

W. H. Simmons.

Fire Escape.

Nº 90,316.

Patented May 18, 1869.

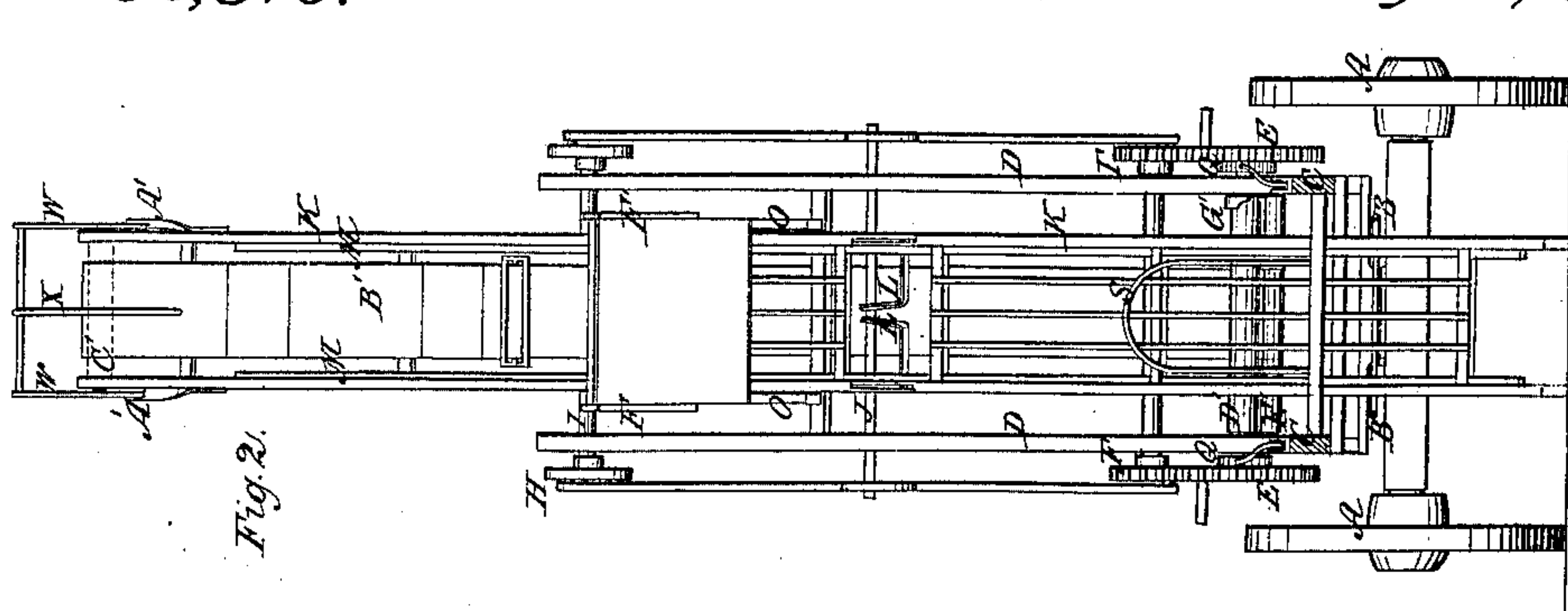


Fig. 2.

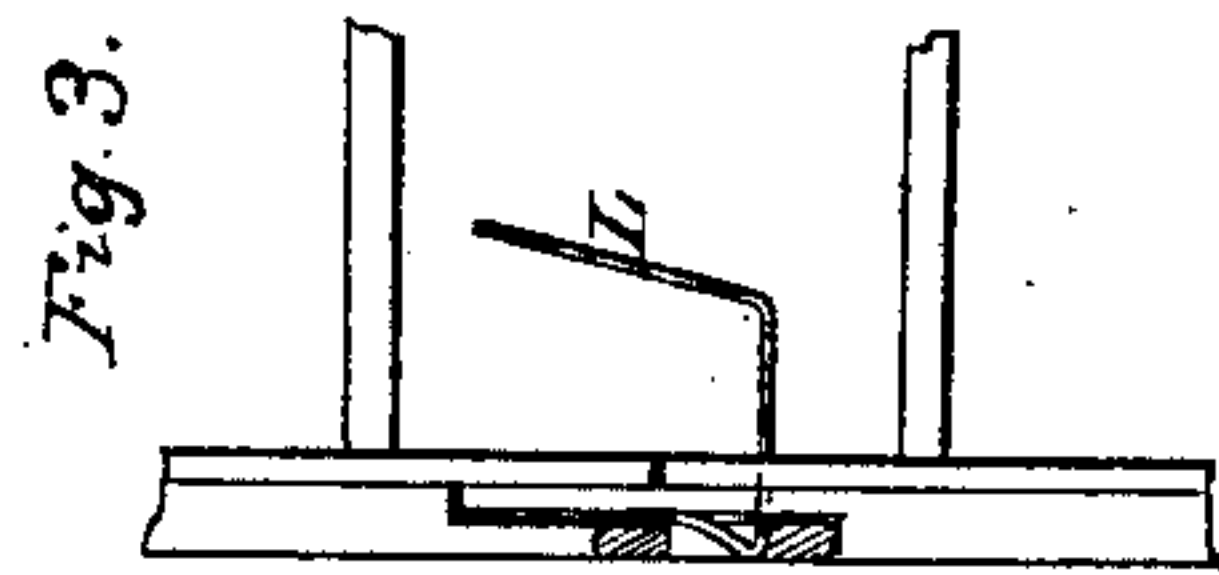


Fig. 3.

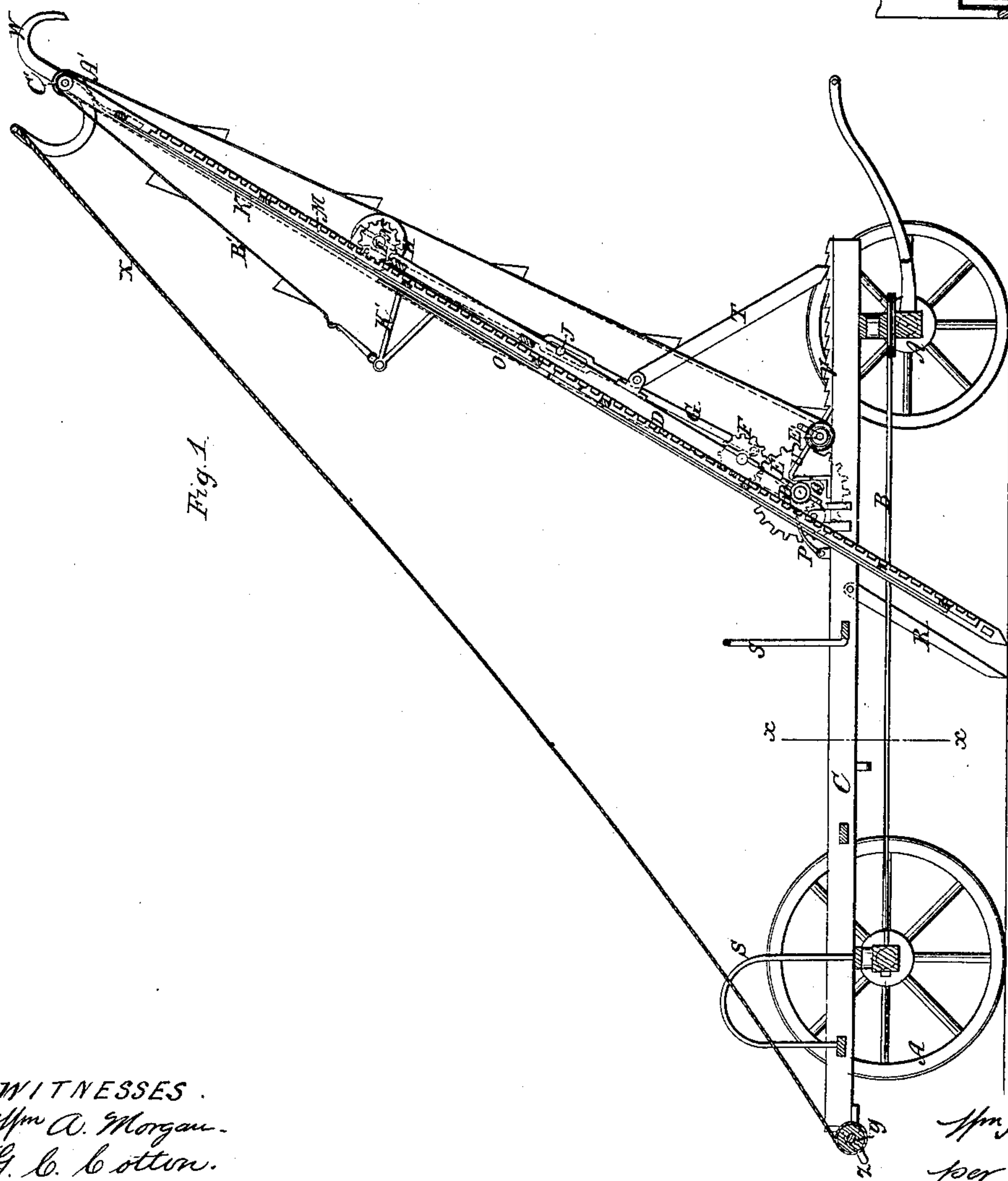


Fig. 1.

WITNESSES.
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WILLIAM H. SIMMONS, OF SKANEATELES, NEW YORK.

Letters Patent No. 90,316, dated May 18, 1869.

IMPROVED FIRE-ESCAPE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM H. SIMMONS, of Skaneateles, in the county of Onondaga, and State of New York, have invented a new and improved Extension Fire-Escape Ladder; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical longitudinal section of my improved fire-escape extension-ladder.

Figure 2 is a vertical cross-section of the same, taken through the line *xx*, fig. 1.

Figure 3 is a detail view of the joint of the ladder, part of the side-bar being broken away.

Similar letters of reference indicate corresponding parts.

My invention has for its object to furnish a simple, convenient, and effective apparatus, by means of which firemen may be able to conveniently and promptly reach the upper stories of buildings in case of fire, and by means of which persons and property may be conveniently and safely rescued from said upper stories, in case the ordinary means of escape are obstructed; and

It consists in the construction and combination of various parts of the apparatus, as hereinafter more fully described.

A is the running part of the apparatus, the forward and rear parts of which are connected by a double reach, B, as shown in figs. 1 and 2.

C is a frame, resting upon and secured to the bolsters of the running gearing A.

To the side-bars of the frame C, a little in front of its middle part, are hinged the lower ends of the side-bars of the rack D.

In bearings attached to the lower part of the side-bars of the rack D, works a shaft, having large gear-wheels, E, provided with crank-pins, or handles, attached to its ends.

The teeth of the crank-wheels E mesh into the teeth of the smaller gear-wheels F, attached to the ends of a shaft, working in bearings attached to the side-bars of the rack D.

G are connecting-rods, the lower ends of which are pivoted to the crank-pins of the gear-wheels F, and the upper ends of which are pivoted to the crank-pins of the crank-wheels H, attached to the ends of the shaft I which works in bearings attached to the upper ends of the side-bars of the rack D.

The middle parts of the rods G, are slotted to receive the ends of the rod J, attached to the middle part of the rack D.

The rod J not only keeps the rods G in proper working-position, but serves as a fulcrum to said rods, to assist them in operating the crank-wheels H.

K are the sections of the extension-ladder, which are each about ten feet long.

In the upper ends of the side-bars of each of the sections K, except the upper one, are formed sockets, into which fit the lower ends of the other sections, where they are held in place by spring-catches L, as shown in fig. 3.

To the inner sides of the side-bars of the sections K are attached toothed racks, M, in such positions that the said sections may slide up and down upon the cross-bars of the rack D, without touching the teeth of the said racks M.

The sections K are raised and lowered by the gear-wheels N, attached to the shaft I, and the teeth of which mesh into the teeth of the racks M, as shown in fig. 1.

The sections K are held down against the teeth of the gear-wheels N, by passing through a slide, O, attached to the upper part of the rack D, where the friction may be relieved by friction-rollers, against which the side-bars of the sections K bear.

The ladder is held securely in any position to which it may be raised, by the pawls P, pivoted to the frame C, and which take hold of ratchet-wheels, Q, attached to or formed upon the crank-gear wheels E, as shown in fig. 2.

The apparatus is kept from being pushed back by the weight of the extended ladder, and of the persons or things upon it, by the brace-bars R, which are pivoted to the side-bars of the frame C, in such position that their pointed ends may rest upon the ground, as shown in fig. 1.

When not in use, the brace-bars R may rest upon hooks attached to the side-bars of the said frame C.

S are brackets, attached to the frame C, within which the sections K are placed when not in use.

The rack D, when not in use, is turned down upon the sections K of the ladder, placed within the brackets S.

T are braces, the upper ends of which are hinged to the side-bars of the rack D, and the lower ends of which, when the said rack D is lowered, rest upon the inclined slides, or guides, U, down which they slide, as the rack is being elevated, to the racks V, upon the teeth of which they take hold, to support the rack and extended ladder.

By changing the position of the braces T upon the racks V, the inclination of the ladder may be varied at pleasure.

To the upper end of the upper section K, of the ladder, are attached S-shaped hooks, W, the rear ends of which are connected to each other, by a cross-bar, to which is attached the upper end of the rope X, the lower end of which is attached to and wound around the roller Y, pivoted to the rear end of the frame C, and to the ends of the journals of which are attached cranks, Z, by which the said roller is operated to wind

up or unwind the rope X, to steady the ladder as it is being raised and lowered.

A' are springs, attached to the upper ends of the upper sections K of the ladder, and the free ends of which rest against the hook W, and which, when the upper end of the ladder has been raised to the desired window, and the cranks Z have been released, force the hooks W forward with a sudden blow, so as to break out the window, and catch upon the window-sill.

B' is a belt, made of leather or other suitable material, and provided with shelves, or buckets, by which persons or things may be lowered from or raised to the top of the ladder.

The belt B', when in use, passes over a roller, C', pivoted to the upper end of the upper section of the ladder, around a hollow roller, D', working upon the shaft of the gear-crank wheels E, and around the roller E', pivoted to the frame O, and provided with cranks, by which the said roller E' is operated to raise and lower the said belt B'.

The belt B' is made in sections, and is provided with clasps, and with hooks or clasps, to secure the said sections detachably to each other, so that the length of the belt may be regulated to adjust it to the length to which the ladder has been extended.

When not in use, and when raising and lowering the ladder, one end of the belt B' is attached to the brackets F', secured to the upper part of the rack D, and the other end is attached to the roller E', around which it is wound as the ladder is lowered, and from which it is unwound as the ladder is raised.

The movement of the belt B' is controlled, when lowering a load, by the brake G', which acts upon the hollow roller D', around which the said belt B' passes.

In raising the ladder, as the lower end of each section reaches the slide O, the upper end of the next lower section is placed against its lower end, and is fastened in place automatically by the spring-catches L.

The spring-catches L may be opened as the ladder is lowered, to release the sections, by the action of a stop or stop-wheel, attached to the rack D, in proper position to operate the said spring-catches at the proper time to release the said sections.

I claim as new, and desire to secure by Letters Patent—

1. The extension-ladder, formed of the sections K, adapted to be locked into each other automatically as they are raised, by means of the springs L and slide O, and to be released by pressing the ends of the springs L toward each other, as herein shown and described.

2. The combination of the crank-gear wheels E, and their shaft-gear wheels F, and their shaft-connecting rods G, crank-wheels H, gear-wheels N, and their shaft I, with each other, with the hinged frame D, and with the toothed racks M, of the sections K, substantially as herein shown and described, and for the purposes set forth.

3. The combination of the guide and fulcrum-rod J, with the slotted middle parts of the connecting-rods G, substantially as herein shown and described, and for the purpose set forth.

4. The adjustable belt B', made in sections, and provided with buckets, or shelves, in combination with the sections K, hollow roller D', and crank-roller E', substantially as herein shown and described, and for the purpose set forth.

5. The double hooks W, pivoted to the upper end of the upper section K, held in position by the rope X, and adapted to be thrown forward through the window, by the springs A', when released by said rope, as herein described, for the purpose specified.

WILLIAM H. SIMMONS.

Witnesses:

PHILIP HARRIS,
JERRY SHALLIST.