No. 613,878. Patented Nov. 8, 1898.

G. E. DE VORE.

ELEVATOR GATE.

(Application filed Oct. 4, 1897.)

(No Model.)

Fig. 1.

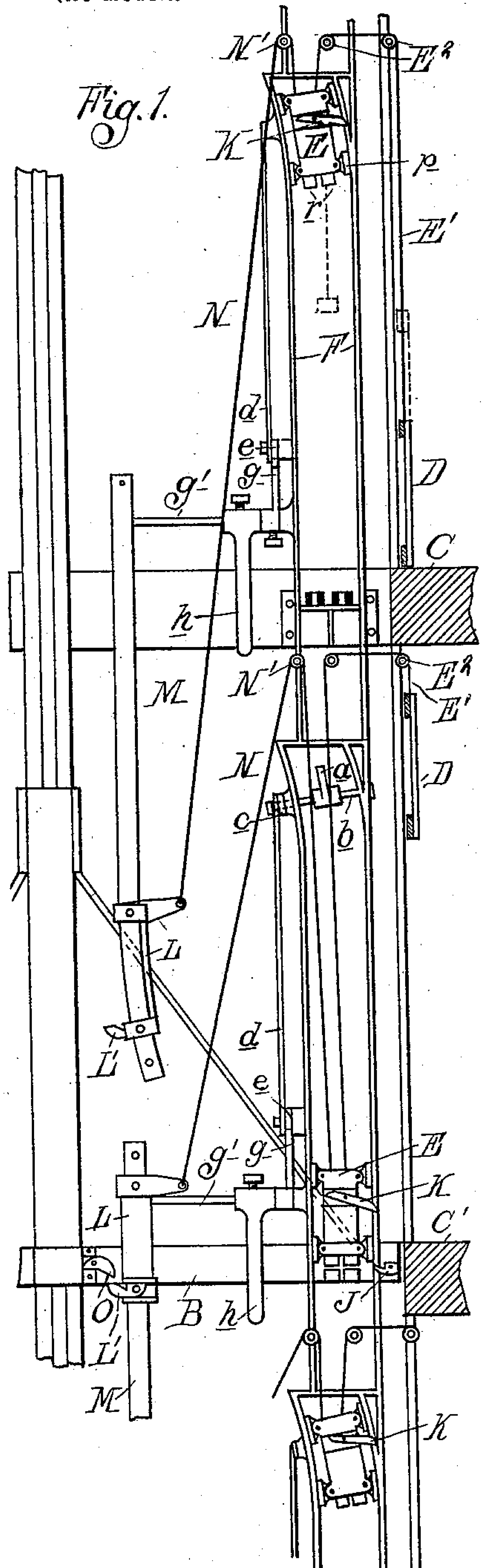


Fig. 4.

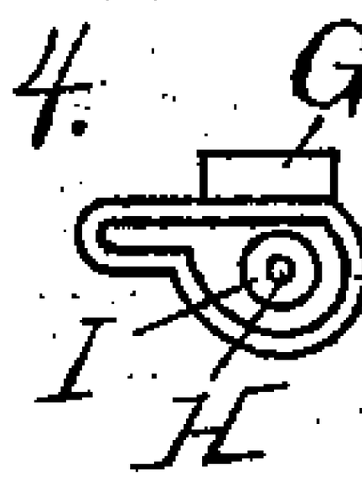


Fig. 2.

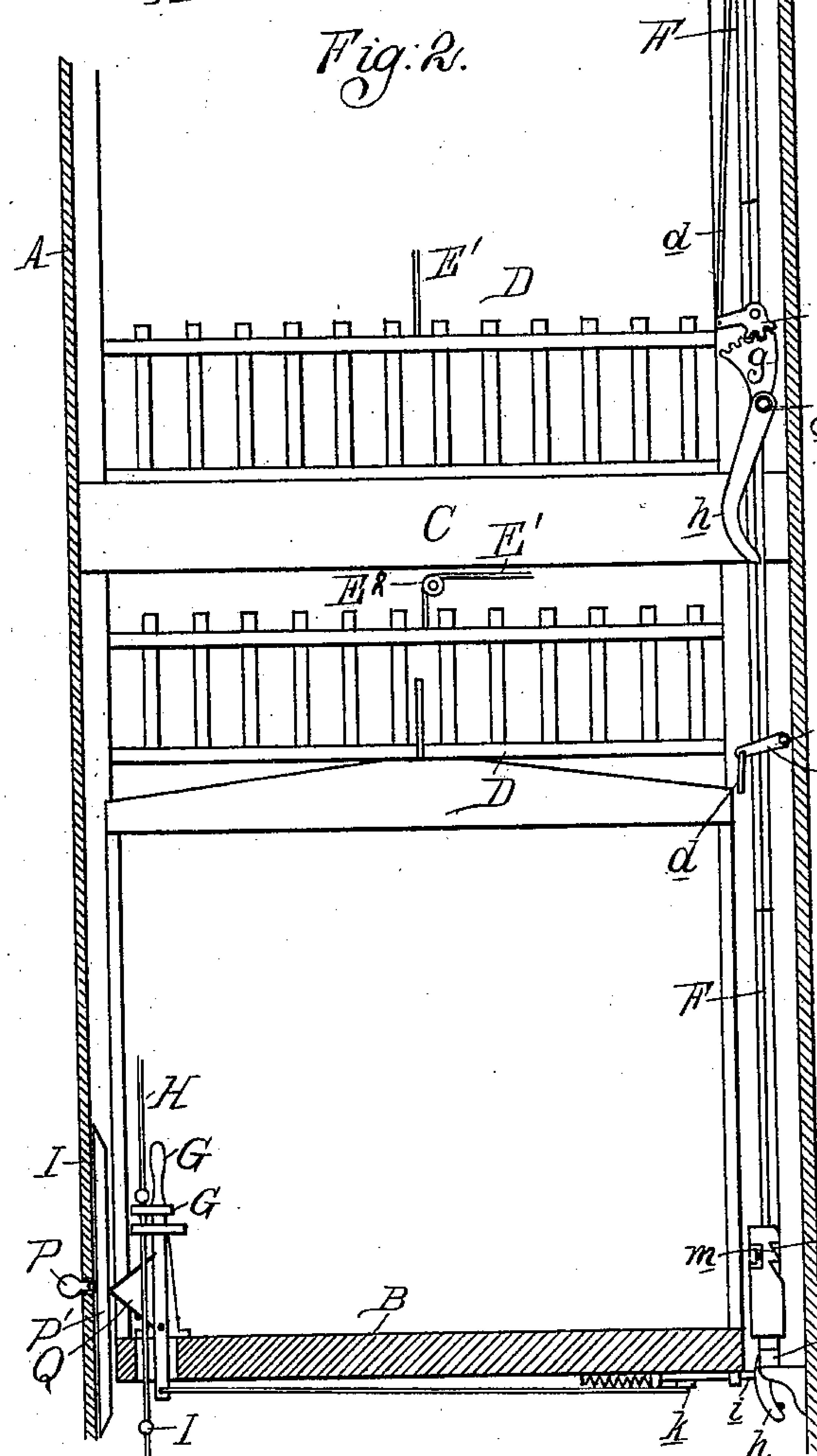
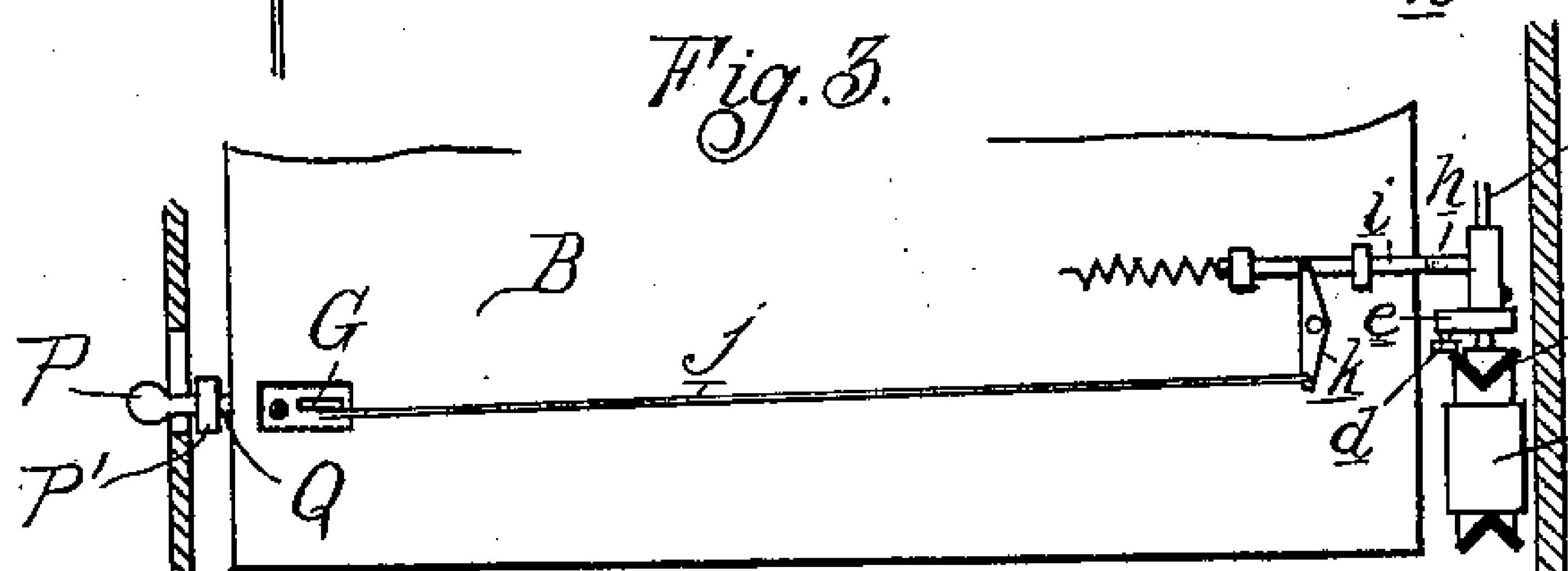


Fig. 3.



Witnesses:
Otto A. Barthel
R. L. Hobbs

Inventor:
George E. De Vore
By [signature] Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GEORGE E. DE VORE, OF LANSING, MICHIGAN, ASSIGNOR OF ONE-HALF TO JAMES J. BAIRD, OF SAME PLACE.

ELEVATOR-GATE.

SPECIFICATION forming part of Letters Patent No. 613,878, dated November 8, 1898.

Application filed October 4, 1897. Serial No. 654,025. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. DE VORE, a citizen of the United States, residing at Lansing, in the county of Ingham and State of Michigan, have invented certain new and useful Improvements in Elevator-Gates, of which the following is a specification, reference being had therein to the accompanying drawings.

It is the object of my invention to obtain an operating mechanism for elevator-gates which, while unaffected by the continuous upward or downward movement of the elevator car or platform past said gate, is adapted to automatically open the latter whenever said car is stopped opposite thereto and to close it again by either the upward or downward movement of said car.

It is a further object of my invention to actuate the gate by a motor independent of the movement of the car, all as more fully hereinafter described and claimed.

In the drawings, Figure 1 is an elevation of an elevator-shaft to which my improvement is applied, the front wall of the shaft being broken away. Fig. 2 is a section at right angles to Fig. 1, and Fig. 3 is a horizontal section. Fig. 4 is a detail of the elevator-stopping mechanism.

A is an elevator-shaft.

B is the car or platform.

C C′ are the floors, and D are the gates or doors guarding the openings into the shaft at each floor. Each gate is provided with a motor independent of the elevator mechanism which is adapted, when released, to open the gate. In the drawings this motor comprises the weight E, vertically slidingly secured to the rails or guideways F on one side of the elevator-shaft and connected to the gate by the cord or flexible connection E′, passing over the sheaves E^2.

The weight E is normally held in its raised position on the guides F by a latch or dog *a*, which is adapted to be withdrawn to release the weight upon the stopping of the car or platform opposite the gate. The mechanism for operating this dog preferably comprises a rock-shaft *b*, to which the dog is secured, the rock-arm *c* thereon connected by the rod *d* to the gear-segment *e*, the latter being in engagement with a segment *g* on the rock-shaft *g′*, to which is secured the operating rock-arm *h*. This arm is arranged in a position where it will be in the path of a movable arm *i* on the elevator-platform when said arm is in its projected position, but when the arm *i* is retracted it will pass clear of the lever *h*. The arm *i* is arranged to be under control of the elevator-operator, so that whenever the car is to be stopped said arm may be projected, operating the lever *h*, and through the connecting mechanism described withdrawing the dog *a*, which releases the weight E and allows it to descend, thereby raising the gate D. I preferably, however, connect the arm *i* directly with the mechanism for stopping the car, so that when the latter is operated to stop the car at a certain floor the gate will be automatically opened.

In the drawings I have shown the mechanism as comprising a lever G on the car carrying the ring or eye G′, through which the starting-cable H passes, the eye G′ being of sufficient size to permit, when in its normal position, of the passage therethrough of the dogs I on the cable H, but when the lever is moved laterally the ring will engage with the dogs and bring the car to a stop. To the lower end of the lever G is connected a rod *j*, which is connected at its opposite end to a lever *k*, adapted to throw the arm *i*.

To raise the weight E and rëengage it with the dog *a*, I provide the following mechanism:

J is an arm or dog secured to the car. K is a dog on the weight E, which when the latter is in its lower position projects into the path of the dog J and will be lifted thereby in the upward movement of the car. At the point at which the dog *a* is located the guides F, on which the weight E slide, are inclined laterally, so as to carry the dog K out of engagement with the dog J at the same time that the weight E engages with the dog *a*. In order to secure a positive engagement of the dog *a* with the weight and to allow for the slight lateral oscillation of the car on its guides, the weight E is provided with a series of notches *m*, with any one of which the dog *a* may engage. Thus if the load on the car is in such a position as to force the latter to one side or the other of the guides, the weight F will

only be carried to a greater or lesser height before the dogs J and K disengage and the dog *a* will engage with the notch *m* opposite thereto at the time of release. The dog K is preferably pivoted on or secured to the weight to have a slight play thereon, so that when it is released by the dog J it will drop back into a position where the latter will completely clear it when the car passes upward or downward thereby, thus avoiding the clicking which would otherwise occur at each passage. L is a head slidingly secured to a guide-rail M on the side of the elevator-shaft and connected by the cord or flexible connection N passing over the sheaves N′ to the weight E. O is a dog secured to the car projecting in the path of an arm L′ on the head L and adapted in the downward movement of the car to carry down said sliding head and raise the weight E to its upper position. At its lower end the guide-rail M is inclined laterally to disengage the dog O from the arm L′ at the same time the dog *a* engages with the weight E. This mechanism will cause the lifting of the weight E and consequent closing by its own gravity of the gate D when the elevator-car descends from a floor at which it has stopped. The dog O is provided with a slight drop to permit of its clearing the arm L′ when disengaged therefrom, similar to the arrangement of the dog K.

In the operation of the mechanism, as already partially described, the upward or downward movement of the car without stopping will leave the gates undisturbed; but when the lever G is moved laterally to stop the car by engaging with one of the dogs I on the cable H it will at the same time project the arm *i* into the path of the arm *h* and in moving said arm will disengage the dog *a* from the weight E, allowing the latter to open the gate. If the car in starting again travels in an upward direction, the dog J will lift the weight E and reëngage it with the dog *a*. If, on the contrary, the car descends, the dog O will draw down the head L and through the connection N will draw up the weight E in a similar manner.

It will be seen that the actuation of the gate is independent of the movement of the car, although it is directly controlled thereby, the motive power for opening the gate being furnished by the weight-motor, and in closing the weight of the gate itself or other lesser counteracting weight furnishing the power. This arrangement does away with an objection and danger common to most automatic gates—viz., that if the gate is prevented from movement through any cause, such as obstruction of its path, the operating mechanism will be broken or even more serious damage will be done.

I preferably provide an attachment by means of which a person on any one of the floors may stop the elevator at that floor and open the gate. This consists in a sliding knob or arm P passing through the wall of the shaft and adapted to project a cam P′ into the path of the cam Q on the lever G, which will throw said lever laterally and stop the car, at the same time opening the gate, as before described.

In order to permit the weights E to pass freely over the guide-rails F, I preferably provide said weights with pivotal shoes *p*, which engage with the rails.

The flexible connections E′ and N are preferably attached to the weight E by passing them through apertures in the weight and attaching a small weight or dog *r* at their lower ends. This permits either of said connections to lift the gate without entangling the other should it be prevented from moving—as, for instance, if an obstruction should prevent the closing of the gate the connection E′ and its weight *r* would remain in the position shown in dotted lines while the weight E was drawn up by the connection N.

Although I have shown and described my invention as used in connection with raising and lowering gates, I do not wish to be limited to this construction, as it is obvious that the same operating mechanism might be employed with other forms of gates or doors.

What I claim as my invention is—

1. The combination with the elevator and gate therefor of a weight-motor adapted when released to open said gate, a dog or latch for normally holding said weight from descending, means for tripping said latch upon the stopping of the car or platform opposite said gate, and means for lifting said weight and reëngaging it with said dog or latch upon either the upward or downward movement of said car.

2. The combination with the elevator and gate therefor, of a weight-motor for opening said gate, a guide-rail to which the weight is slidingly secured, a lifting-dog on the elevator-car for raising said weight on said guide-rail, said guide-rail having an incline at the upper end adapted to move said weight laterally to disengage it from said lifting-dog, a retaining-dog for holding said weight in its raised position, and means for tripping said retaining-dog on the stopping of the car opposite said gate.

3. The combination with the elevator and gate therefor, of a weight-motor for opening said gate, a guide-rail to which the weight is slidingly secured, a lifting-dog on the elevator for raising said weight in the upward movement of said car, a connection for raising said weight in the downward movement of the car comprising a guide-rail, a head slidingly secured thereto, a flexible connection secured at one end to said head, passing over a sheave and secured at its opposite end to said weight; and a dog on the car for depressing said head said guide-rails having inclined portion for disengaging said lifting and depressing dogs when the weight is in its raised position, a retaining-dog adapted to hold the weight in its raised position, and means for tripping

said retaining-dog upon the stopping of the car opposite said gate.

4. The combination with the elevator, the gate and weight-motor for operating said gate, of a dog on the elevator-car adapted to lift the weight, a guide-rail to which said weight is slidingly secured having an incline at its upper end adapted to shift the weight laterally to disengage it from said lifting-dog, and a retaining-dog adapted to hold said weight at different elevations on said rail, according to the point at which it is released from the lifting-dog, said retaining-dog being adapted to be released to allow said weight-motor to operate.

5. In an operating mechanism for an elevator-gate, the combination with the gate and the guide-rails F having the lateral inclines of the weight E, connecting with said gate and having the pivotal shoes *p* slidingly engaging said guide-rails and adapted to slide freely around the inclines therein.

6. In an elevator operating mechanism, the combination of the gate, the sliding weight E, the flexible connections N and flexible connections E between said weight and gate for lifting said gate by the movement of the weight, said connections for lifting said weight and lifting the gate, passing through apertures in said weight and the small weights *r* attached to said connections below said weight.

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

GEORGE E. DE VORE.

Witnesses:
GEO. W. STONE,
CHAS. H. CRANE.