

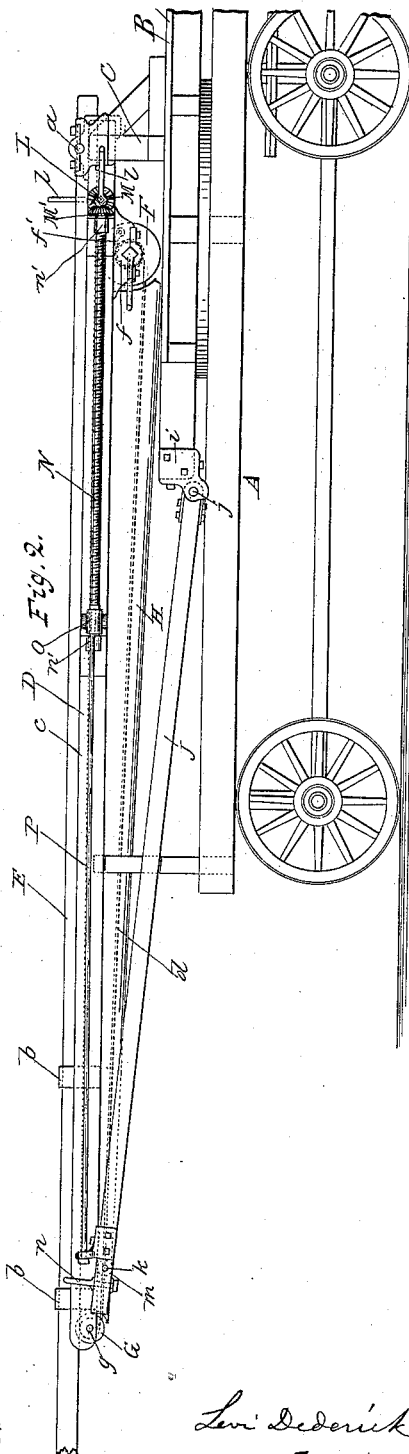
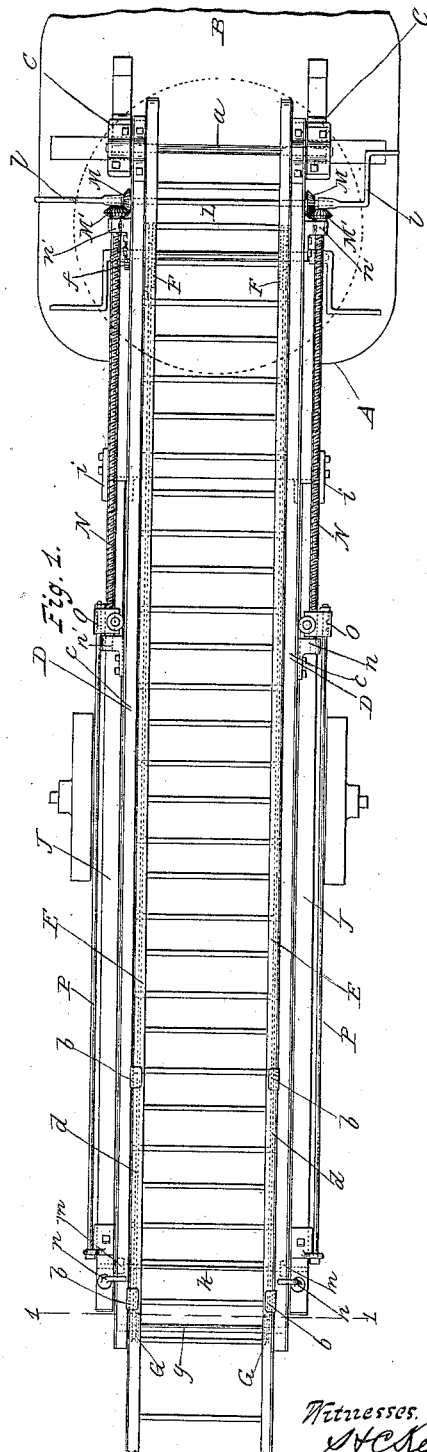
(No Model.)

2 Sheets—Sheet 1.

L. DEDERICK.
EXTENSION FIRE LADDER.

No. 383,107.

Patented May 22, 1888.



Witnesses.
H. C. Kelley
Chas. Keeney.

Levi Dederick,
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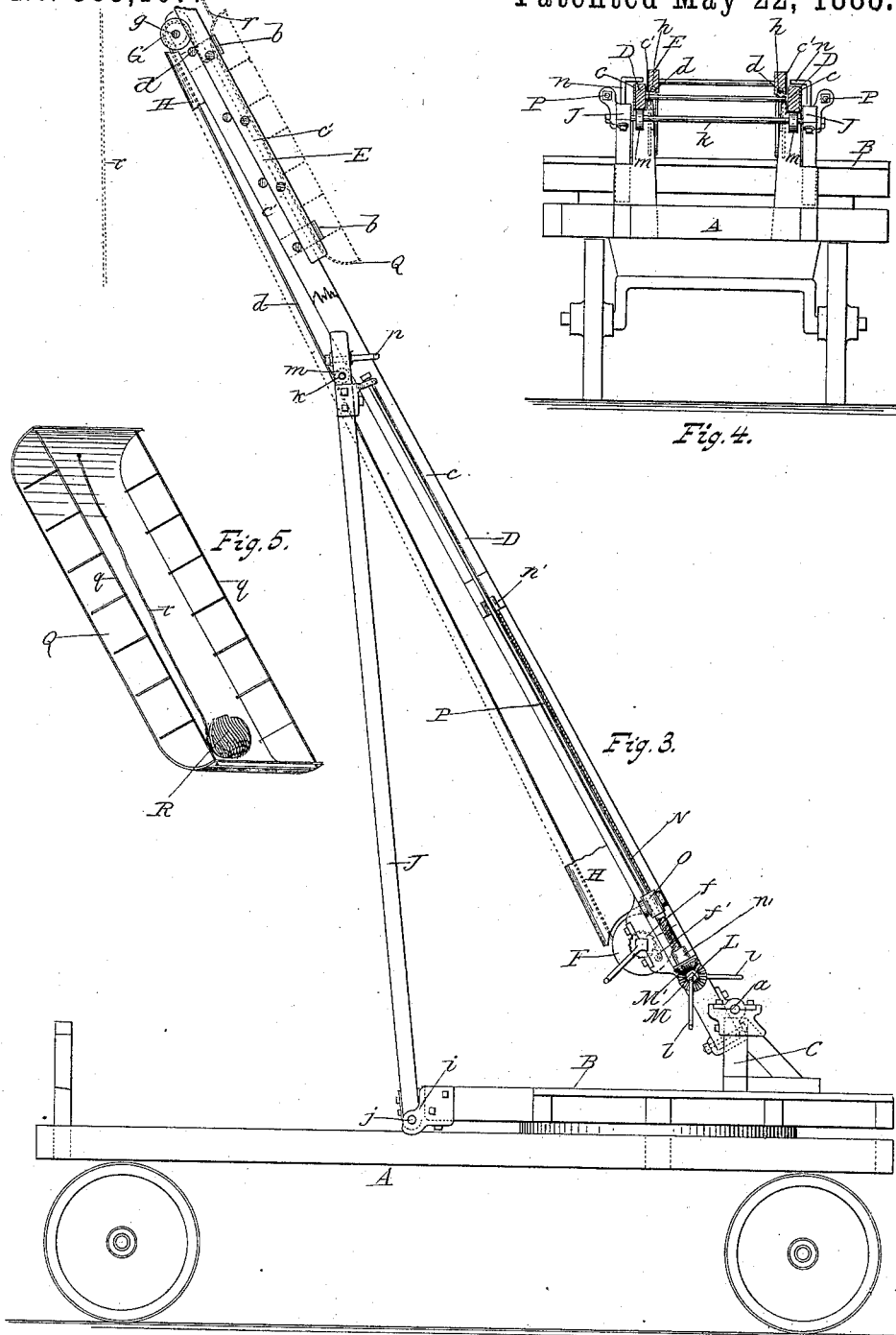
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Witnesses:
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UNITED STATES PATENT OFFICE.

LEVI DEDERICK, OF ALBANY, NEW YORK.

EXTENSION FIRE-LADDER.

SPECIFICATION forming part of Letters Patent No. 383,107, dated May 22, 1888.

Application filed April 11, 1887. Serial No. 231,360. (No model.)

To all whom it may concern:

Be it known that I, LEVI DEDERICK, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Extension Fire-Ladders, of which the following is a specification.

My invention relates to improvements on a former invention in extension fire-ladders made by myself; and it consists in the combinations of devices and elements, particularly described in the specification, and specifically set forth in the claims.

The objects of my invention are to provide and so combine in extension-ladders supporting-props which will have their bases at all times at the same given distance from the joint on which the main ladder turns, while the upper ends of these props will have their upper ends bearing against the main ladder at variable and different points in its length, accordingly as the ladder is elevated more or less toward a perpendicular position, and, further, to provide particular means by which the invention can be embodied in extension fire-ladders. I attain these objects by means illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of an extension fire-ladder embodying my improvements, with the ladders folded horizontally. Fig. 2 is an elevation of the same. Fig. 3 is a side elevation of the same with the ladders elevated. Fig. 4 is a transverse section taken at line 1 in Fig. 1. Fig. 5 is a perspective view of the toboggan used with the ladders.

The same letters of reference refer to like parts throughout the several views.

In the drawings, A represents any suitable truck. B is a turn-platform mounted on the said truck in any suitable manner. C C are suitable posts securely and firmly fixed on the turn-platform. D is the main ladder, which is jointed to posts C C by the shaft *a*. E is a sliding ladder working on ladder D, and held with the same by the holding-lips *b b*, secured to the main ladder and holding on the side rails of the sliding ladder in the usual manner. F is a windlass mounted in suitable bearings secured to the base ends of the side rails *c c* of the main ladder. G G are sheaves or rollers, which are mounted on a suitable shaft, *g*, se-

cured to the upper end of the main ladder. Suitable ropes, *d*, connect at one end with windlass F, and are carried back below the rounds of the main ladder and over sheaves G G, and thence above the said rounds to one of the rounds of the sliding ladder E, to which said ropes are secured. A suitable ratchet-wheel, *f*, is secured to the shaft of windlass F, and a pawl, *f'*, is provided, by which the sliding ladder will be held to any place moved to on the main ladder. A suitable brake can be used for checking the windlass when the ladder E is being moved down to its place on the main ladder, so that it will be prevented from running rapidly down. All these above-described parts are shown in my former inventions, and are not claimed by me as being new, but are used by me in connection with other devices and combinations of devices which constitute my present improvements.

H H are protecting-cases to ropes *d d*, which cases are preferably made of sheet metal, and are secured to the side rails *c c* of the main ladder, and are extended, preferably, from near windlass F to sheaves G G, and are to receive those portions of ropes *d d* which may be uncoiled between the windlass and sheaves. These protecting-cases operate to keep the said ropes dry and from being cut or marred or burned. Made in the lower side of the side rails *c' c'* of the sliding ladder are the longitudinal grooves *h h*, within which the portions of ropes *d d* above the rounds of the main ladder will work and be protected from water and accidental injury while in service.

J J are prop-levers, which are jointed at their base ends with the turn-platform B at a distance rearwardly from posts C C. The drawings show these base ends of said prop-levers jointed with said platform by brackets *i i*, secured to said platform, and shafts *j*, passing through said brackets and the ends of said levers. These prop-levers are made with an extension of length from their joints with platform B as will extend their rearward or upper ends to near the rear or upper ends of the side rails *c c* of the main ladder when the latter is turned down to a horizontal position, as illustrated in Figs. 1 and 2. Mounted on spindles fixed in the upper end portions of these prop-levers are friction-rollers *m m*, (indicated by dotted lines in Figs. 1, 2, and 3,) which

rollers have suitable bearing against the lower
 side edges of side rails *c c* of the main lad-
 der D, and fixed to these same side rails and
 projecting from the upper sides of the same
 5 are the holding-hooks *n n*. A connecting-
 bar, *k*, holds the upper ends of these prop-
 levers from spreading apart. These prop-le-
 vers, having their base ends jointed to the
 platform, with their upper or rearward ends
 10 bearing (through rollers *m m*) against the
 lower sides of the side rails of the main ladder
 without being secured with the same, are free
 to be turned upward from their jointed con-
 nection with the platform B from horizontal
 15 position in Fig. 2 to that of a vertical one, as
 shown in Fig. 3, or to any preferred angle of
 inclination between positions in Fig. 2 and
 that in Fig. 3, and when being turned upward
 their upper or rearward ends will, through
 20 rollers *m m*, lift against the lower side of the
 main ladder, which ladder is itself free to be
 turned from a horizontal position, moving on
 its pivoting shaft *a*, to an elevated position and
 at a greater or less incline, and when these
 25 prop-levers are forcibly turned upward they
 will cause the main ladder to be elevated more
 or less toward a perpendicular position, ac-
 cordingly as the rearward or upper ends of
 these prop-levers are elevated. When the
 30 main ladder is in the horizontal position shown
 in Fig. 2, the bearing-rollers *m m*, fixed to the
 prop-levers J J, will have bearing against the
 lower side edges of the side rails of the main
 ladder at a point near its rear or upper end;
 35 but as the rearward ends of these prop-levers
 are being raised, and are made to effect an ele-
 vation of the rearward end of the main ladder,
 the rollers *m m* will run forward or down-
 wardly along the lower side of side rails
 40 *c c* of the main ladder and have bearing at
 different points on the same, accordingly as
 the degree of angle of said prop-levers is
 made to differ, and these points of bearing of
 the prop-levers on the main ladder will be
 45 nearer the rearward end of the same, or at a
 higher point on the same, when the main lad-
 der is more horizontal, while, when the main
 ladder is brought to more nearly a vertical po-
 sition the points of bearing on the main ladder
 50 will be at a considerable distance forward or
 below the upper or rearward end of the same,
 and in all cases the point of applied support
 of the main ladder by the prop-levers will be
 nearer the base of the main ladder when the
 55 latter is nearer a vertical position and not re-
 quiring such an extensive support, because of
 the greater weight of said ladder and its load
 on its joint-connection with posts C C, and will
 be at points on the main ladder more distant
 60 from its base-joint connection with said posts
 when the ladder has a less incline and less
 weight on its said joint-connection with said
 posts. The rearward ends of these prop-levers
 can be elevated from the nearly horizontal po-
 65 sition shown in Fig. 2 to that shown in Fig.
 3 by means of several suitable mechanical
 devices; yet preference is given to the use of

draw-rods and screw-rods working into screw-
 threaded nuts connected with the draw-rods,
 or to the use of a windlass and ropes, either of
 which will be effective for the purpose of ele-
 70 vating the rear ends of said prop-levers and
 holding them to the elevations they are raised
 to. The drawings show the former employed
 and specifically described. The mechanism
 75 consists of the shaft L, provided with crank-
 handles *l l*, for revolving it, and having on its
 ends the miter-wheels M, (this shaft L is
 mounted in suitable bearings in the base end
 of the main ladder,) and screw-shafts N N, one
 80 at each side of the main ladder and supported
 in suitable bearings, *n' n'*, and having on their
 forward ends miter-wheels M', with the screws
 working within the screw-nuts O O, which are
 secured to the forward ends of the draw-rods
 85 P P, which have connection by their rear ends
 with the rear ends of the prop levers, as shown.
 When the crank-handles *l l* are turned to re-
 volve shaft L in a suitable direction for screw-
 ing the screw rods or shafts N N into their re-
 90 spective nuts O O on the draw-rods, the said
 screw-shafts will, through said nuts, pull the
 draw-rods endwise toward the forward end of
 the main ladder, when this endwise pull will
 cause said rods to draw on the rear ends of the
 95 prop-levers J J, (which are on a plane above
 a line on a plane with the center of motion of
 said prop-levers,) and elevate the same more
 or less toward a vertical position, accordingly
 as the said screw-shafts are revolved. A re-
 100 versed operation of said screw-shafts will effect
 a lowering of said prop-levers. When a wind-
 lass and ropes are used, the windlass can be
 mounted in bearings in the main ladder, in
 place of shaft L and miter-wheels M; or the
 105 windlass can have its bearings in posts C C,
 by being made with shaft *a*, by which the main
 ladder is jointed to said posts; or it can be
 otherwise suitably arranged so as to pull on
 ropes which connect the windlass with the
 110 rearward or upper ends of the prop-levers J J.

Q is a toboggan having both of its ends
 turned up and its sides provided with guards
q q. This toboggan is made of a width cor-
 responding with the width of the sliding lad-
 115 der E between its side rails.

R is a ball of small rope, *r*, the end of which
 rope is secured to one end of the toboggan.
 It is intended that a person can carry this to-
 boggan up the ladders to the height required
 120 for rescuing inmates of burning buildings, and
 when this height is reached the ball R will be
 thrown over a round of the ladder E, when the
 rope will unwind and have its end delivered
 to the ground below, when operators can from
 125 the ground pay out the rope and gently let the
 toboggan, with its occupants, slide down the
 ladders; or this toboggan can be drawn up-
 ward, sliding on the ladders by means of the
 rope *r* drawn on from the ground below and
 130 running over one of the rounds of the sliding
 ladder.

Having described my invention, what I claim
 is—

1. In an extension fire-ladder, the combination with a main ladder, which has a jointed connection at its foot, and with a platform or pieces secured to the same, of a prop-lever 5 which has its base end also jointed with the said platform and its opposite end extended rearwardly or upwardly, and serving by a sliding connection with the main ladder to support the rearward or upper end or portion 10 of said main ladder at different points on the same, accordingly as said prop-lever has its rearward or upper end elevated by force applied to the same, substantially as and for the purposes and operations set forth.

2. In an extension fire-ladder, the combination, with a main ladder which is jointed at its foot end with the platform or posts secured to the same, of prop-levers which have their foot ends jointed with said platform at a point 20 at a distance rearward of the point of joint of the said main ladder with the platform, and have their rearward or upper ends connected by a sliding connection with the main ladder and in normal idle position elevated to a 25 plane relatively above the plane of the center of motion of said levers, and having connections with draw-rods, or their described equivalents, which operate to pull on the said ends to elevate the same, substantially as and for 30 the purposes and operations set forth.

3. In extension fire-ladders, the combination, with a main ladder jointed at its foot end with a platform or posts secured to the same, and the prop-levers which have their foot ends 35 also jointed to said platform and at a distance from the connecting joint of said ladder with the platform, and have their rearward ends

supporting the rear end portion of the main ladder, and also free to be moved upwardly and forwardly to elevate the said ladder to 40 different angles of inclination, of the revolving screw-shafts, and nuts which hold said screw-shafts in connection with draw-rods which are connected with the rearward ends of said prop-levers, substantially as and for 45 the purposes set forth.

4. In extension fire-ladders, the combination, with prop-levers which are jointed with a platform at a point rearward to the point of joint of the main ladder with the same, and 50 which have their free rearward or upper ends supporting the rear end portion of the main ladder, and draw-rods P, connected with nuts which work on the screw-shafts N, of gear mechanism which can be operated at will for 55 revolving said screw-shafts, substantially as and for the purposes set forth.

5. In extension fire-ladders, the combination, with the side rails of the main ladder and ropes of the windlass moving the sliding ladder 60 on said main ladder, of the protecting-cases H, containing the portions of said ropes which are below said main ladder, substantially as and for the purposes set forth.

6. In extension fire-ladders, the combination, 65 with the ropes of the windlass which moves the sliding ladder on the main ladder, of the grooves h, made in the lower side of the side rails of the sliding ladder, substantially as and for the purposes set forth.

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Witnesses:

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