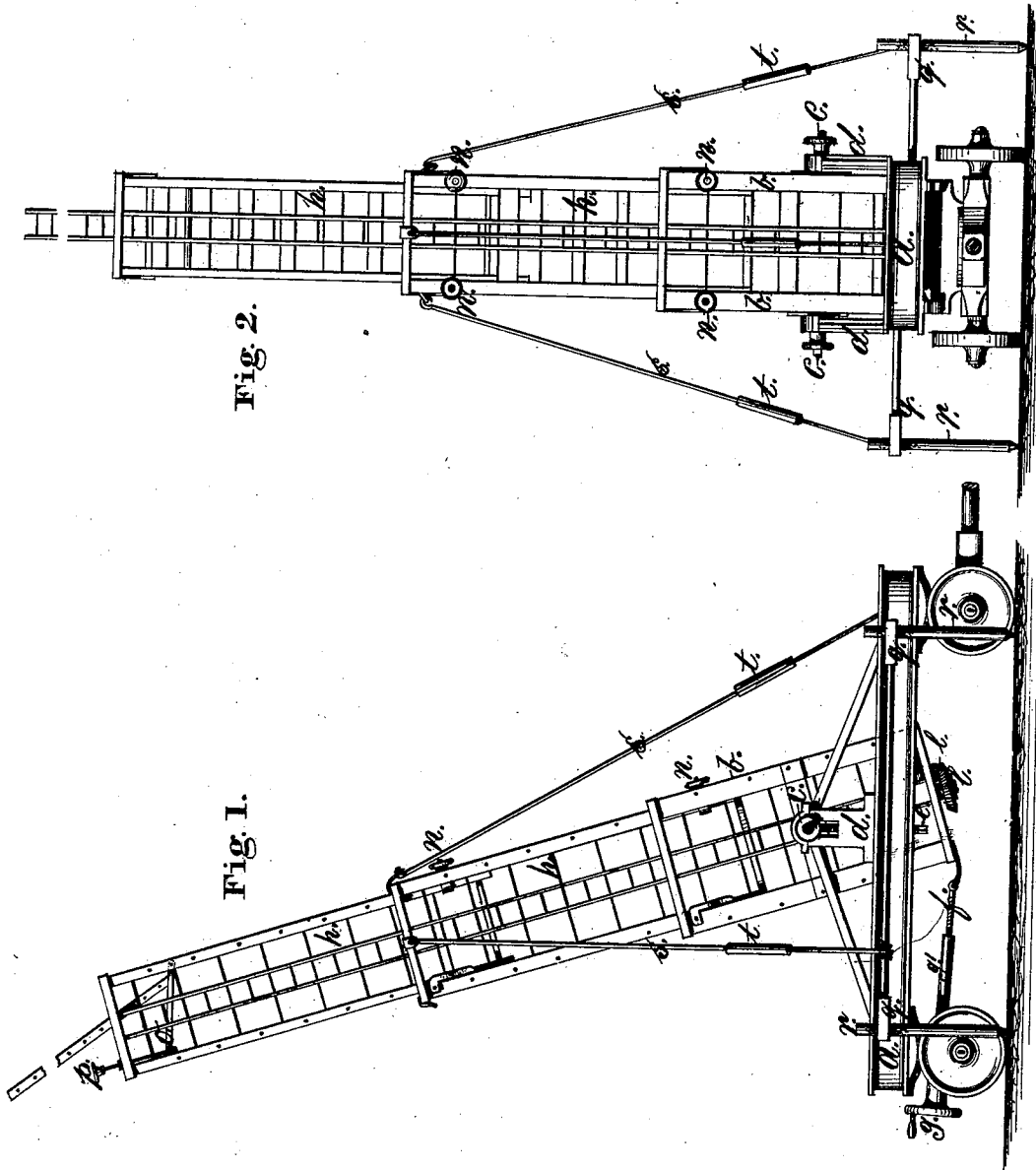


H. L. HOLMES.
FIRE-ESCAPE.

No. 178,929.

Patented June 20, 1876.



WITNESSES.

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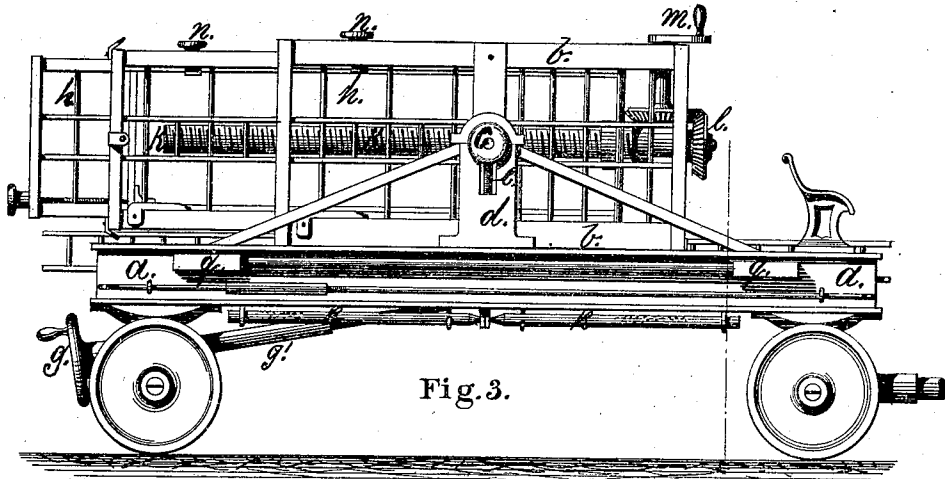


Fig. 3.

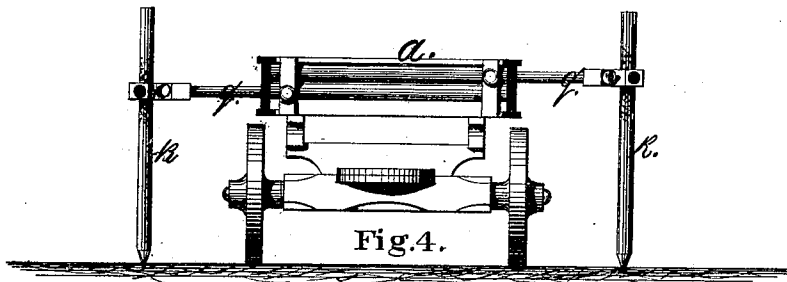


Fig. 4.

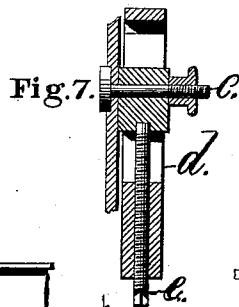


Fig. 7.

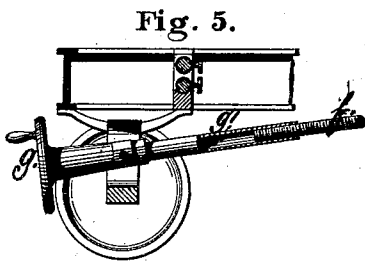


Fig. 5.

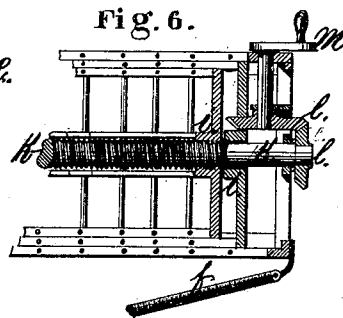


Fig. 6.

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UNITED STATES PATENT OFFICE.

HORATIO L. HOLMES, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN FIRE-ESCAPES.

Specification forming part of Letters Patent No. **178,929**, dated June 20, 1876; application filed March 16, 1876.

To all whom it may concern:

Be it known that I, HORATIO L. HOLMES, of the city and county of Providence, State of Rhode Island, have invented new and useful Improvements in Portable Fire-Escapes or Firemen's Towers; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification.

Figure 1 is a side view of my improved portable fire-escape and tower, shown as erected in an inclined position. Fig. 2 is a front view of my portable fire-escape, showing the tower raised and the extension-frames by which a broad base and firm support are secured for the tower. Fig. 3 is a side view of my portable fire-escape, showing the whole apparatus secured to the carriage for transportation. Fig. 4 is a front view of the carriage, showing the main frame or bed in section, and the extension-frames as laterally drawn out, with the supporting-piles fixed so as to insure a wider base and firm support. Fig. 5 is an enlarged view of the tubular hand-wheel and screw-spindle, by which the tower is swung on the trunnions and thus raised. Fig. 6 is an enlarged view of the main screw-spindle, by which the telescopic portions of the tower are successively raised. Fig. 7 is an enlarged sectional view of the device for adjusting the axis of the trunnions, so that the same may be on a level, or at such an angle as will place the tower in the proper or desired position.

Similar letters of reference indicate corresponding parts.

The object of this invention is to produce a portable fire-escape, fitted to a carriage; and consists in a telescopic tower, which may be extended to any required height, and which is provided with auxiliary ladders and platforms, so as to form a fire-escape, and, also, a firemen's tower, from which water can be thrown on the different stories of a building, and which will also allow of the ascent and descent of persons, the same being provided with an adjustable extension-base, by which a broad and firm bearing is secured for the tower, the whole forming a safe and substantial structure, as will be more fully set forth hereinafter.

In the drawings, *a* is the bed or frame, mounted upon a suitable carriage. This bed *a* forms the base of the superstructure, and to the same the different parts are firmly secured. *b* is the main portion of the tower, formed of light strong open frame-work, and having a convenient ladder formed on each of the four sides. *c c* are the trunnions, in which the tower is hung. These trunnions are supported in adjustable bearings, and the trunnions are provided with clamp-screws, by which the same are firmly held when adjusted. *d d* are the standards, firmly fixed on the frame *a*, and strengthened by lateral braces in these standards. The trunnion-blocks are supported, and are vertically adjustable. *e e* are the adjusting-screws, by which the trunnions on each side can be raised or lowered to adjust the same to the position required by the nature of the ground or the inclination desired for the tower.

f is the hinged screw-spindle, one end of which is hinged to the lower part of the tower, as shown in Figs. 1 and 6. The other end enters a tube provided with a nut, and thus forms a hollow screw-spindle. *g'* is the hollow sleeve, and *g* the hand-wheel secured to the same, and to a hinged bearing at or near the rear axle of the carriage. The tower, supported on the trunnions is raised or lowered by the turning of the hand-wheel *g* in one or the other direction. As the nut is secured to the tube *g'*, extending from the hand-wheel, the screw-spindle *f* can pass through the tube *g'* and the hand-wheel *g*, when the tower is raised. By this simple arrangement the tower can be swung into a perpendicular position in a short time by the exertion of but little force, and firmly held, the apparatus being simple, strong, and efficient. *h h* are the interior or telescopic extensions of the tower. They are, like the tower, four-sided, built in a similar manner, and provided on each side with a ladder.

Two such telescopic extensions are shown in the drawings, but any desired number may be provided, and operated in the same manner and by the same means as herein shown and described. *i i* are nuts or female screws firmly secured to the bottom platforms of each of the extensions *h h*, at or near their center, said nuts being arranged to fit the screw-thread of

the central screw-spindle. *k* is the central screw-spindle firmly supported in suitable bearings, secured to the bottom platform of the main tower *b*, so as to insure sufficient resistance to the thrust of the screw-spindle in raising the telescopic extensions *h h*. The lower part of the spindle *k* has no screw-thread, and is of less diameter, so as to allow the nut in the bottom platform of all the telescopic towers, except the inner one, to pass freely over the same, the length of such portion of the screw-spindle being such as will allow the platforms to pass below the screw-thread, excepting the innermost, or, when raised, the highest section, which will be in contact with the screw-thread.

The length of the screw-spindle is such that after one telescopic section has been raised to its required height, the screw-spindle is still in the nut in its bottom, and remains sufficiently long in the same to raise the next section until the nut in its bottom has fairly entered the thread of the screw-spindle, and so on with each succeeding section. The screw-spindle *k* will thus elevate any desired number of the telescopic sections. The screw-spindle *k* is connected, by means of the beveled pinions *l l*, with the crank or hand wheel *m*, by which the same is turned and the telescopic sections are successively raised. *nn* are clamp-screws by which the different telescopic sections are secured together, and to the tower, so as to form a strong and firm structure. Any number of such clamping devices may be used to firmly hold all the parts.

o is the upper hinged platform, arranged so as to be adjusted to any required angle by the screw *p*, so that, no matter what the inclination of the tower, the platform *o* can always be adjusted on a level, so that a person or persons may stand on the same and perform any required office.

q q are extension-frames, made of tube or in any other form, combining strength with lightness. They are arranged to slide in suitable bearings, so that they may be readily extended laterally, and are provided with clamping devices, by which they may be firmly secured when so extended, so as to form a firm and strong base with the bed-frame *a*.

In the corners of these extension-frames *q q* suitable sockets are provided, into which the piles *r r r r* are firmly secured, so as to rest on the ground, and thus form a firm and extended base for the tower, able to resist all lateral pressure of wind and water, and thus secure a firm and reliable fire-escape.

s s s are adjustable stays provided with the sleeve-couplings *t t*, by which the same can be made to hold the upper part of the tower firmly to the base, as is fully shown in Figs. 1 and 2.

The operation of my fire-escape is as follows: The whole apparatus, secured on the firm and solid bed-frame *a*, mounted on a wheeled carriage, as shown in Fig. 3, arriving at the proper place where the same is to be

raised, a fireman at once locks the wheels of the carriage, so as to secure a firm position; another loosens the clamp-screws on the trunnions *c c*. The first now turns the hand-wheel *g*, and raises the tower to a perpendicular, while the other draws out the extension-frames *q q*, secures the same, and places the piles *r r r* so that the whole extended base rests firmly on the ground. As soon as the tower is swung on the trunnions one man commences to turn the crank *m*, and thus raises the inner or smallest telescopic section. As soon as the first section is raised the clamp-screws *n* may be used to firmly secure the sections together. The screw-spindle is kept turning, and when two sections are thus raised, the second section is secured to the third, and so on until the desired height is reached, when the stays *s s s* are firmly secured.

During the raising of the tower the foreman directs the adjusting of the trunnion-bearings by means of the screws *e e*, so that the axis of the trunnions shall be on a level, or in such a position as will give the proper inclination to the tower.

When the men are properly drilled, the tower can be raised in a very short time, and be so firm, strong, and safe that the hosemen may take their positions on the different platforms in the tower, and thus play on the fire, while the ladders on the four sides may be used to ascend and descend freely without interference.

Fires may thus be more readily subdued, as the hosemen can be on a level with the fire, and use the water with more judgment and effect, while a ladder may be extended from the upper platform to the highest point of the building, and persons or property carried down on either of the ladders on the four sides of the tower.

When the tower is to be lowered the several operations heretofore described are reversed until the whole apparatus is again secured to the frame and carriage, ready to be transported.

I am aware that ladders having four sides, and thus forming a similar tower as mine, have been heretofore made, and hung in a gimbal-frame, so as to adjust themselves; but such frames are necessarily weak, and not sufficiently reliable for such purposes, as the whole weight of the tower and, all additional weight that may be added when in use, must be sustained on the journals of such gimbal-frame. Nor can such gimbal-frames be firmly secured so as to give any desired inclination to the tower, as is the case in my present invention.

I am also aware that telescopic ladders have before this been made; but such ladders could not be raised successively by the same simple mechanism, as is the case in my invention.

Such simplicity of construction and concentration of power as is arranged in my invention, whereby all the telescopic extensions can be raised by one person without stopping, and

without co-operation, are important elements in a fire-escape.

The means provided to insure a firm and extended base to the tower also greatly increase the value and safety of my fire-escape, preventing accident and loss of life and property.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the frame *a*, supported on the wheeled carriage, as described, of the standards *d d*, the adjustable trunnion-bearings, and the screws *e e*, for supporting and adjusting the trunnions, substantially as and for the purpose set forth.

2. The combination, with the swinging and vertically adjustable tower *b*, of the telescopic extensions *h h*, provided with the nuts or female screws *i i*, arranged to be successively raised, substantially as and for the purpose specified.

3. The combination, with the square tower *b*, provided with ladders, substantially as described, and supported on the adjustable trunnions *c c*, of the hinged screw-spindle *f*,

the tubular nut *g'*, and hand-wheel *g*, the whole operating together substantially as and for the purpose specified.

4. The combination, with the screw-spindle *k*, connected by gearing with the crank *m*, of the telescopic extension-sections *h h*, provided with the nuts *i i*, and arranged to be successively raised or lowered by one central screw, substantially as and for the purpose set forth.

5. The combination, with the telescopic tower, substantially as described, of the adjustable platform *o*, arranged so as to be placed at any required angle by the screw *p*, as and for the purpose described.

6. The combination, with the telescopic tower, supported on adjustable trunnions, and raised or lowered by a screw-spindle, substantially as described, of the extension-frames *q q*, the piles *r r r r*, and stays *s s s*, the whole forming a fire-escape and tower, substantially as and for the purpose specified.

HORATIO L. HOLMES.

Witnesses:

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HORACE F. NORTON.