No. 621,669. Patented Mar. 21, 1899.

# F. P. HINDS.

## PNEUMATIC CHECK FOR ELEVATOR GATES.

(Application filed Oct. 20, 1897.)

(No Model.)

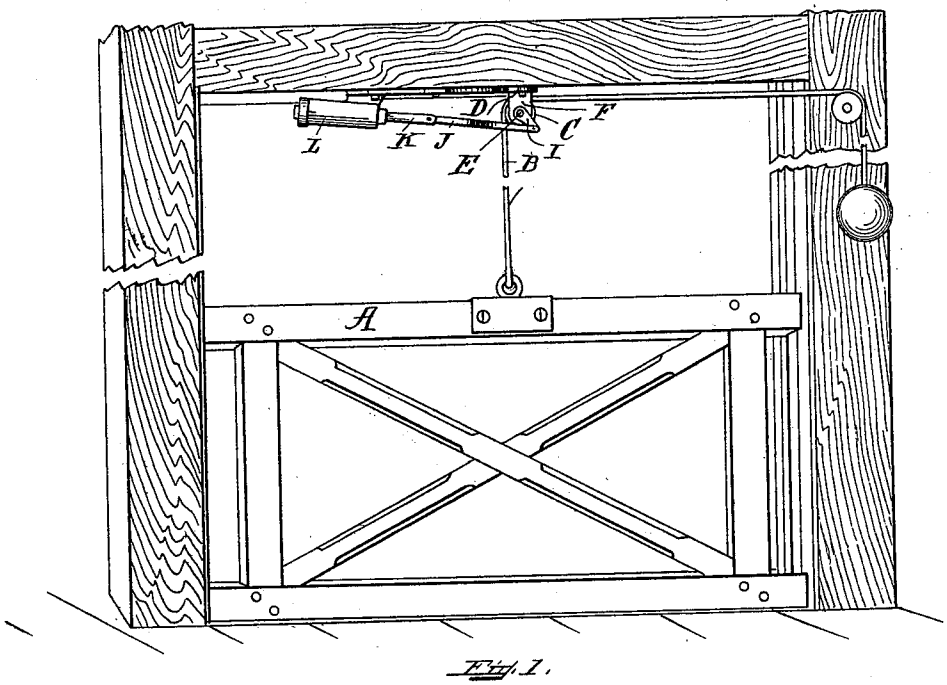



Fig. 1.

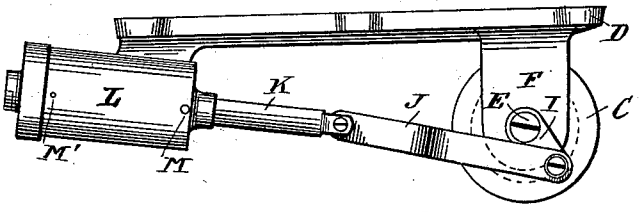



Fig. 2.

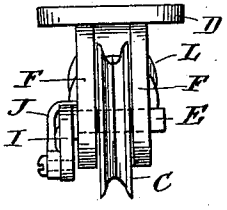



Fig. 3.

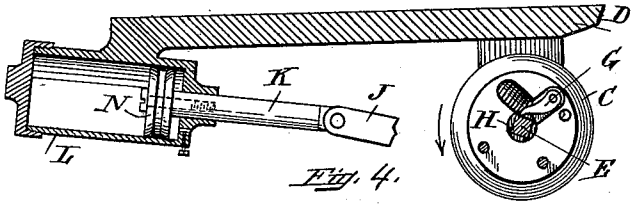



Fig. 4.

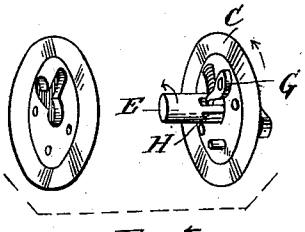



Fig. 5.

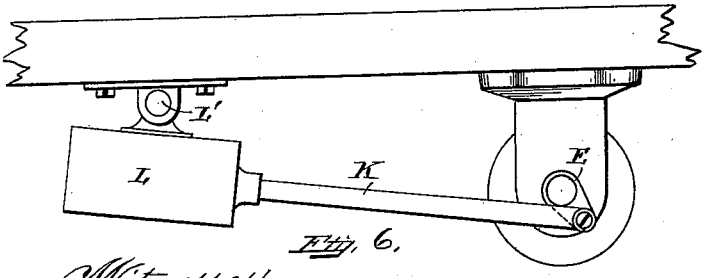



Fig. 6.

Witnesses:
John F. Benton
Edward A. Little

Inventor:
Franklin P. Hinds

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

# UNITED STATES PATENT OFFICE.

FRANKLIN P. HINDS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO JOHN F. BERTON, OF SOMERVILLE, MASSACHUSETTS.

## PNEUMATIC CHECK FOR ELEVATOR-GATES.

SPECIFICATION forming part of Letters Patent No. 621,669, dated March 21, 1899.

Application filed October 20, 1897. Serial No. 655,789. (No model.)

*To all whom it may concern:*

Be it known that I, FRANKLIN P. HINDS, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Mechanism for Regulating the Fall of Counterweighted Elevator-Gates, which will, in connection with the accompanying drawings, be hereinafter fully described, and specifically defined in the appended claim.

My present invention relates to mechanism for controlling the descent of a gate or barrier suspended by a counterweighted cord attached to the middle of the gate and passed over and sustained by one or more overhanging pulleys in the usual manner, the gates being guided by side grooves running in corresponding bars vertically secured to the sides of the passage-way or doorway to the well and being what is known as a "half-automatic" gate—that is, one raised by hand to open the passage-way to the well and car and locked in such raised position while the car stands at the door, but is automatically released by the movement of the car in either direction away from the door and then falls by gravity, the counterweight serving to restrain it somewhat and to help in raising it. The counterweight, however, is not sufficient to counterbalance the gate and therefore cannot prevent its falling with increasing velocity and consequent liability to injure itself or any articles or persons caught in its path. I therefore employ an auxiliary controller consisting of an adjustable automatic check, which is hereinafter more fully described and forms the most essential feature of my present invention.

In the drawings, Figure 1 is a front elevation of an elevator-gate and doorway leading to the well, the gate being closed down and my controlling devices being shown in place above the gate. Fig. 2 is a side view of the controlling device detached from its support on the wall of the elevator-well. Fig. 3 is an end view of the same as seen from the right of Fig. 2. Fig. 4 is a longitudinal section taken vertically through the center of Fig. 2. Fig. 5 is a perspective view of the inner faces of the two halves of the pulley over which the counterweight cord or chain passes to the gate and shows the construction and arrangement of the ratchet devices within the pulley. Fig. 6 is a side view of a modification in which the cylinder is pivoted to the hanger so as to oscillate thereon and the ratchet-shaft of the pulley is connected directly with the piston-rod which operates the air-pump.

Referring to the drawings, the gate A is sustained by a chain or cord B, passed over a grooved pulley C, made in two parts and which is attached to a hanger D, secured to the wall. The pulley C is mounted upon a ratchet-shaft E, journaled in bearings F in said hanger and arranged to turn freely in one direction on the shaft E, which also revolves in said bearings. The pulley C carries between its two halves a ratchet-pawl G, which is arranged to engage the notches or cuts H in the ratchet-shaft E when the pulley is moved thereon in the direction indicated by the arrow; but when the ratchet-pulley C is rotated in the opposite direction the pawl G does not engage the notches H. Consequently the pulley rotates freely in that direction, thus facilitating the raising of the gate by hand; but when the gate is released, as before stated, and starts by its gravity to descend it causes pulley C to rotate in the opposite direction, when the pawl G, actuated by a spring, as shown, engages one of the notches H on shaft E, and thereby causes the shaft to rotate with it. The shaft carries an arm I, which connects with a link J, which operates a piston-rod K, secured to a piston-head N in a cylinder L. These last-named devices constitute the auxiliary controller before referred to and are a part of or properly secured to the body of hanger D, as shown. The cylinder L has two adjustable vents M M′, between which the double piston-head N, carrying leather disks closely fitted to the interior of the cylinder, moves back and forth, such reciprocation being against pneumatic resistance in both directions, and the rotation of shaft E and pulley C when the gate is falling is thereby checked, and a too rapid descent of the gate is thus prevented, the controller being capable of adjustment by means of vents M and M′, thereby producing more or less pneumatic resistance. The downward speed of the gate

can be nicely regulated and adapted to gates of varying sizes and weights. By this device I overcome the common difficulty with such gates which arises from the fact that if too nearly counterbalanced by the weight they are apt under varying conditions of the atmosphere as to dampness and dryness to stick and not fall and guard the doorway at all or to become too free and go down with damaging force, and I have found it impossible to adjust such gates by a simple counterweight so as to effect a uniform and proper movement of the gate and certainty of its automatic operation; but with the described pneumatic attachment or air-pump, which is nicely adjustable and practically uniform in its action, I can give such preponderance to the gate over the counterweight as to insure its descent under all atmospheric conditions and at the same time so adjust the pneumatic controller as to nicely regulate the descent of the gate and avoid all undue speed thereof and all damaging force and shock when such movement is arrested.

It is obvious that the invention described is applicable to other forms of gates or barriers and counterweighted drop scenes or curtains to automatically regulate their fall.

In the modification shown in Fig. 6 the cylinder L is pivoted to the hanger at L′, so as to oscillate thereon, and the arm E of the ratchet-shaft is attached directly to the piston.

The piston-head is retarded in its movements in both directions and reciprocates a number of times during the descent of the gate, and hence I am able to restrain the descent of a gate having considerable preponderance of weight by means of a comparatively small and inexpensive pneumatic check or air-pump, and said check offers no resistance whatever to the raising of the gate, owing to the ratchet-pulley over which the cord passes.

I claim—

The combination with a vertically-movable gate or barrier, of a counterweight therefor and a flexible connection between the two, a pulley for said connection and mounted on a shaft and adapted to rotate freely on the shaft when the gate is elevated and to cause the rotation of said shaft when the gate is descending, and a cylinder and piston, the latter having a pitman-and-crank connection with the shaft of said pulley.

Boston, Massachusetts, September 18, 1897.

FRANKLIN P. HINDS.

Witnesses:

EUGENE HUMPHREY,

R. W. E. HOPPER.