

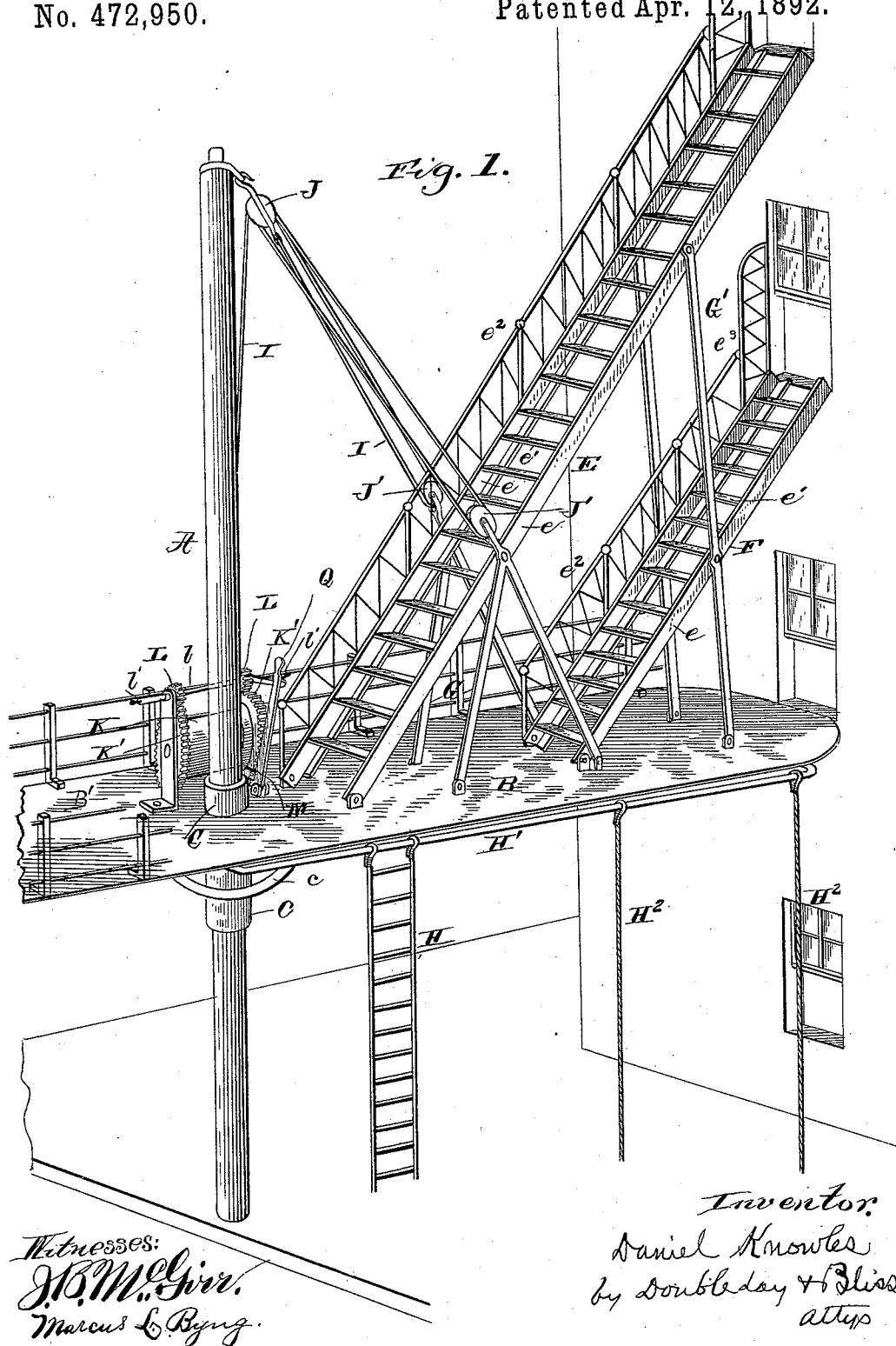
(No Model.)

3 Sheets—Sheet 1.

D. KNOWLES.  
FIRE ESCAPE.

No. 472,950.

Patented Apr. 12, 1892.



(No Model.)

3 Sheets—Sheet 2.

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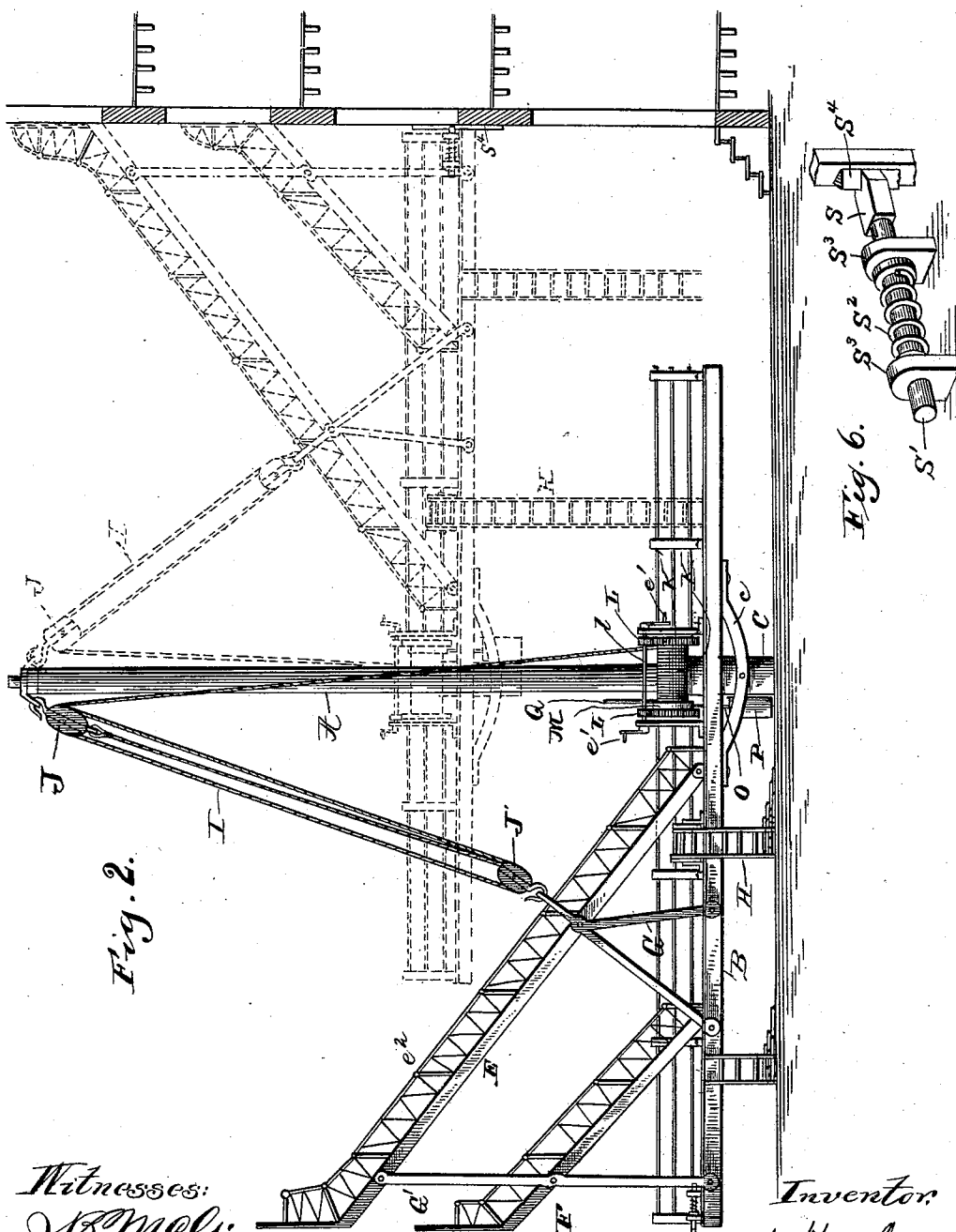


Fig. 2.

Fig. 6.

Witnesses:  
J. B. McGirr.  
Marcus L. Byng.

Inventor:  
Daniel Knowles  
by Doubleday & Bliss  
attys

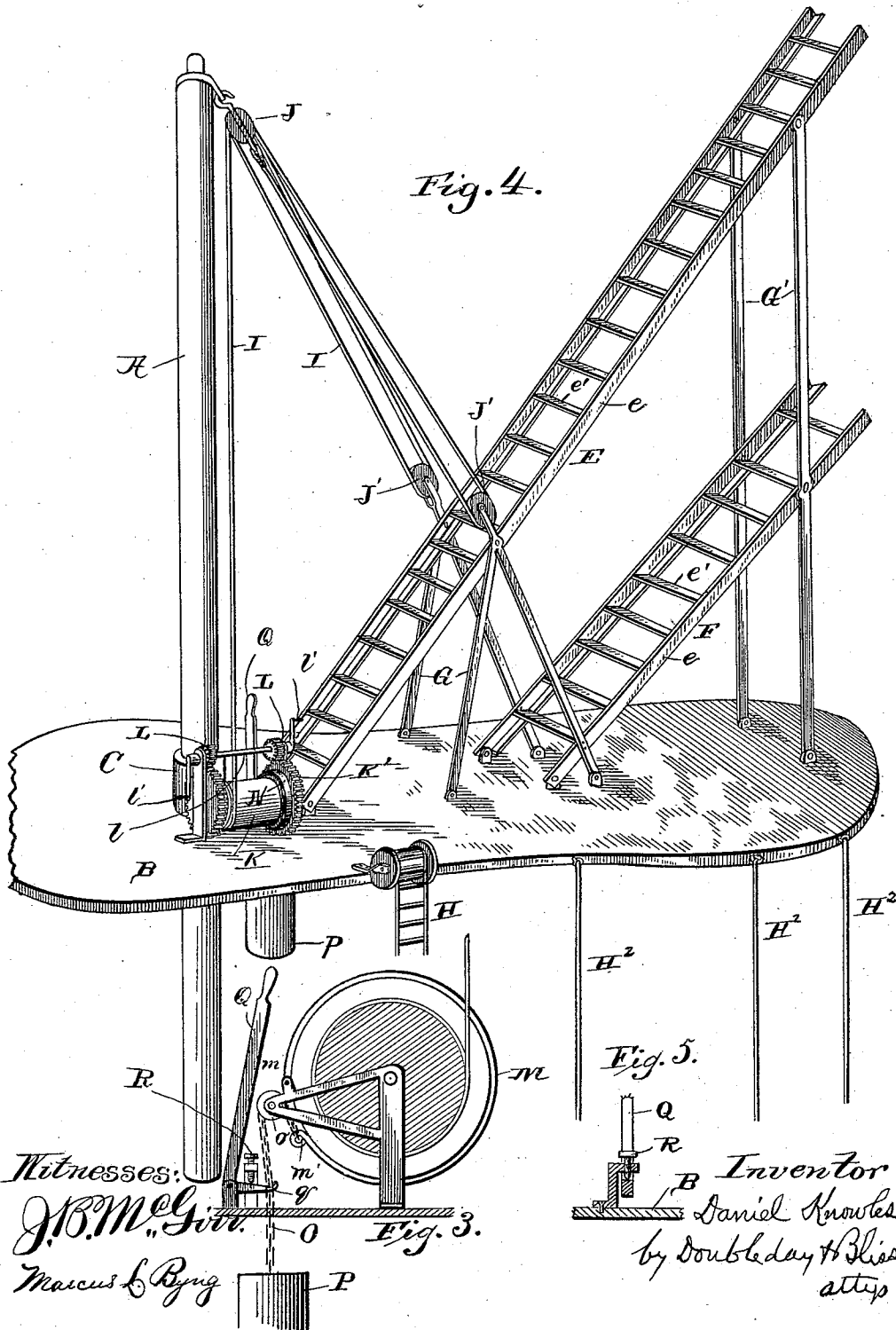
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FIRE ESCAPE.

No. 472,950.

Patented Apr. 12, 1892.



# UNITED STATES PATENT OFFICE.

DANIEL KNOWLES, OF NORFOLK, VIRGINIA, ASSIGNOR OF ONE-FOURTH TO  
GEORGE W. JOHNSON, OF SAME PLACE.

## FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 472,950, dated April 12, 1892.

Application filed March 24, 1891. Serial No. 386,241. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL KNOWLES, a citizen of the United States, residing at Norfolk, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to improvements in fire-escapes, the object being to provide an escape which shall be more easily and safely used than those heretofore employed with which I am acquainted.

15 One of the main objects is to provide rigid ladders or stairways more or less analogous to ordinary house-stairways and so arranged that parties can descend them while walking in an upright position.

20 Another object is to provide for the lowering and raising of such ladders bodily.

The invention also relates to means for turning them away from the building to which they can be applied in case of fire.

25 Figure 1 is a perspective showing the essential parts of a fire-escape embodying my improvements. Fig. 2 is a side elevation showing by dotted lines the positions of the parts when they are placed adjacent to a building to permit escape therefrom and showing by full lines the positions occupied by the parts after they have been lowered. Fig. 3 is a cross-section of the rope-drum or windlass, showing the means of applying a friction-band. Fig. 4 is a perspective of a modification. Figs. 5 and 6 are detail views of detached parts.

30 In the drawings, A represents a post, column, or mast of such form, length, and material as will make it suitable for the purposes to be described. Ordinarily a tubular iron column can be employed, sunk to such a depth in the earth or in a foundation as to be firmly held in place. Upon this are adjustably supported the platform, ladders, and other parts of the escape.

45 The platform is indicated by B, comprising a suitable frame-work and floor. The frame-work may be formed of angle irons and the

flooring of sheet iron. It is connected to the mast or column A by means of a tubular carrier C, sufficiently long and thick to give the requisite support. Braces *c* of a suitable number may be combined with the tubular holder and the platform to give the requisite strength. In fact, the platform may be constructed in any way preferred, and braces, girts, and other like parts can be employed to meet the requirements of each occasion. Preferably the platform extends on each side somewhat beyond the ladders, in order to permit a passage around the ladder, and it is also extended considerably beyond the post A, to provide standing room.

From the platform B there arise at an inclination ladders or stairways E F, of a number corresponding to the number of the floors or stories in the buildings. These, also, as concerns their details, may be constructed in any suitable way and of any preferred material. As shown here, each comprises longitudinal angle-iron bars *e e*, upon which flat steps *e'* are secured, and upon one or both sides a railing, as at *e<sup>2</sup>*, is attached, which latter, preferably, at one or both sides extends upward, as at *e<sup>3</sup>*, at the upper end. These ladders may be more or less vertically adjustable either at their outer and upper ends or throughout. Said ends may be made adjustable by hinging the lower ends and providing properly movable supports for the upper ones; but for all ordinary purposes I prefer to attach them rigidly throughout and support them firmly by means of braces or standards, as shown at G G', and of which any suitable number can be used. The distance of the upper end of ladder F from the platform B and that between the ends of the ladders E and F can be properly adjusted for each building when initially constructing the mechanism—that is to say, said two distances will be made equal to that between the windows of the second and third stories on the one hand and of the third and fourth on the other.

The escape shown is designed for a four-story building, and is intended to permit an escape from either or all of the second, third,

and fourth floors. The platform B itself can be brought opposite the window of the second floor, so that the occupants can easily step thereon and pass around the ladders to the standing part at B'. The ladders F and E, respectively, reach the third and fourth floors, and from their construction it will be seen that persons can easily step from said windows upon said ladders and walk down, being assisted by the side railings at  $e^2$   $e^3$ .

Experience has shown that the ordinary fire-escapes, having ladders with vertically-arranged rounds, cannot be depended on under many circumstances. First, for timorous and weak persons they are practically useless under the most favorable circumstances, and, secondly, when fire breaks through windows adjacent to them the heat imparted to them, as well as the smoke and flame, renders them of no value. In my case, as soon as there is an exit from the window it is possible for a relatively weak or timorous person to have substantially the same support when descending as when coming down an ordinary stairway, and every step removes one farther from the fire.

From the platform B escape can be effected either after it has been lowered or by means of rope ladders H, or hand-ropes  $H^2$   $H^3$ , which may be supported in any suitable way. In Fig. 1 they are shown as attached to a rod H', employed for that purpose.

In order to elevate and lower the platform and the parts secured thereto, I employ a cable or rope, as at I. It passes over pulleys in blocks of any suitable sort and arranged in any preferred way. As shown, the rope is attached to the block at J, it passing thence under a pulley J', thence back to a pulley at J, thence to a second pulley J', thence to pulley at J, and thence downward to a windlass or drum K. Upon this it may be wound in any suitable way, as by means of a crank-shaft  $U$ , having pinions L L, adapted to engage with toothed wheels  $k'$  on the drum.

In order to accurately regulate the descent of the platform, I combine with the windlass a friction-brake. It consists of a band M surrounding as much as possible of a friction disk or cylinder N. The details of this part of the mechanism can also be of any preferred sort. As shown, the band M is secured at  $m$  to a carrier, and the other end at  $m'$  is connected to a chain O, which passes over a sheave and carries a weight P, of such size as to properly hold the band M.

Q is a lever pivoted to the platform and having at  $q$  an engagement with the chain O, so that an operator can lift up on weight P sufficiently to release the friction-brake; but in order to prevent the entire relieving of the friction I limit the play of the lever Q by means of an adjustable stop, as at R.

The pulley and block at J are shown as being swiveled to the upper end of the post,

column, or mast A, so that when the platform, the ladders, and the attached parts are turned around said post or column the rope will maintain the same position relatively thereto at all times, and binding or tangling be prevented. A rope—such as one of those at  $H^2$ —can be used to effect the turning of the platform around the post or column.

By referring to Fig. 2 the mode of operating my improved escape will be readily understood. The platform and parts attached may at ordinary times be left turned partly away from the building, if desired, and locked so as to prevent the entrance of burglars; but I intend, ordinarily, to have the parts of the escape in proper position in relation to the building, at which time, of course, such ladders or escape-ropes as those at H  $H^2$  will be rolled up or otherwise placed upon the platform. In case of fire the mode of using the device will be understood from the above description, in connection with the drawings. If the platform B becomes loaded with persons, it can be safely and rapidly lowered by means of the friction-drum, and after the parties thereon have stepped off it can be again rapidly elevated by means of the rope-winding devices at L and K.

An escape of this character can be advantageously situated in the areas or yards of hotels or houses, where it is not desirable to place them upon the street side.

There can be modification of the mechanism herein shown in several respects. The friction-brake can be applied to the rising and falling platform in ways differing more or less from that specifically illustrated without departing from the essential features of the invention.

I am of course aware of the fact that fire-escapes have been heretofore constructed or proposed having rising and falling platforms or cars; but, so far as I know, the said earlier mechanisms have been of one or the other of two classes, the first comprising those which were mounted upon wheels and had their various parts so constructed and related that it was impossible to secure any rotation horizontally of the platform independently of its vertical support, and those of the second class being such as are permanently secured directly to the wall of the building. In my case there is provided both a vertical movement and a horizontal swinging or rotating movement of the platform, the vertical supporting part of the mechanism providing a vertical hinge or pivot-like guide, around the axis of which the platform can freely vibrate or rotate. The raising and lowering mechanism in this construction is so disposed that the ropes or other parts constituting it do not interfere with this free horizontal movement, the preferred way of accomplishing this being shown—that is, having the raising and lowering mechanism mounted directly on and

free to rotate with the platform—though it will be seen that many of the ends of the invention can be attained otherwise. My vertical support is practically remote from the building, and the platform is preferably of a length shorter than the distance between the support and the building, so that it can be brought around to the direct line between them and then swung away to another position, though in this respect there can be modification, provided the essential features be preserved.

While I herein show both a "platform" and "ladders" and refer to them by separate terms, yet it will be understood that many of the features of novelty can be maintained, even though one of these be substituted for the other.

What I claim is—

1. A fire-escape having a rising-and-falling platform, a vertical support for said platform, which provides a vertical axis or hinge therefor, and is situated from the building a distance greater than that part of the platform which receives those escaping from the building, whereby said platform can, while said support is stationary, be rotated horizontally from a position between the support and building to a position outside thereof, and means for causing the rotation of the platform, substantially as set forth.

2. In a fire-escape, a rising-and-falling platform, a vertical support therefor, one or more ladders secured to said platform, having their receiving ends on one side only of said support, and means for raising and lowering said platform, the latter being connected with the support by a vertical pivot or hinge, whereby it is adapted to have the said ladders turned to a position between the support and the building while the support is stationary, and turned into a position outside thereof either during or after the vertical movements of the platform, and means for causing the rotation of the platform, substantially as set forth.

3. In a fire-escape, the combination of a vertical support, a rising-and-falling and horizontally-rotating platform, said support being at a distance from the building greater than the length of the platform, and mechanism mounted on the platform for raising and lowering it, whereby the platform can be moved both vertically and horizontally while the support is stationary, substantially as set forth.

4. In a fire-escape, the combination of a vertical support, a rising-and-falling platform on said support rotatable horizontally while the support is stationary, and mechanism mounted on the platform for raising and lowering it, substantially as set forth.

5. In a fire-escape, the combination of a vertical support, a rising-and-falling platform on said support rotatable horizontally while the support is stationary, mechanism for raising

and lowering said platform, means for causing the rotation of the platform, and a lock for fastening it in any desired vertical position, substantially as set forth.

6. In a fire-escape, a rising-and-falling platform mounted upon a vertical pivot-like guide, said platform being free to rotate around the axis of said guide while rising and falling, and means for causing the rotation of the platform, substantially as set forth.

7. In a fire-escape, the combination of a rising-and-falling platform and a vertical pivot-like guide for said platform and a raising and lowering mechanism connected at one or more points to said platform, and also connected to a stationary support, said mechanism being free to rotate at both said places of connection around the axis of the said pivot-guide, substantially as set forth.

8. In a fire-escape, the combination, with a vertical pivot-like guide, of a platform adapted to rotate thereon and a raising and lowering mechanism, also adapted to rotate thereon, substantially as set forth.

9. In a fire-escape, the combination of a vertical support secured to or in the ground independently of the building and a rising-and-falling platform pivotally connected to said support and free to swing toward and away from the building, substantially as set forth.

10. In a fire-escape, the combination of a vertical support, a rising-and-falling platform vertically pivoted to said support, a drum on said platform, a rope extending upwardly from said platform to the top of said support and thence downward to the platform again, and a connecting device for the upper part of said rope, pivotally connected to said support, substantially as set forth.

11. The combination of the vertical support, the rising-and-falling platform, the friction-drum mounted in bearings on the platform, the friction-brake on the platform engaging said drum, the rope adapted to be wrapped around said drum, and means on the platform for varying the friction on the drum, substantially as set forth.

12. In a fire-escape, the combination of the vertical support, the platform which rises and falls and rotates freely on said support while the latter is stationary, and the inclined ladders secured to said platform and adapted to be rotated therewith horizontally to a position between the support and the building and then rotated into a position away therefrom, and means for causing the rotation of the platform, substantially as set forth.

13. In a fire-escape, the combination, with the main support having the vertical pivot, of the rising-and-falling platform having its receiving part shorter than the distance from said pivot to the building and connected to the said support, as set forth, whereby it is free to rotate continuously around said pivot, substantially as set forth.

14. In a fire-escape, the combination, with the rising-and-falling platform, of the ladder projecting upwardly therefrom and provided at the upper ends with the upwardly-projecting fender or side guard adapted to stand at the side of a window, substantially as set forth.

5 15. In a fire-escape, the combination, with the rising-and-falling ladder, a friction-brake, the lever for releasing said brake, and the

stop for limiting the lever movement, substantially as described.

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

DANIEL KNOWLES.

Witnesses:

JAMES ERWIN,

C. E. STEWARD.