

(No Model.)

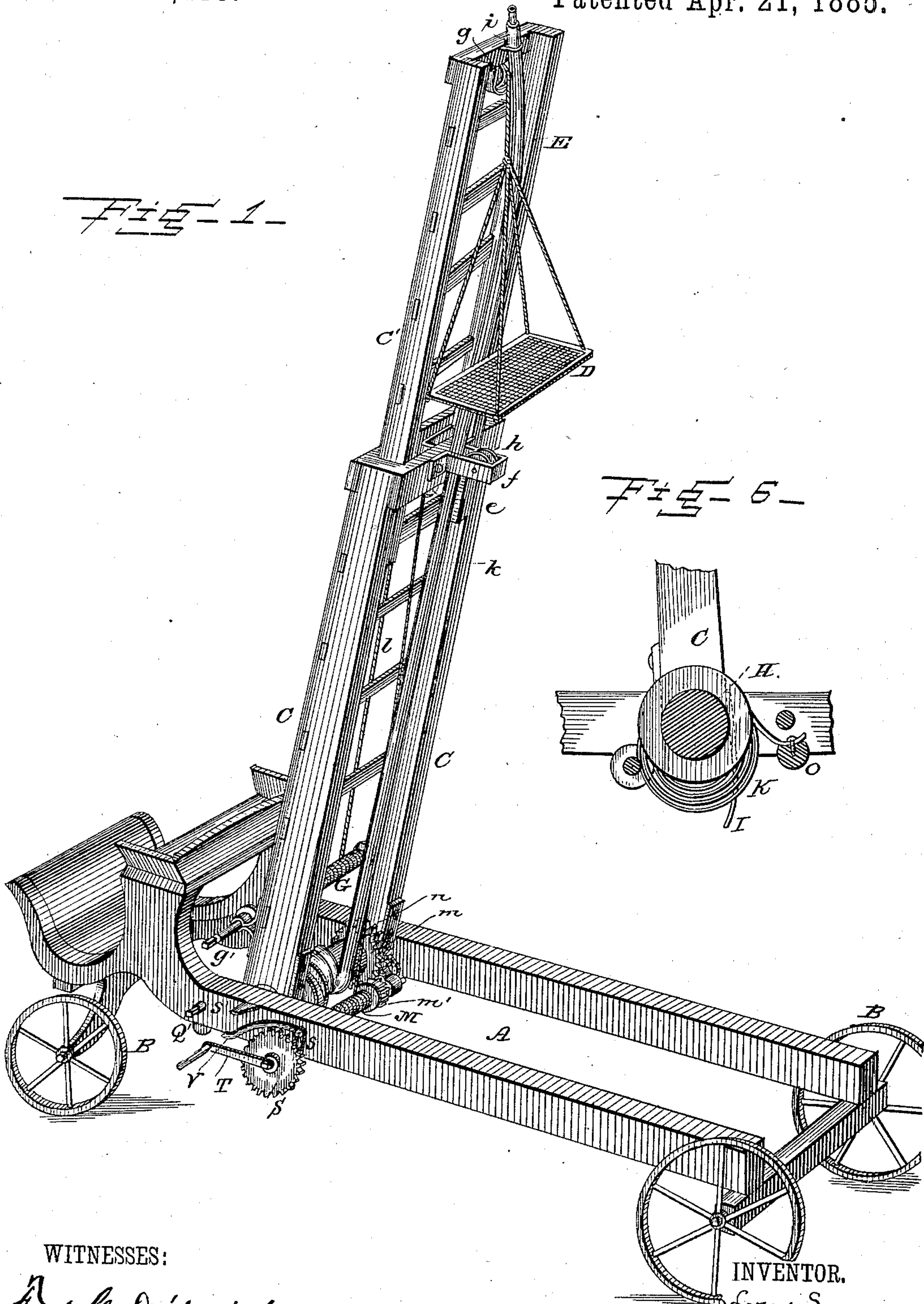
2 Sheets—Sheet 1.

L. SWENSON.  
FIRE ESCAPE LADDER.

No. 316,415.

Patented Apr. 21, 1885.

Fig. 1—



WITNESSES:

*Fred. S. Dietrich.*  
*B. L. Dietrich*

INVENTOR.

*Lorne Swenson*

*By J. N. Macdonald*

ATTORNEYS.



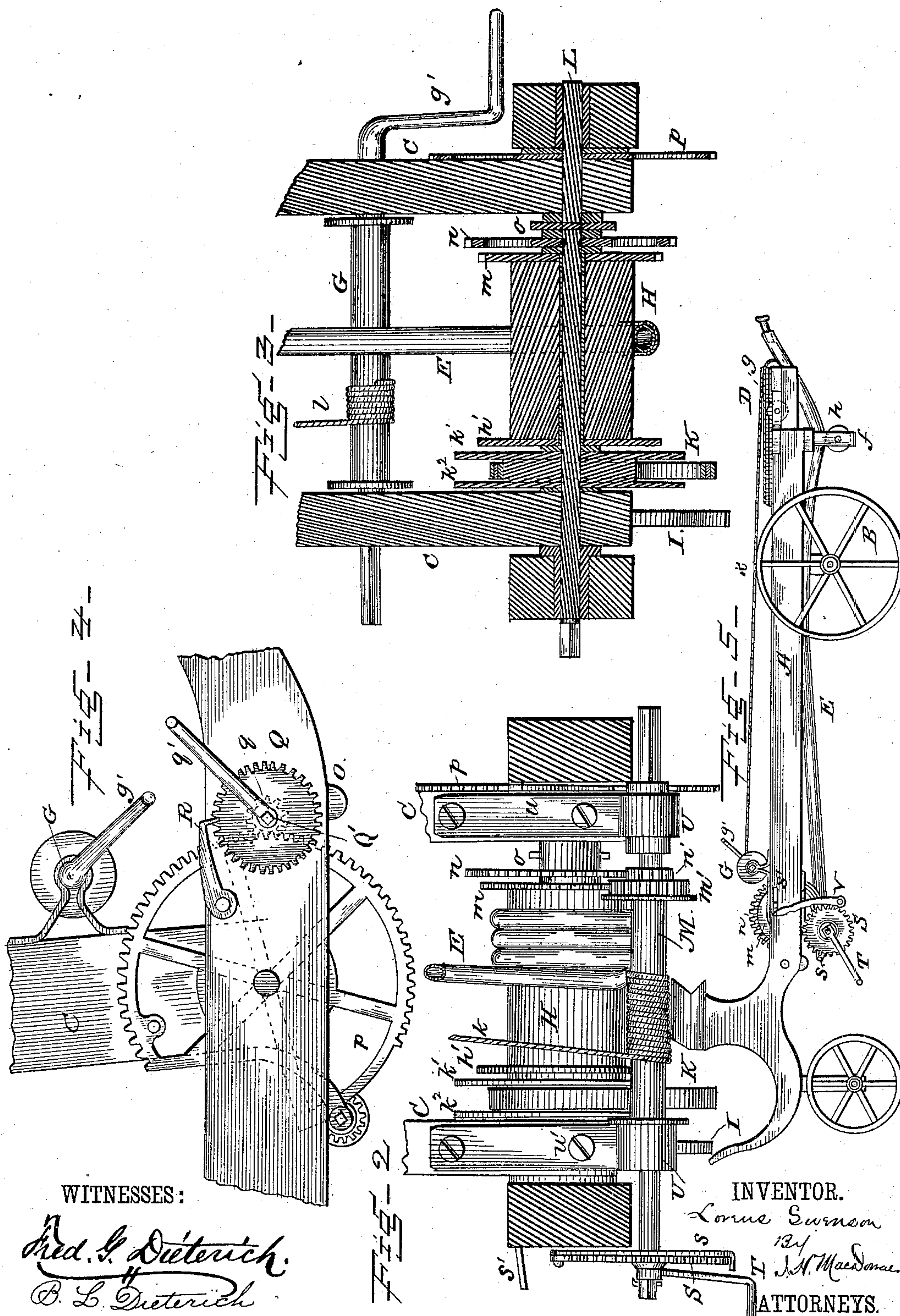
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# UNITED STATES PATENT OFFICE.

LORENS SWENSON, OF CRESCO, IOWA.

## FIRE-ESCAPE LADDER.

SPECIFICATION forming part of Letters Patent No. 316,415, dated April 21, 1885.

Application filed April 11, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, LORENS SWENSON, a citizen of the United States, residing at Cresco, in the county of Howard and State of Iowa, have invented certain new and useful Improvements in Fire-Escape Ladders, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in portable fire-escape ladders and hose-elevators; and it consists in the construction, arrangement, and operation of the several parts, as will be hereinafter more fully set forth in the specification, and pointed out in the accompanying drawings, in which—

Figure 1 is a perspective view of my device, showing the ladder in its raised position. Fig. 2 is a rear elevation of the hoisting mechanism. Fig. 3 is a section of same; Fig. 4, a side elevation of one part of the hoisting-gear; Fig. 5, a side elevation of the truck with the ladder folded thereon, and Fig. 6 a detail side view of the spring-drum.

The upper sections of the ladder are extended or raised on the same general principles as the extension-ladder granted to me in Letters Patent of the United States No. 284,683, September 11, 1883. The means for raising the first section differ materially therefrom, as will be explained.

The ladder here shown is mounted upon a truck consisting of the running-gear frame A and wheels B. I have here shown only two sections, C C'; but the principle is the same for any suitable number of sections. These sections C C' may be of wood or metal, as desired. The lower sections, C, are mounted on the transverse axis L, upon which are also mounted the hose-drum H and the gear-wheels *m n*. A flange, *h'*, at one side and the flange of the wheel *m* at the opposite side of said drum H prevent the hose from slipping. A coiled spring, (one or more,) K, is secured to and is wound upon the drum, having flanges K' K<sup>2</sup>, Fig. 3. The gear-wheels *m n* mesh with the wheels *m' n'* on the shaft M, upon which is wound the rope *k*, which raises and lowers the upper ladder-sections, as in my former patent before referred to. The rope for raising the basket D is secured at one end to and is wound upon the drum or shaft G, which can be actuated at either side of the truck by

suitable cranks, such as *g'*. The upper end of cord *l* passes over the pulley *g*, and has secured to it sustaining-ropes for the basket or platform D. This basket is preferably covered with asbestos cloth, so as to prevent heating.

When the ladder-sections are extended, the lower end of the hose E has a coupling for attaching the hose to an engine-coupling pipe-hose or to a coupling-hose for a fire-plug in such places where water-works are used. The hose passes along the first section, C, over a roller, *h*, secured to the frame by the stay-bands or housing *f*, the upper end of the hose being secured to the upper section by a stay-band, *i*. The drum of coiled spring K being rigidly mounted upon shaft L, when this shaft is moved the spring is wound or unwound, as follows: The shaft M, upon which the rope *k* is wound, is secured to the section C by means of the straps *w'*, attached to the bearings U, Fig. 2. This shaft carries the meshing wheels *m' n'*, and is actuated by the crank T. A cog-wheel, S, is also mounted upon said shaft at one side, and is controlled by a dog, *v*, and clutch *s*. A cog-wheel, Q, is mounted upon the shaft Q' at the outside of the frame, and a pinion, *q*, engaging with the segment *p*, is secured to said shaft on the inside, as shown in dotted lines, Fig. 4. The toothed segment is rigidly secured to and moves with the section C. Suppose now the sections are in their closed positions, as in Fig. 5, the cords or ropes wound upon their respective drums, the spring and hose also wound on their drums, and it is desired to raise the ladder. It can be done in two ways—first, automatically; second, by hand. The springs I K will raise the sections automatically as follows: The spring K, as before described, is wound on a drum or shaft, H, and therefore exerts a force to turn said shaft. Now release the dog R, Fig. 4, and the dog *v* and clutch *s*, Figs. 1 and 5, which prevent the cog-wheels S and Q from moving. This action tends to release the spring K from its confined position, and by its resiliency it acts to unwind. As it does so it turns the shaft L, and therefore the wheels *m n*. These in turn move the wheels *m' n'* and turn shaft M, and cause the lower section to be elevated; but as this is moved to an upright position the segment *p* engages with pinion *q*, causing it to move. Of



course, as the first section moves up the other sections move out at the same time and at a differential rate of speed. This action of the sections draws up the hose and the basket D.

The ladder may be raised at once vertically or at any desired angle of inclination. The pawls and the dogs before described may be thrown into engagement with their respective cog-wheels at any desired point and the ladder held in that position. It is of course obvious that the ladder can be raised by means of the crank-arms attached to the ends of the respective shafts, as shown and described.

The truck can be stopped at the side of the street opposite the fire, the ladder raised to the desired height and inclination, and then the truck moved forward or backward, as the necessities of the case require; or the truck can be run up quickly to a burning window, a person or persons be taken on the basket D, and the truck run quickly back, and the basket then lowered without the danger of descending past the lower windows. Again, when the hose is placed in this position the fireman or pipe-man at the top of the ladder can direct the water without effort to any particular point, this being done by the men at the cranks and trucks, who can change the inclination and position of the ladder very quickly.

If the basket D is not needed, it can be disengaged from the ladder.

When the sections descend, the shafts L M are turned in the opposite direction from that just described, and the spring K again wound up, ready for use. The sections are then turned back upon the truck-frame.

Thus it will be seen that all the cumbersome methods of raising fire-ladders are dispensed with. The several parts are not complex or liable to get out of order, and the device is easily moved from place to place.

Having thus described my invention, what I claim is—

1. In a fire-escape ladder, in combination with the sections C C' and truck A B, the shaft L, carrying the drum H for the hose-pipe, shaft M, carrying the ladder-elevating rope *k*, gear-

wheels *m n* and *m' n'*, meshing into each other, and spring K, with suitable pawl-and-ratchet gear at the ends of the shafts L M to control the motion of said shafts, whereby the sections of the ladder and hose-pipe are elevated at the same time, substantially as described. 50

2. In a fire-escape ladder, the combination of the truck A B and sections C and C', fitting within each other, and having at the lower end the mechanism for elevating the hose, the mechanism for elevating the section of the ladder, as also the mechanism for elevating the safety-basket, and provided at its top with a pulley, *h*, and clamp *i* for holding and guiding the hose, and pulleys *e g* for the elevator-rope, all substantially as described, for the purpose specified. 60

3. In a portable fire-escape ladder, the combination, with the truck and movable sections of the ladder, of a hose-drum and gear-wheels *m n* on the axis of the movable sections, said drum being provided with side flanges to prevent the slipping of the drum, substantially as set forth. 65 70

4. In a portable fire-escape ladder, the combination, with the truck and movable sections, of a flanged hose-drum and gear-wheels *m n*, and one or more coiled springs wound upon a drum provided with flanges, substantially as and for the purpose set forth. 75

5. In a portable fire-escape ladder, the combination, with the truck and movable sections, of a hose-drum, a shaft for the rope of the ladder-sections and gearing therefor, a shaft for the basket-rope and gearing therefor, and a revolving shaft on the truck, to which one or more coiled springs and gearing therefor are attached, whereby the ladder may be raised, lowered, and adjusted substantially in the manner and for the purpose set forth. 80 85

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

LORENS SWENSON.

Witnesses:

JOHN F. LYDON,  
H. A. AXTELL.