

922,016.

L. J. MILKE.

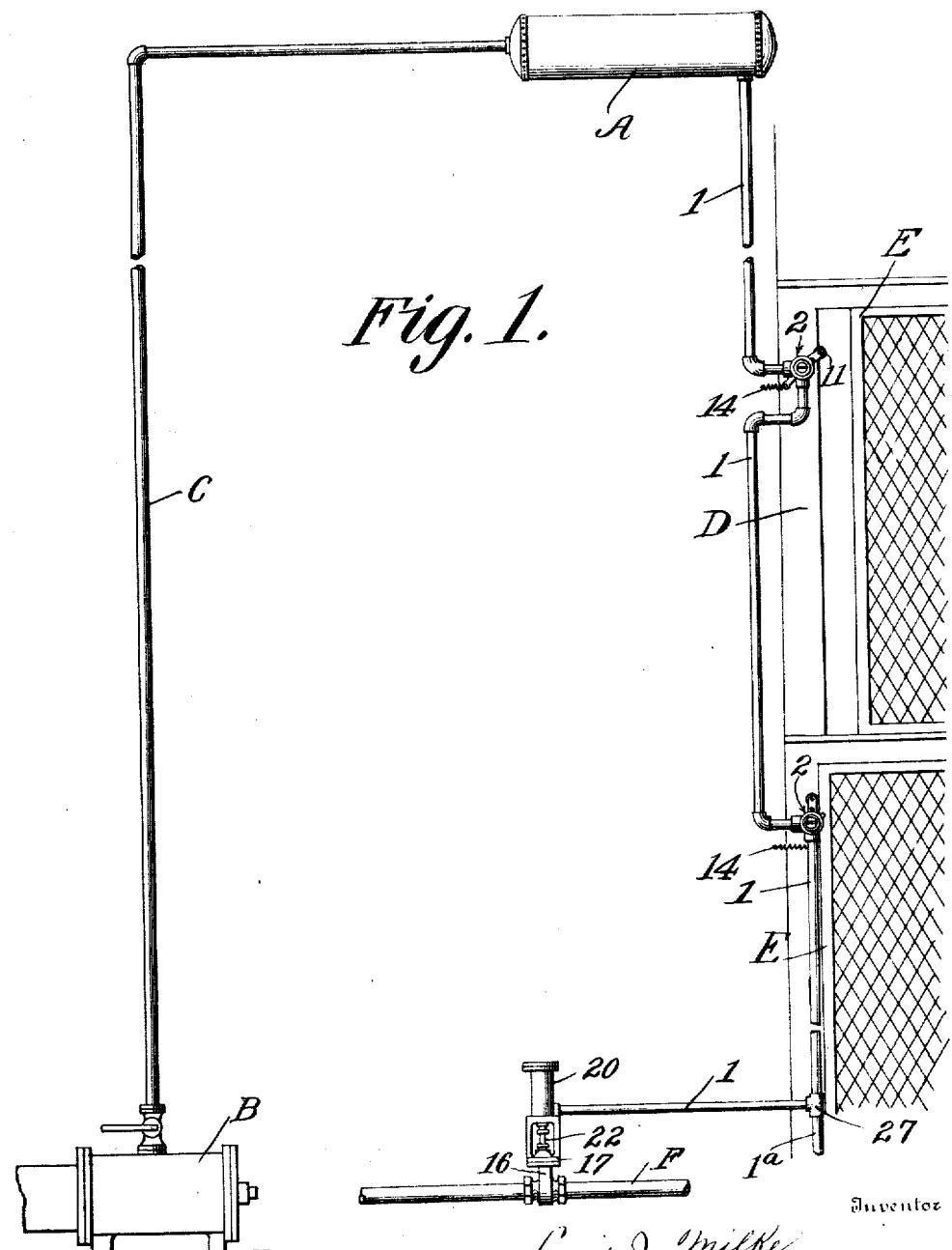
AUTOMATIC CONTROL DEVICE FOR ELEVATORS.

APPLICATION FILED MAR. 19, 1908.

Patented May 18, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

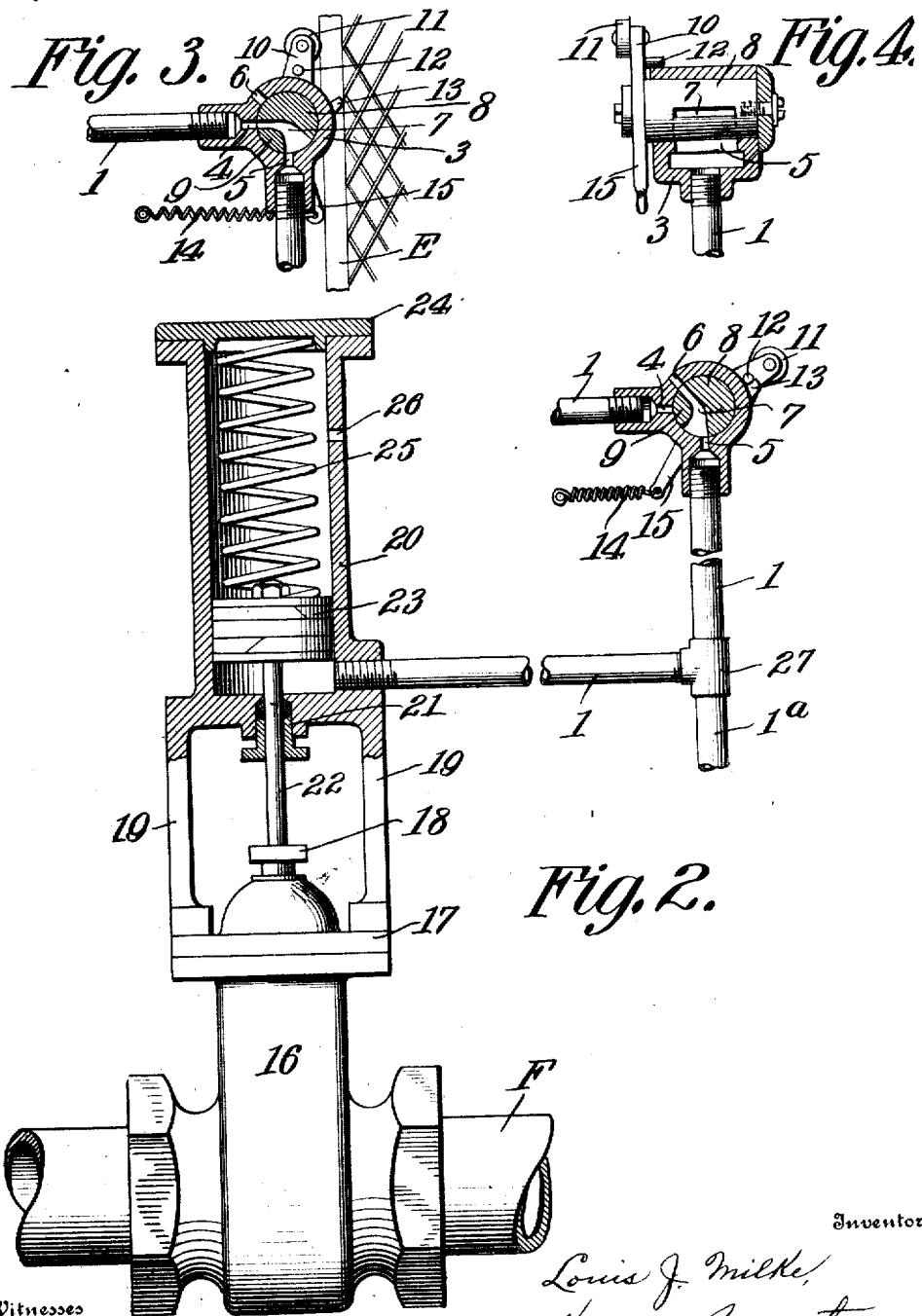
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Witnesses  
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# UNITED STATES PATENT OFFICE.

LOUIS J. MILKE, OF BALTIMORE, MARYLAND.

## AUTOMATIC CONTROL DEVICE FOR ELEVATORS.

No. 922,016

Specification of Letters Patent.

Patented May 18, 1909.

Application filed March 19, 1908. Serial No. 422,151.

To all whom it may concern:

Be it known that I, LOUIS J. MILKE, a citizen of the United States, residing at Baltimore city, State of Maryland, have invented 5 certain new and useful Improvements in Automatic Control Devices for Elevators, of which the following is a specification.

My invention relates to automatic control devices for elevators and has for its object 10 means by which the operation of the elevator is automatically controlled by the opening and closing of the elevator door.

The device has for its particular object to prevent the starting of the car, after it has 15 been stopped at a particular landing and the door opened without the door first having been closed. The device is so constructed that after the car has been stopped at a particular landing, and the door has been 20 opened, it is impossible to again start the car without the door first having been closed, thereby lessening to a degree, the possibility of accident to a passenger in the 25 entering or leaving the car, occasioned by the premature starting thereof, by preventing the starting of the car until the passenger has fully entered or passed out therefrom.

With the foregoing object in view, my invention consists in certain novel features of construction and combinations of parts which will be hereinafter described and 30 pointed out in the claims.

In the accompanying drawings, Figure 1, 35 is an elevation of the general arrangement of my invention as applied to an elevator shaft. Fig. 2, is an enlarged sectional view of the valve and cylinder, being the position assumed when the elevator door is 40 opened. Fig. 3, is a sectional view of the valve, in a different position from that shown in Fig. 2; viz.: with the door closed. Fig. 4, is a longitudinal sectional view of the valve, the body being in elevation.

Referring to Fig. 1 of the drawing, A indicates a tank located at any convenient point in the building and adapted to store air from an ordinary air compressor B, connection being made through a line of pipe C. 45 Conveniently located in the elevator shaft D or at a point adjacent thereto, is a line of pipe 1 connected progressively to a series of two-way valves 2, one of said valves being located at each floor served by the elevator. The valve 3 of said valve 2 is provided with port openings 4, 5 and 6. As

occasion requires, as will hereinafter appear, connection is established between ports 4 and 5, and 5 and 6, through a port 7, in the valve body 8, one side of said port being 60 wide enough to be in register at all times with port 6. The part of the valve body at 9 serves to cut off the inflow of air as will presently appear. Secured to one end of the valve body (see Fig. 4) is a two-arm 65 lever, one arm 10, of which carries an anti-friction roller 11, said roller being placed in the path of the door E forming a closure to the elevator shaft at either floor. Arm 10 also carries a stop pin 12 which engages 70 a lug 13 cast on the valve casing, same serving to co-act with pin 12 in stopping the valve body when ports 6 and 7 are in register, said valve body being acted upon rotatively by a spring 14, one end of which is 75 fast to some convenient object, the other end connected to the other arm 15 of the lever hereinbefore referred to.

Referring to the drawing, F indicates the feed pressure pipe used in operating the 80 elevator. Located at any convenient point on said pipe line is an ordinary gate valve 16. Instead of the ordinary cap used on gate valves, I provide a cap of special construction, consisting of a cap 17 provided 85 with a packing box and gland 18. Rising from cap 17 are a pair of legs or standards 19 carrying a cylinder 20, provided at its lower end with a packing box and gland 21, through which extends the valve stem 22 of 90 the gate valve. Fixed to the upper end of stem 22, is a piston 23, between said piston and head 24 of the cylinder is interposed a compression spring 25 tending to close the valve. The cylinder casing is provided 95 with an opening 26 to permit easy movement of the piston. Threaded in the lower end of the cylinder casing is the terminus of the line of pipe 1.

My device is operated as follows: Assuming that the elevator door E is closed and the elevator car is ascending, the valves 2 will then be in position as shown in Fig. 3, the air which is produced by the compressor B being discharged into the tank A, through the line of pipe C; from the tank A, the compressed air is then discharged through the progressively connected line of pipe 1, through ports 4 and 5 of the valves 2 which are in register, by way of the ports 7 there-in respectively, where it is finally discharged through a section of the pipe line 1 leading

into the lower end of the cylinder casing 20 and below the piston 23; the pressure of the compressed air being sufficient to overcome the pressure of the spring 25 and cause the 5 piston 23 to ascend, thereby opening the gate valve 16, and permitting the pressure fluid to flow through the feed pipe F, necessary to cause the elevator car to ascend. When the elevator car is stopped in its ascent at 10 a particular landing, and the door E opened, the tension spring 14 attached to the arm 15, causes the valve to open as shown in Fig. 2, with the ports 5 and 6 in register, at the same time port 4 is closed by the body 15 part 9; as a consequence the air pressure is cut off and the air in the pipe 1, is permitted to escape through the port 6 which is in register with port 5; as a result the pressure is released from under the piston 20 23 and by reason thereof, the spring 25 forces the piston 23 downward, thereby closing the gate valve 16 in the pressure pipe F; consequently the power is cut off, thereby rendering the further ascent of the 25 elevator car impossible. By reason of the connecting ell 27, the pipe 1 is extended at 1<sup>st</sup> and is connected with a similar valve (not shown) controlling a similar gate valve on a discharge pipe (not shown), the valves 30 being in all respects similar and operating simultaneously and in unison with each other, consequently when the gate valve 16 on the discharge pipe F is closed, simultaneously therewith will the discharge pipe be closed, by the similar or duplicate gate 35 valve (not shown), as a consequence the elevator car can not be made to ascend or descend; it also follows when the gate valve 16 is opened in the manner already described, simultaneously therewith will be 40 opened the similar valve on the discharge pipe, thereby permitting the elevator to be freely operated as long as the door E remains closed. Inasmuch as the descent of 45 the elevator car is operated by the releasing of the pressure by which it was made to ascend, it will be readily seen that the control of the car in descending is governed by a similar gate valve operating on the discharge pipe as that of the valve 16 which 50 has just been described in connection with the pressure pipe F, in the ascent of the elevator car, both these gate valves being in all respects similar in construction and 55 operation, and are adapted to be operated simultaneously by the single source of power and through one and the same devices.

What I claim as new and desire to secure by Letters Patent, is:

60 1. A device of the character described, comprising a valve provided with a plurality of ports therein, an arm for automatically opening and closing the said ports, means secured to the arm for effecting the registration of certain pre-determined ports, a gate

valve, a cylinder carried thereon, a piston reciprocably secured within the cylinder, a spring secured within the cylinder above the said piston, a valve stem connecting the said piston with the said gate valve, means connecting the first mentioned valve with the said cylinder, and means for engaging with the said arm thereby severing the registration of the said ports, and effecting the registration of certain other pre-determined 70 ports, whereby the said piston is automatically made to ascend and thereby open the said gate valve, substantially as described.

2. A device of the character described, comprising a plurality of valves, each comprising a casing provided with a plurality of ports opening thereinto, and a revoluble plug secured within said casing, arms connected with the said plugs, means secured on one end of the arms for securing the said 80 revoluble plugs in register with certain of the ports provided in the said casings, anti-friction rollers provided on the free ends of the said arms, means for forcing the said free ends of the arms backward, thereby 85 severing the register of the ports previously maintained and establishing a new registry between one of the said ports and an additional port provided in the said casing, and means for progressively connecting the 90 95 said valves one with the other, substantially as described.

3. A device of the character described, comprising a plurality of valves and a gate valve, a cylinder provided on the said gate 100 valve, a piston secured within the said cylinder, a spring secured within the cylinder above the said piston, a cylinder head secured on the upper end of the said cylinder, a piston rod connecting the said piston with the said gate valve, a packing box and gland secured around the said piston rod between the said gate valve and the said piston, and means for operating the valves whereby the 105 said piston is reciprocating within the said cylinder thereby opening and closing the said gate valve, substantially as described.

4. A device of the character described, comprising an air compressor, a storage tank, means for connecting the compressor with the storage tank, a plurality of valves, each comprising a casing provided with a plurality of ports opening thereinto, and a revoluble plug provided within each of the 110 said casings, arms exteriorly provided on the said revoluble plugs, tension springs secured to one end of the arms, anti-friction rollers secured on the opposite ends, a gate valve, a cylinder provided on the said gate valve, a piston secured within the cylinder, a spring secured above the said piston, a piston rod connecting the said piston with the said gate valve, means for progressively connecting the first mentioned valves with 115 each other, means for connecting the said 120 125 130

valves with the said cylinder, and means for operating the said arms on the said valves, whereby the said gate valve is opened and closed, substantially as described.

5. A device of the character described, comprising an air compressor, a storage tank, means for connecting the compressor with the tank, a plurality of valves, each comprising a casing provided with a plurality of ports therein, and a revoluble plug secured within each of the said casings, arms exteriorly, provided on the plugs, tension springs secured to one end of the said arms, antifriction rollers secured on the free ends thereof, means for progressively connecting the said valves with each other, a gate valve, a cylinder provided thereon, a piston secured within the said cylinder, a spring secured above the said piston, a cap provided on the said cylinder for securing the said spring therein, a piston rod connecting the said piston with the said gate valve, a packing box and gland separating the piston from the said gate valve, means for connecting the first mentioned valves with the said cylinder, and means for operating the said arms on the said valves, thereby causing the said piston within the said cylinder to be reciprocated therein, whereby the said

gate valve is opened and closed, substantially as described.

6. A device of the character described, comprising a valve provided with a plurality of ports therein, an arm for automatically opening and closing the said ports, means for acting upon the arm for effecting the registration of certain pre-determined ports, a gate valve, a cylinder carried thereon, a piston reciprocably secured within the cylinder, a spring secured within the cylinder above the said piston, a valve stem connecting the said piston with the said gate valve, means connecting the first mentioned valve with the said cylinder, and means connected with the said arm for severing the registration of the said ports already established and effecting the registration of certain other pre-determined ports, whereby the said piston is automatically made to descend and thereby close the said gate valve, substantially as described.

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

LOUIS J. MILKE.

Witnesses:

E. WALTON BREWINGTON,  
MARY M. MAGRAW.