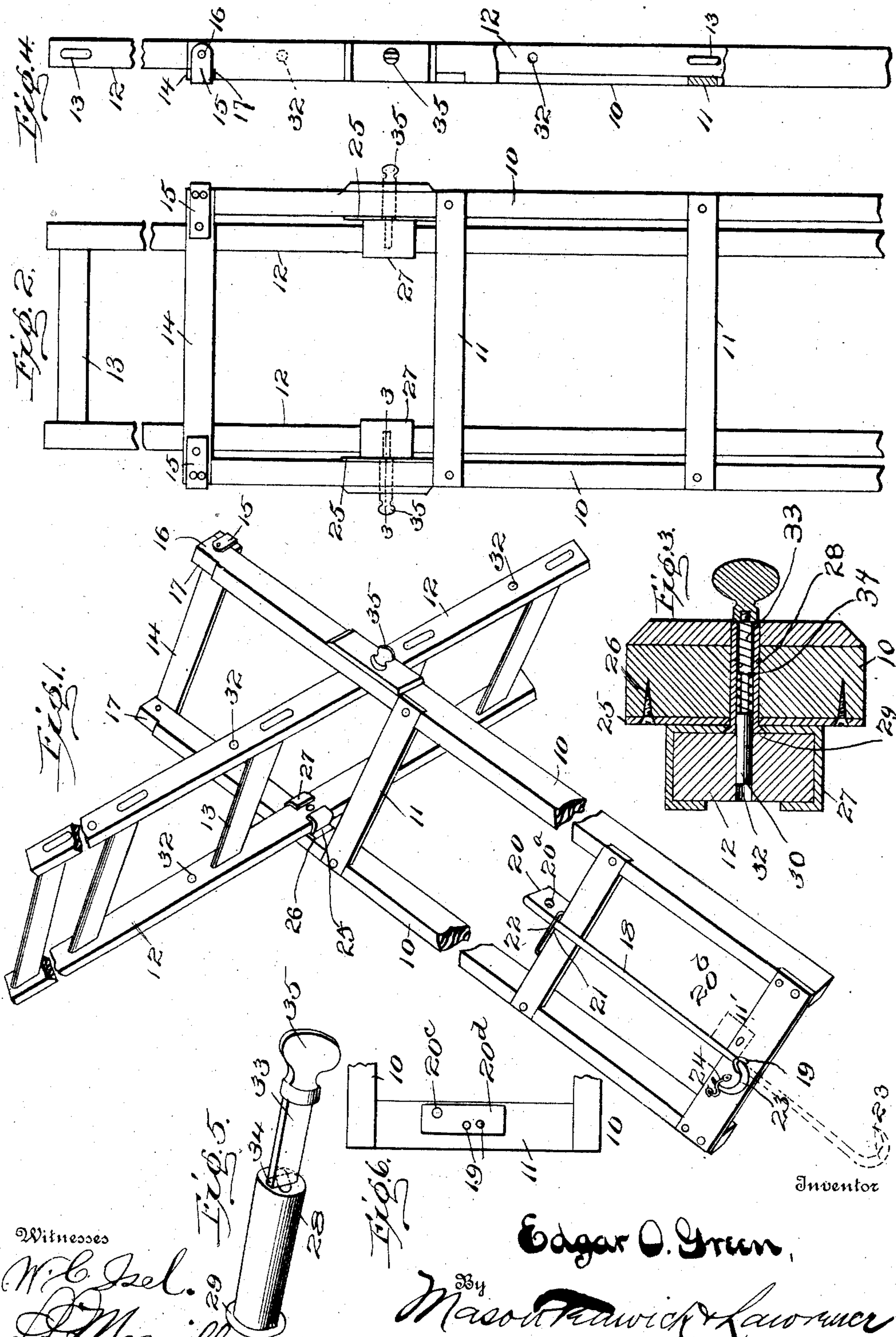


No. 864,751.

PATENTED AUG. 27, 1907.

E. O. GREEN.
LADDER.

APPLICATION FILED SEPT. 26, 1906.



Witnesses

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LADDER.

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To all whom it may concern:

Be it known that I, EDGAR O. GREEN, a citizen of the United States, residing at Ballard, in the county of King and State of Washington, have invented certain new and useful Improvements in 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.

10 This invention relates to ladders and especially to that class of ladders adapted to be used as rigid ladders for scaling and as folding ladders to be used in place of a step ladder.

15 A further object of the invention is to provide in a ladder separate sections hinged together and provided with improved means for sliding one section relative to the other at the hinge.

20 A further object of the invention is to provide in a ladder an improved bolt for retaining the sections in hinged relation to each other and to be withdrawn for permitting the sliding of one section relative to the other.

25 A further object of the invention is to provide in a ladder a rung hinged upon a bail by which the sections are retained in rigid relation to each other when

A further object of the invention is to provide in a ladder a folding hook adapted to engage parts of a structure and to retain the ladder in operative position relative to the structure.

30 With these and other objects in view, the invention comprises certain other novel constructions, combinations and arrangements of parts, as will be hereinafter fully described and claimed.

35 In the drawings:—Figure 1 is a perspective view of the improved ladder hinged and positioned to serve as a step ladder. Fig. 2 is a view in side elevation of the improved ladder folded. Fig. 3 is a view in transverse section showing the adjustable pivoted bolt and taken on line 3—3 of Fig. 2. Fig. 4 is a view in edge elevation of the improved ladder extended and positioned for use as a rigid ladder. Fig. 5 is a view in perspective of the hinge bolt shown in position as withdrawn from engagement with the ladder and locked in such withdrawn position. Fig. 6 is a view in plan of the normally lower end of the ladder showing the plate for securing the grappling hook.

45 Like characters of reference designate corresponding parts throughout the several views.

50 The ladder forming the subject-matter of this application comprises a section composed of the side rails 10, and the transversely disposed rungs 11 rigidly secured thereupon adjacent one edge, as shown particularly in Figs. 1 and 4. Associated with the section described is another section comprising side rails 12 and transverse rungs 13 proportioned somewhat narrower than and to be disposed between the side rails 10.

At one end a rung 14 is connected with the side bars 10 by means of ears 15 forming with the rung a bail pivoted as at 16 and capable of being swung upon the said pivot upon opposite sides of the rails 10, and proportioned to be positioned within notches 17 when 60 operatively disposed relative to the side bars. At its opposite end the ladder is provided with a rod 18 slidably mounted in an eye or staple 19 in the extreme rung 11' and having an angularly disposed plate 20 65 at one end, positioned to pass through a slot 21 in a plate 22 secured to the rung next adjacent the extreme rung and terminating at the end opposite the plate in the hook 23. When the hook 23 is adjacent the extreme rung 11' it is secured in that position by 70 means of a hook or other convenient and approved fastening means 24, and in that position the plate 20 is disposed substantially perpendicular to the rung, and is secured in such position by a screw bolt inserted through the bail 20^c of the plate 20^a of the rung 11' 75 and screwed into the threaded bail 20^b in a plate 20^d which is secured to the under surface of the rung 11'.

At any convenient point, preferably adjacent the end provided with the pivoted rung 14, plates 25 are secured to the inner surfaces of the rails 10 in any 80 approved manner, as by the screws 26, and associated with said plate is a guide or yoke 27. The yoke 27 is pivotally mounted upon a sleeve 28 and held from displacement therefrom by means of a countersunk head 29 formed upon the said sleeve, which said sleeve 85 extends through the plate 25 and through the rails 10. Within the sleeve 28 is mounted a bolt 30 embraced by a spring 31 arranged to hold the bolt 30 within any one of the spaced openings 32 formed in the rails 12, and provided with an angular shank 33 90 and shoulder 34 so proportioned that when the bolt is withdrawn from the sleeve 28, the shoulder 34 engages the outer end of the said sleeve and holds the bolt in a position withdrawn from the openings 32. The bolt 30 is preferably formed at its outer end with 95 any convenient and approved form of head 35, positioned and proportioned to be grasped by the hands of the operator.

In operation the yoke 27 is pivoted upon the rail 10 in juxtaposition to the plate 25 by means of the 100 sleeve 28 and with the bolt 30 withdrawn as shown in Fig. 5 the rails 12 may be inserted and slidably moved through the yoke 27 until the desired position is attained whereupon the bolt 30 is released by turning the said bolt through approximately one-fourth 105 of a revolution, thereby disengaging the shoulders 34 and permitting the bolt to be moved within the openings 32 by the resiliency of the springs 31. The yoke 27 being pivotally engaged upon the sleeve 28 and the rails 12 being engaged therein, it is obvious that 110 the sections may be adjusted upon the said sleeve as a pivot to any acquired angular position. When it

is desired to use the ladder as a rigid, straight ladder, the rails 12 are moved to a closed position, wherein the rails 12 extend coincident with the rails 10 and the pivoted rung 14 moved upon its pivot to the position shown in Figs. 2 and 4. The inner section is then slidably moved longitudinally by releasing the bolts 30 from the openings to form the ladder required and the rigidity is accomplished by reason of the rung 14 engaging the movable section upon one side and the next adjacent rung engaging it upon the same side, and a lateral movement prevented by means of the bolts 30. It will be readily seen that as the inner section is adjustable longitudinally the legs of the sections, when hinged together, may be varied relative to each other so that the ladder may be used in various positions, as, for instance, on a side hill or on stairs, or with one end on the ground and the other end on a porch or the like.

For use upon a roof, the ladder is preferably formed rigid and extended as shown in Fig. 4, and the bar 18 moved to the position shown in dotted lines, whereupon the hook 23 may be hooked over the ridge of a roof and the ladder held thereby upon the inclination of the roof.

What I claim is:—

1. In a ladder, the combination of a plurality of sections, a guide slidably mounted upon one of the sections, a sleeve carried by the guide and pivoted in the opposite section, and means disposed within the sleeve for locking the sections against relative sliding movement.

2. In a ladder, the combination of a plurality of sections, a guide slidably mounted upon one of the sections, a sleeve carried by the guide and pivoted in the opposite section, and a bolt slidably mounted within the sleeve, and

serving to lock the sections against relative sliding movement.

3. In a ladder, the combination of a plurality of sections, a guide slidably mounted upon one of the sections, a pivot member carried by the guide and journaled in the opposite section, and a bolt mounted upon the pivot member and serving to lock the sections against relative sliding movement.

4. In a ladder, a side rail, a sleeve extending through the side rail, a yoke pivotally mounted upon the inner end of the sleeve, a bolt slidably mounted within the sleeve, a second rail slidably mounted within the yoke and provided with an opening arranged to receive and accommodate the bolt, and means upon the bolt for locking the bolt at a withdrawn position.

5. In a ladder, the combination of a plurality of sections, a guide slidably mounted upon one of the sections, a sleeve carried by the guide and pivoted in the opposite section, a bolt slidably mounted within the sleeve and serving to lock the sections against relative sliding action, and means upon the bolt for locking the same in an inoperative position.

6. In a ladder, spaced stiles, rungs spaced upon the stiles, a rod carried slidably by the rungs, and having a hooked end, and a plate carried by the rod and adapted to engage the rungs.

7. In a ladder, spaced stiles, spaced rungs carried transversely of the stiles, a rod mounted upon the rungs and movable slidably and rotatably, and provided with a hooked end, and a plate carried by the rod and positioned to engage the said rungs alternately to secure the hooked portion in and out of operative position.

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

EDGAR O. GREEN.

Witnesses:

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E. N. MARTIN.