

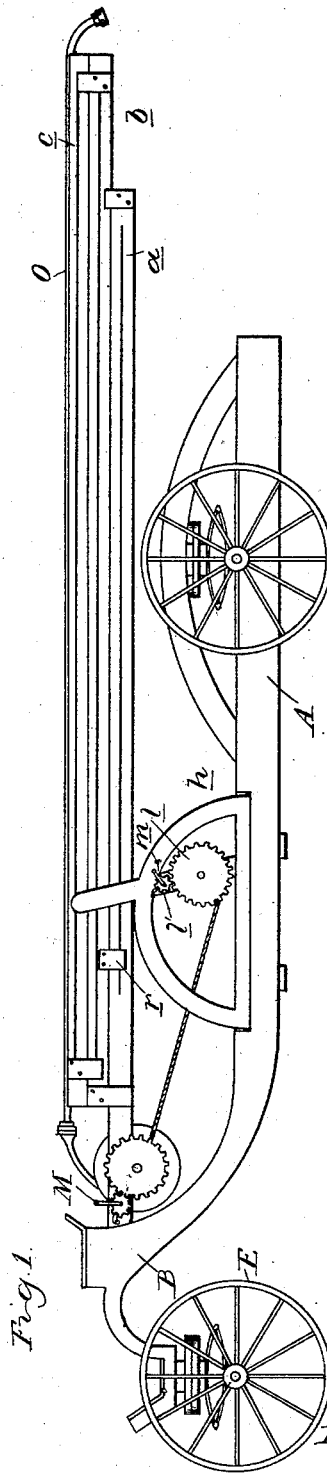
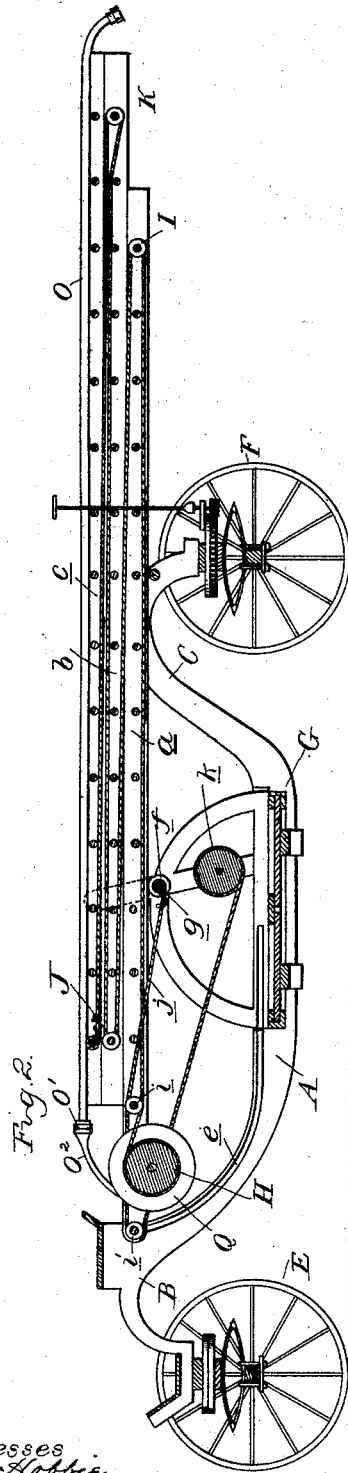
(No Model.)

3 Sheets—Sheet 1.

W. E. WALKER.  
FIRE LADDER.

No. 524,495.

Patented Aug. 14, 1894.



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(No Model.)

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FIRE LADDER.

3 Sheets—Sheet 2.

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Fig. 7.

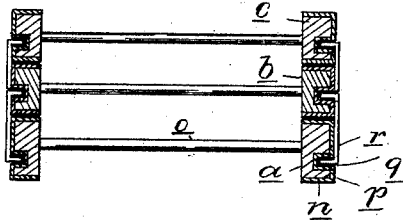
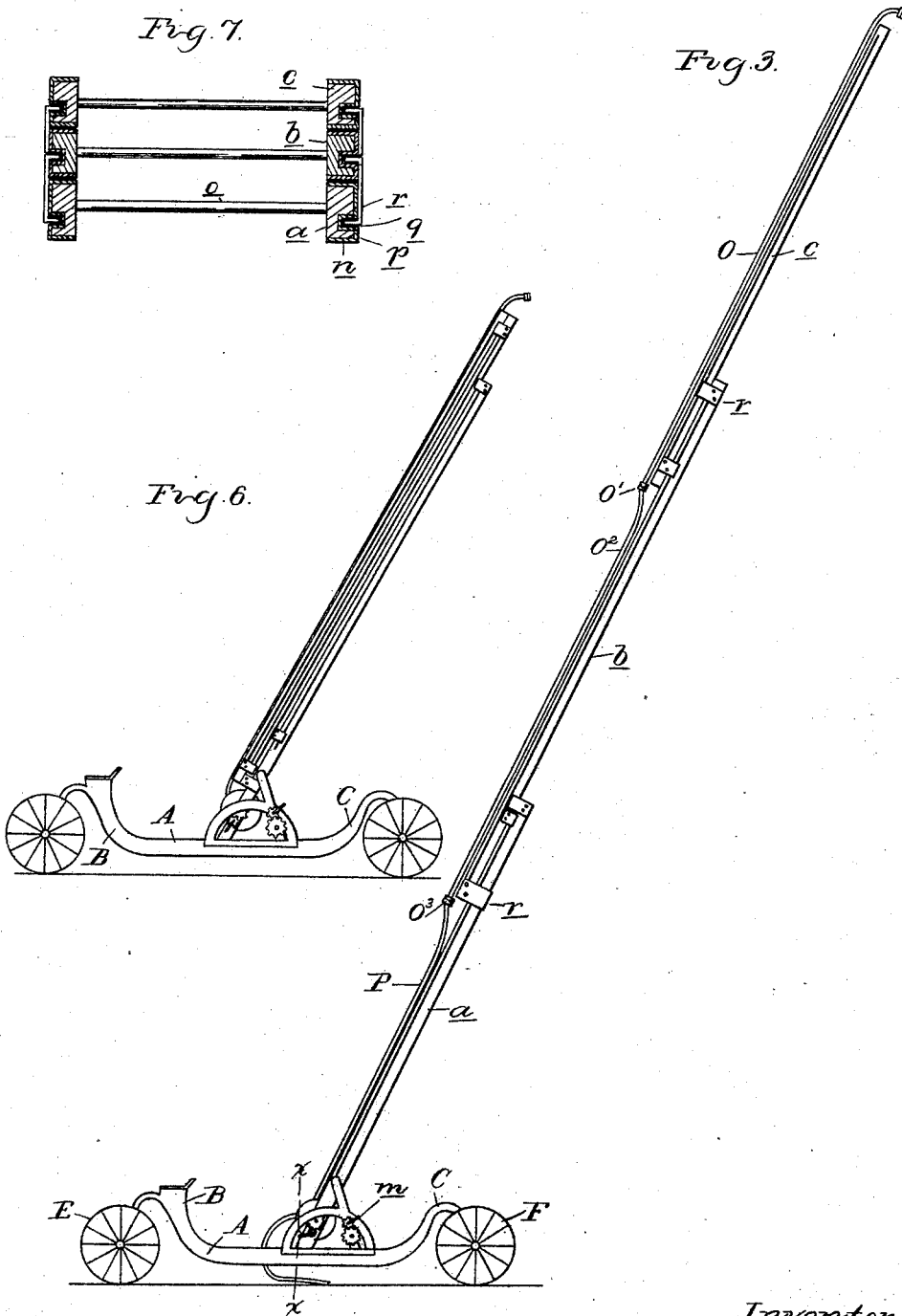


Fig. 3.



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3 Sheets—Sheet 3.

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Fig. 4.

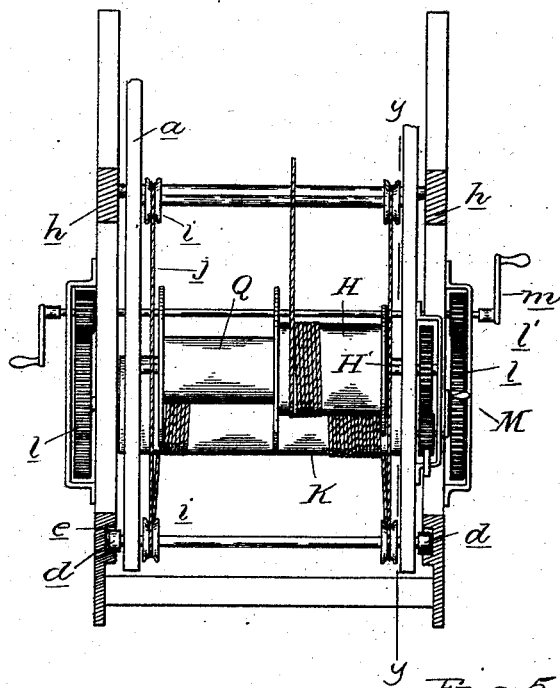
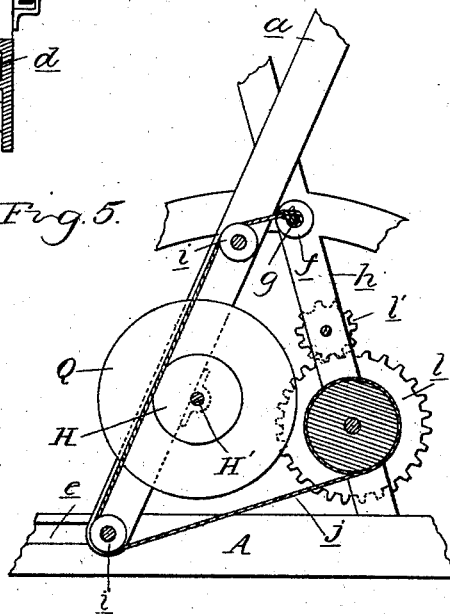


Fig. 5.



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# UNITED STATES PATENT OFFICE.

WILLIAM E. WALKER, OF DETROIT, MICHIGAN, ASSIGNOR TO LAFAYETTE GRIFFITH, CHARLES F. HUNT, FREDERICK W. RIDER, AND JOSEPH F. LA FLEUR, OF SAME PLACE.

## FIRE-LADDER.

SPECIFICATION forming part of Letters Patent No. 524,495, dated August 14, 1894.

Application filed September 2, 1893. Serial No. 484,626. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. 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.

This invention relates to a new and useful improvement in fire ladders and it consists in the construction and arrangement of parts hereinafter described and definitely pointed out in the claims.

In the drawings, Figure 1 is a side elevation of my improved truck showing the ladder down. Fig. 2 is a vertical, longitudinal, section therethrough, showing a slightly modified form of truck. Fig. 3 is a side elevation of the truck showing the ladder extended. Fig. 4 is a cross section on line *x x* in Fig. 3, showing the actuating devices for the ladder enlarged and in elevation. Fig. 5 is a section on line *y y* Fig. 4. Fig. 6 is a diagram side elevation, showing the sections of the ladder turned from the horizontal to their extension position ready to be extended. Fig. 7 is a cross section through the ladders as shown in Fig. 2, illustrating the construction of the ladder and the connection between the sections thereof.

I have shown two different forms of truck (Figs. 1 and 2) either of which may be used, and that which I prefer, is shown in Fig. 2, consisting of the frame A, having the front arch B and the rear arch C, beneath which the front and rear wheels E and F respectively may be turned. The rear wheels or rear truck is provided with any suitable steering device, such as illustrated in Fig. 2, with the tubular arched frame. Either pair of wheels may be turned at right angles to the truck and the ladder moved to or from a building as desired, or at right angles to its extension, so as to present the greatest amount of resistance to prevent its moving when in use. Centrally upon this truck is a turn-table G pivoted to the frame and supporting the ladder. The ladder consists of a lower section *a*, the middle section *b* and the upper section *c*, the lower section is provided at its lower

end with side rollers engaging in guide-ways *e*, in the sides of the frame, substantially as shown and described in Patent No. 301,308 to James E. Walker, and this section rests upon the roller *f* journaled upon a cross-bar *g* of a frame *h* extending upward from the turn-table.

*i* are sheaves at the lower end of the ladder, preferably at each side thereof, over which a rope or cord *j* passes, one end of the cord being fastened rigidly to the cross-bar *g* at a point adjacent to and above the winding drum *k*, and the other end passing over the winding drum *k* journaled in the frame, as shown in Fig. 5. By this construction a most perfect leverage is obtained and the ends of the ladder can be moved in the grooves *e* with but small exertion of power. This winding drum at the side is provided with a gear wheel *l* with which a pinion *l'* engages, the shaft of this pinion being provided with a crank handle *m* for rotating the drum and winding the cord upon the same to draw the end of the ladder toward the turn-table, the latter being guided in the slots *e*. This motion will rock it from the horizontal position, shown in Fig. 2 to the vertical or inclined position, shown in Fig. 6, when the drum *k* being locked in any suitable manner, the ladder will be held in that position ready for extension, being fulcrumed upon the roller *f*.

While the ladder is in its elevated position it is firmly held in place and prevented from swinging back or its upper end out, by the cord or rope *j* which holds the lower end of the ladder fixedly in the end of the guide ways and the portion immediately above firmly on the fulcrum rolls *f*.

The construction of the ladder is shown in detail in Fig. 7. Each ladder comprises the side bars *n* and rounds *o*, the side bars being covered with metallic plates *p* provided on the sides with ways *q*. The metallic plates *p* extend the entire length of the side-bars and are bent over the top and bottom of the bars, forming by this construction a ladder having practically fire-proof side bars. Another advantage is that the ends of the side-bars are protected from the walls of the building, which are often rough and uneven or heated by the conflagration, and by covering their

ends with metal, the ladder will be protected and not so liable to wear and tear, without adding materially to their weight or cost of manufacture.

5 *r* are flanged plates secured to the sides of each ladder with the flanges engaging the guide grooves of the other ladder or section, as plainly illustrated in Fig. 3.

The elevating device of my ladder consists 10 of a single rope connected at its lower end with a winding drum H which is pivoted at the lower end of the lower section of the ladder, and is provided with suitable gear for actuating the same. This rope is looped over 15 the sheave I at the upper end of the lower section, the sheave J at the lower end of the second section and the sheave K at the upper end of the second section, the end of the rope being connected with the lower end of 20 the third section, the whole forming an elevation rope looped over sheaves at the opposite ends of the adjoining sections of the ladder. Now when the ladder has been turned to the position shown in Fig. 6, to elevate it, 25 the operator simply has to turn the crank handle M for actuating the winding drum. This will draw upon the rope and will first extend the upper section, the middle section being balanced by the draft applied in opposite directions at both ends, until the upper section 30 has reached its limit of movement. Then the second section will be elevated by means of the power applied to the lower end of the second section. When the second section has 35 been raised to its limit and the actuating crank locked to its adjusted position, the ladder will be at its limit of extension.

Upon the upper section of the ladder I secure a section of pipe O of length corresponding 40 ing to the length of such upper section and provided at its lower end with a coupler O' adapted to couple with a section of hose O<sup>2</sup> of a length corresponding substantially to the length of the middle section of the ladder, 45 which middle section is provided with a corresponding coupler O<sup>3</sup> adapted to couple with the section P, which extends down to the truck. This lower section is engaged with the winding drum Q which is formed beside the wind-

ing drum H upon the same shaft; as the shaft 50 H' is turned in elevating the ladder, the hose will be unwound and drawn up with the extension of the ladder, and if but a single section is required the hose may be uncoupled 55 and the hose from the engine coupled to the ladder section to carry the stream to the top. The rotation of the crank M in lowering the ladder will wind the hose about the drum Q.

What I claim as my invention is—

1. In a fire ladder, the combination with the 60 truck frame, of ladder sections thereon, inclined guide-ways in the truck frame, rollers on the lower end of the ladder sections engaging said guide-ways, rotatable bearings on the frame for the ladders, sheaves on the 65 lower portion of the ladder located between the rotatable bearings and the lower ends of the ladder, a winding drum on the frame and a cord passing from the winding drum over 70 the sheaves and having its free end secured to the frame adjacent the rotatable bearings, substantially as described.

2. In an extension fire ladder, the combination of side bars connected by rounds, of metallic plates covering the sides of the bars and 75 extending over the top and bottom faces thereof, grooves in said plates on the sides, flanged plates at the ends of the ladder sections having their flanges engaging in said grooves and adjustably securing the sections 80 together, substantially as described.

3. In a fire ladder the combination with a truck frame, of a ladder thereon, a fulcrum for the ladder, a winding drum below the fulcrum, means on the frame for limiting the 85 backward movement of the lower end of the ladder, and a rope on the drum passing around the lower end of the ladder, extending rearward and over a projection of the ladder and having its outer end fixedly secured to the 90 frame at a point adjacent to the fulcrum, substantially as described.

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

WILLIAM E. WALKER.

Witnesses:

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