

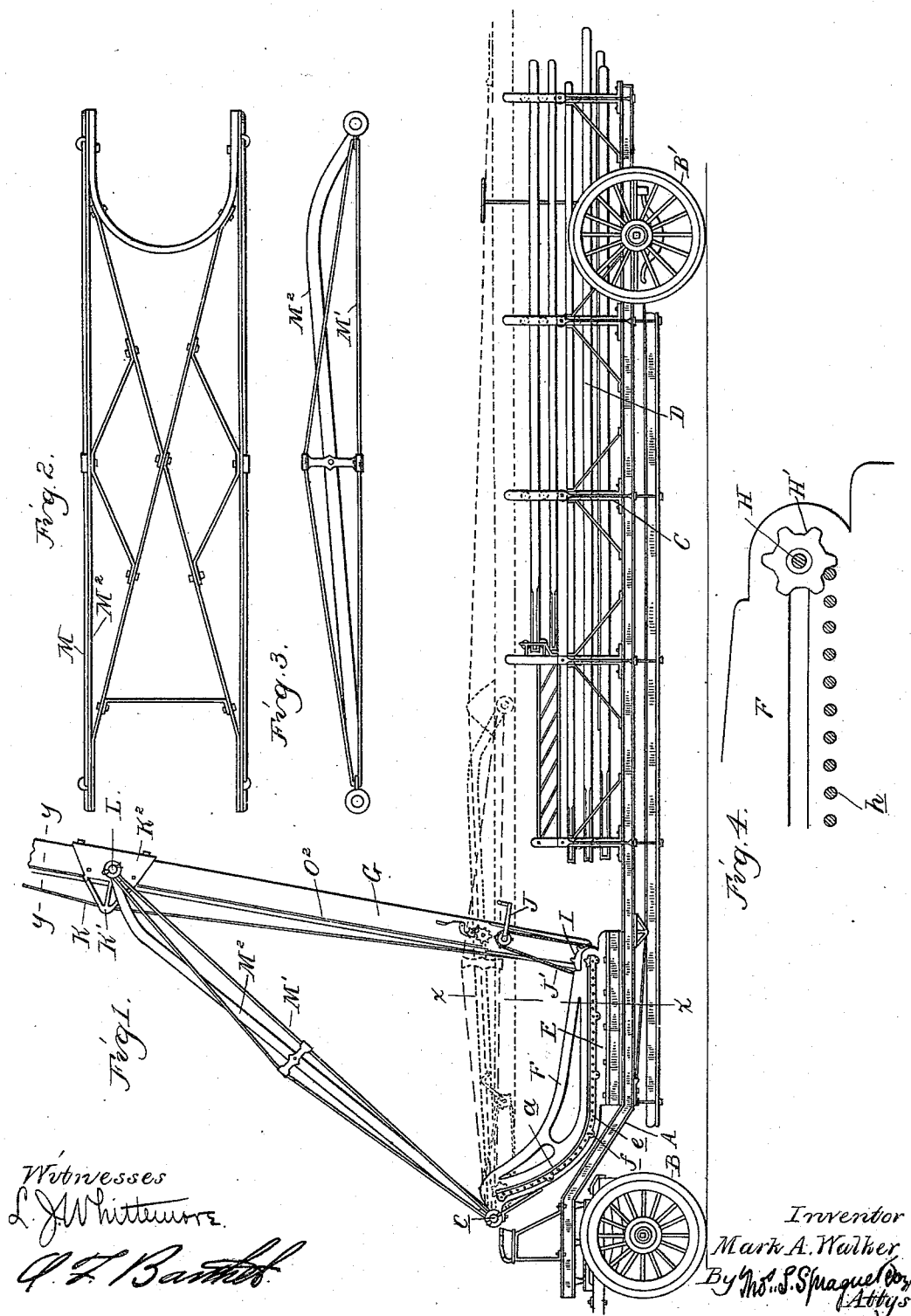
(No Model.)

2 Sheets—Sheet 1.

M. A. WALKER.
FIRE LADDER.

No. 537,655.

Patented Apr. 16, 1895.



Witnesses
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 5.

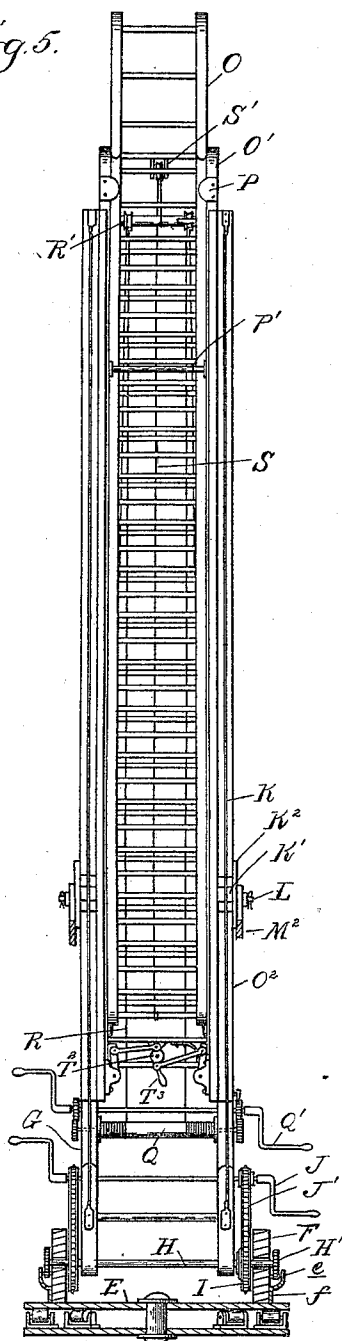


Fig. 6.

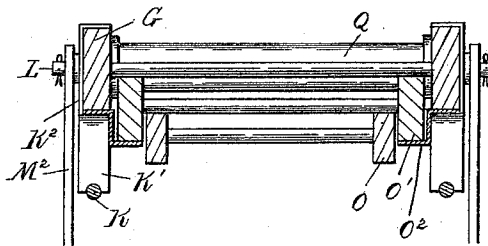
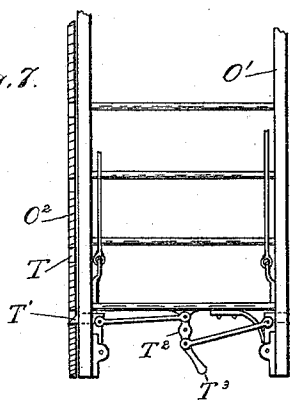


Fig. 7.



Witnesses
[Signature]
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Inventor
Mark A. Walker
By *[Signature]* Attys.

UNITED STATES PATENT OFFICE.

MARK A. WALKER, OF DETROIT, MICHIGAN, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF EIGHT-NINTHS TO WILLIAM H. BARROWS, SHERMAN G. WALKER, AND THOMAS J. QUINN, OF SAME PLACE.

FIRE-LADDER.

SPECIFICATION forming part of Letters Patent No. 537,655, dated April 16, 1895.

Application filed October 23, 1894. Serial No. 526,748. (No model.)

To all whom it may concern:

Be it known that I, MARK A. WALKER, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Fire-Ladders, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the peculiar construction of a support and the actuating devices for an extension fire ladder, whereby the construction of such ladders is simplified, and whereby the ladder can be readily lowered or raised and extended.

The invention further consists in the peculiar construction, arrangement and combination of the various parts, all as more fully hereinafter described.

In the drawings, Figure 1 is a side elevation of a fire ladder embodying my invention showing in full and dotted lines different positions of the extension ladder. Fig. 2 is a plan view of the trussed fulcrum frame. Fig. 3 is a side elevation thereof. Fig. 4 is a longitudinal section illustrating the construction of the rack and pinion employed in raising the ladder. Fig. 5 is a vertical section on line *x x* Fig. 1, showing the extension ladder in elevation. Fig. 6 is a cross section on line *y y*, Fig. 1. Fig. 7 is an elevation showing the lock for one of the extension ladders.

A is the truck frame having the swiveled wheels B at the front end and the wheels B' at the rear end. On this truck frame are the usual standards and cross bars C for supporting the short ladders D. On the front of the frame and preferably supported on roller bearings thereon is a turntable E. On opposite sides of this turntable are the forwardly extending upwardly curved frames F provided with a slot having the curved section *a*. These frames are connected together at their upward forward end by means of the connecting bar *c*. On the frames beside the slot and preferably outside the same are rack bars. These rack bars I preferably construct of a plate or strip *e* secured to the frames F by means of the ears *f* and arranged away from that frame, being connected with the

frame by the pins or bolts *h*, which form the teeth of the rack.

G is the lower section of the ladder. At the lower end of this lower section and journaled in bearings therein is a shaft H, the ends of which project through the guide slots in the frame F and on their ends outside that frame are secured the pinions H' which engage with the rack bars beside the guide slots, as plainly shown in Fig. 4. This shaft inside the frame is provided with a suitable drive gear such as the sprocket wheel I and may be driven by a crank shaft J on the lower section of the ladder, which crank shaft extends across the ladder and at each end is provided with sprocket pinions connected to the sprocket wheels I by suitable sprocket chains J'.

The lower section G of the ladder is provided with a suitable trussed rod K, which rests upon the post K', near the middle of the ladder, which post is secured to a plate K² which forms the support for ears of stub shafts L with which the upper end of the fulcrum frame M is secured. The lower end of this frame is secured to the cross-bar *c* at the front end of the frames F. This frame is provided with the longitudinal side trusses M' and with the arched longitudinal side braces M², so that in its horizontal position, these braces will extend over the extensible sections of the ladder, which rest upon the lower section thereof as shown in dotted lines Fig. 1. The arched sides are connected by suitable cross braces.

O and O' are the first and second extensible sections of the ladder. The first or lower section O slides in the bearing formed beneath the double angle plate O², as shown in Fig. 6 on the lower section of the ladder. The upper section or the second extension slides beneath suitable guide plates P and the guide bearing P', near the upper end of the first extensible section. At the lower end of the lower section of the ladder is a winding drum Q adapted to be actuated by suitable gear connection from crank handles Q'. From this winding drum extend ropes or cables R over drums or sheaves R' at the top of the lower section of the ladder, the other ends of these

ropes being connected at the bottom of the first extension of the ladder.

S is a cord connected at one end to, at or near the lower round of the second extension and passing over a sheave S' near the upper end of this section of the ladder and connected at its opposite end to the upper round of the stationary or lower section of the ladder, as shown in Fig. 5.

10 The plate O² is provided with a series of notches T with which the spring latches T' are adapted to engage, as that section is extended so as to positively lock it at all points of extension. These spring latches are connected by pivoted links to the opposite ends of the lever T² which is journaled on a bracket centrally at the lower end of the first extension, and this lever is provided with an operating handle T³, by means of which the latches
20 T' may be withdrawn to lower the ladder.

The parts being thus constructed their operation is as follows: The normal position of the ladder is as shown in dotted lines in Fig. 1. When it is desired to raise the same the firemen turn the crank handles J which actuate the shaft H and the pinions H'. These pinions working in the rack bearing in the side of the guideslot in the frames F will lower the foot of the ladder down the inclined section a of that
30 guide slot and the ladder will turn about the fulcrum pins L by the connection of the fulcrum frame M with a cross bar c, thus lifting the outer end of the ladder toward the vertical. When the ladder reaches the desired
35 inclination the extensible sections may be lifted by turning the cranks Q' which will lift both sections simultaneously, the lower extensible section being positively actuated by the cords R from the winding drum Q and the upper section will be moved upon the
40 lower extensible section by the cord S passing over the sheave S' as described. I thus obtain about twice the speed in extension over the ladders in which the extensible sections are moved separately instead of together.
45 By arranging the fulcrum frame with its pivotal point about the middle of the lower section of the ladder I very greatly reduce the power required to lift the ladder.

50 It will be noticed that the pivotal point is some distance from the end of the ladder, thus allowing it to be turned before raising

as the projecting end is counter balanced and the liability of the truck to be turned over is avoided. It is also evident that when the
55 ladder is folded on the truck it is balanced in relation to the pivot upon which it is turned in raising it up.

What I claim as my invention is—

1. In a fire ladder, the combination of the
60 ladder the turntable, of frames on opposite sides thereof, guide slots in said frames having an inclined and a horizontal section rack bars beside the guide slots, a transverse shaft on the ladder engaging in said slots, pinions
65 on the shaft engaging said rack bars, and a drive mechanism on the ladder, for said pinions, substantially as described.

2. In a fire ladder, the combination of the ladder, the turn table, frames on opposite
70 sides thereof, guide slots in the frames having the inclined and horizontal section, rack bars beside the slots formed by the strips e secured away from the frames, and the pins
75 h connecting the strips and frames, a transverse shaft on the lower end of the ladder section passing through the guide slots, pinions on the end of the shaft engaging the rack bars, and drive mechanism on the lower end
80 of the ladder for actuating said pinions, substantially as described.

3. In a fire ladder, the combination of the turntable the slotted frames thereon, having their forward ends projecting beyond and at an incline above the table, the ladder having
85 devices engaging said slots and actuating devices to cause the lower end of said ladder to follow the slot, and a frame pivotally connected at one end to the ladder, and at the other end pivoted to the elevated forward
90 ends of the frames on the turntable, substantially as described.

4. In a fire ladder, the combination with the ladder and actuating devices for the base substantially as described of the fulcrum frame
95 comprising arched side braces, trussed longitudinally and having transverse connecting braces between, substantially as described.

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

MARK A. WALKER.

Witnesses:

M. B. O'DOHERTY,
L. J. WHITTEMORE.