

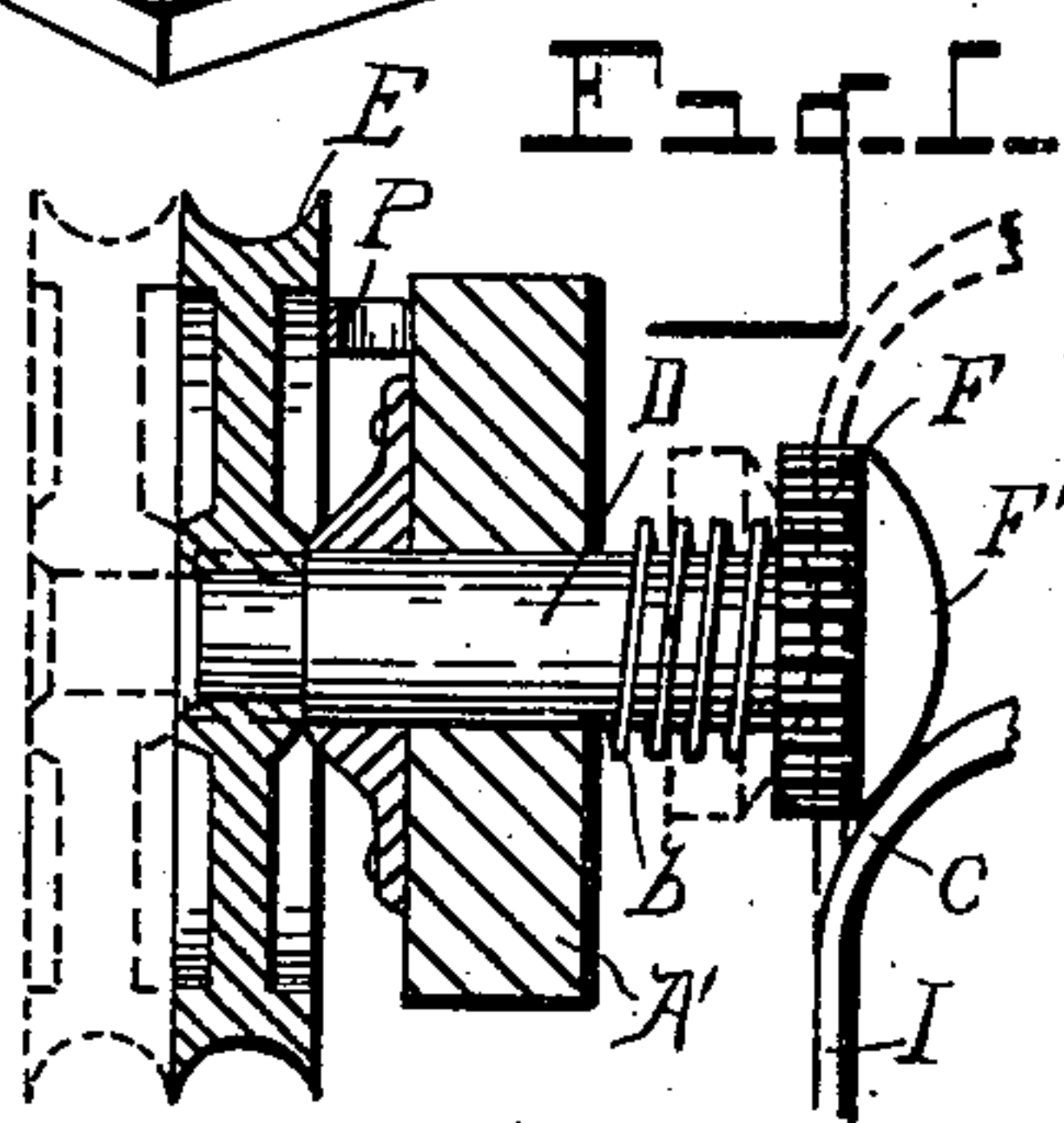
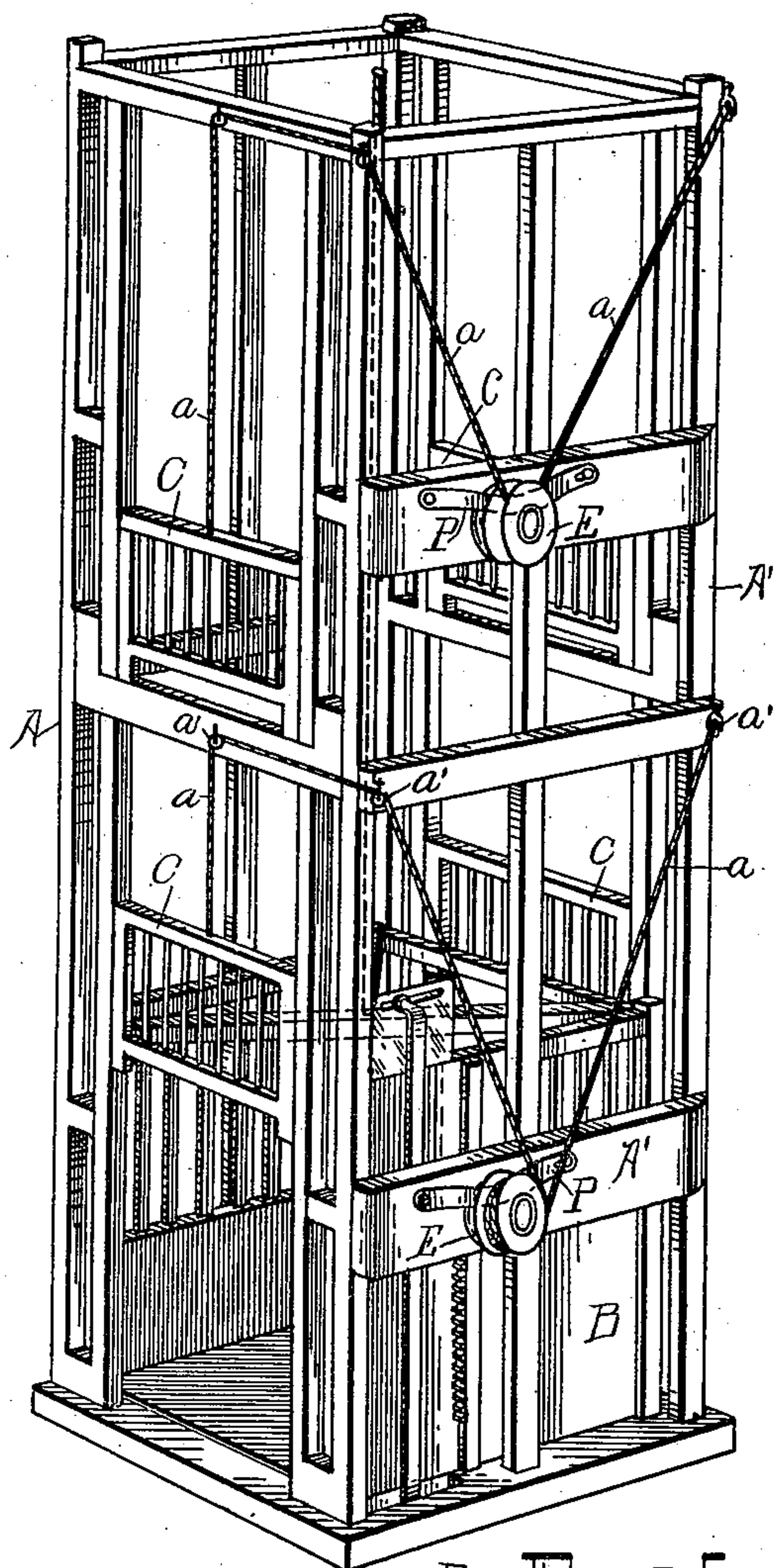
(No Model.)

2 Sheets—Sheet 1.

W. F. TRAVES.
SAFETY GATE FOR ELEVATORS.

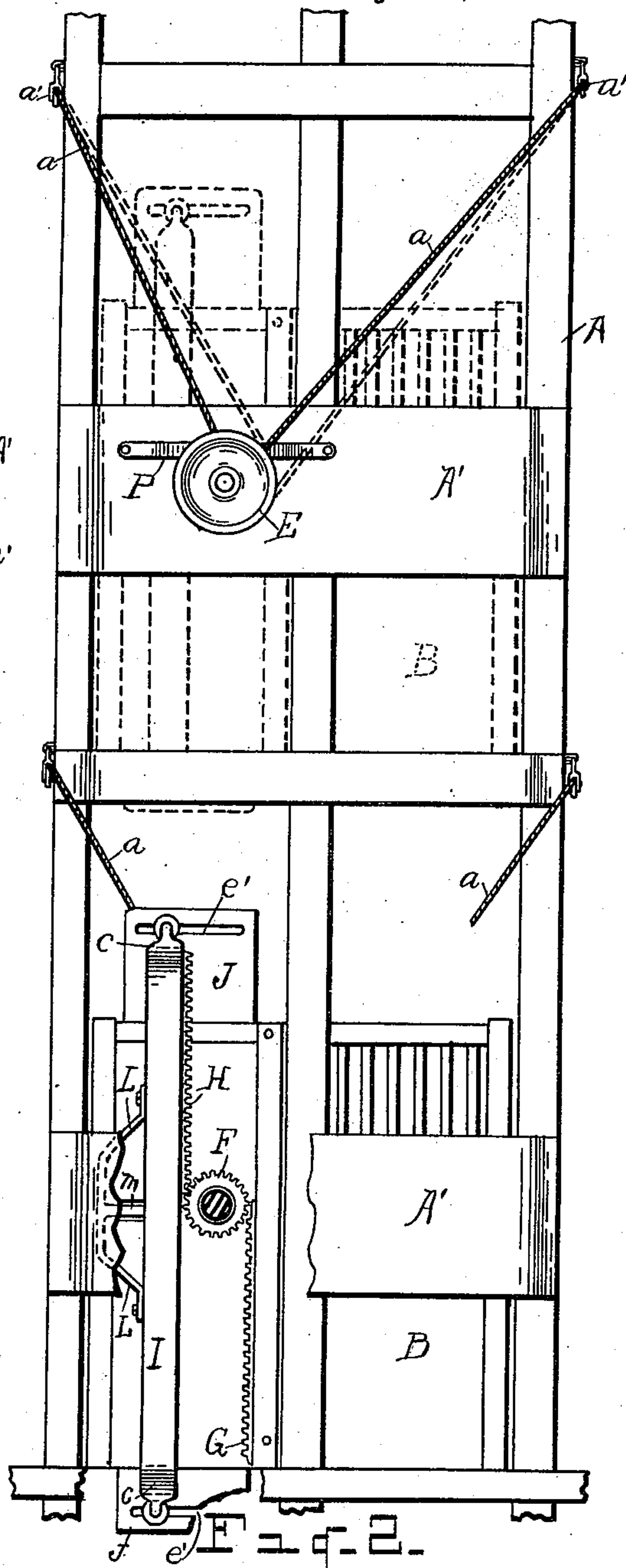
No. 560,306.

Patented May 19, 1896.



WITNESSES

Horace R. Wheeler,
Edward A. Stricker



INVENTOR

Webster F. Traves

By his Attorneys

R. B. Wheeler & Co.

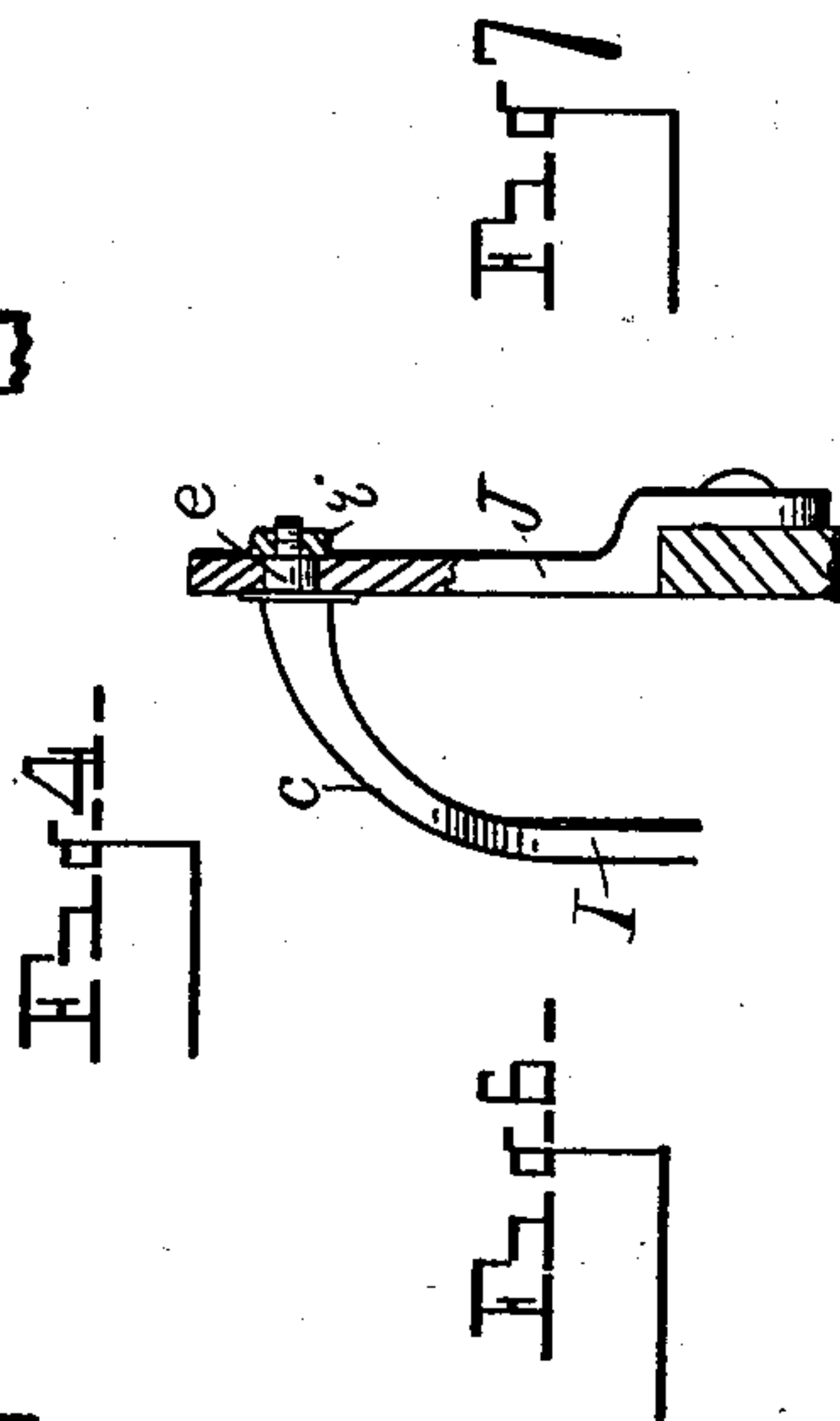
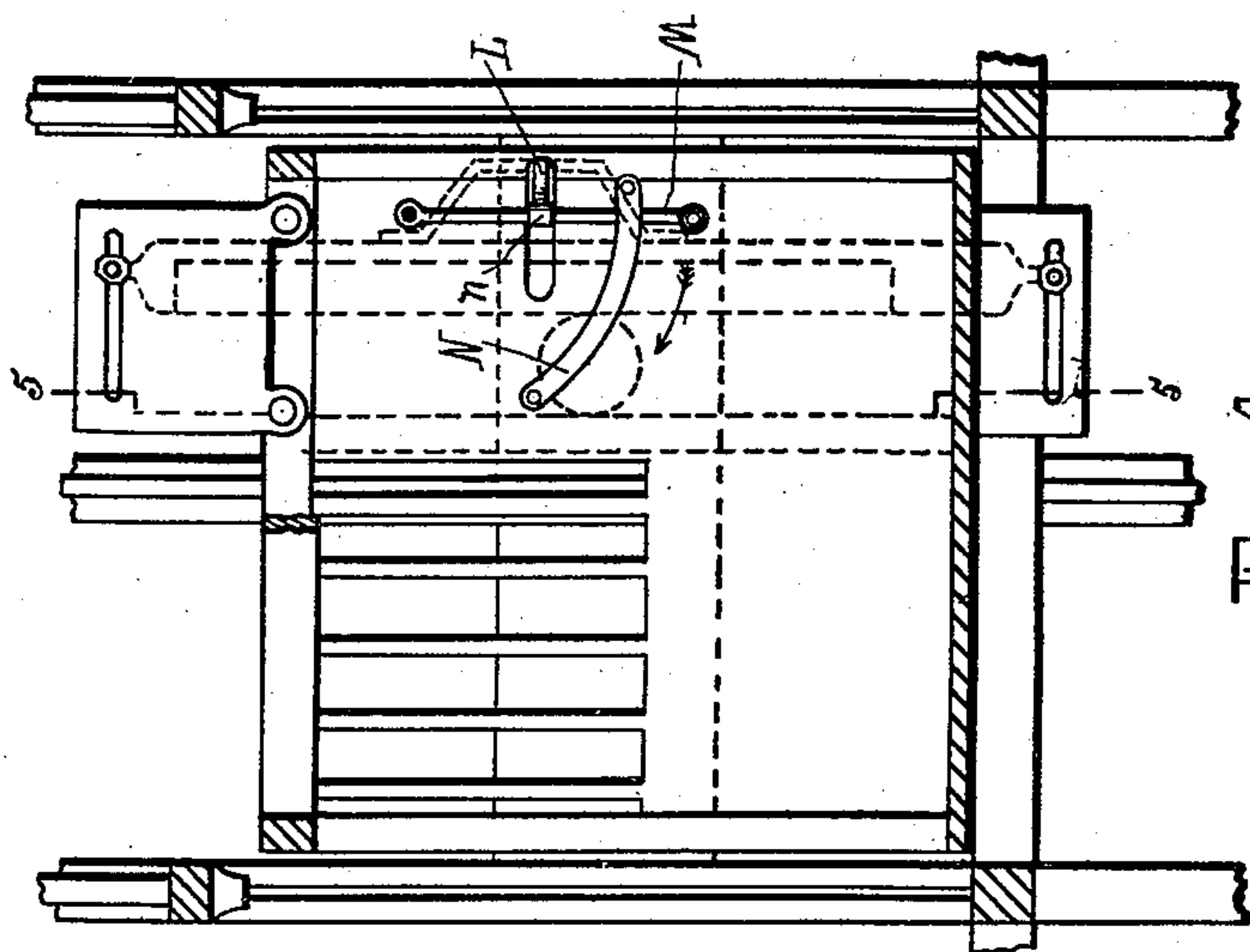
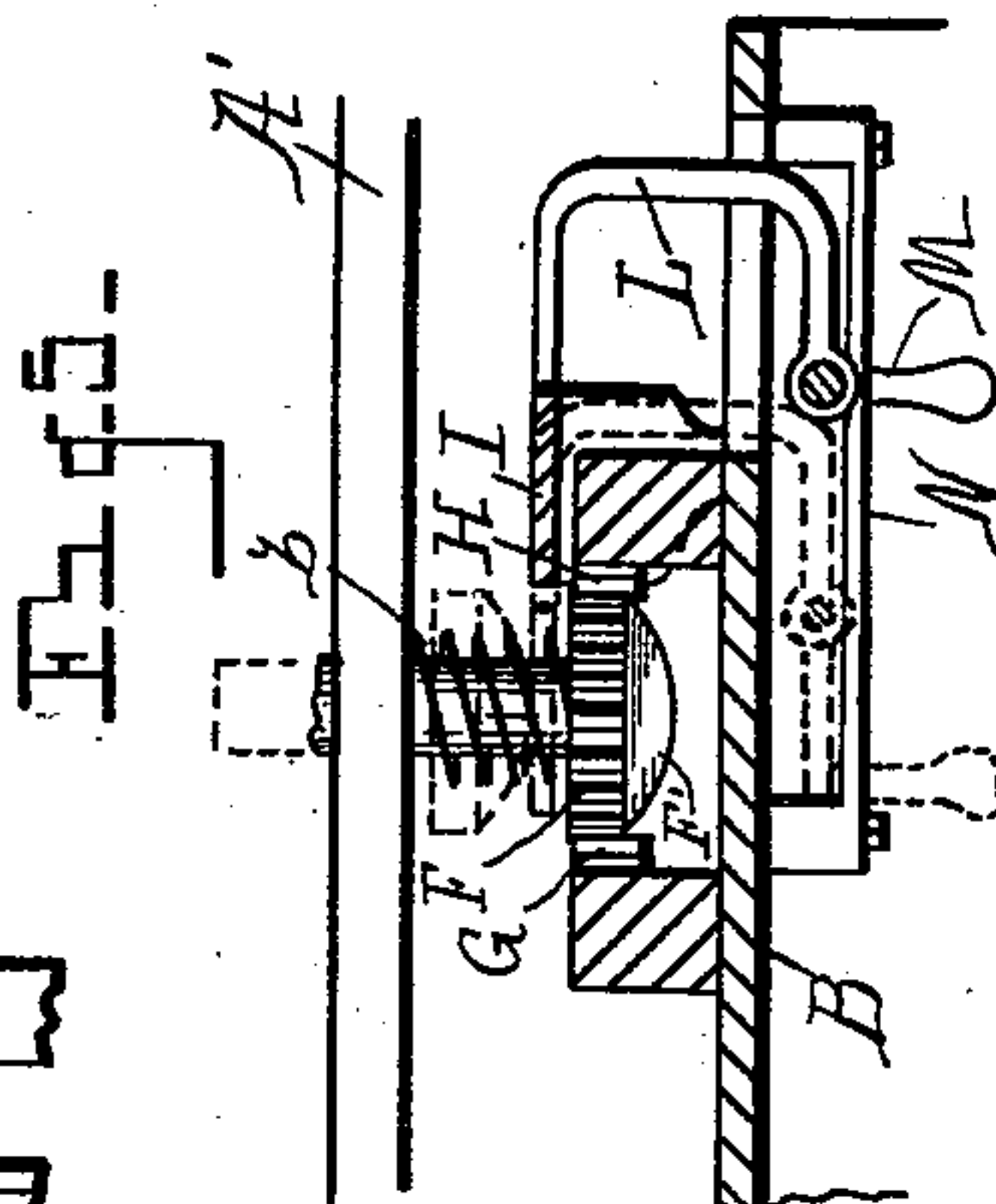
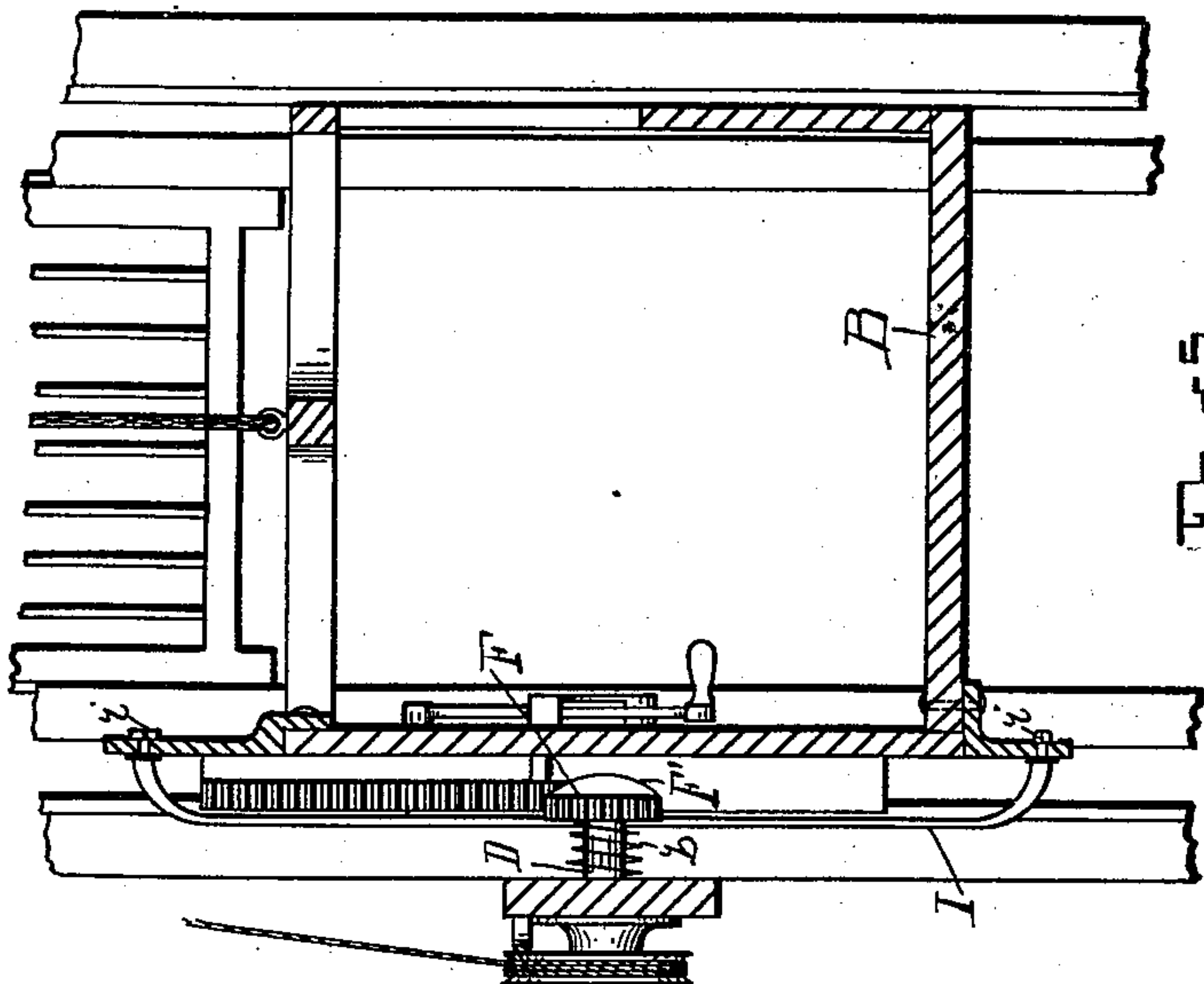
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UNITED STATES PATENT OFFICE.

WEBSTER F. TRAVES, OF DETROIT, MICHIGAN, ASSIGNOR OF TWO-THIRDS
TO GEORGE W. IRVINE AND WILLIAM A. IRVINE, OF SAME PLACE.

SAFETY-GATE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 560,306, dated May 19, 1896.

Application filed September 6, 1895. Serial No. 561,702. (No model.)

To all whom it may concern:

Be it known that I, WEBSTER F. TRAVES, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Safety-Gates for Elevators; and I do 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 the letters of reference marked thereon, which form a part of this specification.

This invention relates to safety-gates for elevators; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The objects of the invention are to provide simple and effective means for automatically actuating the safety-gates of an elevator-shaft by the vertical movement of the car in such manner as to effect the raising of said gates at any floor at which the car may stop and to cause the closing or lowering of said gate when the car shall have passed said floor in either direction, and a further provision whereby the gates at the floors intermediate the starting-point and destination of the elevator-car may remain undisturbed while the car is passing, which objects are attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the frame of an elevator well or shaft and the car located therein provided with my improved gate-actuating mechanism. Fig. 2 is an enlarged side elevation, parts being broken away to more clearly show the construction. Fig. 3 is an enlarged vertical section through the spool on which the actuating ropes or cables are wound and the bearing in which the shaft of said spool is journaled, the shaft of said spool, as well as the pinion thereon, showing in elevation the longitudinal movement of said shaft and parts carried thereby being shown by dotted lines. Fig. 4 is an enlarged vertical section through the car and frame of the shaft. Fig. 5 is a like view on dotted

line 5 5 of Fig. 4. Fig. 6 is an enlarged detail, partly in section, of one end of the movable bar, which serves to throw the pinion out of gear with the rack on the car, showing the manner of securing the end of said bar; and Fig. 7 is an enlarged detail, partly in horizontal section, showing by dotted lines the position of parts when the pinion is out of contact with the racks on the car.

Referring to the letters of reference, A designates the frame of the elevator well or shaft, which may be of any suitable construction. B designates the car, adapted to travel vertically therein.

C designates the safety-gates, which are adapted to slide vertically in opposite openings in the elevator-shaft and which are located at each floor-landing.

Journaled in the frame of the shaft adjacent to each floor is a longitudinally-movable shaft D, carrying upon its outer end a spool E. Secured on the inner end of said shaft is a pinion F, having a boss F' on the face thereof, and located between said pinion and the cross-piece A' of the frame is a coiled spring b, which permits said shaft to move longitudinally and serves to return it to its normal position.

Located on the side of the car, and extending into line with the pinion F, are the opposed rack-bars G and H, respectively, which are adapted to successively engage said pinion and rotate the shaft D and spool E in opposite directions in reciprocal succession as the car travels vertically in the shaft.

Attached to the gates C are the ropes or cables a, which pass through pulleys a', their opposite ends being wound upon the spool E. By this arrangement, when the car is down, the gates at the bottom of the shaft are raised, as shown in Figs. 1 and 2, which position is maintained until the car moves upward, when the rack G, engaging the pinion F, rotates the spool E so as to unwind the cables therefrom, when said lower gates C will fall and close the lower entrance to the elevator-shaft. As the car continues upward, the opposite rack H engages the next succeeding pinion F above and rotates it to the right, or in such direction as to wind the

cables thereon which actuate the gates of the succeeding floor, raising said gates, so that when the car shall have reached the level of the floor they will stand at their greatest height. A continued upward movement of the car carries the rack H past said pinion and brings the opposite rack G into engagement therewith on the opposite side, thereby rotating the spool E in the opposite direction and unwinding the cables therefrom, thus lowering said gates as the car moves upward, and so the operation continues at each floor the car passes, the gates being raised by the rack H and lowered by the rack G.

Upon the descent of the car the rack G is the first to encounter the pinion F as the car moves downward, whereby the spool E is rotated to the right, so as to wind the cables thereon and raise the gates as the car reaches the floor upon which they are located. A further descent of the car carries the rack G free from said pinion and brings the rack H into contact therewith, thereby rotating the pinion in the opposite direction and unwinding the cables from the spool, thereby lowering said gate, the gates at the succeeding floors being operated in like manner as the car travels downward until the bottom of the shaft is reached, when the rack G engages the pinion and raises the gates, maintaining them in that position until the car again moves upward.

It is desirable, as the car moves vertically in the elevator-shaft, that the safety-gates at the various floors be actuated only at the floor at which the car stops. To accomplish this, I employ a movable bar I, which normally lies upon the outer face of the rack H and extends vertically from the top to the bottom of the car, or the distance of the combined length of the two racks H and G. The ends of said movable bar are curved inward, as at *c*, and are reduced at their extremities, as at *e*, so as to pass freely through the horizontal slots *e'*, formed in the plates J, attached to the frame of the car. Said reduced ends *e* of said bar receive the nuts *i* on their inner ends, whereby said bar is securely retained in place, but is permitted to slide horizontally. Attached to the outer edge of said bar I are the supporting-arms L, which unite and pass inward through a horizontal slot *m* in the side of the car, where they are attached at *n* to a vertical lever M, which is pivoted at *o* within the car and is embraced by a curved guard-rail N. When the car is traveling vertically in the shaft and it is desirable to pass several floors without stopping, the lever M, when the car has attained a position between the floors where the racks are free from the pinion F, is swung in the direction indicated by the arrow in Fig. 4, thereby sliding the bar I into position directly between the racks G and H and directly in line with the pinion F, so that the curved end of said bar will engage the boss F' on the face of said pinion as the

car approaches the floor from either direction and force the shaft D to slide outward longitudinally against the action of the spring *b*, carrying the pinion F out of line with the racks G H, as clearly shown by dotted lines in Figs. 3 and 7, preventing said racks from rotating said pinion and obviating the actuation of the gates at any of the floors between the starting-point and the destination of the car. When approaching the floor at which it is desired that the car shall stop, the lever M is drawn back to its normal position, sliding the shifting-bar I from between said racks and again permitting them to engage with the pinion F, when the gates will be actuated, as before described. This is a feature of great importance, especially in elevators where the car travels rapidly, as it obviates a useless wear of the parts and the noise incident to a quick actuation of the gates.

Mounted upon the cross-piece A' of the frame, and bearing against the inner face of the spool E, is a bow-spring P, which serves as a friction-brake to prevent the rotation of said spool at the time either of said racks passes from engagement with said pinion and before said pinion is engaged by the opposite rack.

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

1. The combination with the car carrying the vertical rack, the horizontally-movable shaft carrying a pinion which extends into the path of said rack, the spool on the outer end of said shaft, the movable gate, the rope attached to said gate and winding on said spool, and means, carried by the car, for moving said shaft longitudinally so as to carry the pinion thereon out of the path of said rack.

2. The combination of the car, the rack mounted thereon, the longitudinally-movable shaft carrying a pinion that normally lies in the path of said rack, the spool on the outer end of said shaft, the gate, the cable connecting said gate and spool, the movable bar carried by said car and means for sliding said bar into line with said pinion so that said pinion is engaged thereby by the movement of the car and the shaft of said pinion is moved longitudinally to disengage said pinion from said rack.

3. The combination of the car, the opposed racks carried thereby arranged one above the other, the pinion mounted on the longitudinally-movable shaft and adapted to engage said racks alternately, the spool or drum on the shaft of said pinion, the gate, the cable attached to said gate and to said drum, the movable bar mounted on the car having curved ends and adapted to be moved horizontally into the path of said pinion and the lever or analogous means for actuating said bar.

4. The combination of the car having a rack

thereon, the longitudinally-movable shaft carrying a pinion which normally extends into the path of said rack, the coiled spring mounted on said shaft between said pinion and the
5 shaft-bearing, the spool or drum also carried by said shaft, the gate, the cable connecting said gate and drum, and means carried by said car for moving said shaft longitudinally against the action of said spring which serves

to return said shaft to its normal position when released.

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

WEBSTER F. TRAVES.

Witnesses:

E. S. WHEELER,
HORACE R. WHEELER.