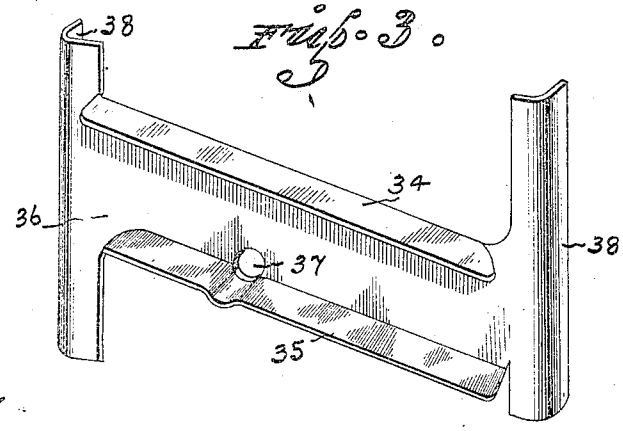


Fig. 4.

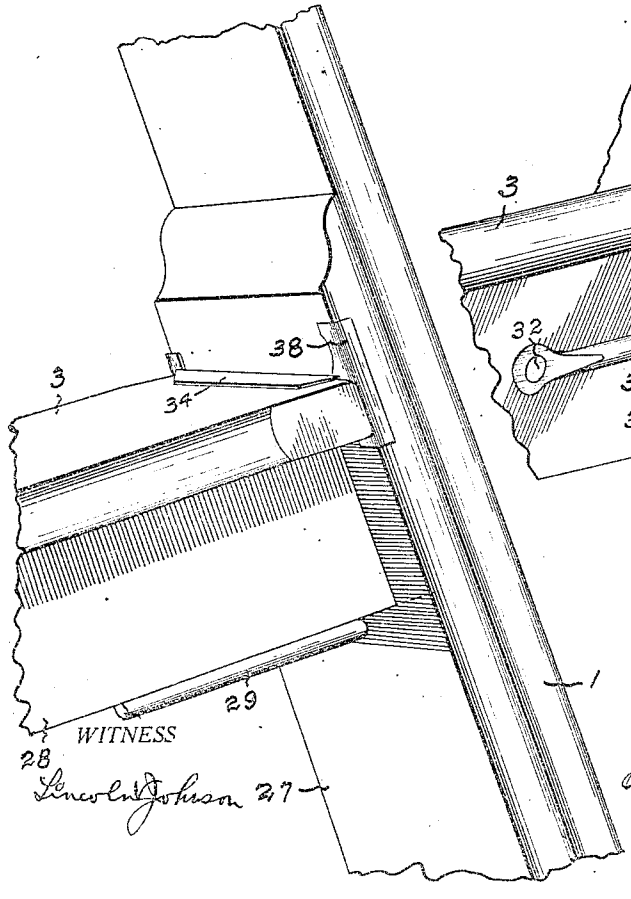
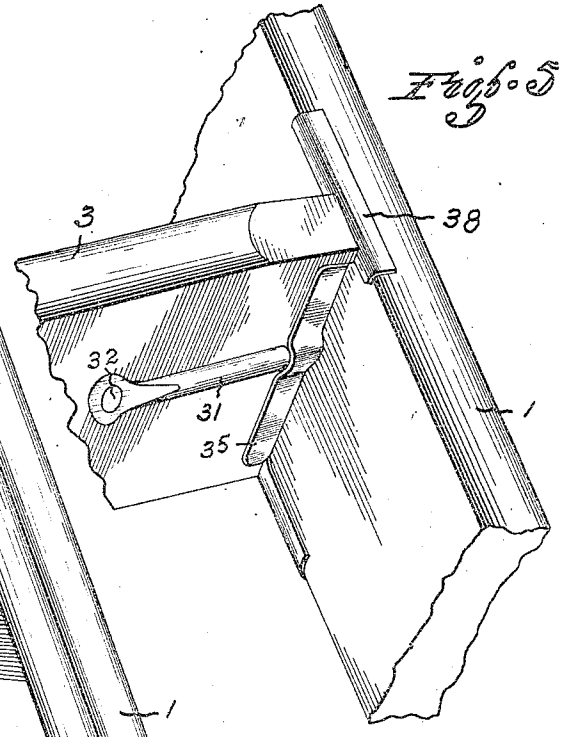


Fig. 5.



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STEP-LADDER.

1,258,332. Specification of Letters Patent. Patented Mar. 5, 1918.

Application filed September 22, 1916. Serial No. 121,613.

To all whom it may concern:

Be it known that I, DURWARD B. HAMPTON, a citizen of the United States, and a resident of St. Helena, county of Napa, State of California, have made a new and useful invention—to wit: Improvements in Step-Ladders; and I do hereby declare the following to be a full, clear, concise, and exact description of the same.

The invention relates particularly to the proper construction and arrangement of the parts with the object of making a ladder that is strong and rigid and that may be produced at the minimum cost.

In this specification and the annexed drawings, the invention is illustrated in the form considered to be the best, but it is to be understood that the invention is not limited to such form, because it may be embodied in other forms, and it is also to be understood that in and by the claims following the description, it is desired to cover the invention in whatever form it may be embodied.

In the accompanying two sheets of drawings:

Figure 1 is a perspective view from in front of a ladder construction in accordance with this invention.

Fig. 2 is an enlarged detail in perspective illustrating one of the side platform braces.

Fig. 3 is a similar view of one of the step braces.

Fig. 4 is a fragmentary enlarged detail of the lower step and foot construction.

Fig. 5 is a fragmentary detail showing the engagement of the ends of the steps with the side bars, showing a modified form of tie bolt.

A fruit picker's step ladder is illustrated in the drawings at Fig. 1, that being the type best illustrating the advantages of this invention. I do not wish to be understood, however, as confining this invention to that type, as any one or all of the novel details of construction therein disclosed may be incorporated in ladders of other types without departing from the spirit of this invention.

In detail the construction illustrated in the drawings include: the side bars 1—1 connected to the platform 2, at the top and supporting the interposed steps 3, and the pivotal brace made up of the side bars 4—4. The brace bars 4—4 are drawn together and joined at the bottom by the bolt 5 with the intervening block 6, forming a tripod of the ladder, which type is more easily set up on uneven ground and equilibrium maintained. For greater stability it is advisable to spread the side bars 1—1 at the foot, tapering them gradually to the platform 2.

Attention is directed to Fig. 2, illustrating the metal brackets interposed between the ends of the side bars 1 and platform 2. The opposite edges of the platform are beveled to snugly fit within the V-shaped channel 8 of the brackets 7 which are provided with the integral bent-over lugs 9 and 10 overhanging the ends of the angle 8 to prevent displacement of the platform. The flange 11 turned up at the edge of the brackets overlies the front edge of the side bars 1, the inside of the upper ends of which lie against the plane 12 in an open socket formed by the flanges 11 and the beads 13, struck up from the body of the brackets 7; the top of the bars 1 are beveled to fit snugly under the angle 8 of the brackets, thus supporting the load on the platform 2 directly on the ends of the side bars 1. The upper ends of the bars 1 are provided with the overlying plates 14 secured thereto by the bolts 15 passing through the holes 16 in the plates 7, securely clamping the ends of the bars therebetween. The upper ends of the bars thus fixed to the brackets 7, are drawn snugly into assembly with the platform 2 by the tie bolt 17 passing through the holes 18, the tension of this tie-rod 17 pulling the side bars and the platform 2 snugly together, the nuts on the opposite ends of the tie rod providing for the take-up of any slack due to shrinkage. The side brackets 7 are provided with the holes 19 to receive the cross rod 20, engaging the pivot plates 21 fixed to the upper ends of the bars 4—4 by the cross bolts 22—22 passing therethrough and lying against the edges of the cross strut 23, interposed between the bars 4—4 and engaging the end plates 24, having upturned flanges 25 engaging the edges of the strut forming a rigid brace for the upper end of the pivotal support. In long ladders it is advisable to introduce an intermediate support consisting of a bolt passing through the tubular sleeve 26 interposed between the bars 4—4.

In long, heavy ladders it is advisable to

reinforce the foot end of the bars 1—1 on the inside with the reinforcing strips 27 joined by the cross strut 28 having its opposite ends mortised into the strips 27 having its upper edge lying against the underside of the lowest step. The strip 27 is fixed to the bars 1—1 by the bolt or rivet 28′ passing therethrough at the bottom and at the top by the tie-rod 29 passing through the side bars 1—1 and provided with running nuts to pull the side bars snugly against the end of the strut 28, forming a very rigid construction at the base of the ladder. The lower step may be further strengthened by an additional tie-rod 30 extending between the bars 1—1, or in very wide ladders by the shorter step ties as at 31, Fig. 5, joined to the lowest step by rivets as at 32.

The intervening steps 3 are interposed between the side bars 1 at convenient tread height, each resting upon a cross rod 33 provided with a running nut to pull the side bars snugly against the end of the steps.

The ends of each step are set in sockets formed by the integral flanges 34—35 struck up from the plate 36, and overhanging the upper and lower sides of the ends of the steps and held in proper horizontal alinement by the holes 37 through which the cross rods 33 pass. The steps are provided with a longitudinal groove in the lower side to receive the cross rods 33 which prevents lateral displacement of the steps. The braces 36 are provided with the upset flanges 38—38 overhanging the opposite edges of the side bars 1, to prevent tipping of the steps 3 and providing a snug and rigid engagement of the ends of the steps with the side bars 1. These braces are preferably formed of an integral blank of sheet metal and may be formed with a minimum of waste as illustrated in Fig. 3.

Particular attention is directed to the fact that none of the upright supporting members are transversely notched or scored in any manner to receive the steps or other connecting members, and therefore retain all of their original strength.

In addition to the simplicity, rigidity and economy in the manner of assembling the platform with its supporting members, it presents no overhanging obstructions likely to injure or become entangled in the branches or limbs of fruit trees in placing or removing the ladder when used for fruit picking. The absence of overhang of the platform 2 beyond the side bars 1 is a desirable safety element in preventing the user stepping beyond the center of gravity. The ladder is designed to simplify the mill work and assembly operations, and the metal work is designed to give the maximum strength with the minimum weight of material.

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

1. A step ladder including side bars, brackets formed with channels and fixed to the upper ends of said side bars on the inside thereof with the lower walls of said channels resting on the top of said side bars, a platform with its ends resting in said channels and means drawing said brackets against the ends of said platform, and a brace for the ladder.

2. A step ladder including side bars, brackets formed with flanges and ribs for engaging the edges of said side bars, and with channels, means securing said brackets to the top of said side bars with said channels resting on the top of said side bars, a platform supported by its ends resting in said channels, means drawing said brackets against the ends of said platform and a brace for the ladder.

3. A step ladder including side bars, brackets formed with flanges and ribs for engaging the edges of said side bars and with channels, means securing said brackets to the top of said side bars with said channels resting on the top of said side bars, a platform supported by its ends resting in said channels, means drawing said brackets against the ends of said platform and a brace for the ladder, and a brace pivoted to said brackets.

4. A step ladder including side bars, brackets formed with channels and fixed to the upper ends of said side bars, a platform with its ends resting within said channels, means drawing said brackets against the ends of said platform, a brace pivoted to said brackets, brackets secured to said side bars, and steps supported by said brackets.

5. A step ladder including side bars; brackets fixed to said side bars; a platform interposed between said brackets; means for drawing said brackets against the ends of said platform; and a brace pivoted between said brackets.

6. A step ladder including side bars having beveled top ends; brackets having V-shaped channels and fixed to the ends of said side bars on the inside, the beveled ends of said bars engaging under said channels; a platform having beveled ends engaging said channels, and means drawing said brackets against said platform.

7. A step ladder including side bars having beveled top ends; brackets having V-shaped channels and fixed to the ends of said side bars on the inside, the beveled ends of said bars engaging under said channels; a platform having beveled ends engaging said channels; and a brace pivoted between said brackets.

8. A step ladder including side bars, brackets formed with channels and fixed to the upper ends of said side bars, a platform

with its ends resting within said channels, means drawing said brackets against the ends of said platform, a brace pivoted to said brackets, brackets secured to said side bars, and steps supported by said brackets, and reinforcing means for the lower ends of said side bars and the lowermost step of the ladder.

9. A step ladder including side bars, brackets formed with channels and fixed to the upper ends of said side bars, a platform with its ends resting within said channels, means drawing said brackets against the ends of said platform, a brace pivoted to said brackets, brackets secured to said side bars, steps supported by said brackets, reinforcing means for the lower ends of said side bars and the lowermost step of the ladder, and a transverse reinforcing bar at the upper part of said brace.

In testimony whereof, I have hereunto set my hand at San Francisco, California, this 11th day of September, 1916.

DURWARD B. HAMPTON.

In presence of—
Z. D. BLAKE,
W. J. BLAKE.