

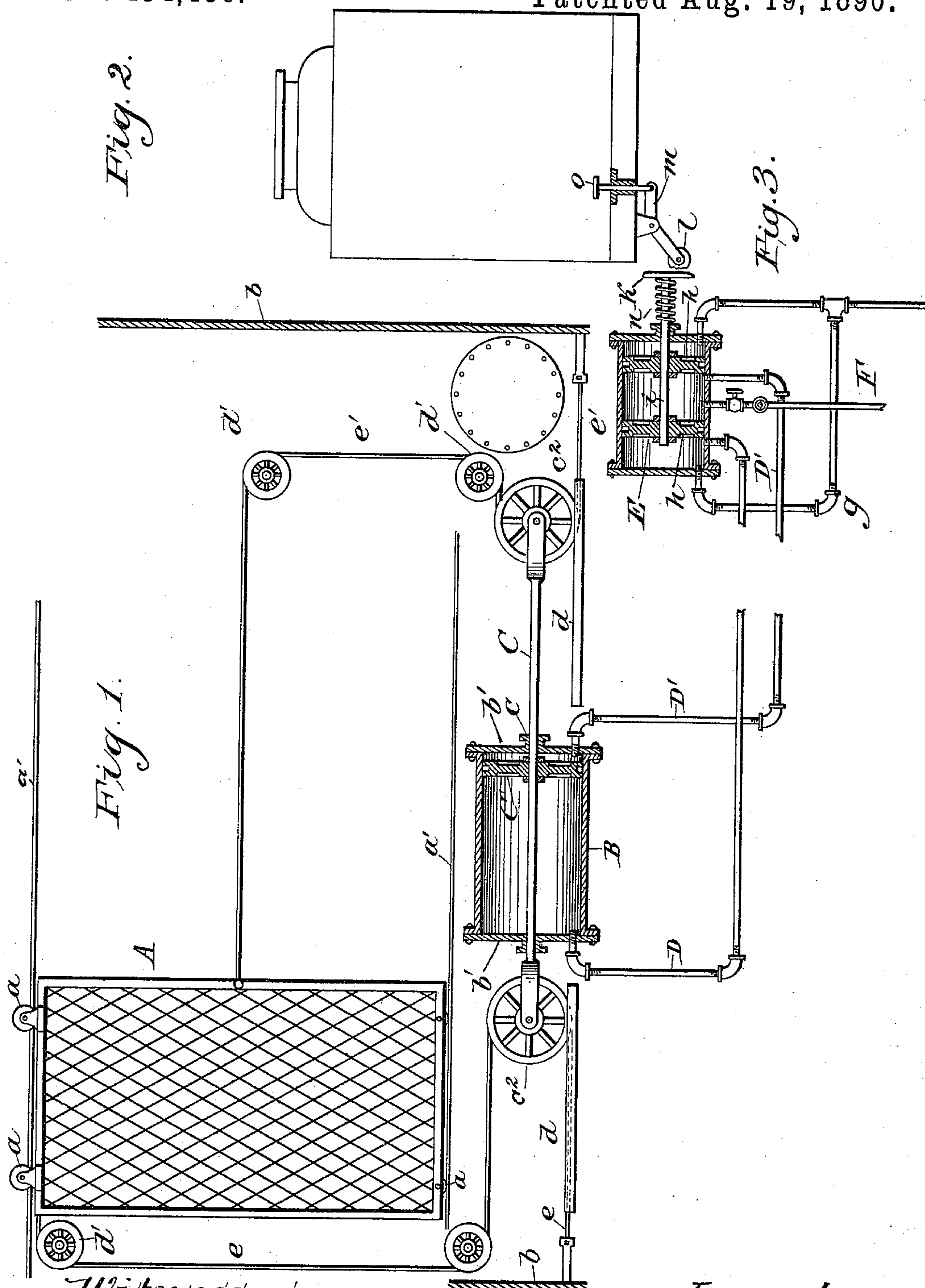
(No Model.)

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DEVICE FOR OPERATING ELEVATOR WELL DOORS.

No. 434,486.

Patented Aug. 19, 1890.



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DEVICE FOR OPERATING ELEVATOR-WELL DOORS.

SPECIFICATION forming part of Letters Patent No. 434,486, dated August 19, 1890.

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To all whom it may concern:

Be it known that I, WILLIAM C. STEPHEN, a citizen of the United States, residing at Austin, in the county of Cook and State of Illinois, have invented a certain new and useful Means for Operating Elevator-Doors, of which the following is a specification.

My invention relates to an improvement in means or devices for operating elevator-doors; and it consists in certain peculiarities of the construction and novel arrangement of the different parts thereof, as will be hereinafter more fully set forth and specifically claimed.

The object of my invention is to automatically close the doors to elevator-shafts as the car or cage passes in its upward or downward movements, thereby preventing the frequent accidents caused by leaving the doors open. I attain this object by the peculiar mechanism and arrangement of the devices employed, and in order to enable others skilled in the art to which my invention pertains to make and use the same, I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1 is a view of an elevator-door, a portion of the walls of the shaft, and the fluid-cylinder. Fig. 2 is a detail view of the car or cage, showing the pedal for operating the valve; and Fig. 3 is a longitudinal sectional view of one of the operating-valves, showing the connection of the different pipes therewith.

A represents a door of an elevator-car made of suitable size and material and provided at the top and bottom with a number of rollers *a*, which are adapted to track or roll freely on horizontal bars *a'*, which bars extend from one side of the elevator-shaft to the other, the door being suspended on the upper rollers and supported by the lower rollers, thus allowing a free lateral movement of the door, as will be readily understood. The lower bar is usually, as shown in Fig. 1, placed flush with the floor of the building, but may sometimes be omitted, when the door will slide back and forth on the upper bar. *b b* are the side walls of the elevator-shaft.

B is a fluid-cylinder made of suitable size and placed and secured horizontally beneath the floor of the building and about midway

between the side walls of the shaft, as shown in Fig. 1. Each end of the cylinder is provided with a cap or head *b'*, secured by suitable bolts and nuts to the flanged ends of the body of the cylinder. Passing through suitable holes in the caps, which holes are provided with ordinary bushing *c*, is a piston-rod C, having rigidly secured at its middle a piston *c'*, which is adapted to fit closely and move in the cavity of the cylinder.

Each end of the piston-rod C is provided with a grooved pulley *c'*, which track upon a suitable surface *d* therefor. At suitable points on the front of the frame of the shaft is journaled a number of pulleys *d'*, over which suitable cords or cables *e* and *e'* pass and are supported. The cord *e* is secured at one end to one side of the door and is passed over the pulleys *d'* and *c'* and secured at the other end to any proper place. The cord *e'* is secured to the opposite side of the door and likewise passed over the pulleys *d'* and *c'* and secured at the other end to a proper point, as will be clearly seen by reference to Fig. 1.

To the lower portion of each end of the cylinder B and opening into the cavity thereof are secured the pipes D D', which supply to and exhaust from the cylinder the operating-fluid, which is controlled by an operating-valve E, which valve is horizontally placed and secured at a suitable point below the floor of the building and controls the movement of the door as well as the induction and exhaust of the operating-fluid. To the lower surface of this valve is secured the other ends of the pipes D D', which have their ports opening into the valve, as shown. At about the middle of the lower portion of the valve is connected a supply-pipe F, which has its port within the valve and connects at the other end with a suitable boiler, from which it receives its supply of steam. On either side of the supply-pipe and opening into the valve are attached the exhaust-pipes *g g*. Within the valve are placed two pistons *h*, which are firmly secured the required distance apart on a stem *i* by means of bolts and nuts or otherwise. This stem passes a short distance through one end of the valve and is provided at its free end with a flat plate *k*, against which the roller *l* on the lever *m*

strikes, as will presently be explained. Between the plate *k* and the head of the valve adjacent thereto and around the stem *i* is placed a spiral spring *n*.

5 In Fig. 2 I have shown the outlines of a car, showing the pedal *o* passing up through the floor of the car and having its lower end secured to the lever *m*, which lever is provided at its free end with a roller *l* and fulcrumed
10 at a suitable point to the outer side of the car.

The operation of my device is as follows: The door is hung, as above described, on a horizontal bar, so that it may move freely back and forth thereon. The cords *e* and *e'* are
15 then attached at one of their ends to the door, one on each side thereof, and passed over the pulleys *d'* and *c'* and secured at the other end, as shown. The operating-fluid is then admitted to the valve *E*, through the supply-
20 pipe *F*, which will force the pistons in the valve to the position shown in Fig. 3 and allow the steam to pass through the pipe *D'* into the cylinder *B*, when the expansion of the steam will cause the piston within the cyl-
25 inder to assume the position shown in Fig. 1, which movement of the piston-rod and pulleys thereon causes the door to close by reason of its gearing. When it is desired to open the door, the operator presses his foot on the
30 pedal *o*, which operation forces the roller *l* on the lever *m* against the plate *k*, which forces the pistons past the ports of the pipes *D D'*, thus closing the port of the pipe *D'* and opening the port of the pipe *D* to the supply of
35 steam. The steam will now pass through the pipe *D* into the cylinder *B* and force the piston and its rod to the opposite end of the cylinder, which movement will cause the door to open, as will be readily understood, and the
40 steam on the other side of the piston to be exhausted at the same time through the pipes *D'* and *g*. As soon as the car passes the floor and the plate *k* is released, the spring *n* will force the pistons in the valve again in the po-
45 sition shown in Fig. 3, thus automatically closing the door.

I have shown one door only in the drawings, as this is all that is required to properly illustrate my invention; but it is evident that I can apply my device to as many floors as de- 50 sired and attain the same results. I may also use either air, steam, or water for operating my device, as is obvious.

Having thus fully described my invention, what I claim as new, and desire to secure by 55 Letters Patent, is—

1. In a device for operating elevator-doors, the combination of a door having the rollers *a*, mounted on the bar *a'*, with the cylinder *B*, having the piston *c'*, the rod *C*, carrying the 60 pulleys *c'* and pipes *D D'*, an operating-valve, the pulleys *d'*, and cords *e* and *e'*, all constructed, arranged, and operating substantially as shown and described, and for the purpose set forth. 65

2. In a device for operating elevator-doors, the combination of a door adapted to move laterally, with the cylinder *B*, having the piston *c'*, the rod *C*, the pulleys *c'*, and pipes *D D'*, connected to the operating-valve *E*, hav- 70 ing the pistons *h h*, the stem *i*, plate *k*, spring *n*, and pipes *F* and *g*, the pulleys *d'*, and cords *e e'*, all constructed, arranged, and operating substantially as shown and described, and for the purpose set forth. 75

3. In a device for operating elevator-doors, the combination of a door having the rollers *a*, mounted on the bar *a'*, with the cylinder *B*, having the piston *c'*, the rod *C*, pulleys *c'*, and pipes *D D'*, the operating-valve *E*, having 80 the pistons *h h*, the stem *i*, plate *k*, spring *n*, and pipes *F* and *g*, the pipes *D D'* being connected to and opening in said valve, the pulleys *d'*, cords *e e'*, the car having the pedal *o*, and lever *m*, provided with a roller *l*, all con- 85 structed, arranged, and operating substantially as shown and described, and for the purpose set forth.

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