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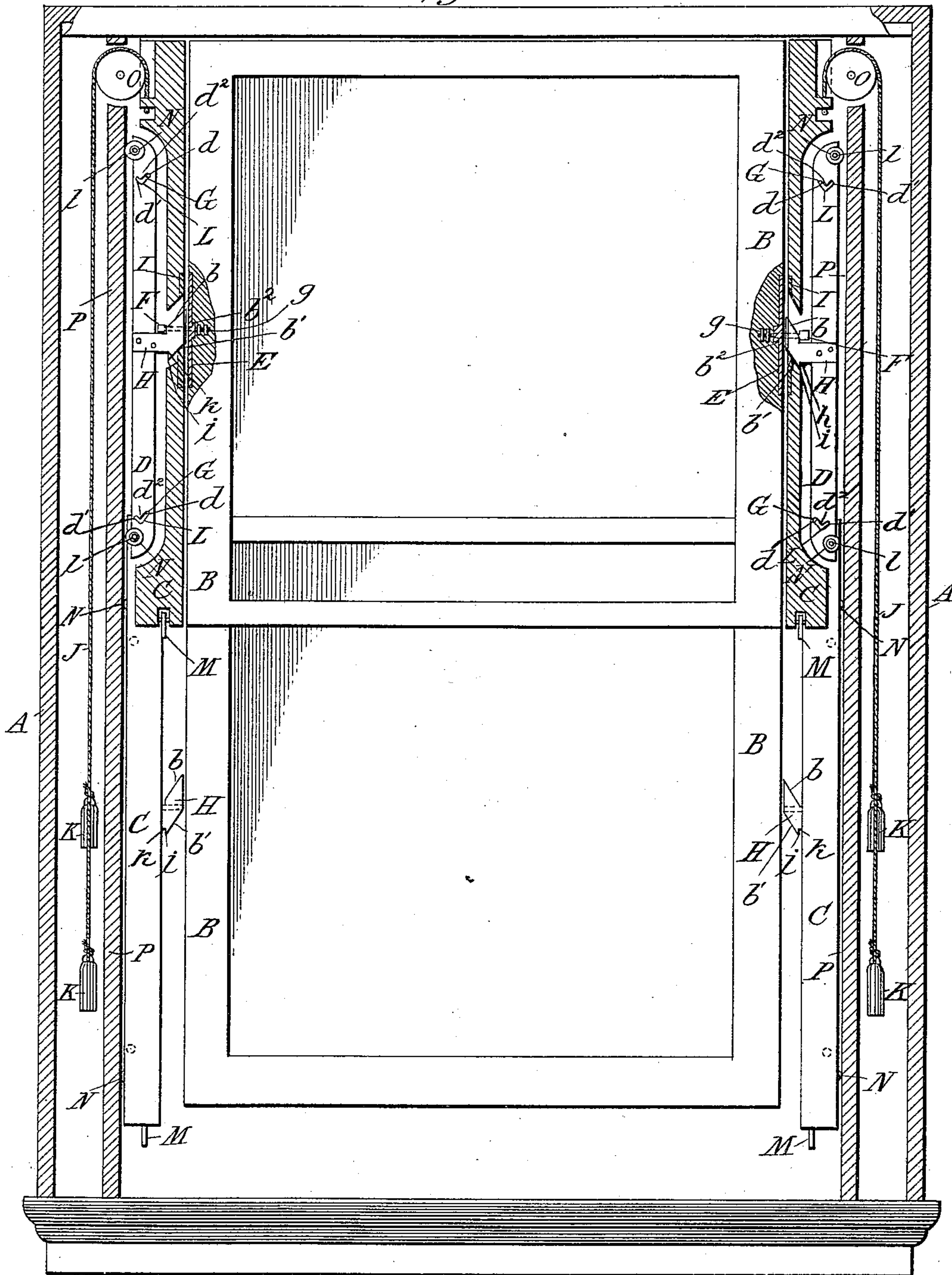
3 Sheets—Sheet 1.

A. RUDOLPH.  
WINDOW SASH.

No. 449,764.

Patented Apr. 7, 1891.

*Fig. 1.*



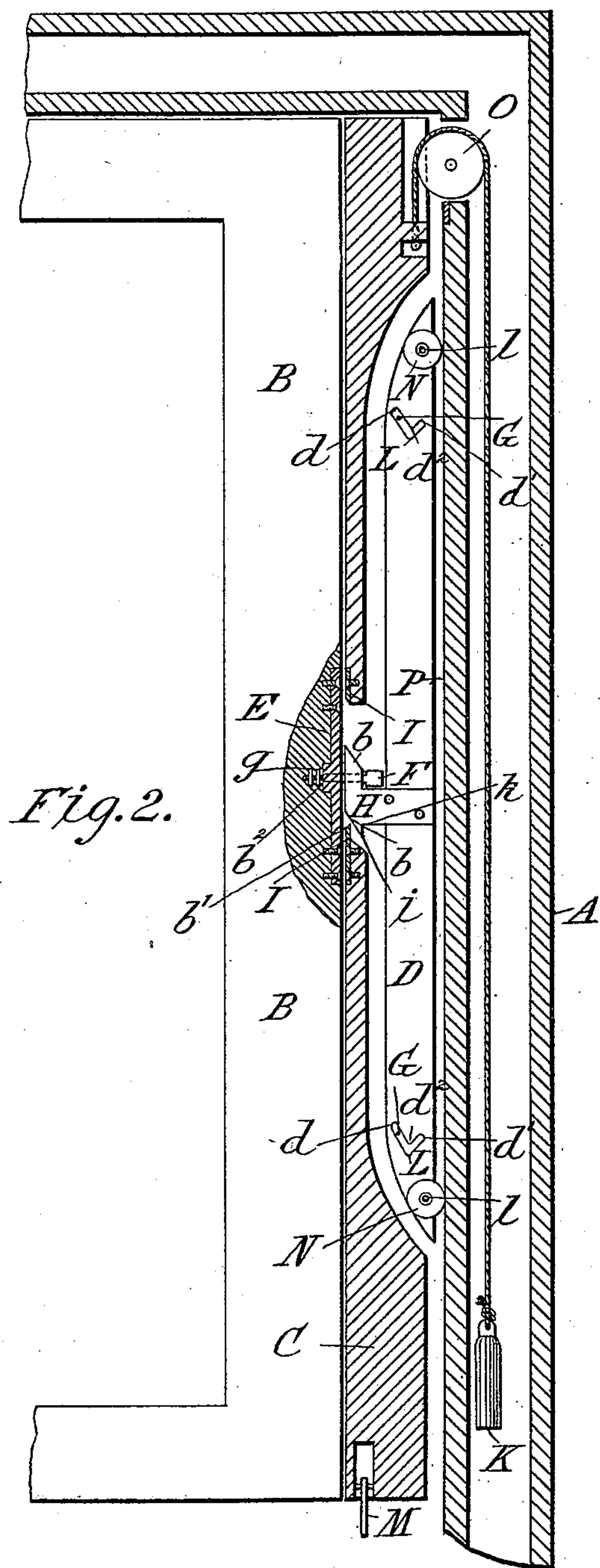
Witnesses:  
Jos. W. Beesey  
Math. Vol. Rudolph

Inventor:  
Alexander Rudolph

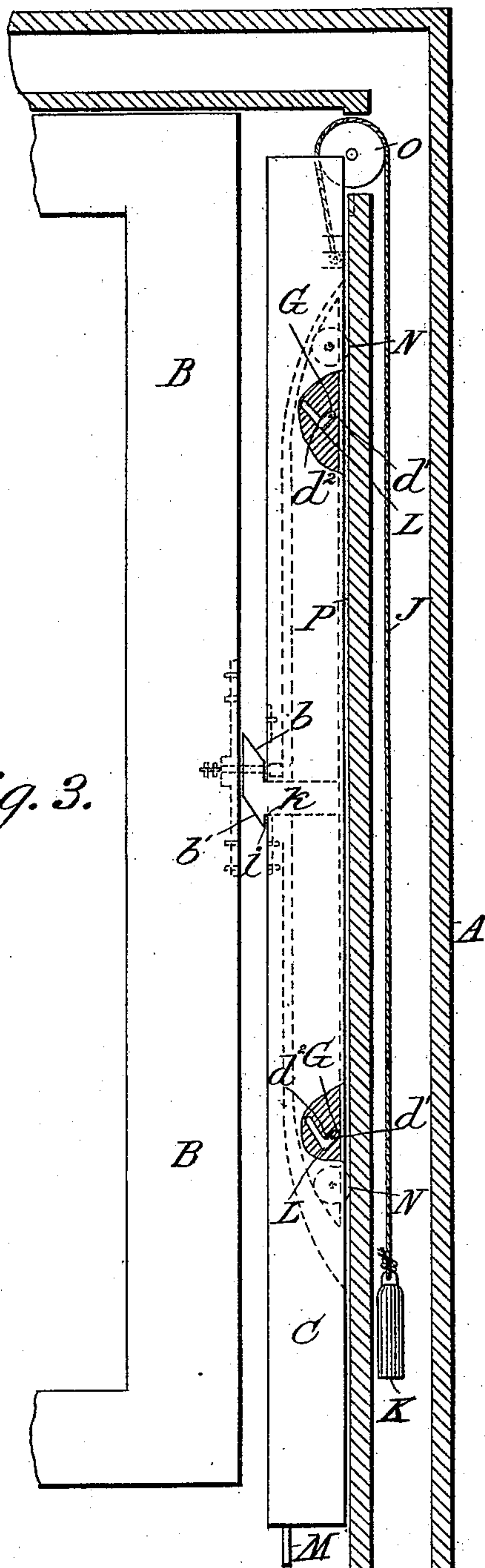
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No. 449,764.

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*Fig. 2.*



*Fig. 3.*

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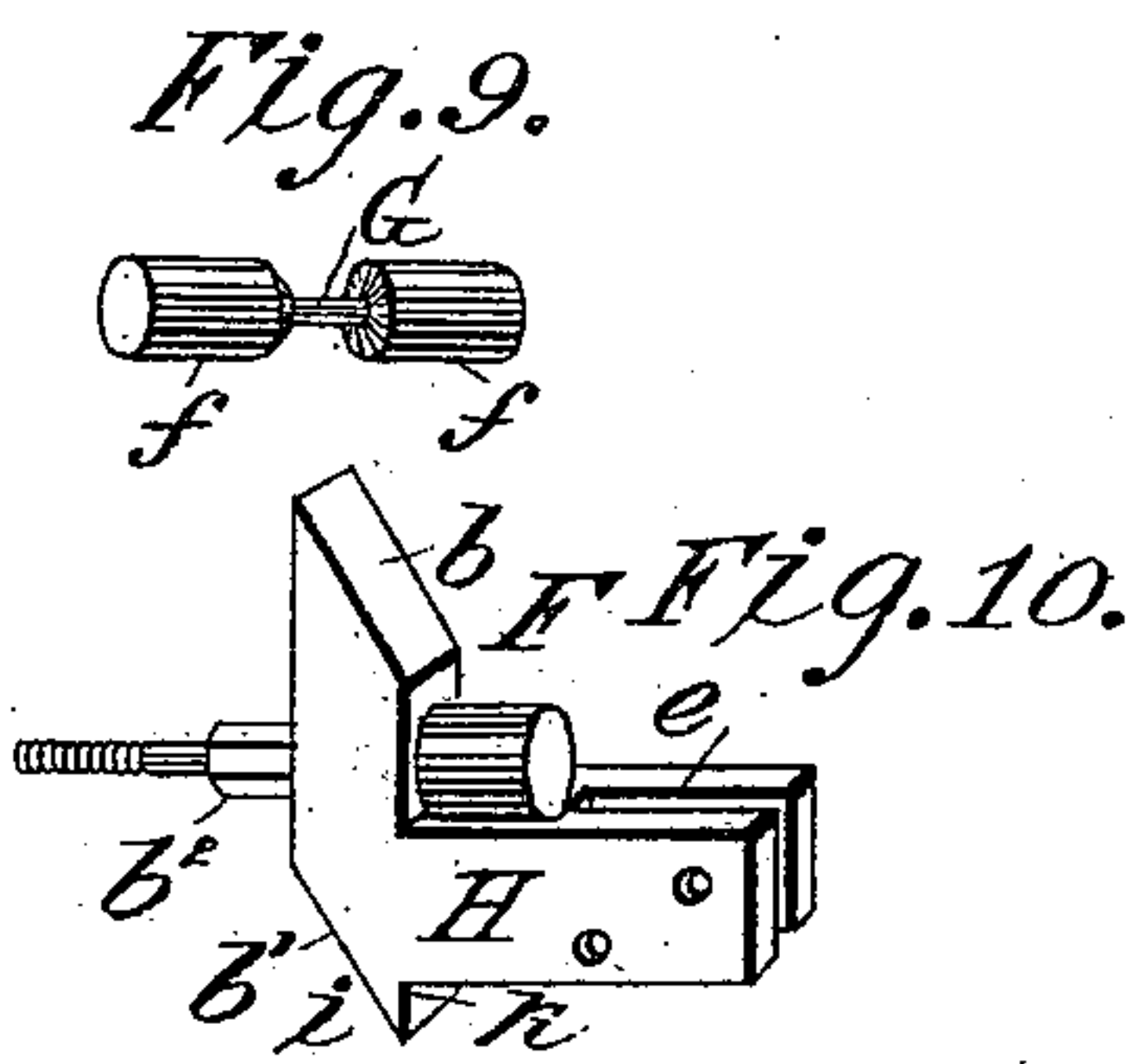
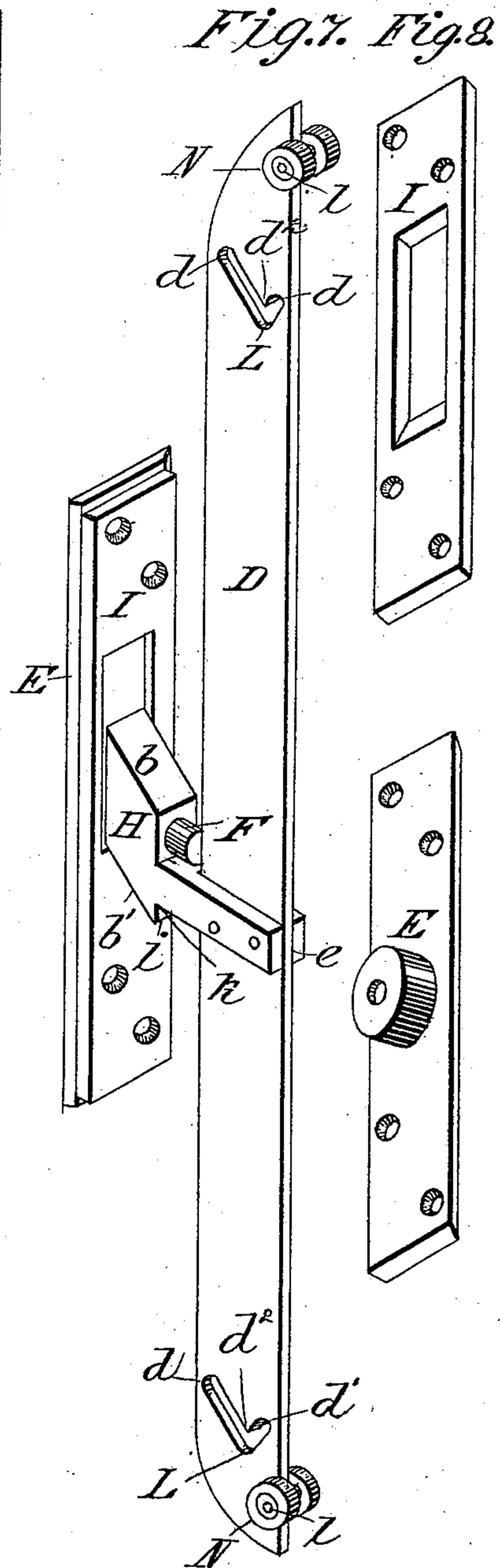
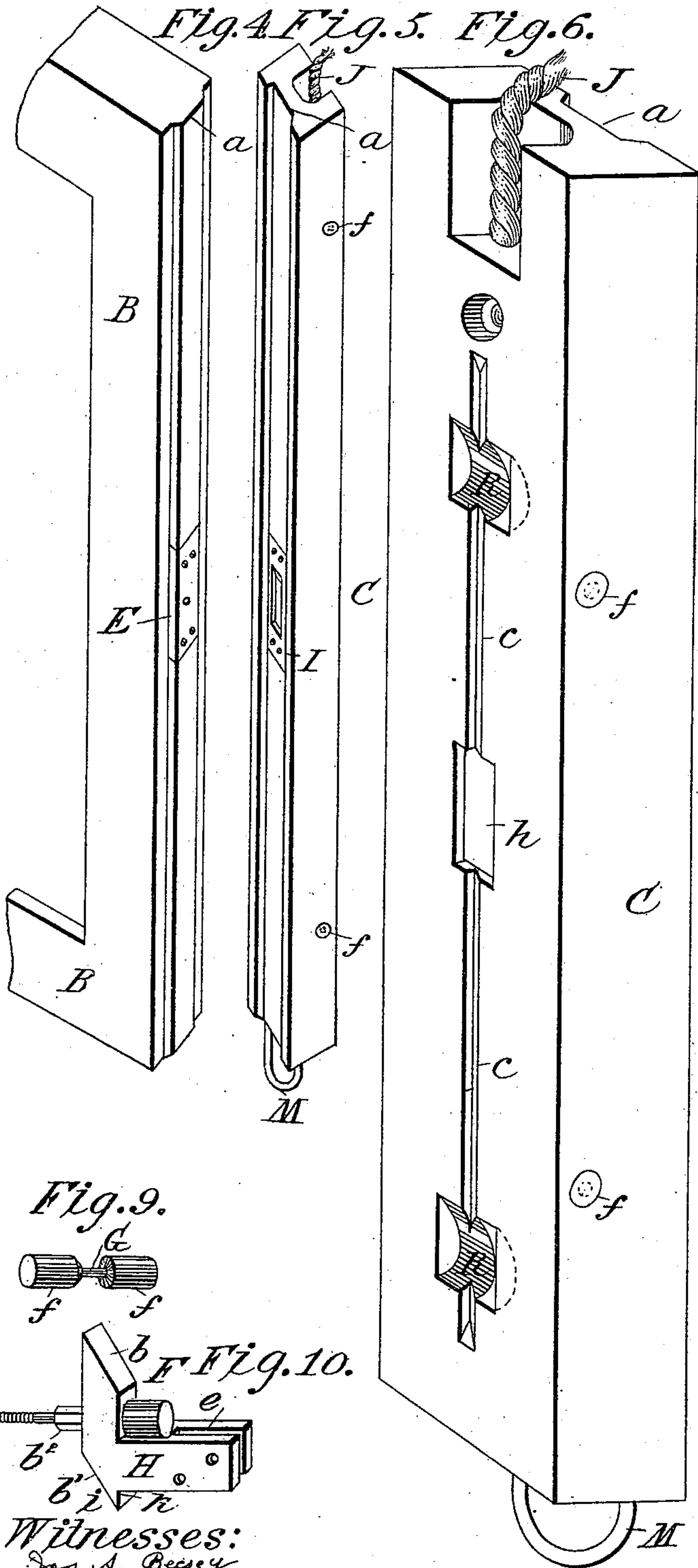
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3 Sheets—Sheet 3.

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Witnesses:  
Jos. A. Beechey  
Matthew Rudolph

Inventor:  
Alexander Rudolph



# UNITED STATES PATENT OFFICE.

ALEXANDER RUDOLPH, OF SAN FRANCISCO, CALIFORNIA.

## WINDOW-SASH.

SPECIFICATION forming part of Letters Patent No. 449,764, dated April 7, 1891.

Application filed March 31, 1890. Serial No. 346,127. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER RUDOLPH, a citizen of the United States, residing at San Francisco, of the county of San Francisco, State of California, have invented an Improved Window-Sash; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in window-sashes of that class in which the frame holding the glass is pivoted in supplemental side bars, which slide up and down in the window-casing; and it consists of a window-sash and supplemental side bars having corresponding longitudinal tongues and grooves to make a tight joint between them when closed together, in combination with central pivots and supporting center pieces having double inclined sides, with lugs on the lower parts. These center pieces are fastened to tongues, which are edgewise inserted in the back of these supplemental side bars having longitudinal grooves of sufficient depth to receive the whole width of these tongues. These center pieces slide obliquely through slots in metallic plates, which are fixed to the side bars, so that the bars and sash may be separated when the sash is to be turned and kept apart by the action of traveling pins, which engage with V-shaped slots in the tongues, and by the action of the lugs formed on the lower portion of the center pieces, which engage with the beveled edges of the metallic plates fixed to the side bars. When these riding pins, adapted to engage loosely with the V-formed slots of the tongues, stop at the sides nearest to the stiles of the sash, the guiding-strips and sash are kept apart. When these riding pins stop at the sides nearest to the sash, the guiding-strips and sash are closed by the weights of the sash. In connection with these devices are certain novel features of construction, all of which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1, Sheet 1, is a front view of the upper and lower sashes, with section of the casing, the upper supplemental side bars, and center pieces of the frame holding the glass. Fig. 2, Sheet 2, is an enlarged section of part of the casing with upper sash and one side

closed and locked together. Fig. 3, Sheet 2, is a similar portion showing the bar and sash separated. Figs. 4 and 5, Sheet 3, are enlarged views of one of the side bars and the corresponding part of the sash, showing the tongue and groove and center plates. Fig. 6, Sheet 3, is an enlarged view of the back of one side bar, showing the longitudinal groove for the tongue, the aperture for the block fastened to the tongue, the depressions for the wheels, and the boxes in which the riding pins are journaled. Fig. 7, Sheet 3, is an enlarged view of the tongue, the center plates with the block and pivot. Fig. 8, Sheet 3, is an enlarged view of the center plates. Fig. 9, Sheet 3, is an enlarged view of the riding pin journaled in the boxes. Fig. 10, Sheet 3, is an enlarged view of the center piece with inclined faces, lug, and pivot, and shows the formation of the slot for inserting and fastening the tongue.

A A are the sides of a window-frame, and B are the window-sashes, which are made enough narrower than the spaces in which they are to slide to admit the narrow guide-pieces C to lie between the sash and the stile of the sash, and also the tongues D with the wheels N, which will be described hereinafter. The guide-pieces C and the corresponding meeting edges of the sash are tongued and grooved longitudinally, as at *aa*, so that when drawn close together these tongues and grooves serve to make a tight joint and exclude air. The sashes have plates E let into a mortise in the center of their opposite edges, and pivot-pins F are fixed to and project from these plates, extending through the beveled slots in plates I of the guide-pieces C, almost touching the edges of the tongues D, which are edgewise inserted and fastened in the vertical grooves *e* of the blocks H, said blocks extending at right angles through the apertures *h* of the guide-pieces C. The longitudinal grooves *c* in the back of the guide-pieces C extend over the top ends of the tongues D, in order to have sufficient room for the tongues D when it is desired to retract the guide-pieces C and disengage the tongues and grooves *aa*. This is done by holding the sash and drawing the guide-pieces C downward and outward by means of the



handles M at the bottom of the guide-pieces C, by which operation the tongues D and the wheels N will be covered by the grooves *c* and depressions R of the guide-pieces C.

5 The tongues will be covered entirely, the wheels only partly. Near the ends of the tongues D a perforation admits a horizontal shaft *l*, projecting enough on each side of the tongues to journal loosely small wheels N and

10 form a head on each end of said shaft. The wheels project over the edges of the tongues D, thereby preventing the edges of these tongues from coming in contact with and defacing the stiles P. The wheels are loosely

15 journaled on the headed shafts *l*, and washers are placed between the tongues D and wheels N, also between the headings of the shafts *l* and the wheels N to relieve friction. The distance between the stiles P in the op-

20 posite casings is made somewhat greater than the entire width of the sash B and the guide-pieces C, in order that the guide-pieces can be retracted sufficiently to disengage the tongues and grooves *a a* to allow the sash to

25 turn freely. To prevent any undesirable side motion when the sash is to be raised or lowered, the plates E, the pivots F, with the blocks H, the tongues D, and the wheels N, fixed to these tongues, just fill the space left

30 between the sash B and the stiles P.

The guide-pieces are separated from the sash when the latter is to be turned by means of the blocks H and the riding pins G, which engage loosely with the V-formed slots L in

35 the tongues D. The blocks H are perforated and fit loosely upon the headed pivot-pins F, so that one of their sides rests against the plates E, which are let into a mortise in the sash B, while the sides *b b'* form inclined

40 planes extending downward and outward from these sides, and passing through beveled slots in the plates I, which are secured to the guide-pieces C. The lower parts of the inclined planes *b'* form lugs *i*, and extend at

45 right angles through the slots in the plates I and the apertures *h* in the guide-pieces C, to receive in the vertical grooves *e* the full width of the tongues D, which are edgewise inserted and fastened to them. As the guide-

50 pieces C are supported by the cords J and counter-weights K, it will be understood that the weight of the sash will cause the lower inclined planes *b'* of the blocks H to slide through the beveled openings in plates I and

55 the apertures *h* in the guide-pieces C, and cause, through the action of the riding pins G, engaging with the V-formed slots L in the tongues D, to draw the plates I and the guide-pieces C closely against the sash, where they

60 are held by gravitation alone. The riding pins G, which engage loosely with the V-formed slots L in the tongues D, are journaled in boxes *f*, which are extending out of the sides of the guide-pieces C, as shown. The

65 blocks H, with the tongues D and the wheels N, are loosely fastened by the headed pivots F to the plates E, by means of nuts *g*, which

engage with the screw-threads formed on the projecting pivot-pins F, and bear against the shoulders *b<sup>2</sup>*. It will be thus seen that the

70 blocks H are attached to the plates E in a permanent and positive manner, while at the same time said blocks will turn freely and independently.

When the guide-strips are to be moved

75 downward and outward to allow the sash to be turned upon its pivots F, it is done by holding the sash and drawing the guide-pieces C downward and outward by means of links or

80 handles M at the bottom of the guide-pieces C, or by other suitable means. When this is done, the lower parts of the beveled openings in the plates I move down the inclined surface *b'* of the blocks H until the beveled edges

85 are lifted over the lugs *i* and come to stop behind the lugs *i* at *k*, when at the same time the riding pins G move down the V-formed slots L in tongues D, and being acted upon by the same outward movement, the riding pins

90 G are lifted over the lugs *d<sup>2</sup>* in the slots L and come to stop at *d'*. By this operation the longitudinal grooves *c*, with the depressions R of the guide-pieces C, will cover the tongues

95 D and the wheels N, the former completely and the latter partly, and the tongues and grooves *a a* are disengaged and allow the sash to be turned on its pivots F. When the sash and the guide-pieces are separated and the sash

100 is ready to revolve upon its pivots F, the wheels will be only partly covered by the depressions in the guide-pieces, said guide-pieces being made a little narrower than the space between the sash and the stiles of the

105 sash, and thus leave only the wheels N in contact with the stiles P. It will be seen that the sashes can be more readily raised and lowered by the action of the wheels than by the friction of the edges of the projecting tongues D.

When it is desired to return the guide-

110 pieces to close contact with the sash, it is only necessary to hold the sash and draw the guide-pieces C downward and inward by means of the links or handles M at the bot-

115 tom of the guide-pieces C. When this is done, the lower beveled edges of plates I will be lifted over the lugs *i* and reach the lower inclined sides *b'* of the blocks H, when at the same time the riding pins G, engaging with the V-formed slots L, will be lifted over the

120 lugs *d<sup>2</sup>* and reach the inclined sides *d*. The weight of the sash, acting upon the inclined sides of blocks H and slots L, draws the sash and the guide-pieces together and retains them in close contact, so that the whole is as

125 tight and solid as if one piece. The pulleys O are adjusted in such a way that the rope J, fastened to the guide-pieces C and acted upon by the weights K, will run parallel with the stiles P when the sash and the guide-pieces

130 are in close contact. It will be seen that by separating the guide-pieces and the sash the rope will be placed in a diagonal position, and thus have a tendency to act upon the up-



per part of the guide-pieces and assist in bringing them in close contact again with the sash when the guide-pieces are pulled downward and inward. It will be understood that  
 5 to large sashes the number of wheels N and V-formed slots L must be increased, and that in the details of arrangement there may be changes without departing from the spirit of my invention, as by fastening the tongues D  
 10 to the blocks H by forming a shoulder on said blocks, and these I do not consider it necessary to specify, since they would not change the principle of my invention.

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

1. In a window, the sash B, in combination with the independent guide-pieces C, between which it may be held or be allowed to turn,  
 20 the pivot-pins F, the blocks H, with the inclined faces  $b b'$ , lugs  $i$ , and plates I, having the beveled slots, said blocks passing through the beveled slots in the plates I and apertures  $h$  in the guide-pieces C, having securely  
 25 fastened to said blocks the tongues D, which may be completely covered by the longitudinal grooves  $c$  in the guide-pieces C, so as to draw the guide-pieces into contact with the sash or separate them, substantially as herein de-  
 30 scribed.

2. The combination, with the sash B, having the pivot-pins F, passing through the beveled slots in the plates I, of the guide-pieces C, having blocks H, with the inclined faces  
 35  $b b'$ , lugs  $i$ , and plates I, said blocks passing through the beveled slots in the plates I and apertures  $h$  in the guide-pieces C, having the tongues D, with the longitudinal grooves  $c$ ,

said tongues having wheels N, loosely jour-  
 40 naled on projecting horizontal shafts  $l$ , with the depressions R, and the tongues and grooves  $a a$ , substantially as herein described.

3. The sash B, having the pivot-pins F, the guiding-pieces C, having the plates I, and the blocks H, having the inclined faces  $b b'$ , lugs  
 45  $i$ , passing through the beveled slots in the plates I and apertures  $h$  in said guide-pieces, having securely fastened to said blocks the tongues D, said tongues having wheels N,  
 50 loosely journaled on headed shafts  $l$ , with depressions R, in combination with the V-shaped slots L and riding pins G, adapted to engage with said slots, by which the guide-pieces may be separated and retained out of contact with  
 55 the sash or returned to it, substantially as herein described.

4. In a window having the sash B turning on pivots within independent sliding guide-pieces, as shown, the means for retaining the  
 60 sash and the guide-pieces in or out of contact by gravitation alone, consisting of the blocks H, with their inclined faces  $b b'$ , lugs  $i$ , acting with the plates I, passing through the beveled  
 65 slots in the plates I and apertures  $h$  in the guide-pieces C, said blocks having tongues D and wheels N, with the grooves  $c$  and depressions R, said tongues having V-formed slots L, and riding pins G, adapted to engage with  
 70 said slots, substantially as herein described.

In testimony whereof I have signed this  
 specification in the presence of two subscrib-  
 ing witnesses.

ALEXANDER RUDOLPH.

Witnesses:

EDWARD B. EARLY,  
 GEORGE HULL.