

No. 673,301.

Patented Apr. 30, 1901.

N. STEINFELD & C. J. MEYER.
FIRE ESCAPE.

(Application filed Oct. 8, 1900.)

(No Model.)

3 Sheets—Sheet 1.

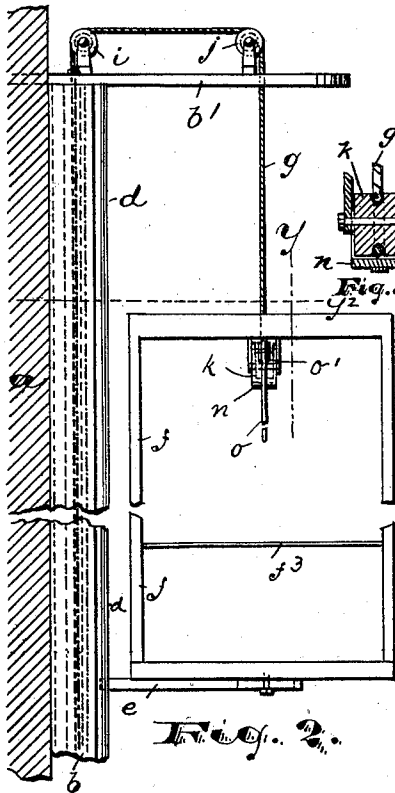


Fig. 2.

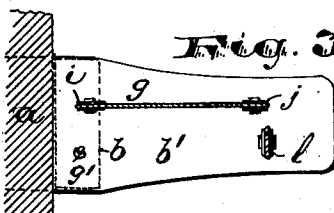


Fig. 3.

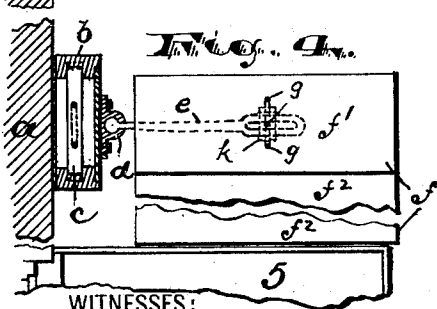


Fig. 4.

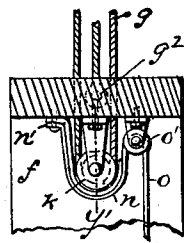


Fig. 5.

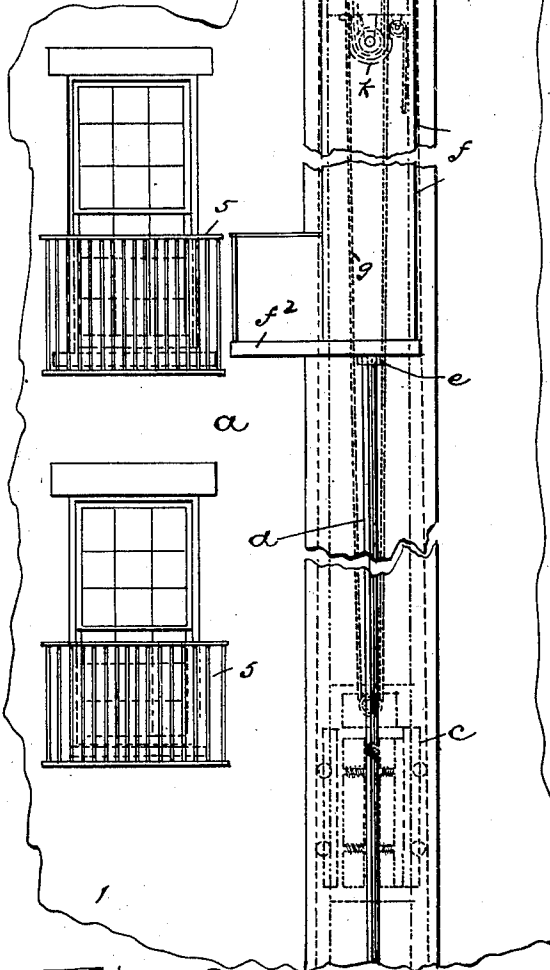


Fig. 1.

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3 Sheets—Sheet 2.

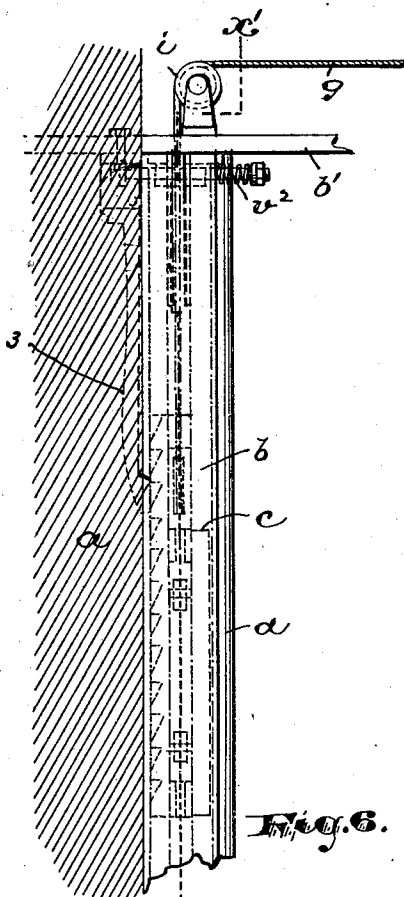


Fig. 6.

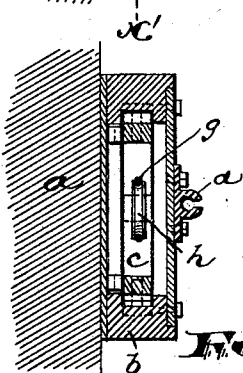


Fig. 7.

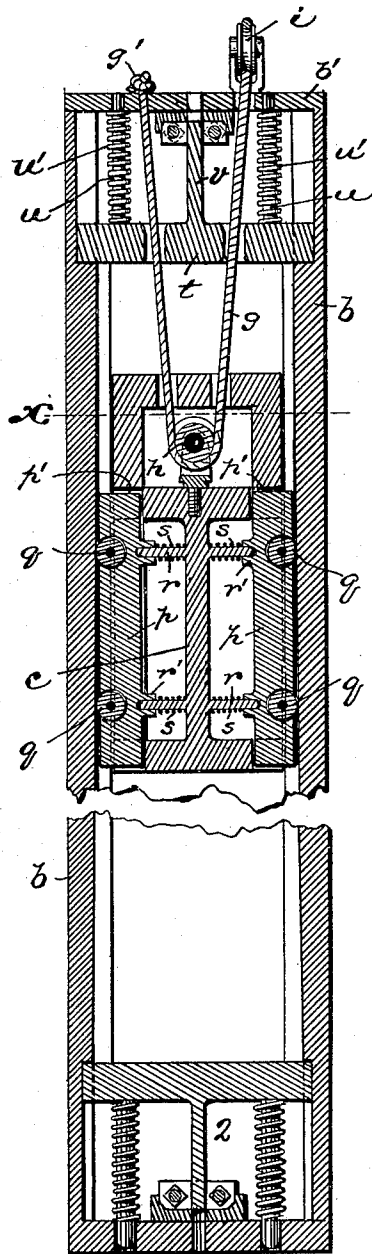


Fig. 8.

Fig. 9.

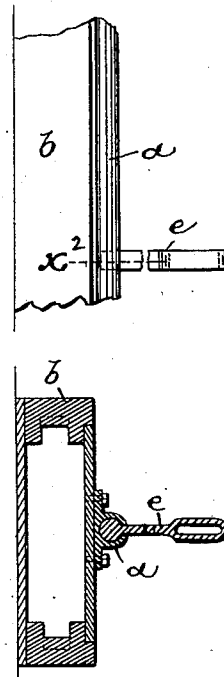


Fig. 10.

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3 Sheets—Sheet 3.

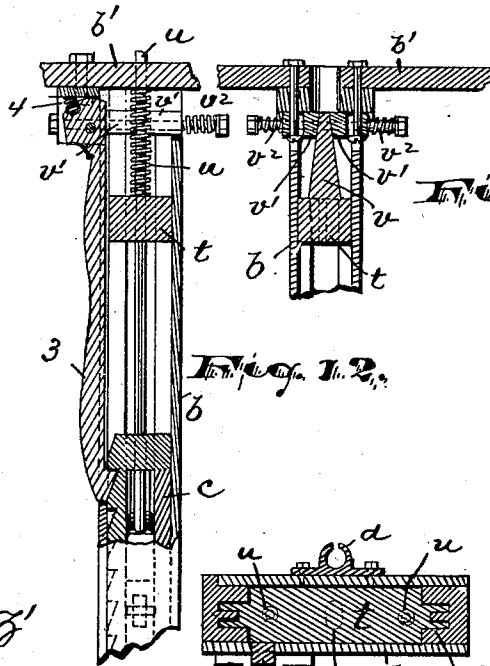
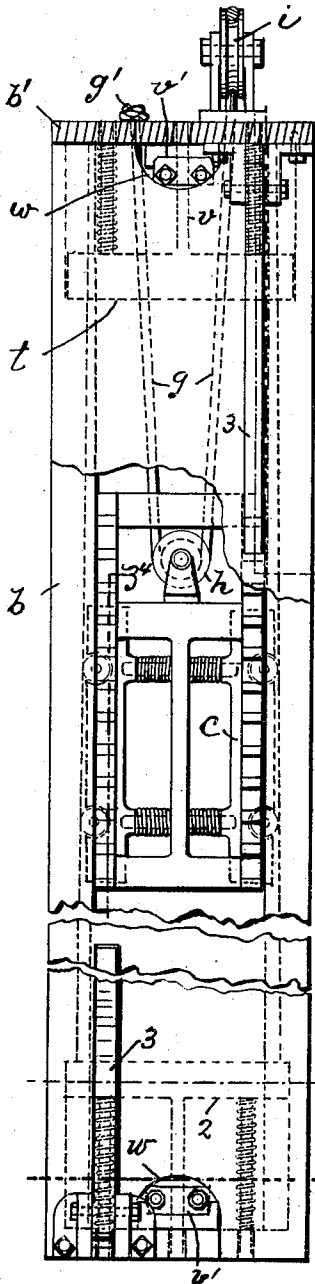


Fig. 13.

Fig. 12.

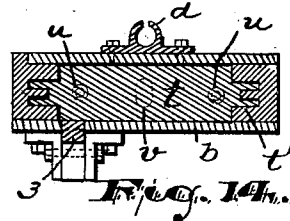


Fig. 14.

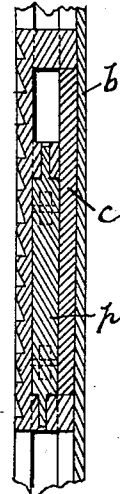


Fig. 15.

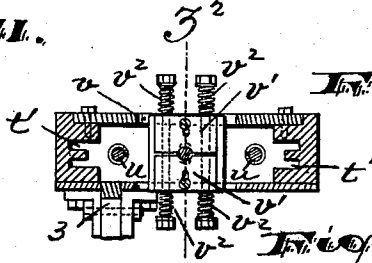


Fig. 16.

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UNITED STATES PATENT OFFICE.

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FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 673,301, dated April 30, 1901.

Application filed October 8, 1900. Serial No. 32,374. (No model.)

To all whom it may concern:

Be it known that we, NATHAN STEINFELD and CHARLES J. MEYER, citizens of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Fire-Escapes; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

The objects of this invention are to facilitate escape from a burning building and to enable the occupants of such building to escape with greater safety; to provide a device which will be convenient and effectual and one which will be of only moderate cost of construction; to enable the return movements of the carriage to be automatic and of great rapidity, so that after the said carriage has delivered one load it will quickly and automatically return to its elevated position to receive a second load; to provide a device, furthermore, which will not become clogged when standing exposed to the weather or be easily obstructed by ice, &c., and to secure other advantages and results, some of which may be hereinafter referred to in connection with the description of the working parts.

The invention consists in the improved fire-escape and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth, and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like characters of reference indicate corresponding parts in each of the several views, Figure 1 is a front elevation of a portion of a fire-escape of my improved construction. Fig. 2 is a side elevation of the upper part of the same. Fig. 3 is a plan showing more particularly the supporting arm or bracket. Fig. 4 is a section on line y^2 , Fig. 2, and showing the carriage or car in plan. Fig. 5 is a detail section taken at line y , Fig. 2, showing the construction of a brake for regulating the speed of the carriage; and Fig. 5^a is a section on line y' of Fig. 5. Fig. 6 is a detail side elevation showing more particularly the upper part

of a slideway for a counterbalance-weight; and Fig. 7 is a horizontal section of the same, taken through line x of Fig. 8, Fig. 8 being a vertical section taken on line x' of Fig. 6. Fig. 9 is a detailed side elevation showing a steadying-arm or keeper for holding the carriage in proper relation to its slideway. Fig. 10 is a section of the same, taken on line x^2 of Fig. 9. Fig. 11 is a rear elevation of the slideway for the counterbalance-weight, showing particularly the upper and lower ends thereof, the said slideway being broken away to show more clearly the construction of the counterbalance-weight and its relation to said slideway. Fig. 12 is a sectional detail taken at line z' of Fig. 11. Fig. 13 is a sectional detail taken at line z^2 of Fig. 16. Fig. 14 is a sectional detail taken at line z^3 of Fig. 11. Fig. 15 is a section taken through line z^4 of Fig. 11, and Fig. 16 is a section taken through line z^5 of Fig. 11.

In said drawings, a indicates a suitable building, to which my improved fire-escape is attached. b is a box-like construction preferably secured to the outside of said building and extending from an elevated point thereon downward to or near to the ground. Said box-like construction b provides interiorly a slideway for a counterbalance-weight c of peculiar construction, and on the outside said box-like structure provides a slideway d for a keeper-arm e , Figs. 1, 2, 4, 9, and 10, said keeper-arm being movably attached to the under side of the carriage f and held in sliding relation to the slideway, so that the said carriage while moving vertically upward or downward will be held at a given distance from the said slideway and be prevented from swaying from or toward the building. The said arm is preferably adjustably secured to the carriage to enable the said carriage to be held at a greater or less distance from the building, and we thus are enabled to hold a carriage so that it will be prevented from striking against copings, sills, window-caps, or the like which may be formed upon the face of the building.

We prefer to have the slideway for the keeper-arm e of the carriage as shown in the drawings, where the said slideway is shaped in resemblance to a longitudinally-slotted tube having ears or means for fastening to

the box, the interior of the tube being undercut, so as to form at opposite sides of the the slot opposite lips or keepers for holding enlarged extremity of the arm within said slideway, the slideway thus being more perfectly protected against the accumulation of ice, by means of which the vertical movements of the escape might possibly become obstructed.

The counterbalance-weight *c* is suspended within the box *b* by means of a rope or cable *g*, the carriage *f* also being suspended at the other end portion of said rope. Intermediate of said weight and carriage the rope is doubled and arranged over pulleys in the following manner: At the top of the box *b* is a bracket *b'*, projecting out over the carriage, and one extremity, as *g'*, of the rope *g* is attached to said bracket at a point within the box *b* or close to the building *a*. From thence the rope extends downward within the box to a pulley *h*, fixed or fastened to the top of the counterbalance-weight *c*, and then upward again to a pulley *i* on the top of the said bracket *b'*. From this pulley *i* the rope extends outwardly from the building to a point in vertical line with the vertical axis of the said carriage, where it passes over another pulley *j* and extends downward through the top of the carriage to a pulley *k*, attached to the under side of said carriage-top. This last pulley is of peculiar construction and serves as a brake-wheel, as will be hereinafter more fully described. From this brake-pulley the rope again extends vertically upward through the top of the carriage and through the bracket and passes over another pulley, *l*, on the top of the bracket and downward through the bracket again to the carriage, the end of said rope being fastened to the said carriage by means of knotting, as at *g''*, or in any other suitable manner. By this arrangement of the rope we are enabled to secure a rotary movement to the pulley *k* at the top of the carriage and by obstructing or retarding this movement by means of a brake-shoe *m* or other suitable frictional device to prevent too rapid downward movements of the carriage, and should the shoe be pressed against the wheel with sufficient force the downward movement of the carriage under the weight of the occupant will be entirely stopped. The brake-shoe *m* comprises, preferably, a band *n* of flexible leather having a lining of metal or other material suitable to produce a frictional contact, the said flexible piece being fastened at one end, as at *n'*, to the top of the carriage, and thence passing down is turned against the under side of the pulley *k* and carried upward and made fast to a brake-rope *o*, which extends over a pulley *o'* and downward again to a position at which it may easily be grasped by the hand to operate the brake. By pulling upon said brake-rope *o* the frictional plate is pressed hard against the periphery of the pulley *k*, so that the rotary movement of said pulley is retarded or prevented, as may be de-

sired, and the carriage on which the occupant stands is wholly under his control.

To secure a proper frictional surface on the brake-pulley *k*, we prefer to provide the said pulley on opposite sides of the rope-groove with broad frictional surfaces, by means of which a slight draft upon the brake-rope will secure the desired retardation of movement.

While we have shown one arrangement of brake, it is obvious that we may employ any other equivalent means for braking the downward movement of the carriage, and where the descent is a comparatively short one we may dispense with the brake entirely, although in ordinary constructions we prefer to employ the brake and we prefer the construction detailed.

The counterbalance-weight *c*, suspended from the rope *g* within the box *b*, comprises, preferably, a metal frame-like structure of sufficient weight to counterbalance or overbalance the weight of the carriage *f*, so that when said carriage is relieved of its load the weight *c* will cause said carriage to ascend to its initial or normal position. At the opposite sides of said weight the same is provided with movable pieces *p*, seated in grooves or sockets *p'*, formed in the sides of the said weight and permitted a limited lateral movement in said sockets. On the outer sides of said movable pieces *p* the same are provided with roller-bearings for rolls *q*, which engage the walls of the box-like casing *b*, and on the inner sides the said pieces have sockets *r'*, loosely receiving pins *r* on the body of the weight and upon which the pieces slide. Springs *s* are arranged on said pins between the body of the weight and the movable piece, said springs being adapted to throw the said pieces outward with suitable force against the side walls of the box-like casing *b*. Said side walls of the casing converge upward or incline slightly toward each other, and thus as the carriage drops toward its lowest limit and the weight ascends the movable pieces *p* are pressed together and the springs *s* are contracted or brought under increased tension, tending to retard the upward movement of the weight and the downward movement of the carriage. The arrival of the carriage at its lowest limit of movement is also cushioned by interposing between the upper end of the weight *c* and the top of the box *b* a compression-plate *t*, sliding at its ends in grooves *t'* in the sides of the box. Said compression-plate has at each end a guide-rod *u*, sliding through an aperture in the end of the box, and around each guide-rod is a spiral cushioning-spring *u'*, tending to throw the plate toward the weight. Furthermore, the compression-plate has a central conical or wedge-shaped plunger *v* extending rearward and lying between friction-blocks *v'*, held against its opposite sides by springs *v''*. Thus to compress the plate the conical plunger *v* must be forced in between the frictional blocks *v'*, which move toward the front and

rear, respectively, of the box or casing *b* through apertures *w*. The lateral springs *v*² resist this, producing a friction which added to the resistance of the springs *w*¹ greatly retards and cushions the upward movement of the weight, and consequently the downward movement of the carriage. A similar cushioning device 2 is provided at the lower limit of movement of the weight, so that the weight will not throw the carriage with too severe a jar or impact against the bearing or bracket *b*¹ at the top of the box.

To hold the weight *c* at either its lower or upper limit of movement, we have provided at both the upper and lower ends of the box-like casing *b* a pawl 3, which enters automatically into engagement with ratchet-teeth formed on the weight *c*. Said pawls are normally held in engagement with the ratchet-teeth by springs 4, and one pawl is adapted to engage the weight as it rises to the top, while the other serves to retain the weight in its lowest position when it is desired that the carriage shall not be operated by said weight. Said pawls may be disengaged from the weight either by hand or any other suitable means. These pawls are employed in order to secure increased safety against accident or premature operation of the carriage; but such pawls may sometimes be dispensed with and the frictional brake depended on to hold the carriage in its elevated position while receiving its load or at its lowest position while discharging the passengers.

The carriage *f* preferably comprises, besides the main platform *f*¹, a bridge portion *f*², adapted to reach out to the usual fire-escape balconies 5 at the various windows, as shown in Fig. 1. A hand-rail *f*³ may be provided for greater safety.

In operating the device the person escaping from the building steps from the top landing to the carriage, held in its elevated position by the pawl. The brake-rope *o* is then grasped and the pawl thrown from engagement with the rack and the carriage allowed to lower under the added weight of the load, the downward movement being controlled by the brake *n*. Arriving at the lower end of movement, which is cushioned, as before described, the persons within the carriage step therefrom, and the latter immediately rises to its elevated position automatically unless the weight is held by the upper pawl. Released from said pawl, the overbalancing-weight causes the carriage to rise to its initial position ready to receive a second load. Because of the weight the carriage rises with great speed, so that little time is lost in return movements.

Having thus described the invention, what we claim as new is—

1. In a fire-escape, the combination of a vertical box-like casing adapted to be fixed to the outer wall of a building and providing parallel ways, a carriage and a weight sliding in said ways, pulleys at the top of the casing and

a pulley at the inner side of the top of the carriage, a rope passing around said pulleys, and a brake adapted to be applied to the pulley in the carriage, substantially as set forth.

2. In a fire-escape, the combination of a vertical slideway adapted to be fastened to the outer wall of a building, a weight traveling in said slideway, a forwardly-projecting bracket at the top of said slideway and pulleys thereon, a carriage in front of the slideway and a pulley on said carriage, a rope connecting the weight and carriage and passing around said pulleys on the bracket and carriage, and means for braking said pulley on the carriage, substantially as set forth.

3. In a fire-escape, the combination with a carriage, a vertical slideway of varying width, a weight sliding in said slideway and having laterally-movable side pieces, and springs forcing said pieces against the walls of the slideway, compression-plates at the ends of the slideway each having a wedge-shaped plunger, and spring-controlled friction-blocks pressing against said plunger, a pulley or pulleys at the top of the slideway, and a rope passing over said pulley or pulleys and supporting, at its opposite end portions, the carriage and weight respectively, substantially as set forth.

4. In a fire-escape, the combination of vertical ways, a weight and a carriage traveling in said ways, a pulley or pulleys above said ways, a pulley on the weight and a pulley on the carriage, a rope fastened at one end at the top of the ways and extending downward around the pulley on the weight, and up again and over a pulley or pulleys above the ways then downward around the pulley on the carriage and upward again around a pulley at the top of the ways and being at its extremity made fast to the carriage, and means for braking the pulley on the carriage, substantially as set forth.

5. In a fire-escape, the combination of a carriage *f*, having a pulley on the top of its interior chamber, a suspending-rope having a downward loop inclosing said pulley, and a brake for said pulley, the pulley presenting wide friction-surfaces at each side of its rope-groove and the said brake comprising a flexible strip fixed at one end and extending part way around the pulley and being connected to draft means, and said means for applying draft, substantially as set forth.

6. In a fire-escape, the combination of a vertically-moving carriage, a weight connected to said carriage and adapted to rise as the carriage descends and vice versa, a casing or box providing a slideway for said weight, said weight having at its sides laterally-movable pieces *p*, and having springs forcing said pieces outward, and the slideway for said weight decreasing in width from the bottom upward, substantially as set forth.

7. The combination with the carriage *f*, the counterbalancing-weight *c*, and a casing *b*, providing a slideway for said weight, and hav-

ing an outer groove *d*, receiving a guiding-arm *e*, on the carriage, of a compression-plate disposed transversely of the said slideway near its end and having rearwardly-extending rods *u*, working in apertures in the end of the casing *b*, and spiral springs upon said rods, a central conical or wedge-shaped plunger on the rear of said compression-plate, lateral frictional blocks, and springs forcing
 5 ing rods *u*, working in apertures in the end of the casing *b*, and spiral springs upon said rods, a central conical or wedge-shaped plunger on the rear of said compression-plate, lateral frictional blocks, and springs forcing
 10 said blocks against the plunger, substantially as set forth.

8. In a fire-escape, the combination of a carriage or car adapted to move up and down, a pulley on said carriage or car, a suspending

rope or cable having a loop passing beneath 15 said pulley and sustaining a portion of the weight of the car, a counterbalance-weight, and means for braking the said pulley on the carriage or car, substantially as set forth.

In testimony that we claim the foregoing 20 we have hereunto set our hands this 12th day of September, 1900.

NATHAN STEINFELD.
 CHARLES J. MEYER.

Witnesses:

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 C. B. PITNEY.