

No. 736,056.

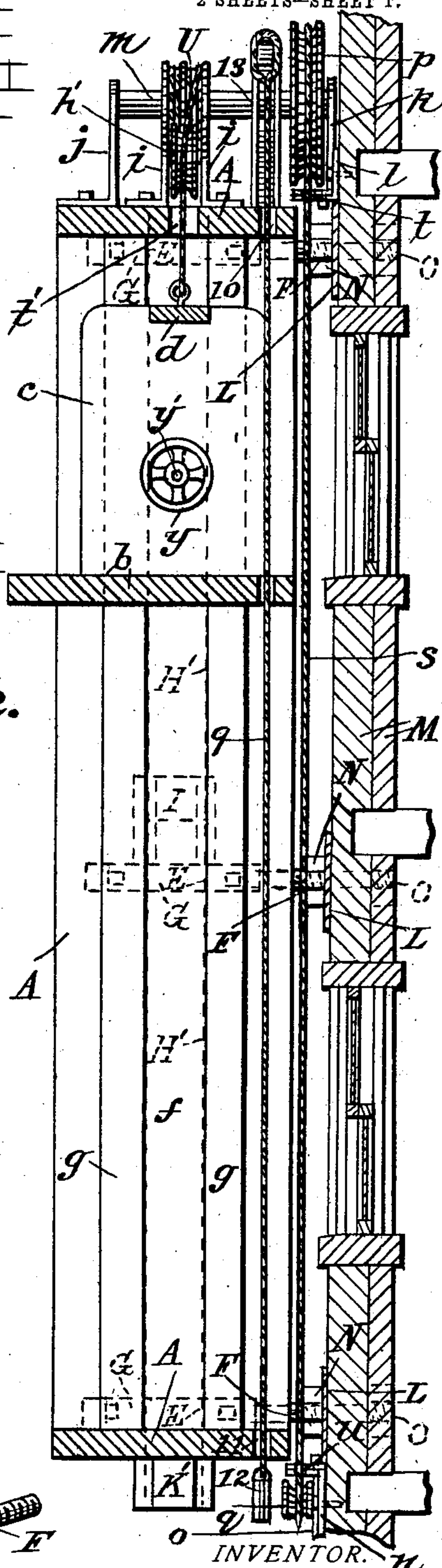
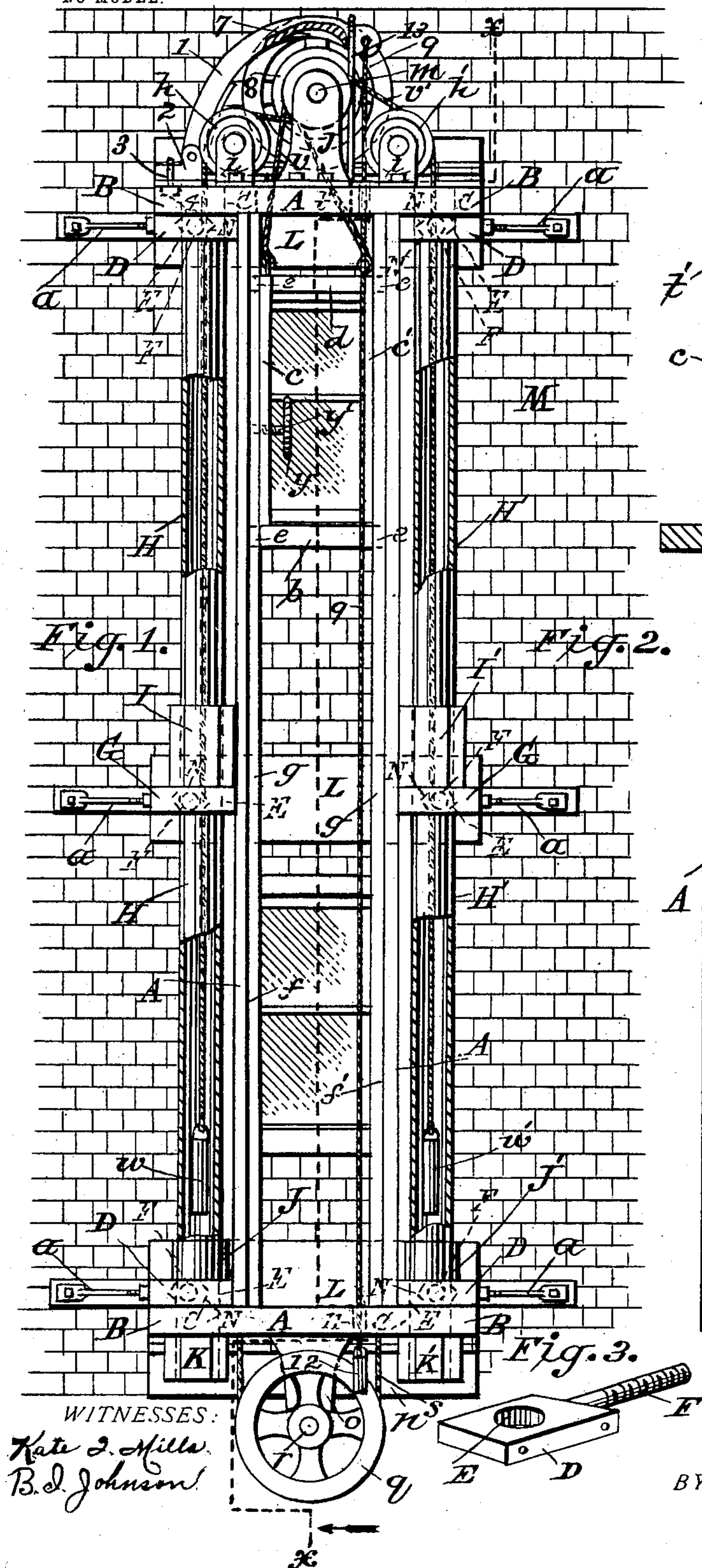
PATENTED AUG. 11, 1903.

E. BANHAGEL.
FIRE ESCAPE.

APPLICATION FILED APR. 13, 1903.

NO MODEL

2 SHEETS—SHEET 1.



No. 736,056.

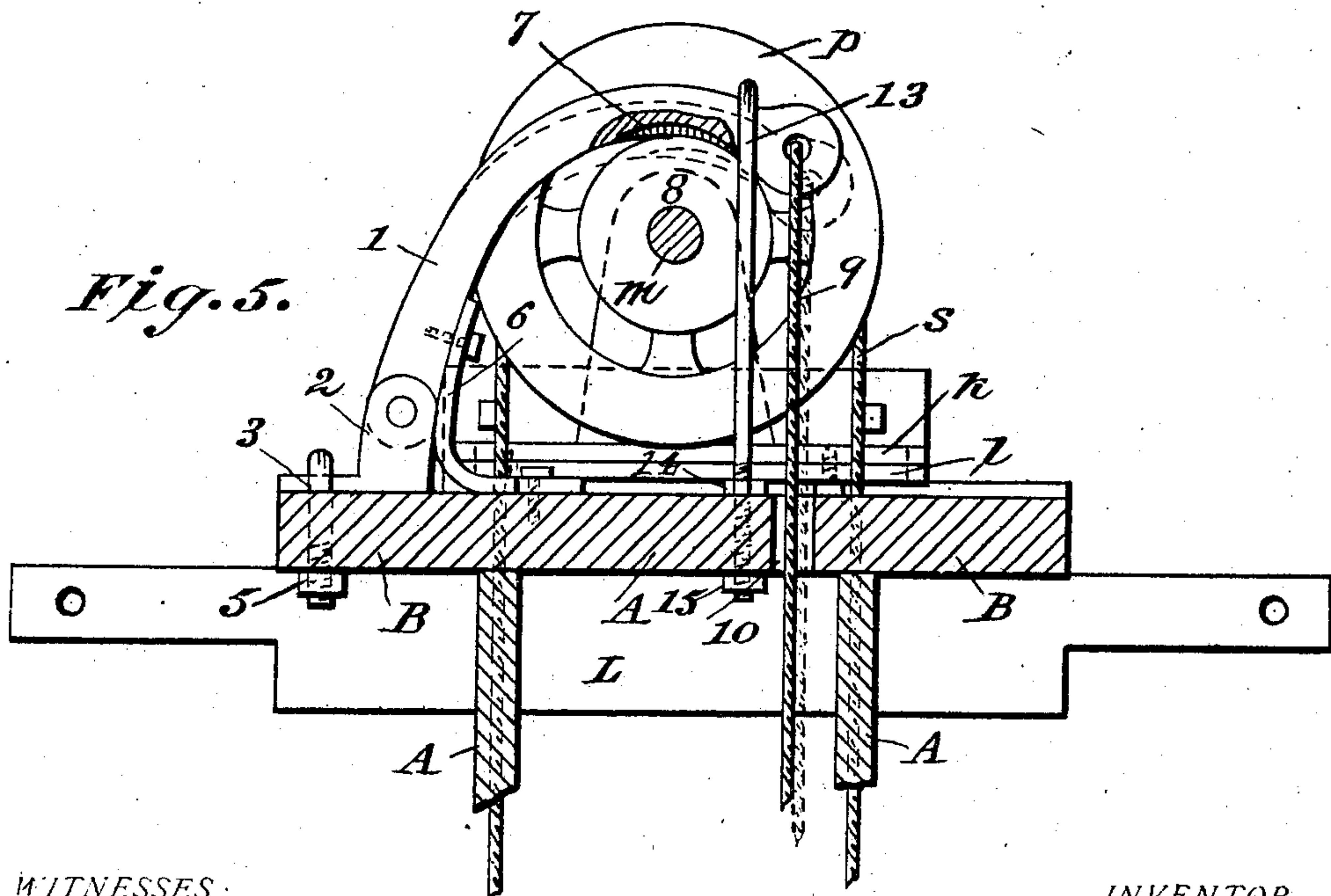
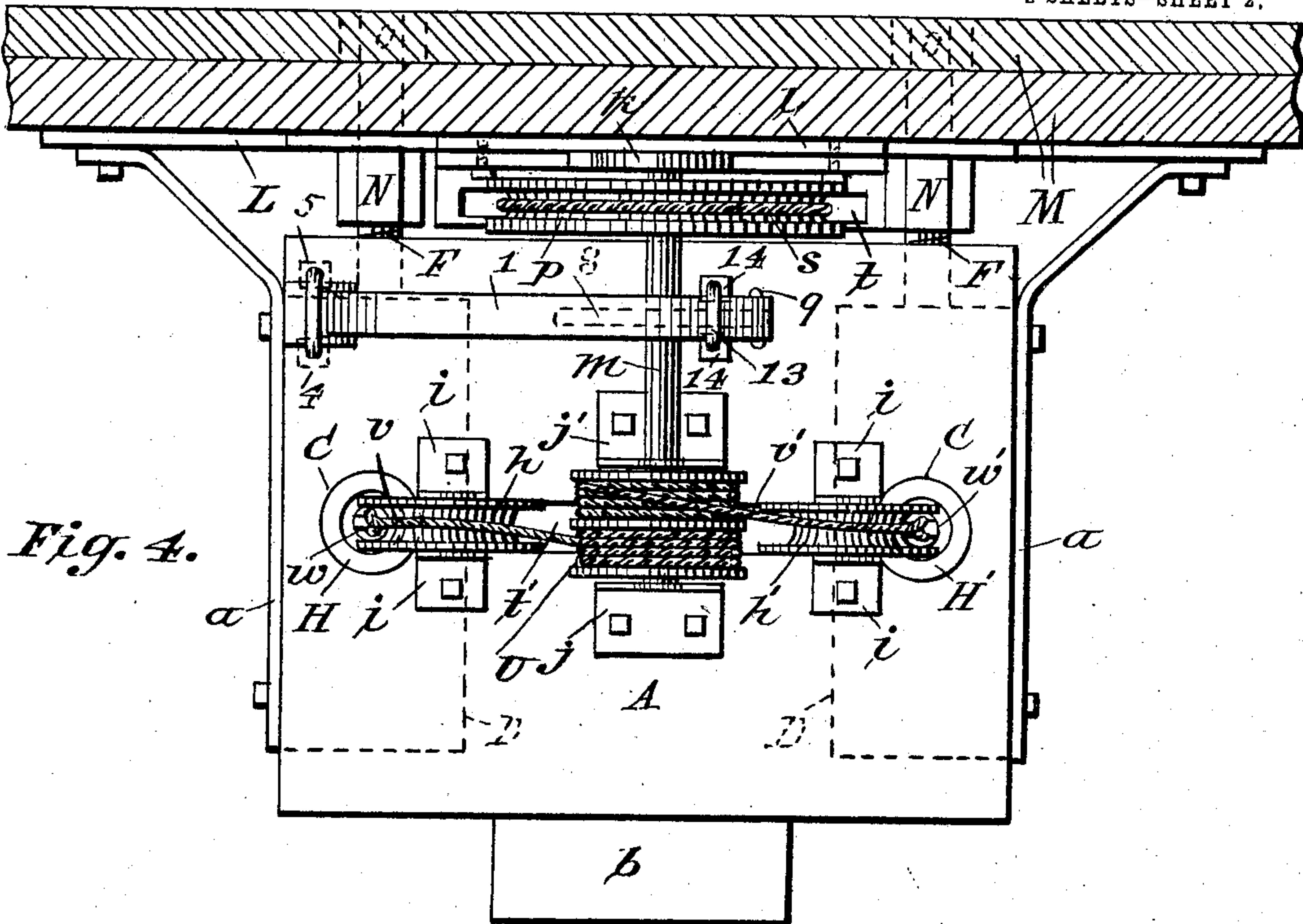
PATENTED AUG. 11, 1903.

E. BANHAGEL.
FIRE ESCAPE.

APPLICATION FILED APR. 13, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



WITNESSES:

Kate L. Mills,
B. S. Johnson.

INVENTOR.

Edward Banhagel.
BY Edward L. Mills,
ATTORNEY.

UNITED STATES PATENT OFFICE.

EDUARD BANHAGEL, OF IONIA, MICHIGAN.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 736,056, dated August 11, 1903.

Application filed April 13, 1903. Serial No. 152,291. (No model.)

To all whom it may concern:

Be it known that I, EDUARD BANHAGEL, a citizen of the United States, residing at Ionia, in the county of Ionia and State of Michigan, have invented certain new and useful Improvements in Fire-Escapes; and I 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.

My invention relates to improvements in fire-escapes; and the purpose of the same is to produce a safe and rapid means of exit for a person, persons, or freight from a burning building, one which consists of simple means for operating the device either from the interior of the building through the window-opening or from the platform of the car or the ground, also one which may be used as an elevator for the use of firemen or the handling of freight either ascending or descending, one which is adapted to ascend of its own motion by the means therein employed and to descend by means of the weight of an object which is placed upon it, also one which is adapted to be adjusted to a plumb position whether the outside wall of a building to which it is adjustably attached be plumb or otherwise; and the object of my invention is to provide a device which is simple in its construction, consisting of but few parts, being light but strong as compared with its length and breadth, and which may be easily and cheaply manufactured; and, furthermore, it consists in the construction and arrangement of its parts, which will be more fully hereinafter described, and definitely pointed out in the claims. I attain these objects by means of the mechanism herein described, and illustrated by the accompanying drawings, in which—

Figure 1 is a front elevation of my improved fire-escape, showing a portion of its parts as being in section in order to disclose more fully the means by which the car of the same is operated. Fig. 2 is a longitudinal vertical section of the same, taken on the line *xx* of Fig. 1. Fig. 3 is a detail perspective view of one of my improved supporting-plates shown as having been detached from its shaft. Fig. 4 is an enlarged plan view of my improved fire-escape shown in detail to more fully illus-

trate its operating mechanism. Fig. 5 is an enlarged front view of my improved brake mechanism shown in detail as being attached to the upper portion of the shaft, which portion is shown partly in section to more fully disclose the means whereby and through which it is operated.

Referring to the drawings, A indicates a perpendicular oblong shaft in the form of a frame having overlapping ends B B B B at its top and bottom (made of wrought-iron or other non-combustible material) with holes C C C C extending through them midway their length and breadth.

D D D D D are oblong plates having holes E E E E through their centers, their ends being provided with round long threaded lugs F F F F F F. Said plates D D D D are secured to the under and upper side of the overlapping end portions B B B B, their holes E E E E being of the same diameter as the holes C C C C in said overlapping end portions B B B B.

G G are plates similar in construction to plates D D D D and are secured to the perpendicular walls of the oblong shaft A about midway the under and upper side portion of the overlapping ends B B B B.

H and H' are pipes, which are of the same outside diameter as the holes E E E E in the oblong plates D D D D and holes C C C C in the overlapping end portions B B B B, also in the oblong plates G G, through which they extend in an upright or perpendicular position. They are placed in sections one above another and are secured by means of nuts I and I', threaded collars J and J', and nuts K and K'.

L L L are elongated face-plates secured to the outside wall of a building M by means of bolts inserted therein. The oblong plates D D D D and G G, which support the perpendicular oblong shaft A, are adjustably secured to the wall M by means of the round long threaded lugs F F F F F F, extending through it and the elongated face-plates L L L, and are held in place by the nuts N N N N N N on the outside and nuts O O O O O O, countersunk in the inner portion of said wall M.

a a a a a are angular braces, one of the ends of which is secured to the edges of the oblong plates D D D D and G G by means of

bolts inserted therein and the opposite ends to the front face of the elongated face-plates L L L by the same means. The purpose of said braces *a a a a a* is to hold the perpendicular oblong shaft in a rigid position and prevent the same from vibrating when the car of the device is in motion, which car is of ordinary construction, consisting of a platform *b*, with side walls *c* and *c'*, said side walls *c* and *c'* being connected at their tops by means of a cross-beam *d*, said car being interposed between the inner surfaces of the perpendicular walls of the perpendicular oblong shaft A and is held in place by means of tongues *e e e e* and grooves *f* and *f'*, which grooves are formed by the perpendicular strips *g g g g* and extend longitudinally with the walls of the perpendicular oblong shaft A midway their outer edges, two of said tongues *e e* being interposed within the grooves *f* and *f'*, opposite the platform *b*, and two at the top of the side walls *c* and *c'*, opposite the ends of the cross-beam *d*.

Referring to Figs. 1 and 4, *h* and *h'* are grooved pulleys having projecting shaft ends which are supported in standards *i i i i* at the upper portions of the same, said standards *i i i i* being secured to the upper surface of the perpendicular oblong shaft A by means of bolts inserted therein. Said grooved pulleys *h* and *h'* have their outer surfaces in perpendicular alinement and parallel to the perpendicular front surface of the perpendicular oblong shaft A.

j and *j'* are standards secured to the upper horizontal surface of the perpendicular oblong shaft A, midway the outer perpendicular surfaces of said perpendicular oblong shaft A, by means of bolts inserted therein. *k* is a standard of similar construction, which is secured to an angular plate *l*, abutting the upper edge of one of the elongated face-plates L by means of bolts inserted therein. A shaft *m* is mounted within said standards *j, j'*, and *k* at their upper end portions. Directly underneath the angular plate *l* and standard *k* is an angular plate *n* and standard *o* of similar construction, said angular plate *n* having its outer surface abutting the lower edge of the elongated face-plate L, which is directly opposite the lower horizontal portion of the perpendicular oblong shaft A.

Mounted upon the shaft *m* near the standard *k* is a large grooved pulley *p*. Directly underneath said grooved pulley *p* is another pulley *q* of similar construction and of the same diameter, which is mounted on a shaft *r*, supported in the standard *o*. Said shaft *r* is fixedly secured to the angular plate *n* and outside wall M of the building by means of bolts inserted therein.

s is an endless cable extending over pulleys *p* and *q* through elongated slots *t* and *u*, formed in the horizontal portions of the standards *k* and *o* and angular plates *l* and *n*.

Mounted on the shaft *m* between the up-

right portions of the standards *j* and *j'* is a drum U, having triple flanges formed therewith, one on each outer surface and one in the center thereof.

v and *v'* are cables which are wound around the drum U in opposite directions, one from the upper side and the other from the under side thereof, and they are separated from each other by means of a flange in the center of said drum U, the purpose of which is to prevent the cables *v* and *v'* rubbing against each other and also to prevent unnecessary friction against the flanges of the grooved pulleys *h* and *h'*, which would otherwise be when they are in motion should two separate drums with double flanges be used instead of one with three flanges, as shown and described. The ends of the cables *v* and *v'* extend downward through an elongated slot *t'* in the upper portion of the perpendicular oblong shaft A and are secured to the tops of the walls *c* and *c'* of the car. The opposite ends of said cables *v* and *v'* extend over the grooved pulleys *h* and *h'* and are secured to weights *w* and *w'* within the pipes H and H', said weights *w* and *w'* serving the purpose for elevating the car to the upper portion of the perpendicular oblong shaft A.

y is a hand-wheel having a threaded shaft *y'*, which extends through the wall *c* of the car opposite the grooves *f*. It is adapted to regulate the speed of the car while it is descending.

Referring to Fig. 5, my improved brake mechanism consists of a curved arm 1, pivotally secured within a forked standard 2, secured to the upper surface of one of the overlapping portions B of the perpendicular oblong shaft A by means of a clevis 3 and nuts 4 and 5. 6 is a curved spring secured to the under side of the curved arm 1 and the upper surface of the perpendicular oblong shaft A by means of bolts inserted therein. 7 is a curved groove formed in the under side of the curved arm 1 near its outer end, said curved portion being of the same contour as the outer circumferential surface of the wheel 8, which is mounted upon the shaft *m* directly underneath it. The purpose of the groove 7 is to prevent the curved arm 1 springing sidewise when in frictional contact with the wheel 8. At the outer free end of the curved arm 1 a cable 9 is secured, which extends downward through holes 10 and 11 in the upper and lower portions of the perpendicular oblong shaft A. Said cable 9 is kept in a taut position by means of a weight 12 at its lower end. 13 is an elongated clevis which forms a stop against which the outer end of the curved arm 1 bears at its upper end portion, the curved arm 1 being interposed between the upright portions of said elongated clevis 13, which clevis is secured to the upper portion of the perpendicular oblong shaft A by means of nuts 14 14 and 15 15.

A suitable covering or housing should be provided to protect the working parts of the

device; but it was thought to be unnecessary to show one in the drawings, as it would not be considered a part of my invention.

To operate the car from an upper story of a building, it will be necessary to see that the shaft y' at the center of the hand-wheel y is turned up tight against the perpendicular surface of the groove f until a person has stepped upon the platform b and is ready to descend, when the hand-wheel y is gradually turned in the opposite direction until the requisite speed is attained. The car may be quickly stopped at any portion of its upward flight by pulling down on the cable 9, which brings the curved arm 1 in frictional contact with the wheel 8, mounted on the shaft m . It will be readily understood that the car will only be elevated when used as an elevator, when the weights w and w' are heavier than the objects placed therein, without pulling down hand over hand on the endless cable s .

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

1. The combination with the side wall of a building and elongated face-plates secured thereto, of a fire-escape comprising a perpendicular, oblong shaft, having overlapping ends at its top and bottom with holes extending therethrough midway their length and breadth and two grooves formed in its inner, perpendicular surface, and a slot in its upper, horizontal portion, a series of oblong plates secured to the under and upper side of the overlapping ends and side wall of the perpendicular, oblong shaft, having holes in their centers and round, long threaded lugs on their ends, with a series of pipes extending within and through said holes supported and secured by means of threaded collars and nuts, a car having a cross-beam, platform and side walls with tongues formed therewith, a series of standards secured to the upper surface of the horizontal portion of the perpendicular, oblong shaft, and to a standard and angular plate on the side wall of the building, which standard and angular plate have an elongated slot in their horizontal portion, a flanged drum mounted on a shaft journaled within said standards, having cables wound around said drum in opposite directions, one from the upper side, and the other from the under side thereof, two grooved pulleys mounted on standards secured to the upper surface of the perpendicular, oblong shaft, and two weights interposed within the series of pipes secured within the overlapping ends of the perpendicular, oblong shaft, having said cables extended over said grooved pulleys with each of their ends secured to said weights, their opposite ends extended downward through the elongated slot in the upper, horizontal portion of the perpendicular shaft, and secured to the upper ends of the side walls of the car, with a fixed pulley secured to the inner end of the shaft m , which shaft m , is mounted within the series of standards se-

cured to the upper surface of the horizontal portion of the perpendicular, oblong shaft, and to the standard and angular plate on the side wall of the building, and a movable pulley loosely mounted on a shaft secured within a standard and angular plate on the side wall of the building directly underneath the standard and angular plate above them, having an elongated slot, also, in their horizontal portion, and an endless cable extended over said pulleys and through said slots, and means for securing the oblong plates with the perpendicular, oblong shaft, to the elongated face-plates and side wall of the building, and the car within the perpendicular, oblong shaft, at any portion of its travel, substantially as described.

2. The combination with the side wall of a building and elongated face-plates secured thereto, of a fire-escape comprising a perpendicular, oblong shaft, having overlapping ends at its top and bottom with holes extending therethrough midway their length and breadth, and two grooves formed in its inner, perpendicular surface and a slot in its upper, horizontal portion, a series of oblong plates secured to the under and upper side of the overlapping ends and side walls of the perpendicular, oblong shaft, having holes in their centers and round, long threaded lugs on their ends, with a series of pipes extended within and through said holes supported and secured by means of threaded collars and nuts, a series of angular braces secured to the edges of said oblong plates, a car having a cross-beam, platform and side walls with tongues formed therewith, a series of standards secured to the upper surface of the horizontal portion of the perpendicular, oblong shaft, and to a standard and angular plate on the side wall of the building, which standard and angular plate have an elongated slot in their horizontal portion, a flanged drum mounted on a shaft journaled within said standards, having cables wound around said drum in opposite directions, one from the upper side, and the other from the under side thereof, two grooved pulleys mounted on standards secured to the upper surface of the perpendicular, oblong shaft, and two weights interposed within the series of pipes secured within the overlapping ends of the perpendicular, oblong shaft, having said cables extended over said grooved pulleys with each of their ends secured to said weights, their opposite ends extended downward through the elongated slot in the upper, horizontal portion of the perpendicular, oblong shaft, and secured to the upper ends of the side walls of the car, with a fixed pulley secured to the inner end of the shaft m , which shaft m , is mounted within the series of standards secured to the upper surface of the horizontal portion of the perpendicular, oblong shaft, and to the standard and angular plate on the side wall of the building, and a movable pulley loosely mounted on a shaft secured within a standard and angular

plate on the side wall of the building directly underneath the standard and angular plate above them, having an elongated slot, also, in their horizontal portion, and an endless cable extended over said pulleys and through said slots, and means for securing the angular braces with the oblong plates and perpendicular, oblong shaft, to the elongated face-plates and side wall of the building, substantially as described.

3. In a fire-escape, the combination of the perpendicular, oblong shaft A, having overlapping ends B, holes C, grooves *f*, and *f'*, elongated slot *t'*, and holes 10, and 11, of a series of oblong plates D, and G, having holes E, in their centers and round, long threaded lugs F, on their ends, with a series of pipes H, and H', extended within and through said holes C, and E, supported and secured by means of threaded collars J, and J', and nuts K, and K', with a series of angular braces *a*, secured to the edges of said oblong plates D, and G, and to elongated face-plates L, on the side wall of a building, a car having a cross-beam *d*, platform *b*, and side walls *c*, and *c'*, with tongues *e*, formed therewith, a series of standards *j* and *j'*, secured to the upper surface of the horizontal portion of the perpendicular, oblong shaft, A and a standard *k*, and angular plate *l*, on the side wall of the building, having an elongated slot *t* in their horizontal portion, a shaft *m*, journaled within said standards *j*, *j'*, and *k*, with a flanged drum U, mounted thereon having cables *v*, and *v'*, wound around said drum in opposite directions, one from the upper side and the other from the underside thereof, two grooved pulleys *h*, and *h'*, mounted on standards *i*, and *i'*, secured to the upper surface of the perpendicular, oblong shaft, A, and two weights *w*, and *w'*, interposed within the series of pipes H, and H', having said cables *v*, and *v'*, extended over said grooved pulleys *h*, and *h'*, with each of their ends secured to said weights *w*, and *w'*, their opposite ends extended downward through the elongated slot *t'*, in the upper, horizontal portion of the perpendicular, oblong shaft A, and secured to the upper ends of the side walls of the car, with a fixed pulley *p*, secured to the inner end of the shaft *m*, and a movable pulley *q* loosely mounted on a shaft *r*, secured within a standard *o*, and angular plate *n*, on the side wall of the building directly underneath the standard *k*, and angular plate *l*, above them, having an elongated slot, also, in their horizontal portion, and an endless cable *s*, extending over said pulleys *p*, and *q*, and through said slots *t*, and *u*, in combination with a brake mechanism comprising a curved arm pivotally mounted within a forked standard secured to the upper surface of the perpendicular, oblong shaft, having a curved groove in the under side of said curved arm, near its outer end, and a curved spring secured to the under side of the curved arm, at

its inner, lower end portion and to the upper surface of the perpendicular, oblong shaft, a wheel fixedly mounted on the shaft *m*, adapted to be engaged with the curved groove in the curved arm, by means of a cable secured to the outer end of said curved arm, extending downward through the holes in the upper and lower horizontal portions of the perpendicular, oblong shaft, having a weight attached thereto, substantially as described.

4. In a fire-escape, the combination of the perpendicular, oblong shaft A, having overlapping ends B, holes C, grooves *f*, and *f'*, elongated slot *t'*, and holes 10, and 11, of a series of oblong plates having holes in their centers and round, long threaded lugs on their ends, with a series of pipes extended within and through said holes, supported and secured by means of threaded collars and nuts, with a series of angular braces secured to the edges of said oblong plates, and to elongated face-plates on the side wall of a building, a car having a cross-beam, platform and side walls, with tongues formed therewith, a series of standards secured to the upper surface of the horizontal portion of the perpendicular, oblong shaft, and a standard and angular plate on the side wall of the building, having an elongated slot in their horizontal portion, a shaft journaled within said standards, with a triple-flanged drum U, mounted thereon having cables wound around said triple-flanged drum in opposite directions, one from the upper side and the other from the under side thereof, and separated by means of a center flange, two grooved pulleys mounted on standards secured to the upper surface of the perpendicular, oblong shaft, and two weights interposed within the series of pipes, having said cables extended over said grooved pulleys, with each of their ends secured to said weights, their opposite ends extending downward through the elongated slot in the upper, horizontal portion of the perpendicular, oblong shaft, and secured to the upper ends of the side walls of the car, with a fixed pulley secured to the inner end of the shaft *m*, and a movable pulley loosely mounted on a shaft, secured within a standard and angular plate on the side wall of the building, directly underneath the standard and angular plate, above them, having an elongated slot also, in their horizontal portion, and an endless cable extending over said pulleys, and through said slots, in combination with a brake mechanism comprising a curved arm 1, pivotally mounted within a forked standard 2, secured to the upper surface of one of the overlapping ends of the perpendicular, oblong shaft, having a curved groove 7, in the under side of said curved arm 1, near its outer end, and a curved spring 6, secured to the under side of the curved arm 1, at its inner, lower end portion and to the upper surface of the perpendicular, oblong shaft A, a wheel 8, fixedly mounted on the shaft *m*, adapted to

be engaged with the curved groove 7, in the curved arm 1, and an elongated clevis 13, secured in the upper, horizontal portion of the perpendicular, oblong shaft, and means for
5 operating the curved arm 1, within the elongated clevis 13, substantially as described.

5. The combination of the shafts *m*, and *r*, pulleys *p*, and *q*, and endless cable *s*, with the standards *k*, and *o*, and angular plates *l*,

and *n*, having slots *l*, and *u*, therein, substantially as described.

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

EDUARD BANHAGEL.

Witnesses:

W. B. HEATH,
LEE YATES.