Sept. 4, 1923. 1,466,757

L. F. RIEMER

FOLDING LADDER

Filed Dec. 30, 1922

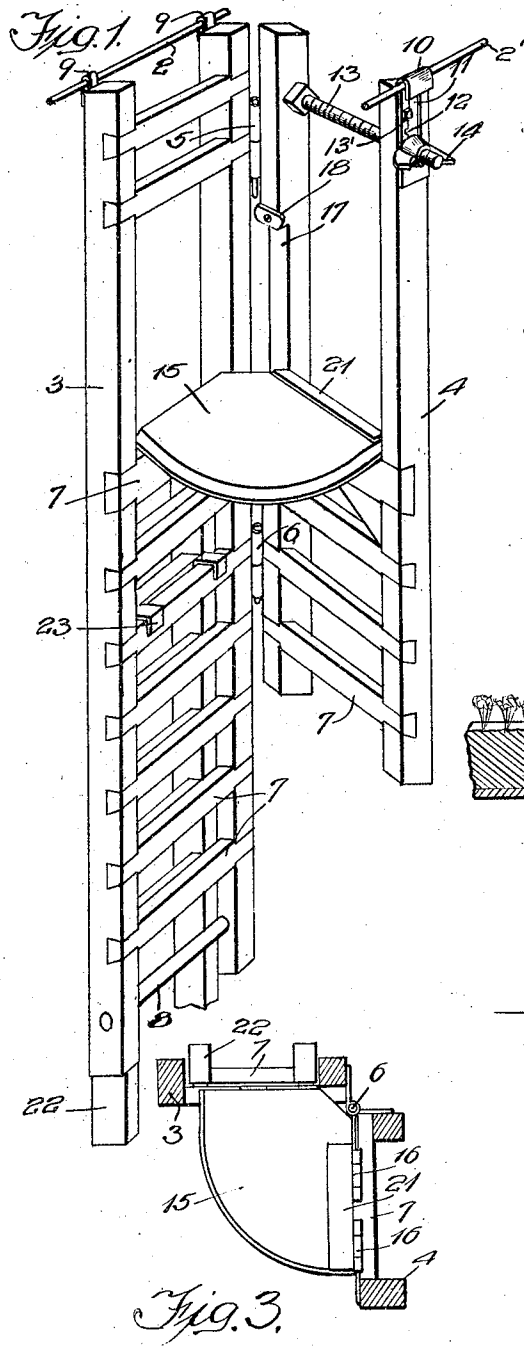


Fig. 1.

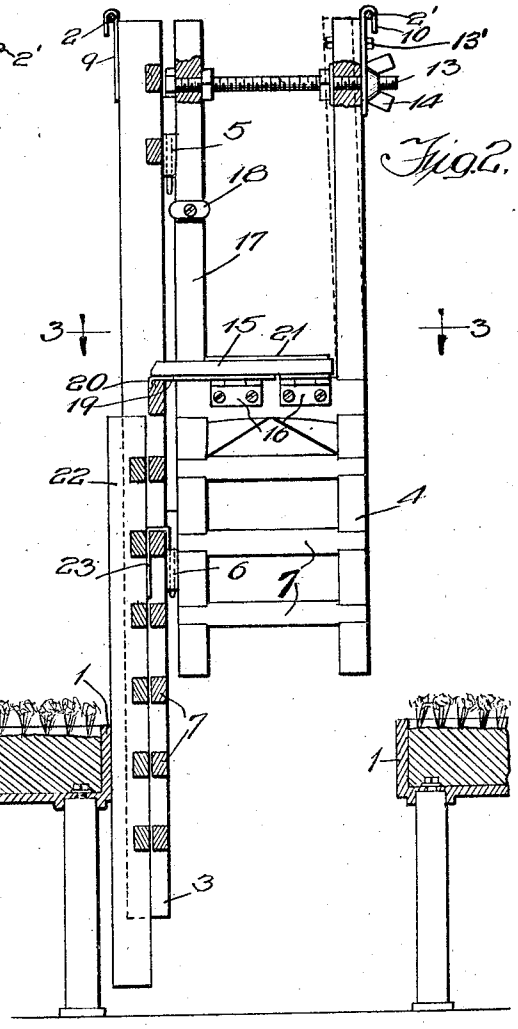


Fig. 2.

Fig. 3.

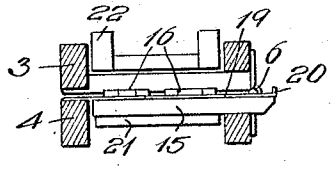


Fig. 4.

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UNITED STATES PATENT OFFICE.

LOUIS F. RIEMER, OF MORTON GROVE, ILLINOIS.

FOLDING LADDER.

Application filed December 30, 1922. Serial No. 609,883.

To all whom it may concern:

Be it known that I, LOUIS F. RIEMER, a citizen of the United States, residing at Morton Grove, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Folding Ladder, of which the following is a description.

My invention relates to an improvement in a folding ladder and more particularly to a ladder adapted for use while cleaning ventilators, ventilator parts, windows or lights of greenhouses or the like, painting, repairing or doing other work upon the walls.

One of the objects of my invention is to provide a collapsible or folding ladder comprising a pair of ladder sections hinged together at their sides, one of the sections being preferably shorter than the other so that a passage-way will always be clear between the aisles of the greenhouse irrespective of whether the ladder is in operative use or not.

Another object of my invention is to provide a movable platform engageable between the ladder sections and upon which an operator, the end of a scaffold, tools, cleaning utensils or other objects may be supported.

Another object of my invention is to provide a platform which, when in operative use, will hold said ladders in the desired relation and prevent accidental collapsing or closing thereof and which may be moved out of the way so as to lie in a vertical plane and permit passage of a person up or down the ladder.

Another object of my invention is to provide a ladder of the kind described which may be suspended from the rods or shafts of the ventilator mechanism which are generally adjacent the roof of the green house.

Another object of my invention is to provide a ladder of the kind described, which will be compact, simple in construction and operation, durable, and which may be easily, conveniently and quickly placed in operative position or removal therefrom and which shall be satisfactorily and efficient for use wherever found applicable.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosures herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts,

Fig. 1 is a perspective view showing the ladders in operative position as suspended from the ventilator rods;

Fig. 2 is a vertical sectional view taken at right angles through one of the ladder sections, showing the other ladder in elevation;

Fig. 3 is a sectional view taken substantially on line 3—3 of Fig. 2 with the bucket-supporting platform in operative position, and

Fig. 4 is a sectional view similar to that shown in Fig. 3, but with the ladder sections folded together and the bucket-supporting platform in inoperative position.

In the drawings, wherein I have illustrated, for greenhouse or like use, the preferred embodiment of my invention, 1 indicates the benches or boxes which are usually arranged on opposite sides of a center aisle in greenhouse or the like. Extending substantially parallel to the aisle but at quite an elevation thereabove are shown the rods 2 and 2′ forming a part of the operating mechanism for the ventilators and which are arranged adjacent the roof of the greenhouse in most cases. It is usually very difficult to make any repairs to the windows, lights or to the ventilator mechanism of a greenhouse because of the danger of injuring the greenhouse or the plants therebelow when arranging and working with ladders in the aisles.

Another objection is that when the work is being done the aisles are blocked and passage therethrough is prevented with the types of ladders which have heretofore been used. In order to overcome this difficulty and to permit passage, even though work is being performed on the ventilators, or other mechanism, I have provided a ladder comprising a plurality of sections hinged at their side edges, one of said sections being preferably shorter than the other so that when it is suspended downwardly from the roof of the greenhouse it does not extend the full distance to the floor so that it may be above the aisle, and in which position passage thereunder is permitted.

3 indicates one of the ladder sections and 4 another ladder section, said sections hinged together at their sides by means of hinges 5 and 6 arranged adjacent the upper and lower ends thereof.

It will be noted that the pin projecting downwardly from the upper hinge is longer than the pin projecting from the lower hinge so that when the sections are assembled the upper pin may be first seated in its cooperating hinge part, then the ladder section lowered slightly and the lower pin then dropped into its cooperating hinge part.

Any type of rungs may be used in the ladder sections, as for instance, the rectangular rungs 7 shown or of circular cross section like the lowest rung 8. Some of the rungs adjacent the upper end of the sections have been omitted for a purpose to be hereinafter described.

Hooks 9 are carried by the upper end of the ladder section 3 so as to overlie the ventilator shaft 2 to suspend the ladder section 3 therefrom. A hook 10 is carried at the upper end of the outer side of the section 4 so that it may be hung upon the ventilator shaft 2′, parallel to the ventilator shaft 2, in the manner shown. The hook 10 is preferably vertically adjustable and in the form shown has an elongated slot 11 therein with a series of offset notches 12 selectively engageable with a bolt 13′ to adjustably hold the hanger 10 in position. A threaded bolt 13 is inserted at its ends through the uprights of the ladder 4, one end of said bolt passing through the slot of the hanger 10. A nut or wing bolt 14 threadedly engages the free end of the bolt 13 beyond the hanger and is adjustable to move the uprights of the ladder toward one another as indicated in dotted lines in Fig. 2.

In order to hold the sections 3 and 4 in their operative position and prevent them from accidentally folding together, or opening too much, a platform 15 is hinged along one edge as at 16 to one of the sections, as for instance to the section 4. A portion of one of the side members of the section 4 is preferably cut away or recessed as at 17 so that when the platform 15 is swung upwardly into inoperative position it will lie substantially flush with the section 4 so that the ladder sections may be closed together or collapsed and occupy but slightly more space than the single ladder section 3. A catch or latch member 18 may be provided on the section 4 to cooperate with the platform 15 and hold it in its inoperative position, if so desired.

In order to reinforce the platform 15 so as to suspend a heavy load, as for instance the weight of the person who is repairing the ventilator, a plate 19 is arranged on the platform, said plate being preferably of metal and secured to the platform in any desired manner as for instance by screws or the like (not shown), one end of said plate being offset laterally as at 20 to form a hook to engage over an edge of one of the rungs 7 and lock the sections to prevent the ladder sections from spreading when in operative position. Another reinforcing member comprising a bar 21 may be arranged at the hinged end of the platform 15, if so desired.

The lower end of the ladder section 3 is arranged to engage the side edge of the benches 1, but in case the ceiling is too high for the ladder section 3, another ladder section 22 may be provided to cooperate with the ladder section 3 to form an extension ladder, said ladder section 22 being detachably suspended from the ladder section 3 by means of hooks 23 or the like. It is obvious that when the ladder is in its open or operative position, the lower end of the ladder section 4 will be at a sufficient height above the ground that an attendant may pass through the aisles.

The platform 15 may be swung to its inoperative position when the workman, who is to repair the ventilator, desires to pass the platform in ascending or descending the ladder. The platform may be used for a number of purposes, as for instance, to support the buckets of paint, water, or various tools, to support a workman directly thereon, or, if desired, a pair of the hinged ladders may be arranged in the greenhouse and one end of a scaffold or platform may be supported therebetween in a suitable manner. I have shown in dotted lines in Fig. 2 how the auxiliary ladder part may be adjusted at the upper end to fit different spacings of rods.

It is obvious that a sheet of canvas, or the like, may be supported between a plurality of ladders in order that paint and tools may not accidentally drop upon the flowers therebelow.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In combination with a longitudinally extending bench and rods thereabove parallel thereto, a pair of ladders movably interconnected and having means for suspension from one of said rods and one of said ladders engageable with a side of said bench.

2. In combination with a pair of longitudinally extending benches having an aisle therebetween and rods thereabove extend-

ing parallel thereto, a pair of ladders joined together so as to lie in different vertical planes, means for suspending one of said ladders from said rods so that it engages with the side edge of one of said benches, the other of said ladders being shorter than said first mentioned ladder so as to permit passage under said shorter ladder through said aisle.

3. In a structure of the kind described and in combination, a pair of ladders of different lengths connected together and adjustable angularly of one another so as to lie in different vertical planes, and means for suspending the longer of said ladders from above.

4. In a structure of the kind described and in combination, a pair of ladders adjustable angularly of one another so as to lie in vertical different planes, and means for suspending said ladders from above.

5. In a structure of the kind described and in combination, a pair of ladders adjustable angularly of one another so as to lie in vertical different planes, means for suspending one of said ladders from a rod thereabove, and means for suspending the other of said ladders from a rod extending substantially parallel to said first mentioned rod.

6. In a structure of the kind described and in combination, a pair of ladders pivotally connected together to turn on vertical axes, and a supporting platform hinged along one edge to one of said ladders and engageable at its free edge with the other of said ladders to prevent said ladders from accidentally closing together.

7. In a structure of the kind described and in combination, a pair of ladders hinged together at their adjacent edges so as to turn on a common vertical axis, a platform hinged to one of said ladders and engageable with the other of said ladders when said ladders are opened to a predetermined angle, whereby accidental folding of said ladders toward one another is prevented.

8. In a structure of the kind described and in combination with a longitudinally extending bench and a plurality of rods spaced apart thereabove and extending parallel thereto, a ladder having means for suspending it in a vertical plane from one of said rods to engage with said bench, a second ladder, means for connecting said ladders together so that they may fold, means for suspending the second of said ladders from another of said rods to lie in another vertical plane, and means for holding said ladders apart at a predetermined angle therebetween.

9. In combination with a pair of longitudinally extending benches having an aisle therebetween and rods extending parallel to said benches thereabove, of a pair of ladder sections hinged together at one edge so as to lie in different vertical planes, one of said ladder sections being shorter than the other and adapted to be suspended from one of said rods, the other of said sections adapted to be suspended from another of said rods, and a movable platform carried by one of said sections and engageable with the other to hold said sections apart at a predetermined angle therebetween but permit the passage of a person on said ladder past said platform when desired.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

LOUIS F. RIEMER.

Witnesses:
ROY W. HILL,
RUTH M. EPHRAIM.