No. 622,755. Patented Apr. 11, 1899.

F. S. BRAID.

ELEVATOR CONTROLLER.

(Application filed July 22, 1898.)

(No Model.)

Fig. 1.

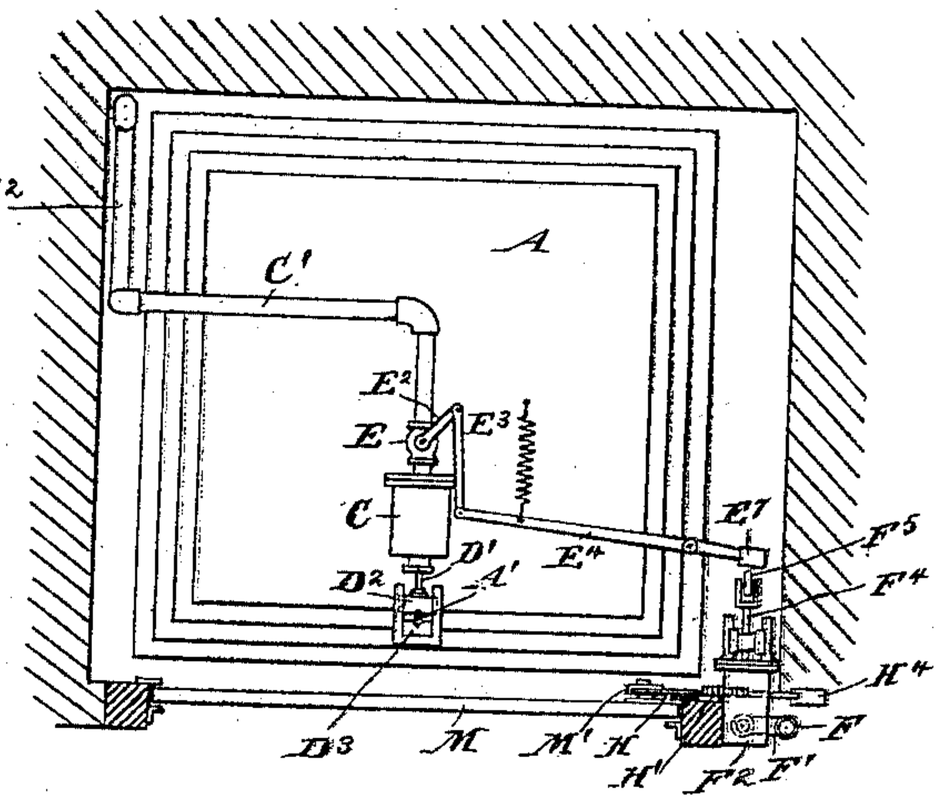


Fig. 3.

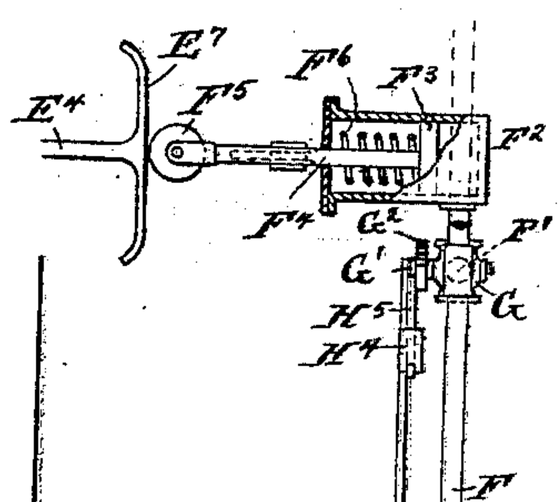
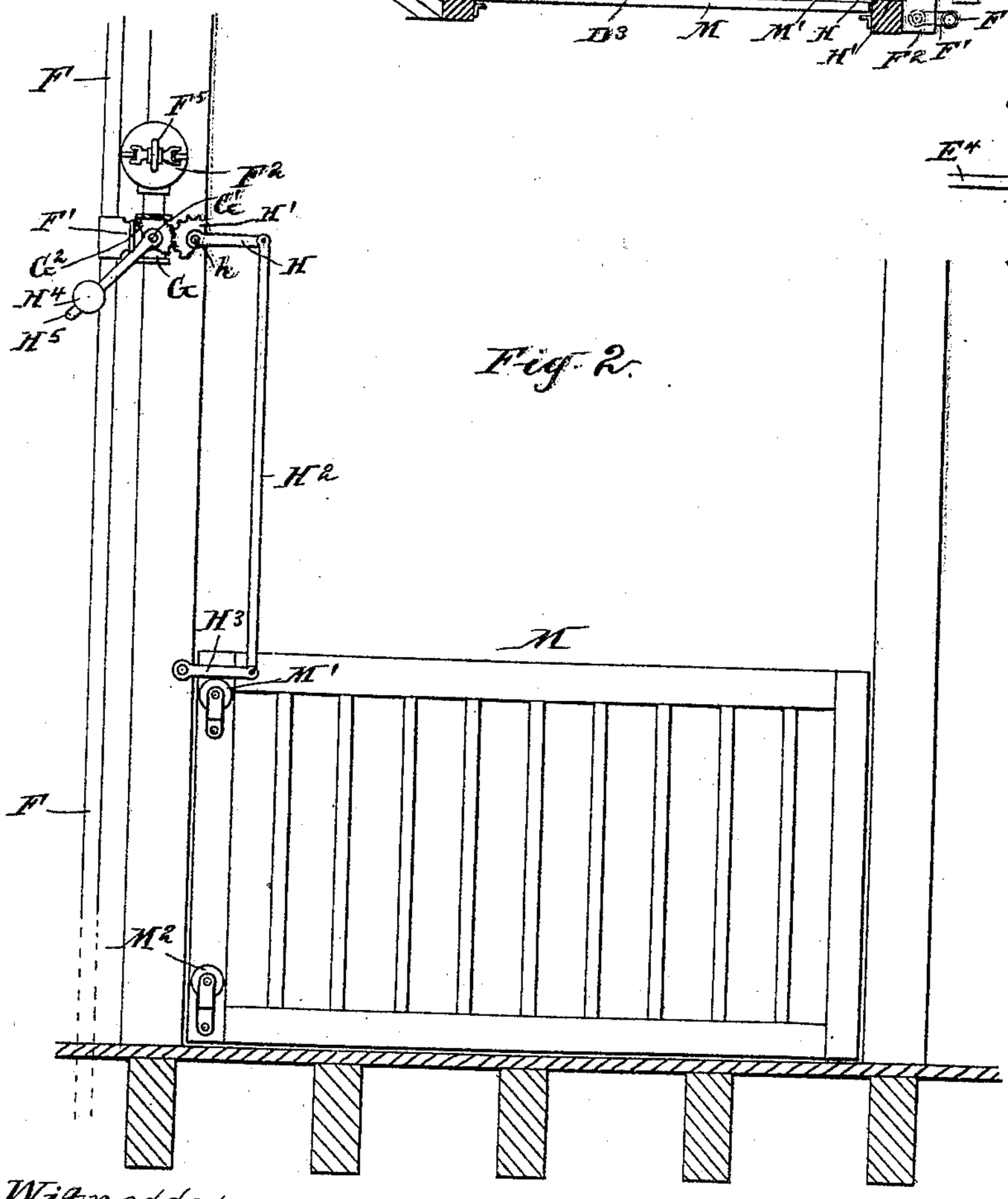


Fig. 2.



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UNITED STATES PATENT OFFICE.

FOUNTAIN S. BRAID, OF NEW YORK, N. Y.

ELEVATOR-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 622,755, dated April 11, 1899.

Application filed July 22, 1898. Serial No. 686,556. (No model.)

To all whom it may concern:

Be it known that I, FOUNTAIN S. BRAID, a citizen of the United States, residing in New York, (Brooklyn,) in the State of New York, have invented a certain new and useful Improvement in Elevator-Controllers, of which the following is a specification.

The invention belongs to that class in which the elevator-car is held against movement in either direction by a clamp or locking device engaging the operating-rope and holding it, the locking device being actuated by the movement of the shaft door or gate, and this invention relates more particularly to mechanism in immediate connection with such door or gate and serving to initiate the movement of the locking device. A difficulty encountered in successfully operating controllers of this class is the large expenditure of power exerted by the attendant in opening and closing the door by reason of the resistance offered by the train of mechanism necessarily set in motion by such act.

The object of this invention is to provide means whereby the door or gate may be moved with but little or no additional exertion and at the same time transmit the power required in operating the locking device.

The invention consists in initiating the movement of the locking device by means of a separate cylinder and piston mounted near the shaft door or gate and controlling the admission of pressure thereto by a valve operated by the movement of such door or gate, so that instead of exerting sufficient force to set the locking mechanism the movement of the gate merely turns a valve controlling the pressure, which when thus admitted to the cylinder will through the piston exert the considerable force required. The advantages gained will be at once seen and appreciated. The attendant is enabled to open and close the door or gate as easily as in the ordinary construction not equipped with locking devices. In situations where the locking is effected by pneumatic or other pressure the separate cylinder may receive its supply from the same source, and in any situation the cost of installation and maintenance is not great in comparison with the saving in labor.

The accompanying drawings form a part of this specification and show the invention as I have carried it out.

Figure 1 is a plan or top view of an elevator-cage equipped with a locking device and my improved means for operating the latter. Certain portions are in horizontal section. The remaining figures are on a larger scale. Fig. 2 is a face view of the gate as seen from the interior of the elevator-shaft and a portion of the immediately-adjacent framing. Fig. 3 is a corresponding vertical section, partly in elevation.

Similar letters of reference indicate the same parts in all the figures.

A is an elevator car or cage, which may be of any ordinary or approved type equipped with hoisting mechanism and safety appliances of any preferred construction, and A′ is the operating or hand rope, extending vertically of the elevator-shaft, through the car, to be grasped by the attendant in the latter and by its means control the hoisting mechanism. (Not shown.)

The car carries a locking device adapted when set to grasp and hold the hand-rope against movement in either direction relatively to the car, and thus prevent starting the latter until released. I have shown such device as consisting of a pair of jaws D^2 D^3, inclosing the hand-rope between them, one fixed to the framework of the car and the other carried on the projecting end of a piston-rod D′, attached to a piston within the cylinder C, fixed to the car. Pressure is received from a reservoir at any convenient location through a flexible pipe or hose C^2 and branch pipe C′, controlled by a valve E, operated by an arm E^2, link E^3, and lever E^4. When through this train of connections the valve is turned to admit pressure behind the piston, the rod D′ is thrust forward and the jaws D^2 D^3 clamp the rope with a force determined by the pressure and the proportions of the parts. The clamp automatically releases itself when the pressure is relieved by a spring (not shown) inclosed in the cylinder and lying between the cylinder-head and front face of the piston.

The lever E^4 carries at the outer end a vertical shoe E^7, adapted to be acted upon by mechanism mounted on the landing and op-

erated by the movement of the door or gate. This mechanism forms the basis of this invention, and it may serve with the locking device above described or any other form adapted to accomplish the desired end of holding the car against movement in either direction while the shaft door or gate is in the open or partially open condition.

F is a pipe extending vertically of the elevator-shaft and bringing pressure from the reservoir supplying the locking-cylinder or from any other available source, equipped at each floor or landing with a branch pipe F′, communicating with the cylinder F^2 behind the inclosed piston F^3 and controlled by the three-way valve G, having a stem G′. On the projecting forward end of the piston-rod F^4 is an antifriction-roller F^5, and F^6 is a spring exerting its force in opposition to the pressure and serving to automatically drive the piston inward and withdraw the roller when the pressure in the cylinder is released. The cylinder is mounted in the framing adjacent to the door or gate and in such relation to the elevator-car and the shoe E^7 thereon that when the car is at or near the level of the landing the piston-rod F^4 will be in line with some portion of the shoe and act through the roller F^5 directly against the latter when the piston moves forward, and thus through the lever E^4 and its connections set the clamp D^2 D^3.

The means I have shown for throwing the valve G consists of a segmental gear G^2, carried by the valve-stem, meshing with a corresponding gear H′, turning on a center *h* and having a lever-arm H extending outwardly into the path of the gate M. The latter is shown as of the vertically-sliding type and carries two rollers M′ and M^2, one near the top of the gate and the other at a lower point in the same vertical line. To the lever-arm H is knuckled a link H^2, extending downward to a lever H^3, corresponding to the lever-arm and moving therewith through the connecting-link. The link and levers are arranged in the vertical path of the roller, and when the gate is lifted the upper roller M′ strikes the lower lever H^3 and tilts it into the upright or nearly upright position, the motion being communicated through the link and lever H to the valve G. During the further movement of the gate the roller M′ continues in contact with the link, thus holding the valve open, and by the time the gate has risen sufficiently to carry the roller M′ out of contact with the link and upper lever the lower roller M^2 is similarly engaged and prevents the closing of the valve so long as the gate is in the elevated condition. A reverse movement of the gate releases the link and levers when the downward motion is completed and the latter automatically return to the first position by gravity, assisted by a weight H^4 on an arm H^5 of the segment G^2, tending to turn the valve to the closed position. The upward movement of the gate turns the three-way valve G into position to admit pressure to the cylinder F^2 and thrust the rod F^4 forward and set the clamp, thus holding the operating-rope A′ securely until the gate is again lowered, allowing the valve G to turn to the position in which the further admission of pressure is stopped and that already behind the piston escapes through the opening F^7. The action of the spring F^6, asserting itself, forces the piston rearward and withdraws the roller from contact with the shoe and allows the clamping or locking mechanism to release its grasp on the hand-rope. The elevator-car may then be moved as usual.

Modifications may be made in the forms and proportions of the parts and the general arrangement may be varied to suit the conditions and space presented in various cases.

Forms of locking devices other than the one described may be used, and the mechanism shown for controlling the valve G and communicating motion thereto from the gate may be varied.

It will be understood that the mechanism is to be duplicated on each landing or floor. Instead of a weight to return the valve to the normal position springs may be substituted.

I claim—

In an elevator-controller, a landing gate or door, a cylinder mounted near the latter and receiving pressure, a piston in said cylinder moved by the pressure, mechanism controlling the admission of pressure to said cylinder operated by said gate or door in opening and closing, and mechanism carried on the car adapted to grasp and hold the operating-rope of the latter and actuated by the movement of said piston, all substantially as and for the purposes herein set forth.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

FOUNTAIN S. BRAID.

Witnesses:
JOHN S. STETSON,
JOHN BOWIE.