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H. L. MARSTON & J. D. HATCH.

EXTENSION LADDER.

(Application filed Apr. 26, 1900.)

(No Model.)

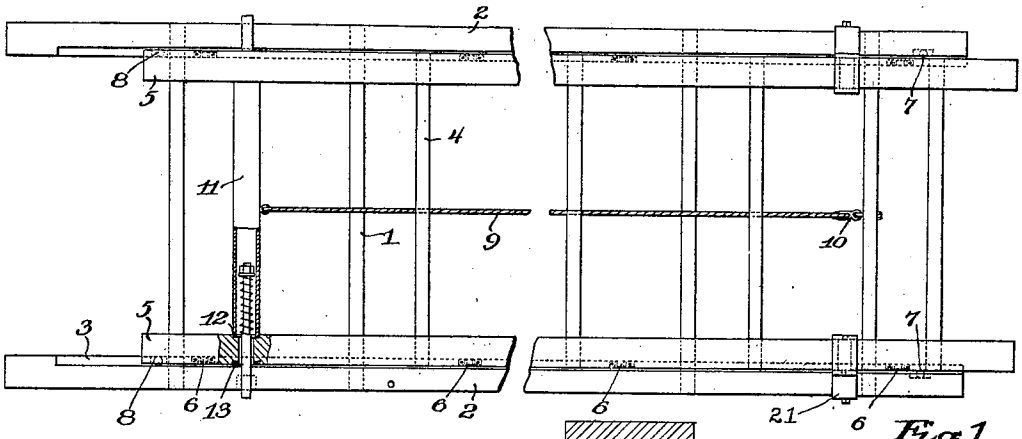


Fig. 1.

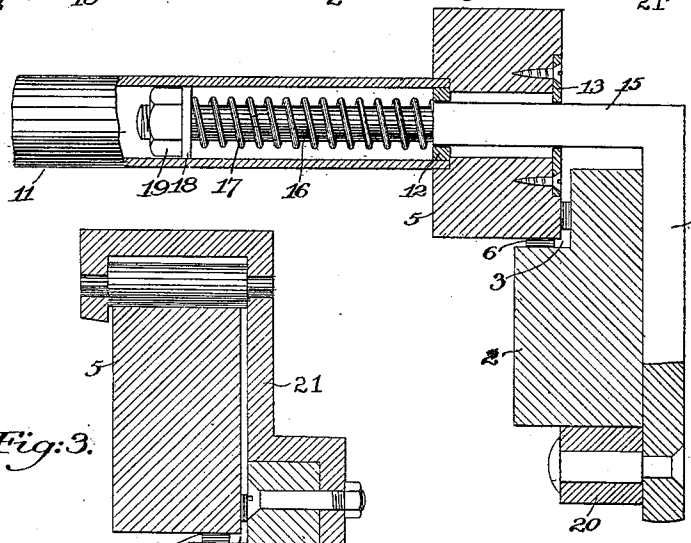


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

HARRY L. MARSTON AND JACOB D. HATCH, OF BROCKTON, MASSACHUSETTS.

EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 659,310, dated October 9, 1900.

Application filed April 26, 1900. Serial No. 14,374. (No model.)

To all whom it may concern:

Be it known that we, HARRY L. MARSTON and JACOB D. HATCH, citizens of the United States, residing at Brockton, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Extension-Ladders; and we 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.

The present invention relates to extension-ladders.

One object of the present invention is to provide an extension-ladder that shall be strong, compact, and easily extended.

Another object of the present invention is to provide a guide-bracket for extension-ladders which shall be supported without rotation when in its normal or operative position, but which may be turned up clear of the section of the ladder normally engaged thereby for convenience in piling on the ladder-truck.

To the above ends the present invention consists in the combinations hereinafter set forth, and pointed out in the claims.

In the illustrated embodiment of our invention, Figure 1 is a plan view of our improved extension-ladder. Fig. 2 is a sectional view of our improved guide-bracket. Fig. 3 is a sectional view of the rigid guide-bracket.

In the illustrated embodiment of our invention, 1 represents the lower or stationary section of an extension-ladder, preferably having the side pieces 2 rabbeted, as shown at 3. The side pieces 5 of the upper or movable section 4 are arranged to slide in these rabbets 3, this construction providing an extension-ladder which will be compact when folded or closed and of great strength when extended. In order to facilitate the sliding of the upper section 4 on the lower section 1, we have mounted in the rabbet 3 a series of friction-rollers 6 6, arranged to support the side pieces 5 of the upper section of the ladder. The side rollers 7 7 and 8 8 are mounted, respectively, near the upper end of the lower section 1 and the lower end of the upper section 4, preventing side contact of the upper section in the rabbet. The upper section 4 is thus supported entirely upon rollers and may be easily and quickly raised by any suitable means, conveniently the cord or rope 9, passing over the pulley 10 and fastened to the lowest round 11, without the possibility of one section catching or jamming upon the other.

In our improved extension-ladder we have provided a guide-bracket of simple construction mounted upon one section and arranged to engage and support the side piece of the other section, the bracket being so mounted that while it engages the side piece of the other section it is held without rotation in its support. The bracket is so arranged, however, that it may be turned up out of engagement with the side piece, leaving the lower section without projections to interfere with the piling or sliding of the closed ladder on the ladder-truck.

In the illustrated embodiment of our invention the lowest round 11 of the movable or upper section of the ladder is formed of piping or other suitable hollow material, a washer 12 with a square hole being secured in the end of said round. On the outside of the side piece 5 and preferably flush therewith is secured the metallic plate 13, also provided with a square hole which registers with the hole in washer 12. A guide-bracket 14, the shank thereof comprising the parts 15 and 16, which are square and circular, respectively, in cross-section, is mounted in the hollow round 11. A coiled spring 17, engaging at one end the washer 12 and at the other the washer 18, secured by the nut 19, maintains the roller 20, mounted in said bracket, in operative engagement with the side piece 2. In this position the square part 15 of the shank of the bracket is supported in the square holes in washer 12 and plate 13, thereby preventing any rotation of the bracket, and thus avoiding the possibility of the sections jamming.

In the illustrated embodiment of our invention we have shown the part 15 of the shank of the bracket-guide and the corresponding holes in washer 12 and plate 13 as square; but it is evident that the shape thereof may be considerably varied without departing from the spirit of our invention.

A rigid guide-bracket 21, fixedly secured

to the side piece 2 of the stationary section 1, near the upper end thereof, coöperates with the folding guide-bracket 14 to maintain the sections in proper operative position, but in and of itself constitutes no part of our invention.

The operation of our improved guide-bracket is as follows: The bracket is shown in Fig. 2 in its normal or operative position. When it is desired to turn up the bracket for piling the closed ladder on a trucks, the bracket is first drawn out longitudinally of its shank against the tension of the spring 17 until the square part 15 is clear of the plate 13, the roller 20 then being clear of the side piece 2 of the bottom section 1. The bracket may now be rotated through ninety degrees and allowed to return to its retracted position by the tension of the coiled spring 17, the roller 20 being above the side piece 2 instead of below it. The ladder may now be placed on the truck, there being no projection beneath this end of the bottom section to interfere with its rolling or sliding freely in the supports provided for it. When the ladder is to be raised, the bracket is pulled out and turned through ninety degrees, the coiled spring drawing it back into operative position.

We are aware that it is old in the art to provide guide-brackets for extension-ladders which shall be automatically pushed out and turned by cam-surfaces on the ladder as it is being extended, but these brackets were unreliable on account of their complicated construction. This was a very great objection, inasmuch as reliability of a device is the first requisite in the art.

Our device is simple, having no small parts to be easily broken or deranged, and is absolutely reliable in operation, being positively actuated by hand.

Having thus described our invention, we claim as new and desire to secure by Letters Patent of the United States—

1. In an extension-ladder, the combination with a hollow rung having a polygonal interior for part of its length, of a guide-bracket having a shank of corresponding shape for part of its length and movable longitudinally in said rung to disengage the correspondingly-shaped shank and rung to permit rotation of said bracket, and means to prevent longitudinal movement of said bracket, substantially as described.

2. In an extension-ladder, the combination with a hollow rung, of a guide-bracket provided with a shank arranged to reciprocate in said rung, a bearing for said shank in the rung, the inner portion of said shank being shaped to turn freely in said bearing and the outer portion being shaped to engage said bearing to hold the shank from rotation, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

HARRY L. MARSTON.
JACOB D. HATCH.

Witnesses:
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ALFRED H. HILDRETH.