(No Model.)

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MEANS FOR LOCKING ELEVATOR CONTROLLERS.

No. 588,540. Patented Aug. 17, 1897.

Fig. 1.

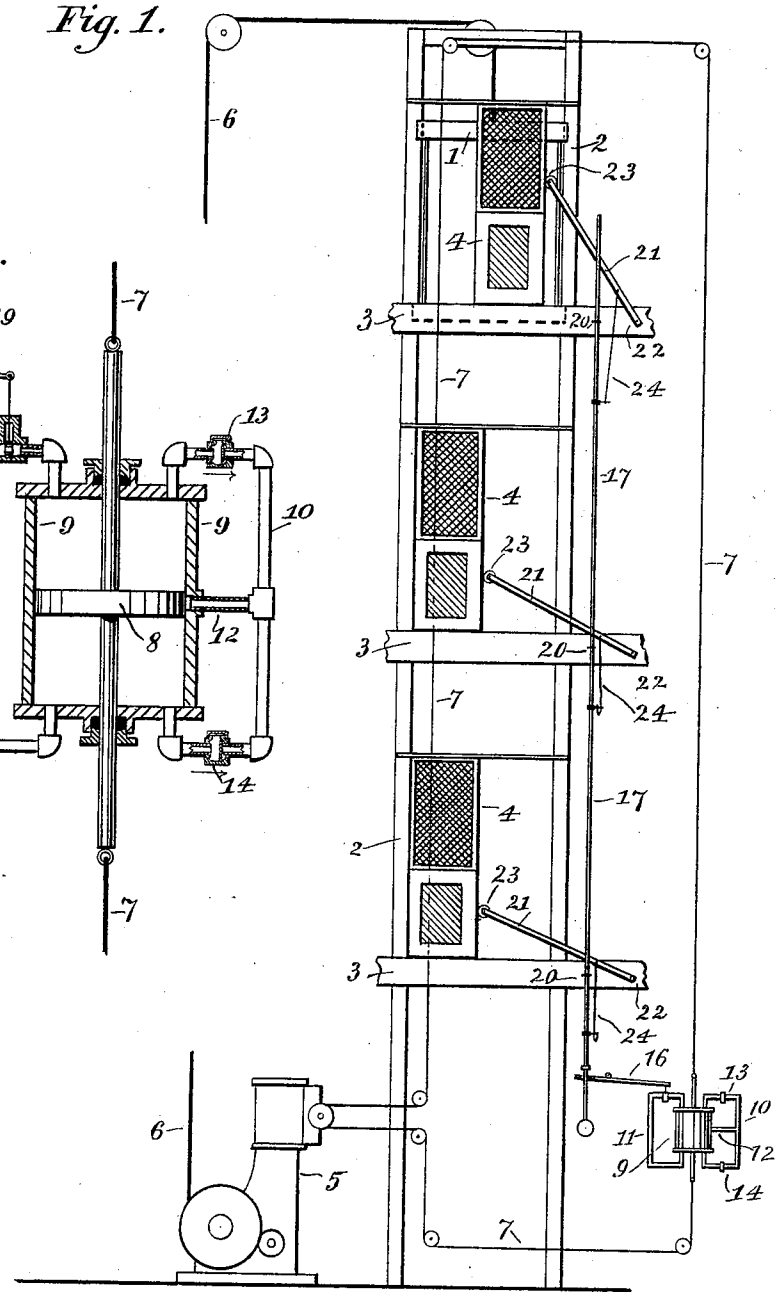


Fig. 2.

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MEANS FOR LOCKING ELEVATOR-CONTROLLERS.

SPECIFICATION forming part of Letters Patent No. 588,540, dated August 17, 1897.

Application filed November 30, 1895. Serial No. 570,635. (No model.)

To all whom it may concern:

Be it known that I, THOMAS G. TURNER, a citizen of the United States, and a resident of the city, county, and State of New York, have made certain new and useful Improvements in Means for Locking Elevator-Controllers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

The object of my invention is to provide a simple and comparatively inexpensive apparatus attachable to any elevator which will prevent the starting of the car while a door is open; and to this end it consists of a fluid-check controlled by the movement or position of a landing-door and controlling the operation of the starting devices.

In the accompanying drawings, Figure 1 is a view in elevation, showing my invention applied to an elevator; and Fig. 2 is a sectional view of the fluid-chamber, its piston, and circulating-pipes and valves, which is one form of what I term herein the "fluid-check."

In said drawings, 1 represents the elevator car or cage, which travels in ways 2 in the usual manner. Each landing (indicated by the beams 3) is provided with a door 4 of any desired construction. The car is raised and lowered by a motor 5, which, as shown, is a steam-engine, but any other type of motor may be used instead, if desired. The car is connected to the hoisting-drum of the motor by the cable 6. The operation of the motor is controlled by the hand-rope 7, which passes through the car, as usual, and by which the motor is started, stopped, and reversed. Secured to the hand-rope 7, so as to practically form part thereof, is a piston 8, Fig. 2, confined in a properly-supported stationary cylinder or chamber 9, provided with two sets of circulatory pipes 10 and 11. The pipe 10 is connected with each end of the cylinder 9 and also with the central part of the cylinder by the pipe 12, the exact position of the pipe being determined by the normal position of the piston 8 when the motor is at rest, as will be presently described. Check-valves 13 and 14 are arranged in said pipe 10 so as to open toward the cylinder. The pipe 11 is provided with a stop-valve 15, which, as shown in Fig. 2, is closed. The opening and closing of the valve 15 is effected by the lever 16, which is operated by the rod 17. The lever 16 is pivoted, so that the valve will be opened by a downward movement of the opposite end of the lever. The rod 17 passes through that end of the lever and is provided with an adjustable collar 18, which engages with the lever and forces it down when the rod 17 descends. When the rod is lifted and the lever 16 is relieved of the pressure or weight of the rod, the spring 19 (or the weight of the lever, as shown in Fig. 1) carries down the end to which the valve 15 is connected and closes said valve, so as to stop circulation through the pipe 11.

The rod 17 is arranged in a vertical position within or adjacent to the elevator-shaft, being so secured in place that it may be freely raised and lowered, as by guides 20, and it is suitably weighted to cause it to descend when deprived of support, as hereinafter described. The levers 21 are pivoted, as at 22, to any suitable support near or back of the doors. As shown, they are pivoted to the floor-beams 3. The opposite or free end of each lever carries a roller 23, which is arranged to rest against the back edge of the door and support the lever in such position that when the door is opened, as shown at the top of Fig. 1, the lever will be swung on its pivot, the roller 23 riding up the back edge of the door. Each of the levers 21 is connected by an independent connection 24 with the rod 17. As shown, these connections 24 consist of a flexible rope or chain connected at one end to the lever and at the opposite end to the rod.

The operation of my invention is as follows: The pipes 10 and 11 and the cylinder 9 (except for the space occupied by the piston) are completely filled with some substantially incompressible fluid—such, for instance, as water, glycerin, or oil. When the valve 15 is open, the fluid will flow freely through pipe 11 from one end of the cylinder to the other as the piston is moved by the hand-rope in either direction. With the valve 15 open, if the hand-rope 7 in the car is pulled down in the usual way, the piston 8 will move freely to the top of the cylinder and the engine will be started, so as to raise the car. When the desired landing is reached, the car is stopped by the hand-rope, the piston being brought

to a central position, and the door is opened, as shown at the top of Fig. 1. The opening of the door swings the lever 22 upward, and the rod 17 is thereby lifted, carrying the stop 18 free from the apertured end of the lever 16. The spring 19 instantly forces the opposite end of the lever down, closing the valve 15. This stops circulation through the pipe 11 and (as the check-valves 13 and 14 open only toward the cylinder) prevents any liquid on one side of the piston 8 from passing to the other side. This prevents the piston, if it be on the middle of the cylinder, from being moved by the hand-rope to start the engine, and thus locks the hand-rope and prevents the car from being started in either direction until the door is closed.

The pipes 10 and 12 are provided to prevent the piston from being locked while the engine is running, as might otherwise happen if the valve 15 should be accidentally closed, as by the accidental opening of a door or otherwise. As stated, the piston 8 is intended, in the apparatus shown in the drawings, to be in the middle of the cylinder when the engine is at rest, nearer or at the top of the cylinder when the engine is running ahead, and nearer or at the bottom of the cylinder when the engine is reversed. If, for instance, when the piston is near the top of the cylinder the valve 15 should be closed, the hand-rope 7 could not, without the provision of the pipes 10 and 12 or some equivalent mechanism, be moved to stop the engine, but with the apparatus shown, if such a contingency should occur, the hand-rope can be moved to carry the piston to the center of the cylinder to stop the engine, because the liquid or fluid in front of the piston, which would otherwise oppose its movement, will flow through the pipe 12, the pipe 10, and one of the check-valves into the cylinder back of the piston until the piston reaches the center of the cylinder and shuts off the circulation by covering the opening of pipe 12, as shown in Fig. 2. When this occurs, the engine will have been stopped and the hand-rope will be locked so as to prevent the starting of the engine until the doors are all shut and the valve 15 opened.

It is to be understood that the parts of the device are to be so proportioned and arranged to suit the varying conditions of actual use that the hand-rope will be securely locked until the doors are all fully closed, so as to practically prevent the serious accidents constantly being caused by careless operators who fail to close the car-doors. It is also to be understood that I do not confine myself to the details of construction and arrangement of parts herein shown. For instance, I use the term "landing-door" to describe a door like those shown in the drawings or any equivalent mechanism or member of the structure which controls ingress to and egress from the elevator-shaft. In the same way the various parts and connections will require and are susceptible of modification, but these are all within the capacity of a skilled artisan and do not require enumeration here.

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

1. The combination with an elevator-car, of a landing-door, stopping and starting mechanism, a fluid-check and means, substantially as described, whereby said fluid-check operates to lock the stopping and starting mechanism when said door is open and the car is at a standstill, substantially as shown and described.

2. The combination with an elevator-car, of a landing-door, stopping and starting mechanism, a hand-rope, a check, for controlling the movement of the hand-rope consisting of a substantially incompressible fluid and a suitable chamber containing said fluid, and means, actuated by the movement or position of the landing-door, for controlling the circulation in said chamber, substantially as shown and described.

3. In an elevator attachment the combination of a landing-door, a chamber adapted to be filled with fluid, a piston therein connected with the hand-rope, and mechanism operated by the movement or position of said landing-door for controlling communication between portions of said chamber on different sides of the piston, substantially as shown and described.

4. In an elevator attachment the combination of a landing-door, a chamber adapted to be filled with fluid, a piston therein connected with the hand-rope, mechanism actuated by the movement or position of said landing-door for controlling communication between portions of said chamber on different sides of the piston, and mechanism for equalizing the quantity of fluid on each side of the piston to prevent the piston being locked while the car is in motion, substantially as shown and described.

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