

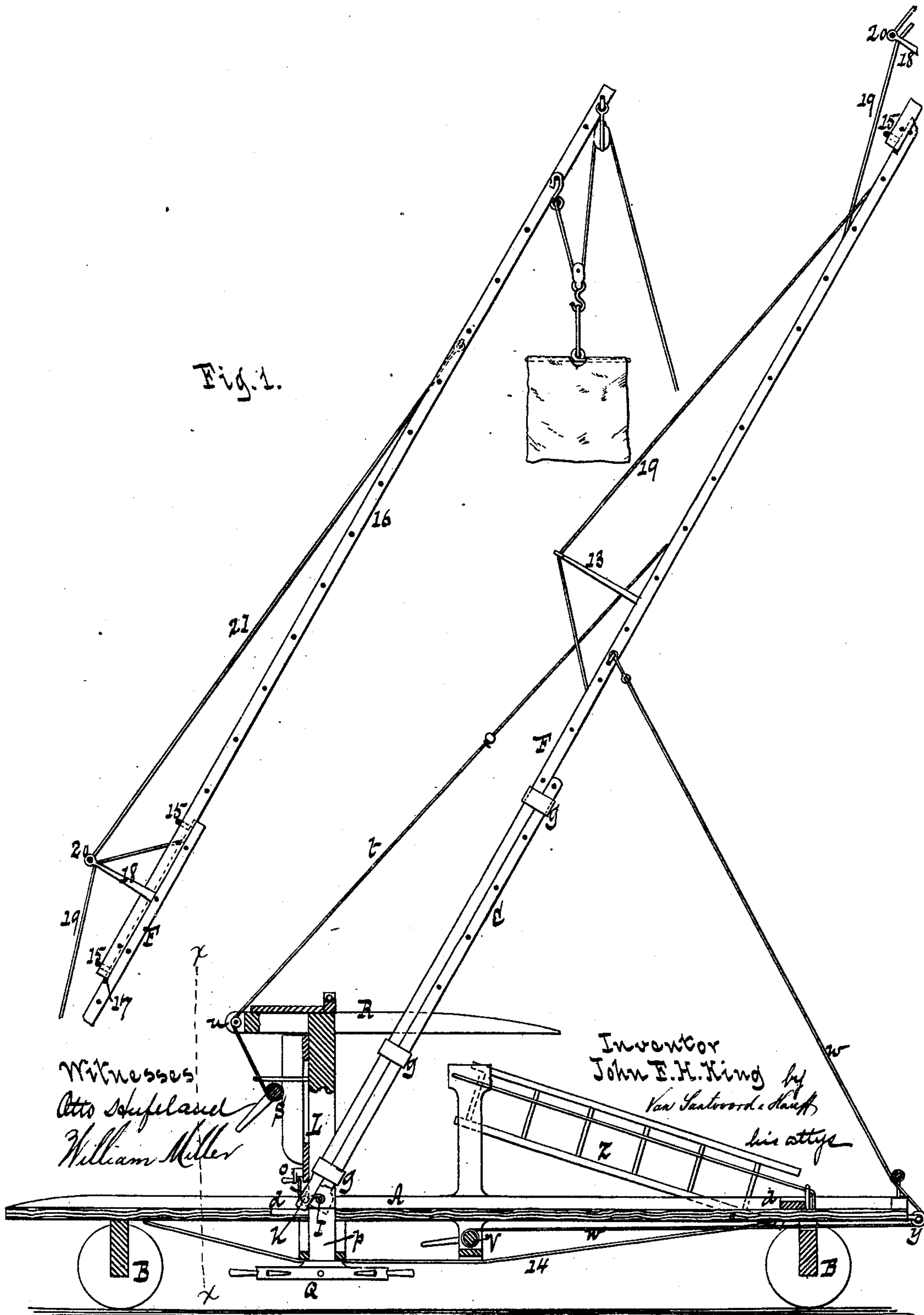
(No Model.)

4 Sheets—Sheet 1.

J. F. H. KING.
Fire Escape Ladders.

No. 235,255.

Patented Dec. 7, 1880.



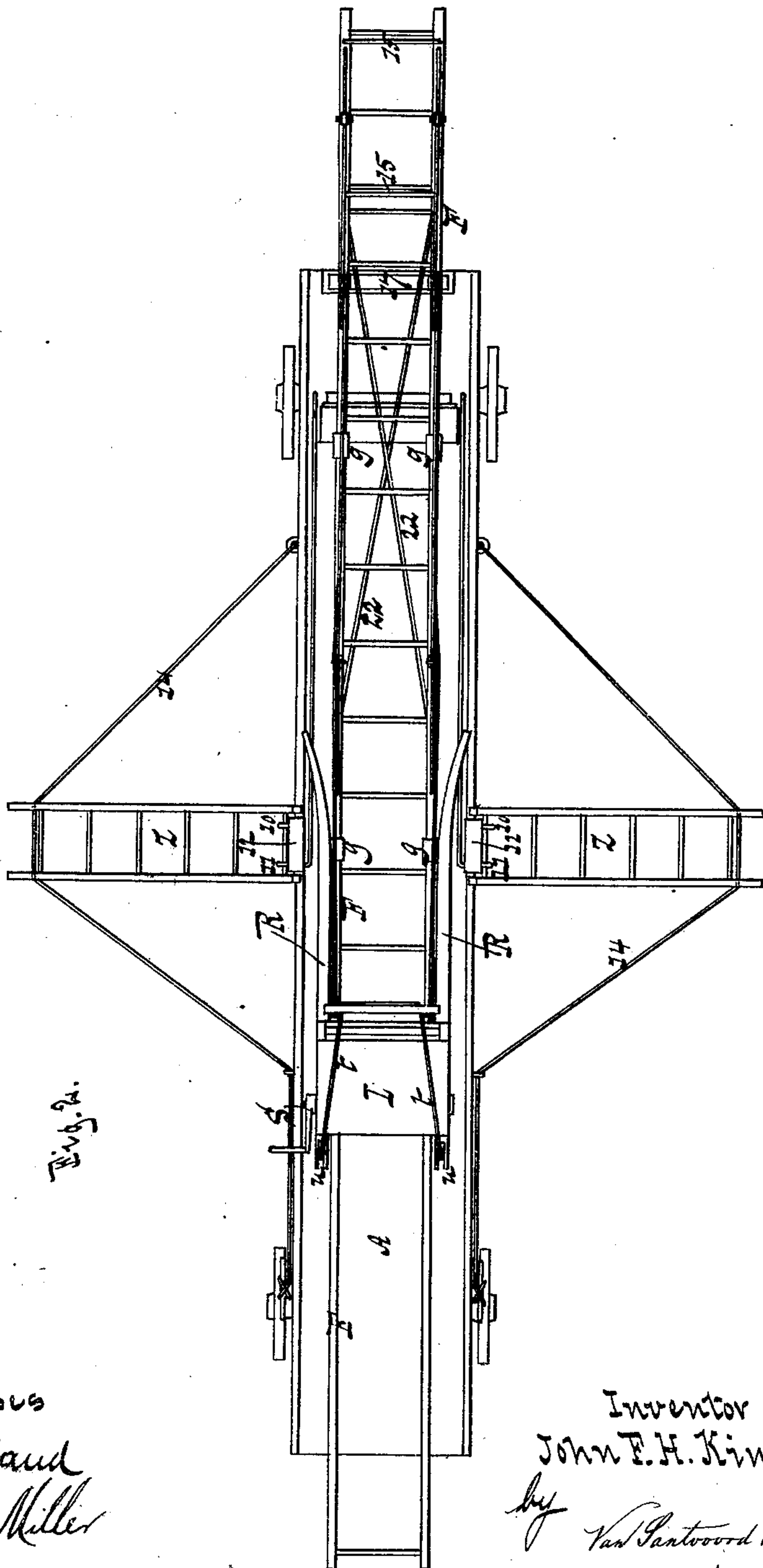
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4 Sheets—Sheet 2.

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Witnesses
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William Miller

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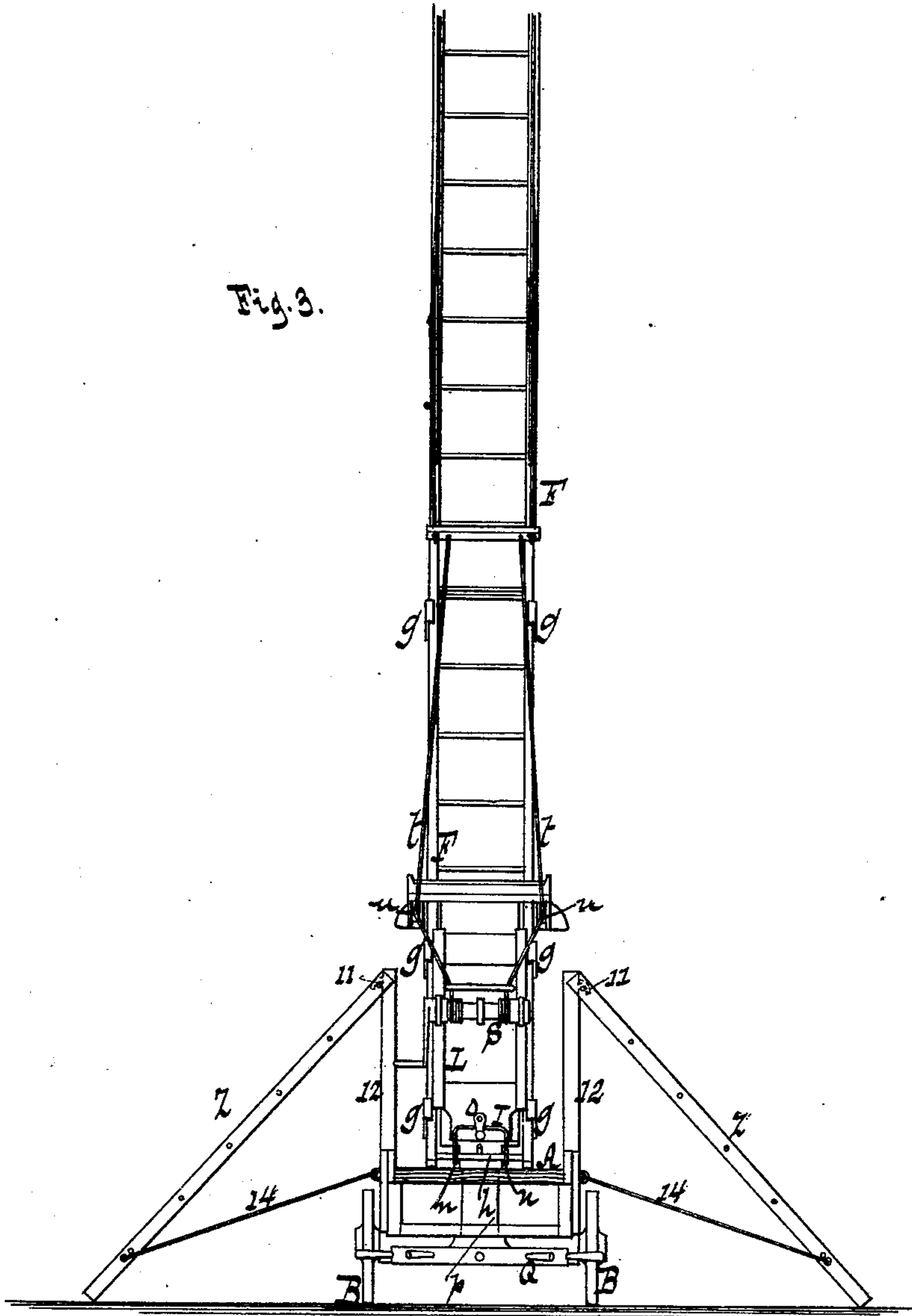
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Fig. 4.

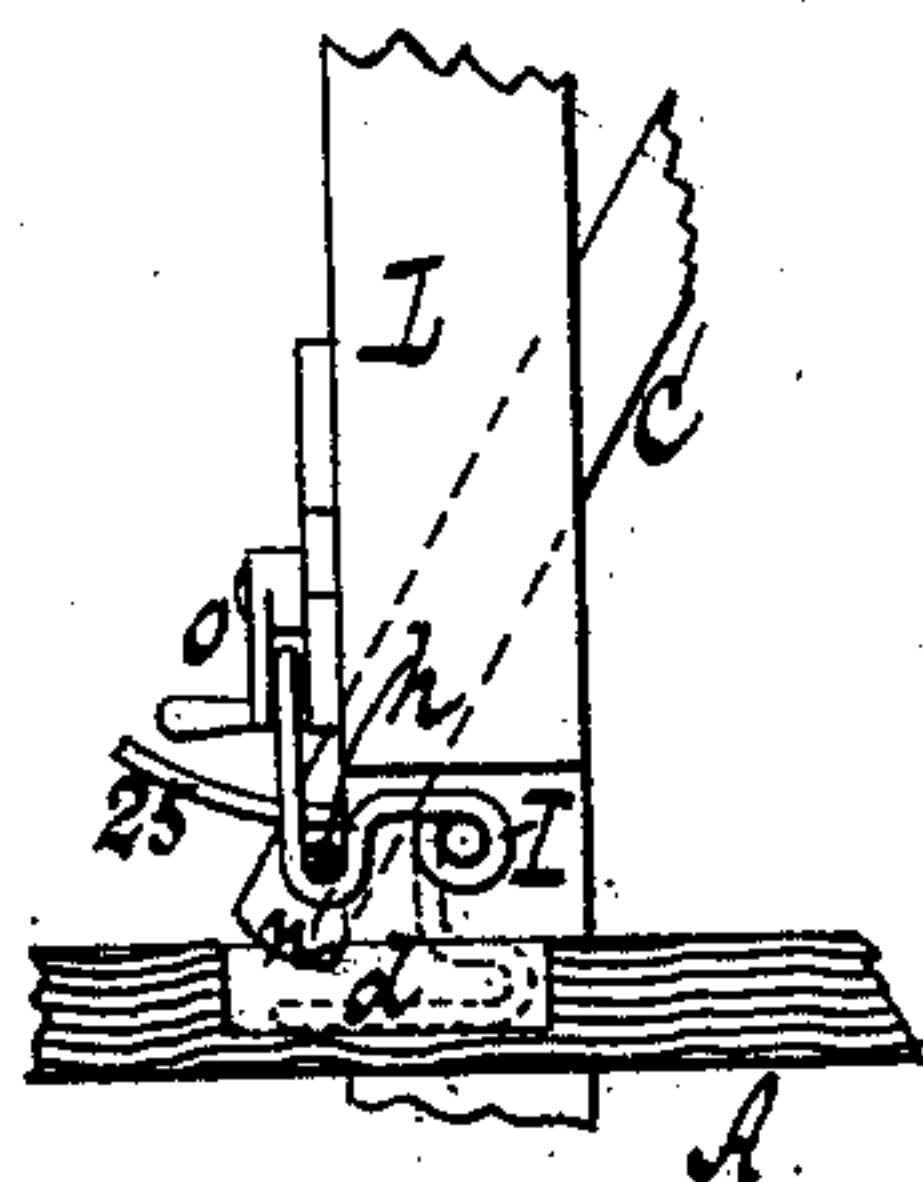


Fig. 5.

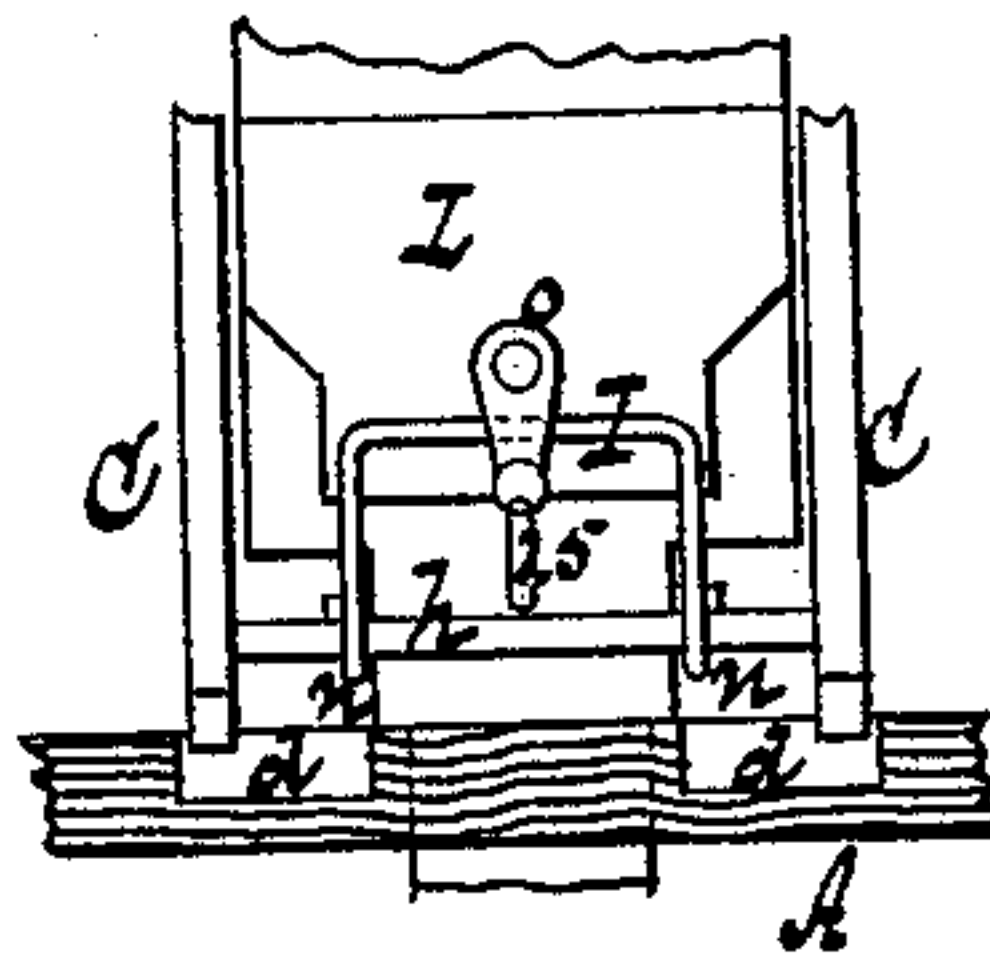


Fig. 6.

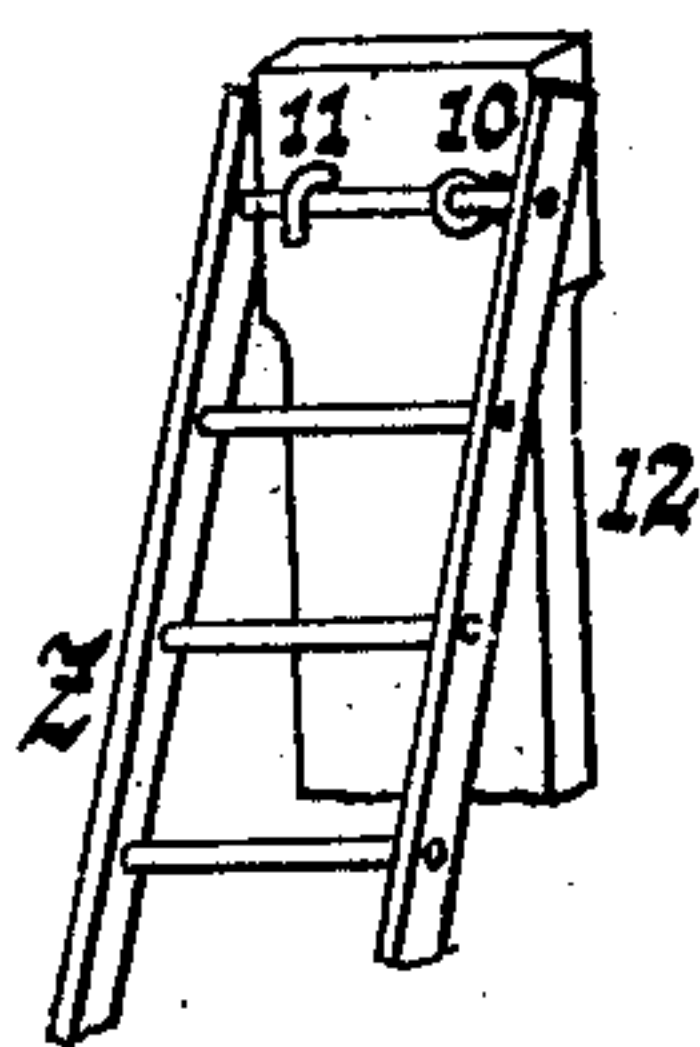
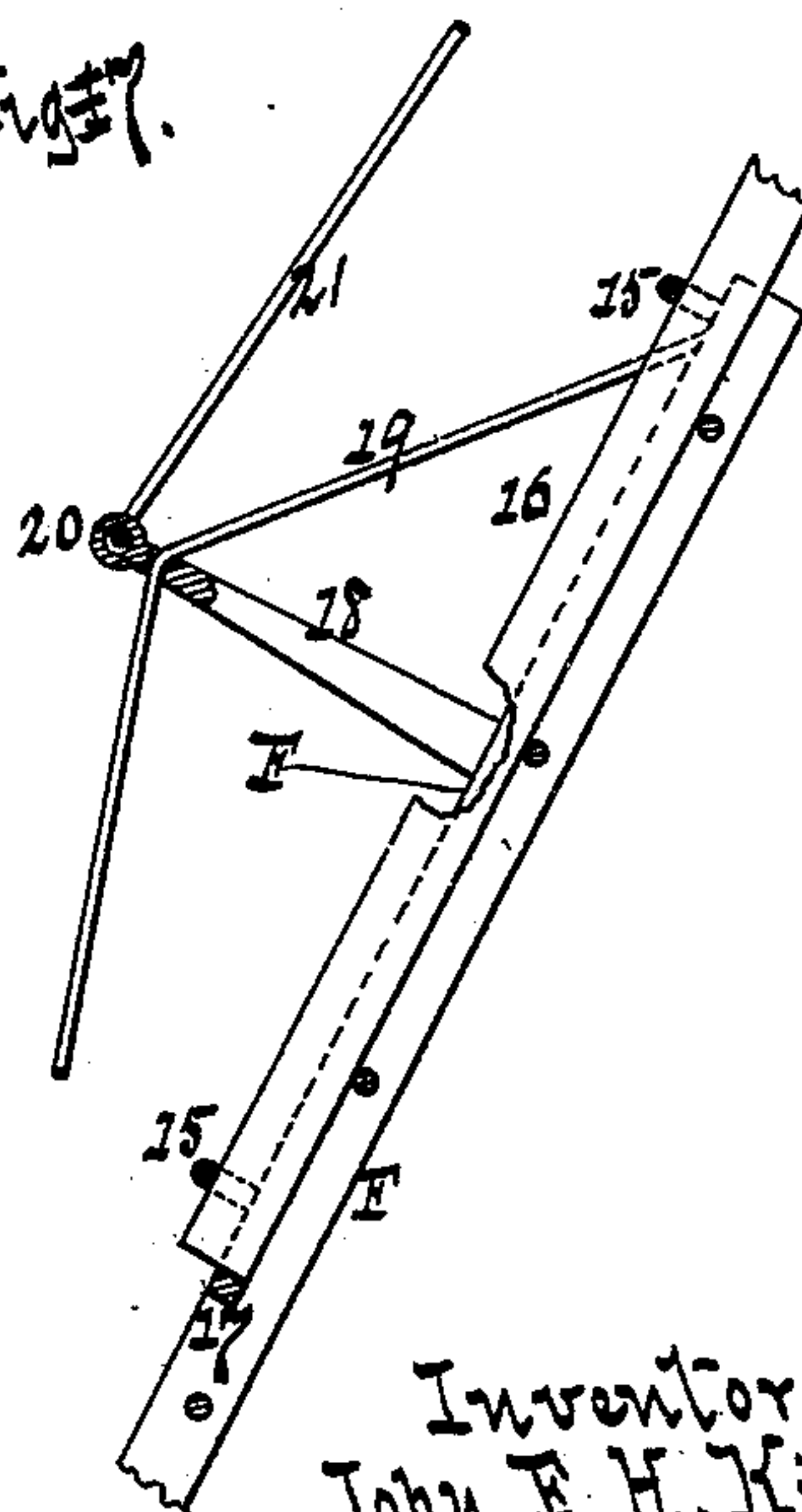


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN F. H. KING, OF PORT RICHMOND, NEW YORK, ASSIGNOR TO
ANNIE L. B. KING, OF SAME PLACE.

FIRE-ESCAPE LADDER.

SPECIFICATION forming part of Letters Patent No. 235,255, dated December 7, 1880.

Application filed September 16, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. H. KING, a citizen of the United States, residing at Port Richmond, in the county of Richmond, State of New York, have invented new and useful Improvements in Ladder Fire-Escapes, of which the following is a specification.

This invention relates to portable fire-escapes, and is especially adapted in some of its features to that class of apparatus known as "self-supporting ladders," designed to rescue people from burning buildings.

Improvements have been made from time to time which from various causes have failed to attain their end. The great cause of failure appears to be the fact that, in order to obtain sufficient length of ladder, they had to be raised from one end of the carriage, while they were attached to a turn-table secured on the other end, necessitating their leaning against a house in order to carry weight. A later invention is a telescopic ladder with a frame attachment, the frame being placed on the ground and the butt of the ladder placed in slots to receive it, and it is then raised by the assistance of about twelve men. This ladder, also, has to lean against a building for support.

All the above ladders, with the exception of the one last described, are raised from turntables fixed on one end of the carriage, and have no lateral support, and for the most part, when in service, stand across the roadway, rendering it impassable. Their great delay in adjustment, particularly when the objective point changes suddenly, together with their inability to operate as self-supporting ladders, coupled with their great length and weight, render them tardy in getting to fires. It would be attended with great danger to attempt to raise the detached ladders with frames in a storm or on snow or ice. In my previous invention, patented June 8, 1880, No. 228,647, I attempted to obviate those objections, and to some extent succeeded; but finding that even with those objections overcome great celerity of action must be attained, I invented the ladder forming the subject-matter of this application with this particular view, and also to

meet the objections against former invention of this description.

This invention consists in certain novel combinations of parts hereinafter fully described, and pointed out in the claim, a preliminary description being therefore omitted.

The invention is illustrated in the accompanying drawings, in which Figure 1 represents a longitudinal vertical section, showing the escape in position for use. Fig. 2 is a plan or top view, partly in section. Fig. 3 is a vertical cross-section on the line *x x*, Fig. 1. Fig. 4 is a side view of the bearing for the sliding ladder on a larger scale than in the previous figures. Fig. 5 is a front view thereof. Fig. 6 is a view showing the connections of the side ladders. Fig. 7 shows the junction of the supplemental ladder with the sliding ladder.

Similar letters indicate corresponding parts.

The letter A designates a truck running on wheels B, and C a ladder resting on the top of the truck when the escape is not in use. This ladder C is detached from the truck A, and when at rest it is checked at both ends by stops *d d*, so that it is immovable in a longitudinal direction, the stops being formed, in this example, at one end by the edge of an opening in the top of the truck, into which opening the ladder sinks at such end, and at the other end by a cross-piece fixed to the truck.

The letter F designates a second ladder, which is connected to the detached ladder C by open clasps *g*, so that it is capable of sliding thereon, the clasps being fastened to the sides of the detached ladder and embracing the sides of the sliding ladder. At or near the lower end of the sliding ladder F is a shaft, *h*, which is a fixture of such ladder, the same being inserted into the sides thereof, like its rounds, and which is provided with a bearing, *I*, capable of being moved or adjusted, so as to engage or disengage the shaft, thereby either confining or freeing the sliding ladder. In this example, the movable bearing *I* consists of a yoke, which is hung at both ends on a pivot fixed to a frame, *L*, and is provided with two semicircular eyes, *n*, which are opposite to each other in a horizontal plane, and at such a point on the yoke that when the

sliding ladder F is moved to a forward position preparatory to elevating the same, as hereinafter more fully described, and the yoke is swung to a substantially vertical position, the eyes catch or receive the shaft *h* within them, while, when the yoke is swung to a horizontal position, the eyes release the shaft. The eyes *n* of the yoke sink into cavities formed in the top of the truck A when the yoke is swung to a lower position, and the yoke is retained in an upper position by a latch, *o*, which is attached to a suitable part of the frame L. At the bottom of the frame L is a cylindrical post, *p*, which extends through the top of the truck A, and through a cross-timber below such top, while it carries a hand-wheel, *Q*, at its lower end for turning the same. The post *p* thus is a medium for connecting the frame L to the truck, and by its means the frame is rendered capable of a horizontally rotating motion.

On the upper part of the frame L are two arms, *R*, which project therefrom parallel to each other and in a substantially horizontal plane. The distance between the arms *R* is equal to the width of the ladders C F, and the position thereof is such that when the ladders are elevated they are received between the arms, and are thereby guided and steadied. To facilitate the entrance of the ladders between the arms *R* the latter are bent or curved outward at their free ends.

In the frame L is mounted a windlass, *S*, to which is connected one end of a rope, *t*, or the like, the other end of which is connected to the sliding ladder F. The point at which the rope *t* is connected to the sliding ladder F is at or about midway between its ends; and to guide the rope on the frame L the ladder is provided with rollers *u*.

On the lower part of the truck A is a second windlass, *V*, from which extends a rope, *w*, or the like, over a roller, *y*, to the sliding ladder F.

On the opposite sides of the truck A are located ladders *Z*, which are connected to the truck by joints so constructed that such ladders may be placed upon the truck when not in use, or set with their lower ends resting on the ground, in which latter case the ladders assume an inclined position and act as braces to the truck, besides giving facile access to its upper part. The joints referred to consist, in this example, of eyebolts 10 and hooks 11, one to each ladder, which are applied to standards 12, forming part of the truck structure, in juxtaposition with each other. The top rounds of the side ladders, *Z*, are hung in the eyebolts 10, to swing therein, and when the ladders are placed on the ground such rounds engage the hooks 11 by catching in them. For the purpose of supporting the side ladders on the truck the latter is equipped with steps on its opposite sides.

To the side ladders, *Z*, are applied guy-

ropes 14, one to each ladder, which are rove through the sides of the ladder and connected to the truck A at their opposite ends, so that when the ladders are put on the ground they are sustained by the ropes in an outer direction, while they are free to be placed on the truck, inasmuch as the ladders are susceptible of moving on the ropes.

The sliding ladder F is constructed with stirrups 15, extending from side to side thereof, near its outer or upper end, for the reception of a supplemental ladder, 16, and with a cross-piece, 17, forming a rest for the lower end of such ladder. For the purpose of strengthening the sliding ladder F it is provided with trusses consisting of posts 13 18 and tension-rods 19, applied to the sides of the ladder. The posts 18 are located near the outer or upper end of the sliding ladder F, and are provided with eyes 20, while the supplemental ladder 16 has connected thereto on its upper part one of the ends of tension-rods 21, the other end of which is adapted to connect with the eyes of the posts. The width of the supplemental ladder 16 is equal to the distance between the sides of the sliding ladder F, and when it is desired to use the supplemental ladder the lower end thereof is slid under the stirrups 15 until such end rests on the cross-piece 17. The tension-rods 21 are then connected to the truss-posts 18, and by this means the supplemental ladder is firmly held in position.

The lower part or half of the sliding ladder F is left destitute of rounds, and when the apparatus is not in use the sliding ladder is moved back on the truck, with its sides flanking the horizontally-rotating frame L, the yoke forming the bearing I for the shaft *h* of this ladder having first been brought to its lower position. Then, when it is desired to use the escape, the sliding ladder F is slid forward, by means of the rope *w* and windlass *V*, until the shaft *h* is brought above the eyes *n* of the yoke, this being determined by the contact of the shaft with the frame L. The yoke is then set to an upper position, so as to engage the shaft, and the rope *t* is drawn onto the windlass *S*, whereby the sliding ladder is swung to an upper position on the shaft, carrying with it the detached ladder C, the rounds of which then take the place of those omitted from the sliding ladder, as before stated.

The ladders can be brought to any desired angle by taking up more or less of the rope *t*, and the direction of the ladder can be changed at will by rotating the frame L on its axis.

When the ladders are relowered on the truck the sliding ladder F can be moved to a rear position by freeing the shaft *h* and winding up the rope *t* in the same manner as for elevating the ladders.

The strength of the apparatus is increased by providing the ladders with inner diagonal braces, 22 22, such braces being fastened to

the sides of the ladders, respectively, at their opposite ends, and arranged to intersect each other. In this example the braces 22 22 are applied to the sliding ladder F and the supplemental ladder 16.

My improved escape can be used with great advantage for carrying a car from one window to another, or from a window to a house-top, the car being connected to the upper part of either ladder by a block and tackle, as clearly shown in Fig. 1.

In some cases the post *p* is stepped in the cross-timber below the top of the truck A, and the post is provided with a spur-wheel meshing into an endless screw for turning the post with its frame.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a fire-escape, the combination, with a suitable truck, of a detached ladder resting on the truck, stops for checking the detached ladder at both ends when it is at rest, a sliding ladder connected to the detached ladder, a shaft fixed to the sliding ladder at or near its lower end, a movable bearing adapted to engage and disengage the shaft of the sliding ladder, and means for adjusting the sliding ladder, all constructed and adapted to operate substantially as described.

2. In a fire-escape, the combination, with a suitable truck, with a detached ladder resting on the truck, a sliding ladder connected to the detached ladder, and a shaft fixed to the sliding ladder at or near its lower end, of a horizontally-rotating frame mounted on the truck, parallel arms projecting from the frame for guiding and steadying the ladders, a movable bearing for the shaft of the sliding lad-

der attached to the frame, a windlass mounted in the frame, and a rope extending from the sliding ladder to the windlass, all constructed and adapted to operate substantially as described.

3. The combination, with the truck A, the horizontally-rotating frame L, the sliding ladder F, and its shaft, of the swinging yoke forming a bearing for the shaft, and the latch for retaining the yoke in an upper position, substantially as described.

4. The combination, with the truck A, of side ladders connected to the truck by joints so constructed that the side ladders may be placed on the truck or set with their lower ends resting on the ground, in which position the side ladders act as braces to the truck, substantially as described.

5. The combination, with the truck A, constructed with the standards 12, having the juxtaposed eyebolts 10 and hooks 11, of the side ladders having their top rounds hung in the eyebolts and adapted to engage the hooks, substantially as described.

6. The combination, with the truck A, of the side ladders, Z, connected to the truck, substantially as described, and the guy-ropes 14, rove through the sides of the ladders and connected to the truck at its opposite ends, for the purpose set forth.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN F. H. KING.

Witnesses:

CHAS. WAHLERS,
D. VAN SANTVOORD.