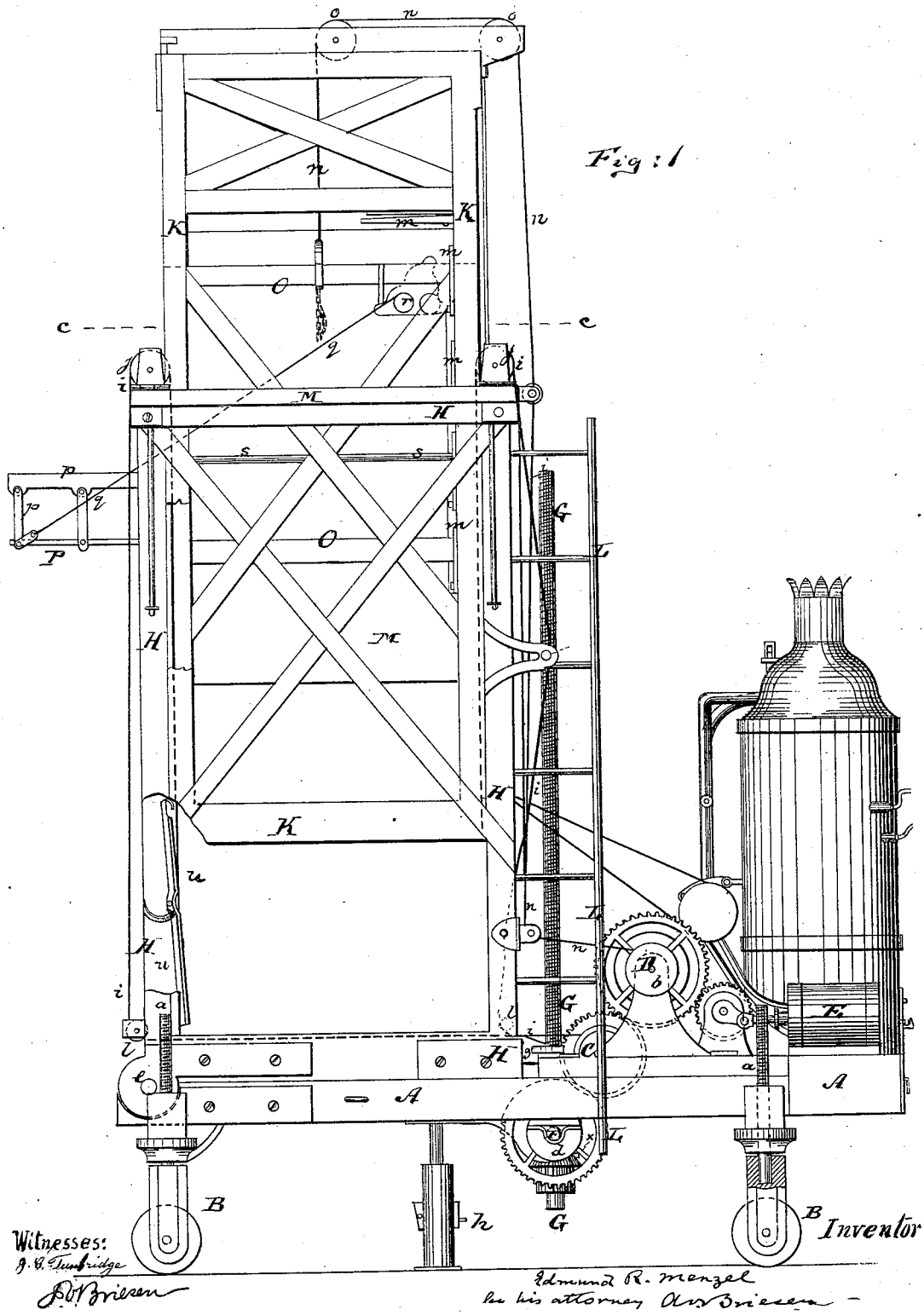
4 Sheets—Sheet 1.

E. R. MENZEL.

FIRE-ESCAPE.

No. 193,264. Patented July 17, 1877.

Fig: 1



Witnesses:
J. C. Tumbridge
A. V. Briesen

Edmund R. Menzel
by his attorney A. V. Briesen

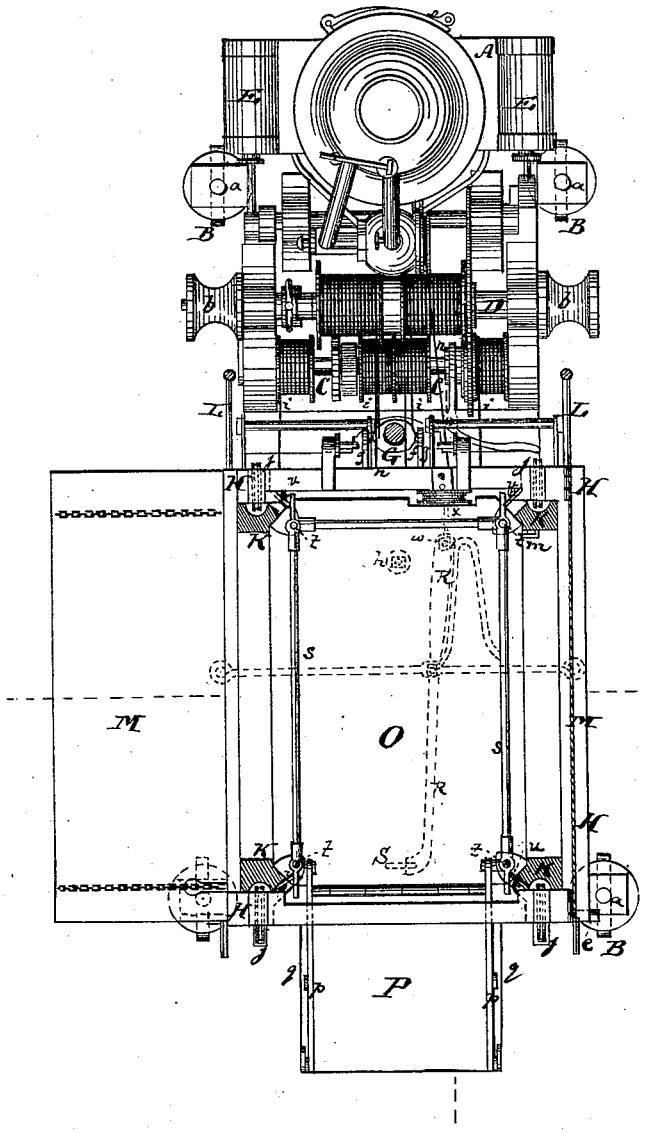
Inventor

E. R. MENZEL.

FIRE-ESCAPE.

No. 193,264. Patented July 17, 1877.

Fig. 2.



Witnesses
John C. Tunbridge
D. V. Briesen

Inventor
Edmund R. Menzel
by his attorney
A. V. Briesen

E. R. MENZEL.

FIRE-ESCAPE.

No. 193,264. Patented July 17, 1877.

Fig: 3

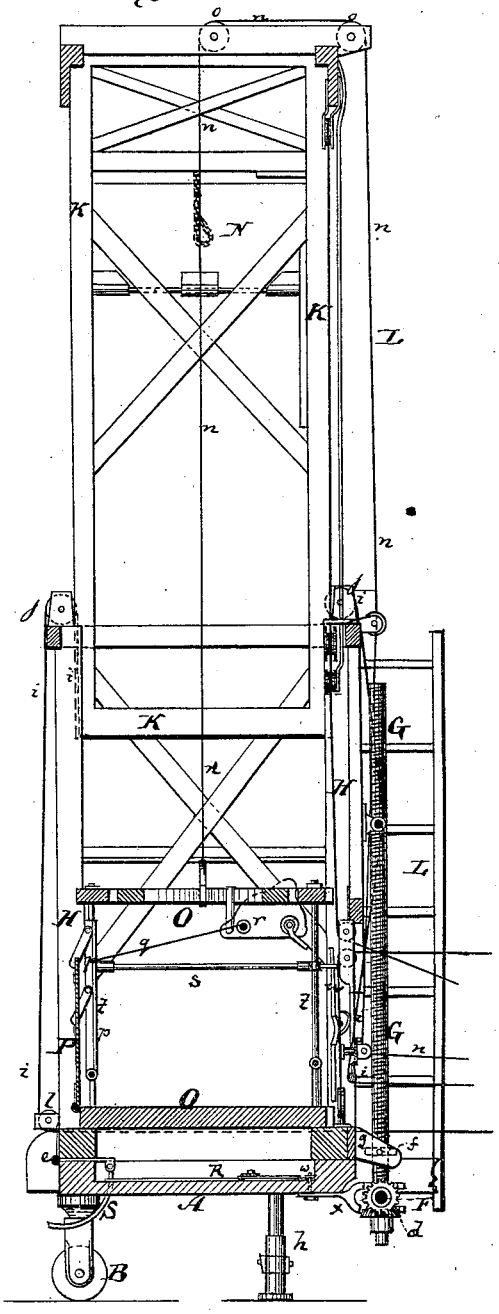
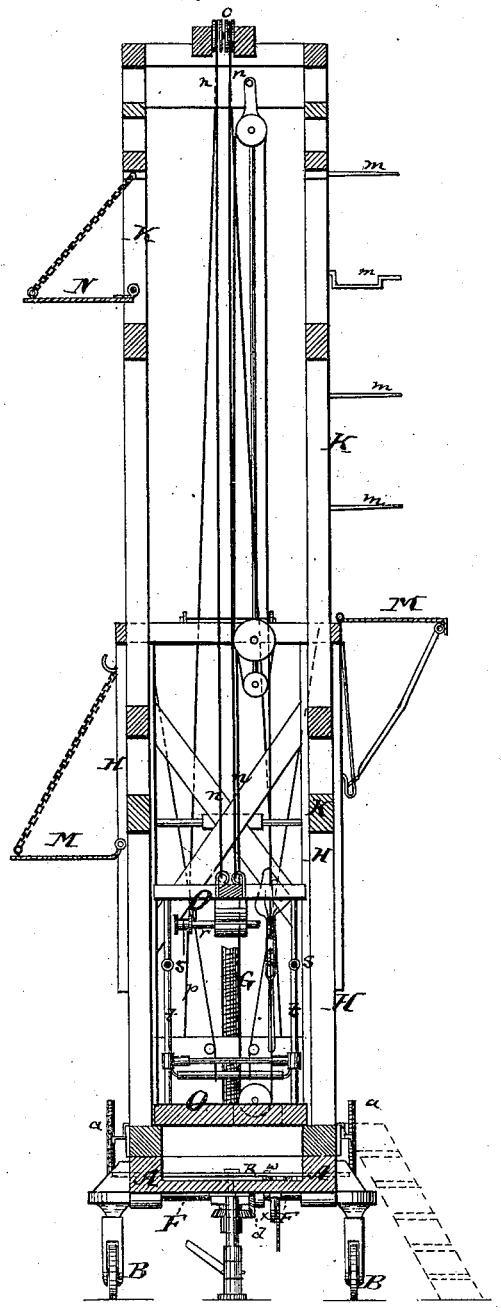


Fig: 4



Witnesses
John C. Tunbridge.
D. V. Briesen

Inventor
Edmund R. Menzel
by his attorney
D. V. Briesen

4 Sheets—Sheet 4.

E. R. MENZEL.

FIRE-ESCAPE.

No. 193,264. Patented July 17, 1877.

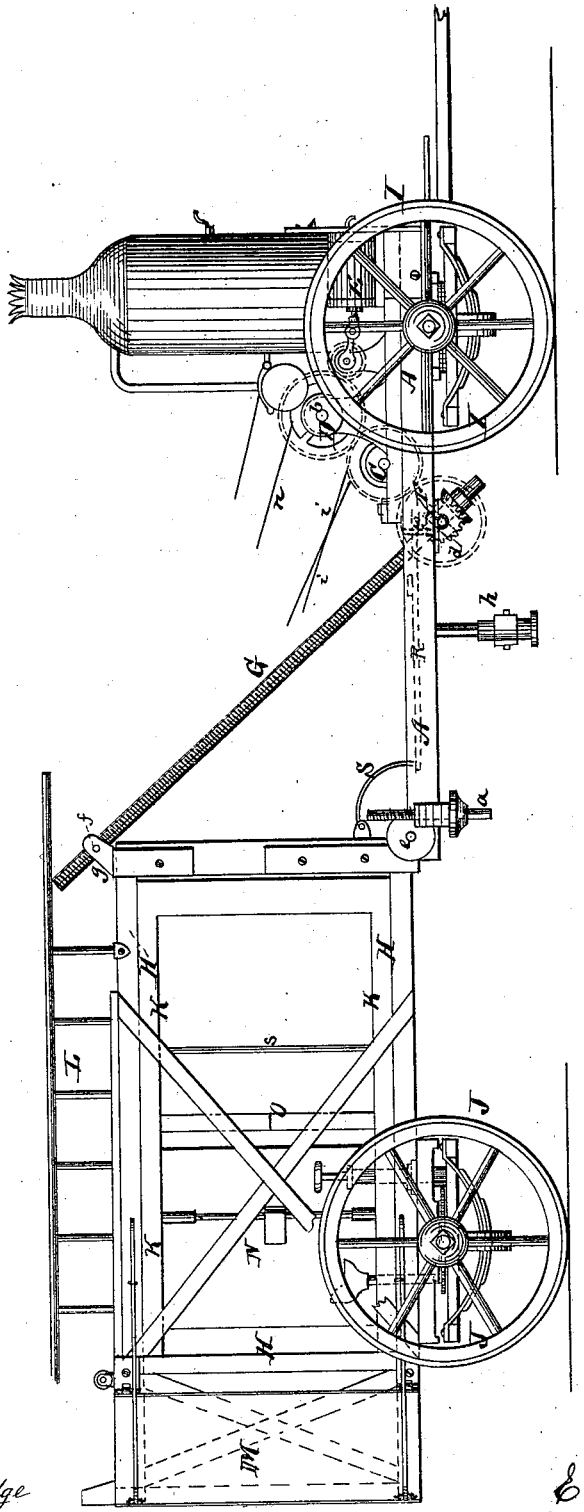


Fig: 5

Witnesses:
John C. Tumbridge
A. V. Briesen

Inventor:
Edmund R. Menzel
by his attorney
A. V. Briesen

UNITED STATES PATENT OFFICE.

EDMUND R. MENZEL, OF HOBOKEN, NEW JERSEY.

IMPROVEMENT IN FIRE-ESCAPES.

Specification forming part of Letters Patent No. **193,264**, dated July 17, 1877; application filed May 11, 1877.

To all whom it may concern:

Be it known that I, EDMUND ROBERT MENZEL, of Hoboken, in the county of Hudson and State of New Jersey, have invented a new and Improved Fire-Escape, of which the following is a specification:

Figure 1, Sheet 1, is a side elevation of my improved fire-escape. Fig. 2, Sheet 2, is a top view, partly in section, thereof, the line *c c*, Fig. 1, indicating the plane of section. These two figures, 1 and 2, are drawn on a larger scale than the remaining figures. Fig. 3, Sheet 3, is a vertical longitudinal section, and Fig. 4, Sheet 3, a vertical transverse section of the same. Fig. 5, Sheet 4, is a side view of the same, showing it folded and placed on trucks for transportation.

Similar letters of reference indicate corresponding parts in all the figures.

This invention relates to a new fire-escape, which is mounted upon wheels for convenience of transportation, and which, in use, can be extended to a considerable height. The extension-frame constitutes the guide for an elevator cage or car, which can be raised and lowered at will, to aid in the escape of persons from burning houses, and in the supply of means and help necessary for extinguishing the fire. The extension-frame, which, in use, is in vertical position, can, nevertheless, be folded down into a horizontal position, so that the entire apparatus may be readily conveyed on trucks, which are adapted to support it.

The invention consists of a series of novel features in the construction of the fire-escape, and of several novel combinations, which enter into the same, and which are all hereinafter clearly and specifically pointed out.

The letter A in the drawing represents a horizontal platform or frame-work, which constitutes the chief support of the apparatus, and which, when the fire-escape is to be used, is supported by four wheels, B B, that are hung in swivel-shanks like casters, so that they may permit the apparatus to be conveniently moved in any desired direction. The shanks *a a* of these caster-wheels are screw-threaded, so that, by turning them, the distance between the frame-work A and the pavement or ground may be varied. This enables me to properly adjust the platform on uneven ground, or where one set of rollers stands in a gutter and the other on the street. The casters can, moreover, be slipped off their threaded shanks *a*, as indicated by sectional part in Fig. 1, so that they may be out of the way when the machine is conveyed on trucks, as in Fig. 5. Upon the platform A are supported two shafts, C and D, of which one, C, serves to extend the elevator-frame, while the other, D, serves to move the elevator cage or car. These shafts receive motion from a suitable steam-cylinder, E, which is also supported on the platform A, and which is connected with a suitable boiler, likewise supported thereon.

In place of said cylinder and boiler other suitable motive-power may be used. The shaft D carries also a couple of windlasses or drums, *b*, which, when revolved, may serve to wind up a rope, by which the apparatus is connected to the ground, and to thus move the machine into any suitable position. Suitable brakes and clutches are or may be applied to the shafts C D to regulate their movements in the operation of the machine.

The shaft C may, by a clutch, *x*, also be thrown in gear with a wheel, *d*, that is hung loose upon a rock-shaft, F, which has its bearings on the platform A, and which is traversed by the lower part of a long screw, G. The wheel *d*, when turned, serves also by intermediate gearing to turn said screw G, and thereby to fold down the elevator-frame in manner hereinafter described, the shaft F swinging in accordance with the inclination of the screw G, that is swiveled in it.

To one end of the platform A is hinged, by a strong bolt or shaft, *e*, one corner of the elevator-frame H, which, when in a vertical position, as in Figs. 1 and 3, stands entirely on the platform, and is supported by the same.

The screw G, hereinabove mentioned, passes through a nut, *f*, which is pivoted in ears *g* that project from the elevator-frame H, as shown in Figs. 3 and 5, and by revolving said screw (which is in a vertical position when the elevator-frame stands upright) the elevator-frame is swung on its pivot *e* into a horizontal position, as shown in Fig. 5. In this position the apparatus can be supported upon two

trucks, I and J, of which one, I, is placed beneath the platform A, while the other, J, is placed under the horizontal elevator-frame H; and thus the apparatus may be conveniently transported along streets or thoroughfares to and from the places of conflagration.

After the elevator-frame has been folded into the horizontal position upon its truck J, to which it is locked by suitable catches, the platform A is raised by a hydraulic jack, *h*, which is suspended beneath the platform A, so as to permit the truck I to be placed under it; and the caster-wheels B are then slipped off their screw-shanks *a*, and placed upon the vehicle out of the way. The truck J has a steering appliance and a seat, so that by its means the vehicle may be properly directed.

When the apparatus is to be used at a fire the elevator-frame is raised into a vertical position by revolving the screw G, and the hydraulic jack extended so that it may reach to the ground, and said jack operated after the casters B have been reapplied to their pins *a*, so as to first allow the truck I to be withdrawn, and next to bring the casters down upon the ground.

It will be seen that it is a feature of importance to swivel the screw G in the vibrating shaft F, and to pivot the nut *f* in the ears *g*, as the parts will thereby adjust themselves properly to the varying inclination of the screw G in changing the position of the elevator-frame from a vertical to a horizontal position, or vice versa.

The elevator-frame H is extensible, being made in two or more sections that slide one within the other. The drawing shows it to be made in two sections, the lower of which, H, is pivoted to the platform in manner stated, while the upper, K, is capable of sliding up and down within the section H to elongate the same to a proper extent; but additional sliding sections may be supplied. The extension K has its lower end connected with a series of ropes or chains, *i i*, which pass over friction-rollers *j* that are placed at the top of the frame H; thence downward, over a series of lower friction-rollers *l*, and thence to the shaft or drum C. Thus, by revolving the shaft C in one direction, the ropes or chains *i* will be wound upon it, and the frame K elevated, while, if it is turned in the opposite direction, the shaft C will cause the ropes to unwind, and the extension part K to descend by its own weight. One or more ladders, L, are attached to the outer side of the elevator-frame H, to enable firemen to ascend to the top of the same, and the extension-frame K has a series of folding rungs, *m m*, pivoted to it, which, if swung outward, as in Fig. 4, will constitute steps for the ascending and descending firemen; but in moving the extension-frame K up or down the rungs *m* are folded inward, so as not to project or interfere with the proper adjustment of said frame K. Hinged platforms M M are also attached to the upper outer part of the frame H for the firemen to stand upon in plying their hose.

These platforms can, when not to be used, be folded snugly against the side of the frame H. Similar platforms N are or may be hinged to the outer side of the extension-frame K, as in Fig. 4, to serve the like purpose as the platforms M, and, if the frame K is to be moved up or down, such platforms N must first be folded flush against the frame K.

Within the extensible elevator-frame, above described, is placed an elevator cage or car, O, which may be moved up and down therein, and serves to take persons from the upper stories of burning houses and lower them to the ground, or vice versa.

The car O is suspended by ropes or chains *n* from pulleys *o o* that are hung in the top of the uppermost extension-section K. These ropes or chains *n* are connected with the shaft D, on which they can be wound or unwound at pleasure, to raise or lower the car O. At one side the car O is provided with a hinged platform, P, which has jointed side guards or rails *p p*, and which may be let down into a horizontal position when the car is raised, as in Fig. 1. In this case the platform P constitutes a bridge to a window, balcony, roof, or other means of escape, and enables persons to safely reach the car. While the car travels up or down, the platform P is raised into a vertical position, as in Fig. 3, and serves in that case as a guard to keep persons from falling off the moving car. I prefer to connect the hinged platform P by ropes or chains *q q* with an arbor, *r*, which is hung in the upper frame-work of the car, and which is connected with a winding spring or weight. When this spring is released or made free to act by the touch upon a suitable trigger, it causes the arbor *r* to rotate to wind up the ropes *q*, and raise the platform P into the vertical position; and when afterward the said platform is let down again, the ropes *q*, in unwinding from the arbor *r*, serve to wind up the spring, and to set the same for again raising the platform.

The three other sides of the car are provided with horizontal guard-rails *s s*, which are guided on posts *t t* of the car, and capable of sliding thereon. While the car is in use the rails *s* are at such a height as to prevent its passengers from failing off; but when the car approaches the platform A the side rails *s* will be caught by pivoted spring-catches *u u* that are affixed to the frame H, and will by them be held up while the car completes its downward motion. The rails *s* are thereby sufficiently elevated, so as not to obstruct egress from or approach to the lowered elevator-car, as clearly indicated in Fig. 3. In ascending, the car swings the catches *u* aside, so that the rails *s* may again drop into their proper position.

For locking the elevator-frame H in its upright position I use a spring-lever, R, which is pivoted to the platform A, and catches into

a notch of a curved guide-plate, S, that projects from the frame H, as indicated in Fig. 3, and by dotted lines in Fig. 2. The lever R connects by a pin, *w*, also with the clutch *x* that throws the wheel *d* in gear with the shaft C, so that by moving said lever R the elevator-frame is unlocked simultaneously with the commencement of the operation of the screw G, by which said frame is folded down.

It will be seen that by my improved fire-escape the loss of human life by fire can be almost entirely prevented, where, heretofore, especially in high structures, the danger of such loss was very great. The apparatus is easily transported, can be conveniently set up, and is adapted to rapidly and conveniently remove invalids, children, and women from burning structures without exposing them even to the dangers or inconveniences to which they must submit in all other fire-escapes.

I claim as my invention—

1. The combination of the platform A and hinged elevator-frame H, with the supporting-rollers B and removable trucks I and J, all arranged to operate so that the trucks are removed when the elevator-frame is erected, substantially as herein shown and described.

2. The combination of the platform A, vibrating shaft or guide F, screw G, and pivoted nut *f*, with the pivoted elevator-frame H, all operating substantially as herein shown and described.

3. The combination of the locking-lever R of the pivoted elevator-frame H, with the clutch *x*, which throws the screw G into gear, substantially as herein shown and described.

4. The hydraulic jack *h*, suspended from the platform A, in combination with the removable casters B B, substantially as and for the purpose specified.

5. The combination of the elevator-frame with the folding rungs *m m*, pivoted thereto, substantially as herein shown and described.

6. The combination of the elevator-car O and hinged gate or platform P with the ropes *q* and spring-arbor *r*, all arranged to operate substantially as herein shown and described.

7. The combination of the elevator-car O with the posts *t* and with the guard-rail *s*, which is adapted to slide on said posts, substantially as herein shown and described.

8. The combination of the elevator-car O with the sliding rail *s* and with the pivoted catches *u*, whereby said rail is arrested shortly before the car A reaches its lower position, substantially as specified.

EDMUND ROBERT MENZEL.

Witnesses:

ERNEST C. WEBB,

F. V. BRIESEN.