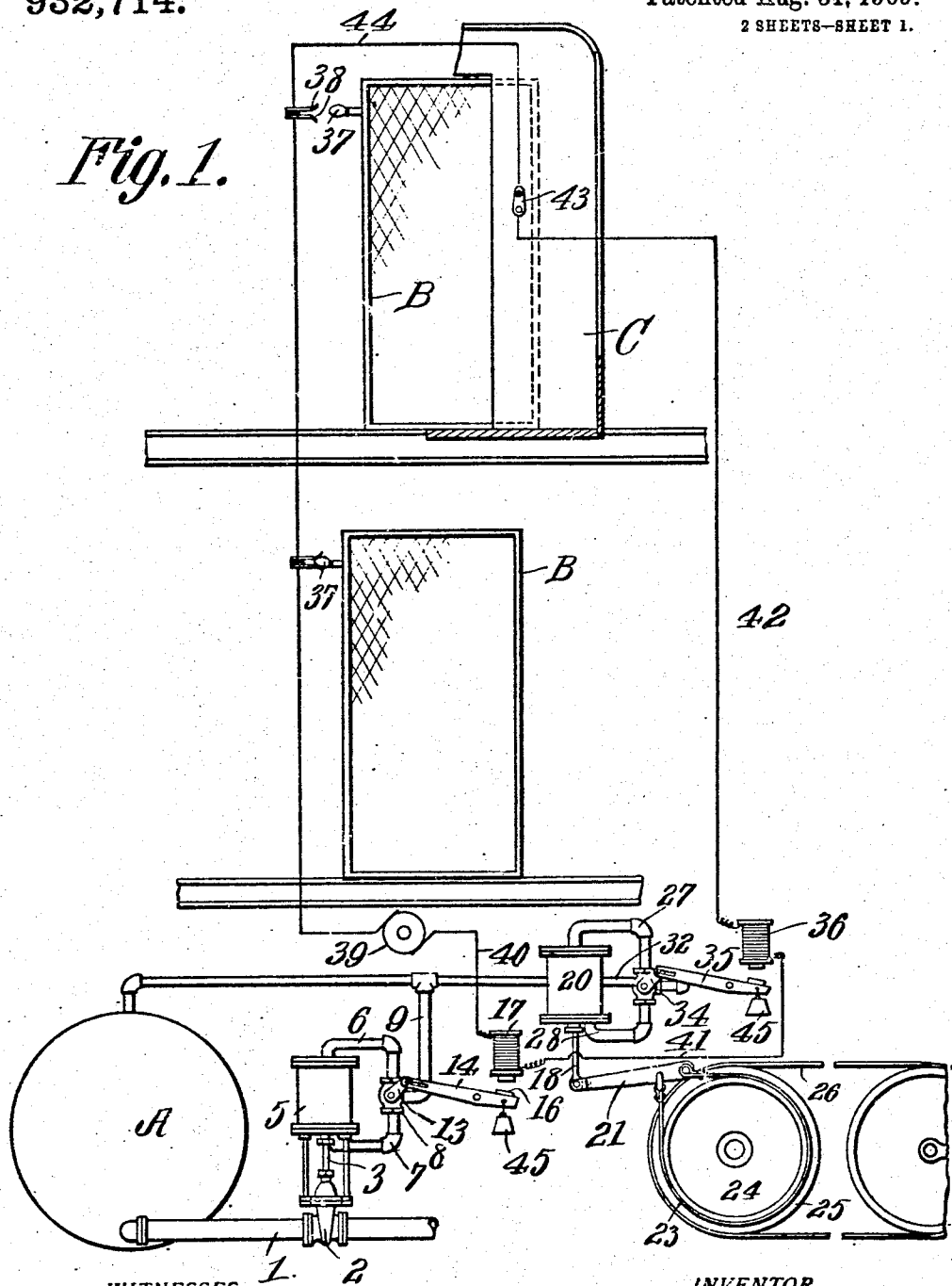


L. J. MILKE.
 AUTOMATIC CONTROL DEVICE FOR ELEVATORS.
 APPLICATION FILED AUG. 11, 1908.

932,714.

Patented Aug. 31, 1909.
 2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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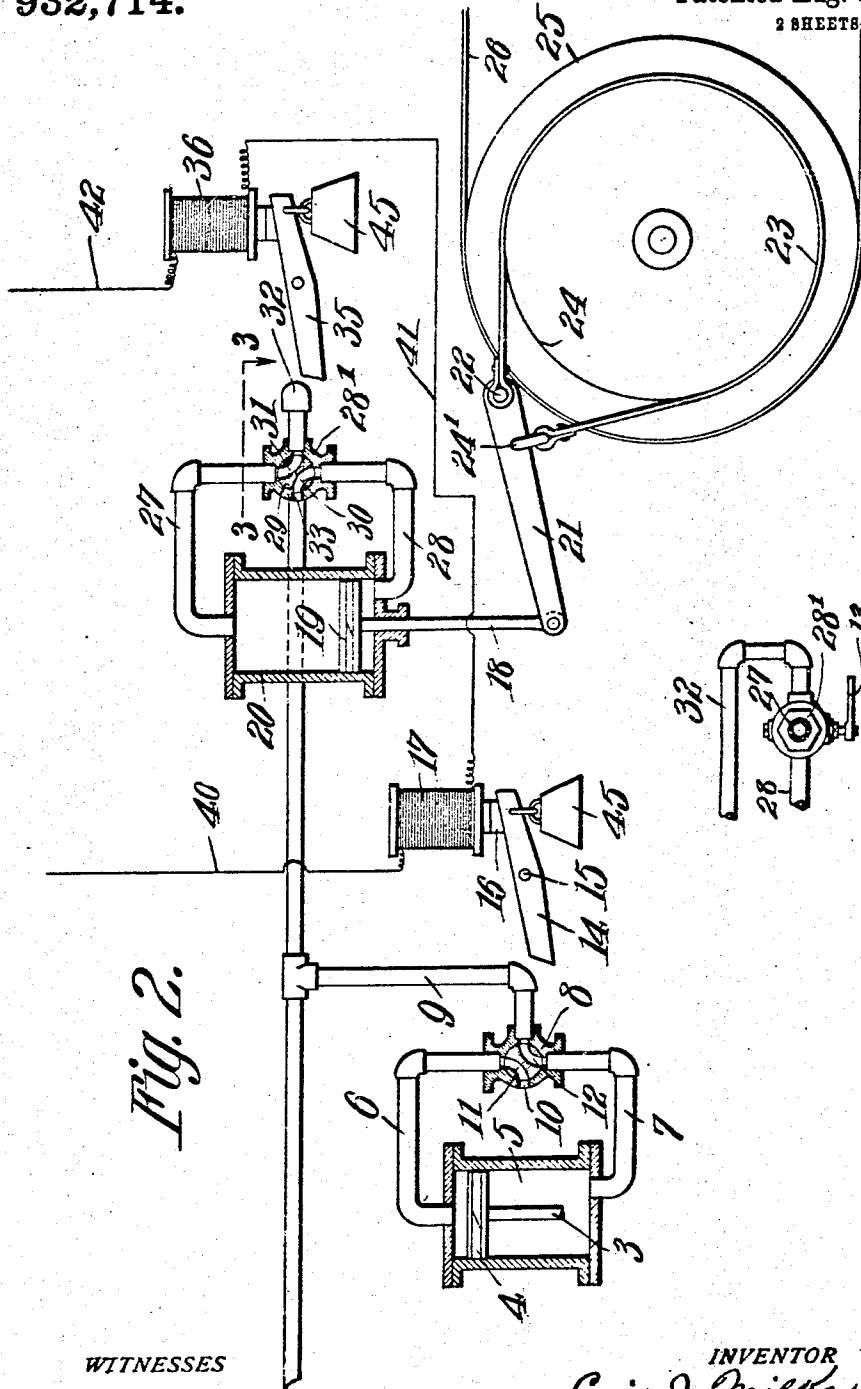


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

LOUIS J. MILKE, OF BALTIMORE, MARYLAND.

AUTOMATIC CONTROL DEVICE FOR ELEVATORS.

932,714.

Specification of Letters Patent.

Patented Aug. 31, 1909.

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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 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 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 been stopped at a particular landing, and the door opened without the door first having been closed. The device being so constructed that after the car has been stopped at a particular landing, and the door having been 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 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 pointed out in the claims.

In the accompanying drawing Figure 1 is a side elevation of the mechanism in the position assumed when one of the doors to the elevator shaft is opened. Fig. 2 is a similar view of a part of the mechanism shown in Fig. 1, drawn to an enlarged scale, there being parts in section and parts broken away. The operative parts are in a position opposite to that shown in Fig. 1. Fig. 3 is a sectional plan view of a part of Fig. 2 taken on the line 3—3.

Like characters of reference indicate similar parts throughout the several figures of drawings in which A indicates a tank of fluid under pressure, connecting this tank and the elevator piston (not shown) is the usual supply pipe 1, and in this line of pipe is interposed an ordinary gate valve 2, the stem 3 of which is a continuation of the piston rod of a piston 4 adapted to reciprocate within a cylinder 5. Opening into the said cylinder 5 at either end thereof are pipes 6 and 7, said pipes serving in opposed alternation as feed and exhaust pipes through

the medium of the four-way valve 8 into which one end of each of the pipes 6 and 7 are fitted. Also fitted to this valve casing 8 is one branch of a supply pipe 9 in communication with the tank A, or other source of pressure. At a point diametrically opposite where the said pipe 9 enters the valve casing is an exhaust port 10.

The barrel of the valve is provided with ports 11 and 12, said ports being adapted to bring the several pipes into communication as will presently appear. To the stem of the valve barrel is fixed a lever 13 connected to another lever 14 by a pin and slot connection, said lever 14 being pivoted at 15 to some fixed part of the apparatus, and carrying on its outer end an armature 16 adapted to be attracted by a magnetic coil 17, when same is energized. Connected to the piston rod 18 of a piston 19, fitted to a cylinder 20, is a lever 21, pivoted at 22, to some fixed support (not shown), and having a band 23 extending around a drum 24 and attached to the said lever at a point intermediate of its ends as indicated at 24', the whole constituting what is commonly known as a band brake. Fixed to the said drum 24 is a pulley 25 over which passes a belt or rope 26, said rope being operatively connected to the hoisting mechanism of the elevator car, so that when the car is moved, the pulley 25 will be caused to rotate.

Connected to the cylinder 20 are two pipes 27 and 28 similar to the pipes 6 and 7, and similarly connected to a valve 28' having a barrel 29 provided with ports 30 and 31. This valve receives a supply of fluid under pressure through a pipe 32 and is also provided with an exhaust port 33. Fixed to the stem of the valve barrel 29 is a lever 34 connected to a lever 35, similar to the lever 14 and under the action of the magnetic coil 36.

Fixed to each of the doors B opening to the elevator shaft, is a plug 37, adapted, when the door is closed to engage the terminals 38 of an electric circuit, thereby closing the circuit which is here diagrammatically shown.

From a source of electrical energy here shown as a dynamo 39 through a conductor 40, through the coils 17, thence by the conductor 41, through the coil 36, through the conductor 42, through the switch 43, located in the elevator car C, thence over the conductor 44 consecutively through the cir-

cuit breakers 37 back to the dynamo. In operation assume the doors to be all closed, in which case there will be no interruption to the current and the coils 17 and 36 will be energized, attracting the ends of the levers 14 and 35 respectively, and causing the valves to assume the positions shown in Fig. 2, whereupon the pressure will be exerted on the bottom of the piston 4 by reason of the port 12 placing the supply pipe 9 into communication with the pipe 7, thereby opening the gate valve 2 and allowing the hoisting mechanism to be operated; at the same time the fluid on top of the piston 4 has been exhausted through the pipe 6, ports 11 and 10 into the atmosphere, or in case water is used may be conveyed off through suitable piping. Simultaneous with this operation a similar one is occurring in the other valve. The magnet 36 having attracted the lever 35, which throws the ports in the valve stem 29 in a position reverse to those in the valve 8, thus allowing the pressure to come in on top of the piston 19 and by this means release the band brake 23.

When any one of the doors are opened the circuit is broken by reason of the plug 37 leaving the contacts 38, the magnets 17 and 36 are thus deenergized and the weights 45 on the ends of the levers 14 and 35 reverse the levers 13 and 34 to the positions as shown in Fig. 1, whereupon the reverse movement is imparted to the pistons and the gate valve 2 is closed and the brake applied to the pulley 25, thereby preventing any possibility of the car being moved unintentionally or drifting as is often the case while the door is open.

The switch 43 located in the car B may be used by the operator for stopping the car should control be lost at any time, it being obvious that the operation will be the same as if the circuit was broken at any other point.

Slight changes and alterations might be resorted to in the form and arrangement of the several parts described without departing from the spirit and scope of my invention, hence I do not desire to limit myself to the exact construction as herein set forth, but—

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

1. A device of the character described, comprising a pair of cylinders, a pair of piston rods, pistons carried thereby, and reciprocable within the cylinders, a pair of valves having a plurality of ports provided therein, means connecting the valves with the cylinders, a storage supply tank, means connecting the tank with the said valves, a main supply pipe, a gate valve interposed therein, the valve stem provided on the gate valve forming the piston rod within one of

the aforesaid cylinders, a lever pivotally supported and connected at one end with the other aforesaid piston rod, a rotatable drum, a band secured around the drum and to the said lever at a point intermediate of its ends, means for operating the said valves whereby the pistons are reciprocated within the said cylinders, thereby closing the said gate valve and simultaneously stopping the rotation of the said drum, substantially as described.

2. A device of the character described, comprising a pair of cylinders, a pair of piston rods, pistons carried thereby and reciprocable within the said cylinders, a supply pipe, a gate valve carried on one end of one of the said piston rods and interposed in the said supply pipe, the said piston rod forming the valve stem of the said gate valve, a revoluble drum, a lever, a band extended around the drum and secured to the said lever intermediate of the ends thereof, said lever being connected with the other piston rod, a pair of valves having a plurality of ports provided therein, means connecting the valves with the said cylinders, a supply tank, means connecting the tank with the said valves, and means for operating the said valves whereby one of the said pistons within one cylinder is made to ascend simultaneously with the descent of the other piston in the other cylinder, substantially as described.

3. A device of the character described, comprising a pair of cylinders, a pair of piston rods, pistons carried thereby and reciprocable within the said cylinders, a supply pipe, a gate valve interposed therein, the valve stem of which is formed on the free end of one of the said piston rods, a revoluble drum, a band secured around the said drum, a lever connected intermediate of its ends with the said band, the lever being connected to the free end of the other piston rod, a pair of valves, having valve stems within the valves, and a plurality of ports provided therein, a supply pipe connecting therewith, pipes connecting the said valves with the said cylinders, levers connected with the said valve stems, additional levers pivotally secured and connected with the first mentioned levers, and means for operating the said levers, thereby opening and closing the said valves, whereby one of the said pistons is made to ascend simultaneously with the descent of the other, substantially as described.

4. A device of the character described, comprising a pair of cylinders, a pair of piston rods, a piston carried by each piston rod and reciprocable within each of the cylinders, a supply pipe, a gate valve interposed therein, a valve stem formed on the free end of one of the said piston rods and reciprocable within the said valve, a revoluble drum, a band secured around the said drum, a lever pivotally secured and connected interme-

diating its ends with the said band, said lever being connected with the other piston rod, a pair of valves having valve stems with a plurality of ports provided therein, means
 5 connecting the valves with the said cylinders, a supply pipe connected with the said valves, levers pivotally secured and connected with the aforesaid valve stems, armatures provided on the free ends of the said levers,
 10 magnetic coils, a source of electric current supply, means connecting the said coils with the said source of supply, thereby energizing the said coils and means for deenergizing the said coils, substantially as described.

15 5. A device of the character described, comprising a pair of valves, having a plurality of ports provided therein, a pair of cylinders, means connecting the valves with the cylinders, piston rods secured within the
 20 cylinders, pistons carried thereby, and reciprocable within the cylinders, a storage tank, means connecting the tank with the said valves, a main supply pipe, a gate valve interposed therein, the valve stem provided
 25 on the gate valve forming the piston rod within one of the aforesaid cylinders, a rotatable drum, means connecting the drum with the piston rod within the remaining cylinder, and means for operating the said
 30 valves whereby one of the said pistons is made to ascend simultaneously with the descent of the other, thereby closing the said gate valve and simultaneously stopping the rotation of the said drum, substantially as
 35 described.

6. A device of the character described, comprising a pair of valves, having a plurality of ports provided therein, a pair of
 40 cylinders, means connecting the valves with the cylinders, piston rods secured within the cylinders, pistons carried thereby, and reciprocable within the cylinders, a storage supply tank, a main supply pipe connected therewith, means connecting the said tank
 45 with the said valves, a gate valve interposed

in the said supply pipe, a rotatable drum, means connecting the said gate valve and drum respectively with one of the piston rods in each respective cylinder, levers provided on the said valves, armatures provided on the said levers, magnetic coils, means energizing the said coils, whereby the said armatures on the said levers are attracted thereto, thereby closing the said gate valve and simultaneously stopping the rotation of the said drum, substantially as described.

7. A device of the character described, comprising a pair of valves, having a plurality of ports provided therein, a pair of cylinders, means connecting the valves with the cylinders, piston rods secured within the cylinders, pistons carried thereby, and reciprocable within the cylinders, a storage supply tank, a supply pipe connected therewith,
 60 a gate valve interposed in the said supply pipe, pipes connecting the said tank with the said valves, a rotatable drum, means connecting the said gate valve and drum respectively with one of the said piston rods in
 70 each respective cylinder, levers provided on the said valves, armatures provided on the said levers, magnetic coils, means connecting the said coils with a source of electric supply, whereby the said coils are energized and
 75 thereby attract the said armatures on the said levers, means for deenergizing the said coils whereby the said armatures are released from the said coils, whereby the said gate valve is closed and opened respectively,
 80 thereby permitting the rotating and stopping of the said drum simultaneously with the opening and closing of 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.