(No Model.) 2 Sheets—Sheet 1.

A. JOHNSON.

STEP LADDER.

No. 458,461. Patented Aug. 25, 1891.

Fig. I

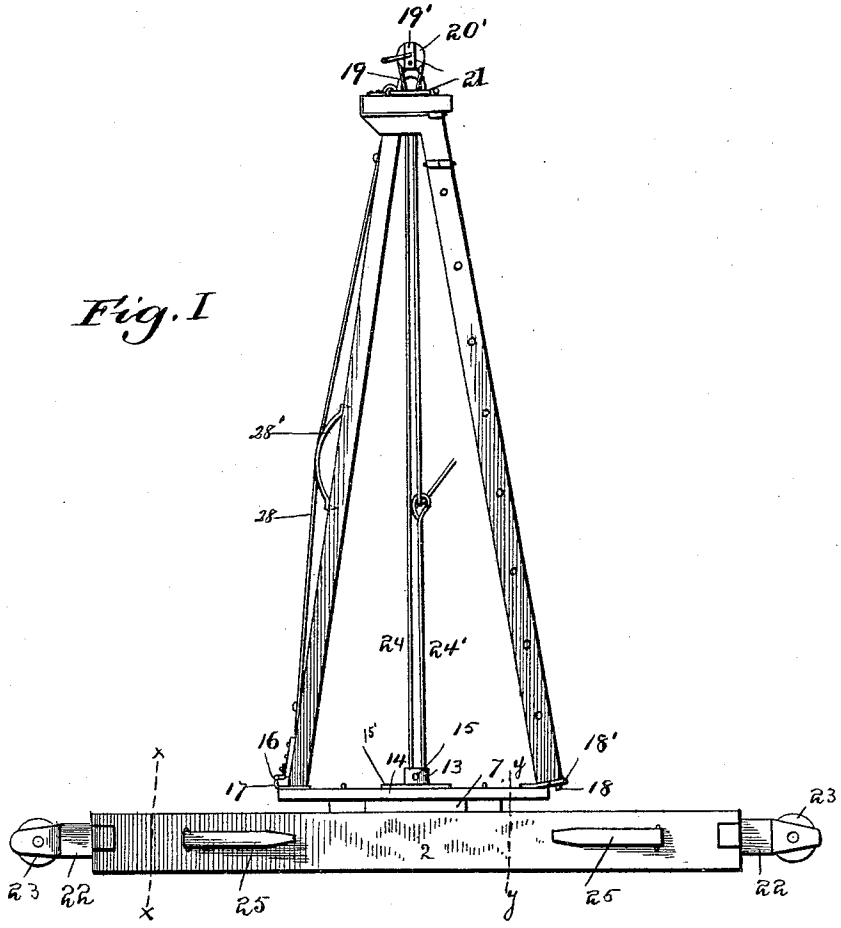
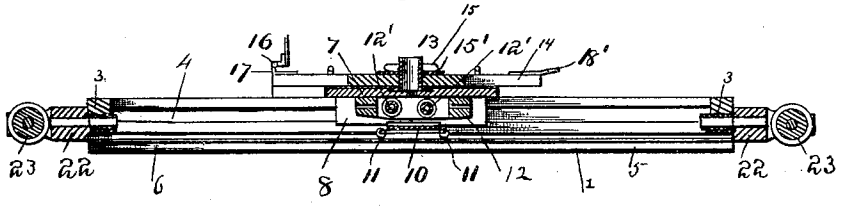


Fig. III.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. II.

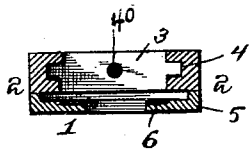


Fig. IV.

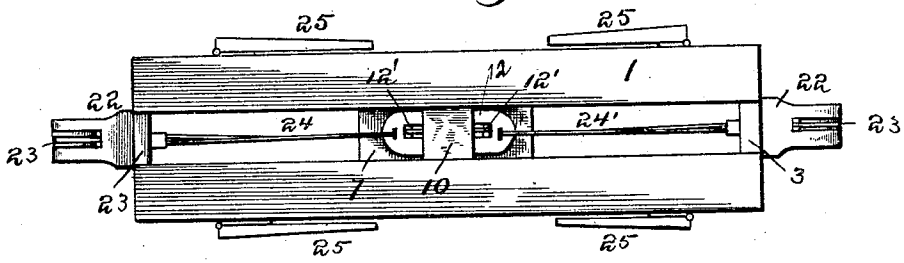


Fig. V.

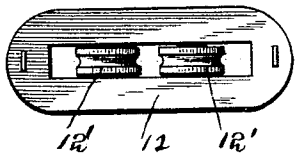


Fig. VI.

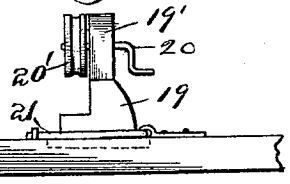
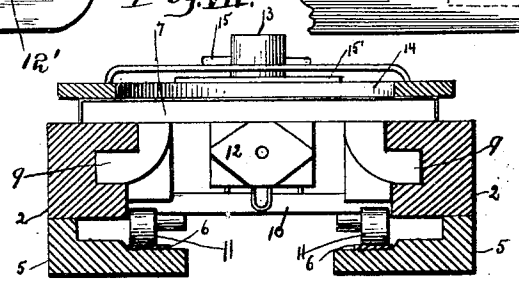


Fig. VII.



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UNITED STATES PATENT OFFICE.

ANDY JOHNSON, OF GREENVIEW, ILLINOIS.

STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 458,461, dated August 25, 1891.

Application filed April 7, 1891. Serial No. 387,984. (No model.)

To all whom it may concern:

Be it known that I, ANDY JOHNSON, a citizen of the United States, residing at Greenview, in the county of Menard and State of Illinois, have invented certain new and useful Improvements in Step-Ladders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in step-ladders, and more particularly to that class which are adapted to be moved forward or backward by the person standing thereon.

My invention has for its object, first, to provide a simple ladder, which can be moved by the person thereon by simply operating a crank on the ladder; secondly, to construct the ladder in such a manner that it can be readily and easily turned around, and, finally, to provide a base or track on which the ladder is mounted.

With these ends in view my invention consists of a track of suitable length having the sides channeled or grooved in their inner faces, and in these grooves is adapted to slide the base on which the ladder is mounted. Between the guides on this base are two pulleys, which have their axles journaled in a strip secured on the base, and fastened to the base and the guides is a plate which is provided with friction-rollers arranged to operate on a projecting flange on either side piece. The base is adapted to slide on the top of the side pieces, and loosely secured on this base around a central hollow spindle is another plate, to which the end of the ladder is detachably secured. On the top of the ladder is arranged a pulley over which the operating-rope is passed, and the ladder is moved by turning a handle on the shaft of this pulley, and thus operating a rope. The rope passes down through the hollow spindle and under the pulleys beneath the base, and thence each end passes in opposite directions to the outer end of the track over a pulley fitted in a projecting bracket on said ends and back again, and the ends are fastened on opposite sides of the base. To prevent the ladder from tipping over, I provide arms pivotally secured to the side pieces, and when it is desired to use the ladder these arms are turned outward at right angles to the sides and they bear on the ground or floor.

My invention further consists of certain details of construction and arrangements of parts, as will be fully described hereinafter.

To enable others to readily understand my invention, I have illustrated the same in the accompanying drawings, in which—

Figure I is a side elevation of my invention arranged and adapted for use. Fig. II is a sectional elevation on the line $x\,x$ of Fig. I, with the ladder removed. Fig. III is a longitudinal sectional view taken through the center of the base and with the ladder removed. Fig. IV is a bottom plan view of the base, showing the guides, &c. Fig. V is a detail view of the block having the pulleys journaled therein beneath the base, and Fig. VI is a detail view of the pulley on the top of the ladder. Fig. VII is a transverse sectional view taken on the line $y\,y$ of Fig. I.

Referring to the drawings, in which like numerals of reference denote corresponding parts in all the figures, 1 designates the track on which the ladder is arranged to move. This track lies flat upon the ground or floor, and it is composed of the parallel sides 2, which are joined at their ends by cross-pieces 3. These side pieces 2 are provided with longitudinal channels or grooves 4 on their inner faces, and to the sides are secured flat strips 5, which project inwardly beyond the side pieces proper and form a track on which the carriage supporting the ladder is adapted to travel. These projecting strips 5 may be formed integral with the sides, and they are provided with a metallic covering 6, on which the carriage moves, which takes up the wear and insures easy movement thereon.

Extending across the top of the track 1 is a flat piece 7, on which the ladder is placed, said piece 7 forming a part of the carriage. This piece 7 is provided with the guides 8, which extend downward below the channels or grooves in the sides 2 to bear against said sides, and these guides are provided with projections 9, which fit in the channels or grooves and serve to hold the ladder in a steady and upright position.

Secured on the lower ends of the guides is a flat piece 10, which forms the base of the carriage, and this base is provided with fric-

tion-rollers 11 on its lower side, arranged to operate on the metallic covering 6 on the strips 5. These rollers are secured to the base in any suitable manner; but they are arranged in such positions that any increased or unusual weight on the ladder will not cause the base 10 to interfere with their proper operation, and for this reason I prefer to bevel the ends of said base above the rollers or form a cavity above the same, as desired.

On the base 10, and fitting snugly between the same and the flat piece 7, is a strip 12, secured firmly in place between the guides, and this strip is provided with a central longitudinal opening, in which are arranged two pulleys 12′, one in front of the other and a suitable distance apart, and these pulleys operate on shafts journaled in the strip 12. The ends of this strip are provided with small holes, through which run the cords that operate and move the ladder. The flat piece 7 on top of the sides is covered with a metallic plate, and there is a central opening in the plate and covering through which the operating-cords pass. Extending upward from this opening is a hollow tube or spindle 13, which has its flared lower end clamped between the piece 7 and the metallic covering thereon, thus holding it in a firm upright position. Loosely secured on this tube 13 is another flat piece 14, to which the legs of the ladder are detachably secured, and which constitutes the base of the ladder. This piece 14 can be made in sections and joined together by fastening-wires, as shown in Figs. II and III, and the latter construction is preferred, so that the base can be readily detached from the carriage when so desired. The base is secured in place by a pin 15, which passes through the center of the tube 13 and bears on a washer 15′, fitted around said tube and resting on the base 14. The pin also serves to separate the operating-cords, which pass on either side thereof through the tube. The rear legs of the ladder are pivoted on the rearward-projecting ends of the base 14 by pins 16, which pass through sockets in plates 17 on the legs of the ladder and on the ends of the base, and these plates form, in connection with the pins, hinges, by means of which the ladder can be extended and its top lowered close to the ground or floor to enable the operating-cords to be fixed in position. The front legs of the ladder are provided with downwardly-extending pins 18, having enlarged hooked heads, and these pins are arranged to fit in eyes 18′, formed on wire strips extending outwardly from the base 14, so that the ladder may be easily and quickly arranged and adjusted in position and as easily removed when required. As the base is loosely fitted around the tube or spindle 13, the ladder can be revolved or turned around at will, and the pin 15 and washer 15′ hold the ladder in a firm and upright position at whatever angle it may be turned with reference to the track 1.

The ladder itself is of the ordinary construction, and its rear legs are provided with strengthening-wires 28, which are drawn tightly over curved bars 28′, which have their ends turned inward at an angle and sharpened to attach the same to the legs, and the wires pass through grooves in the curved portion thereof.

On the top of the ladder and fitted in an opening therein is a bell-shaped hood 19, which is provided with an opening in one side thereof, and has a rod 19′ extending upward a short distance from its crown. Passing through this rod is a shaft 20, which is provided with a crank and handle on one end and on the other is rigidly secured a guide-pulley 20′. This hood 19 is loosely secured in place on the ladder by a ring 21, hinged on one side and provided with a hook and eye, and this ring fits around the hood and impinges against a flange on the hood to hold it in place in the opening.

Projecting outwardly from either end 3 of the track is a bracket 22, and in the ends of these brackets are journaled shafts which carry sheaves or pulleys 23. These brackets are provided with an opening 40, extending through the ends of the track, through which the operating-rope passes.

The operating-rope is made in two pieces 24 24′, and said parts pass over the pulley 20′, down through the tube 13 on either side of the pin 15, after which they diverge and run under the pulleys 12′ in opposite directions, and over the pulleys 23, and are then secured on opposite sides of the strip 12. One of the ends is provided with a loop through which the other end passes. By this construction and arrangement of devices the operator, standing on the ladder, has only to turn the handle on the shaft 20, which causes the cord to travel over the pulley 20′, and as the ends of the cords pass over pulleys in opposite ends of the track and are fastened to opposite sides of the carriage the movement of the cord causes the carriage and ladder to move forward or backward, according to the direction in which the handle is turned.

To prevent the ladder from tilting over, I provide arms 25, which are pivoted to the outer sides of the tracks, and when these arms are turned outwardly they bear against the ground or floor and prevent the ladder from tilting.

I am aware that changes in the form and proportion of parts and details of construction can be made without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such changes as fall within the scope of my invention.

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

1. In a step-ladder, the combination of a base, the track on said base, a carriage having rollers adapted to move on the track, the

top plate pivotally mounted on the carriage, and the ladder, substantially as described.

2. In a step-ladder, the combination of a track, a carriage arranged to move on said track, the guides on the carriage adapted to slide in ways in the sides of the track, the spindle projecting upward from said carriage, the ladder secured on a base-plate loosely fitted on the spindle or tube, and the operating-rope, substantially as described.

3. In a step-ladder, the combination of a track, the brackets having the pulleys therein projecting from the ends of said track, a carriage movable on the track and provided with guides arranged to slide in ways in the sides of the track, the pulleys secured in said carriage, the ladder secured on a base-plate which is loosely fitted around a spindle or tube projecting upward from the carriage, and the operating-rope, substantially as described.

4. In a step-ladder, the combination of a track, the pulleys arranged in brackets on the track, a carriage provided with friction-rollers and movable on the track, the lateral projecting guides on the carriage arranged to slide in ways in the sides of the track, the rollers in the carriage, a base-plate revoluble on the carriage and carrying the ladder, and the operating-rope, substantially as described.

5. In a step-ladder, the combination of a base, the track on the base, and the side pieces having the ways or grooves, the carriage movable on the track and guided in the ways or grooves, the top plate pivotally mounted on the carriage, and the ladder having its rear legs hinged to the top plate and its front legs provided with pins to fit in loops on said plate, substantially as described.

6. A step-ladder having the strengthening-wires secured on the legs thereof and the curved rod provided with a groove through which the wire passes, the ends of the rod being turned at an angle to fasten the same to the ladder, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ANDY JOHNSON.

Witnesses:
J. H. STICHTMANN,
A. P. BLANE.