

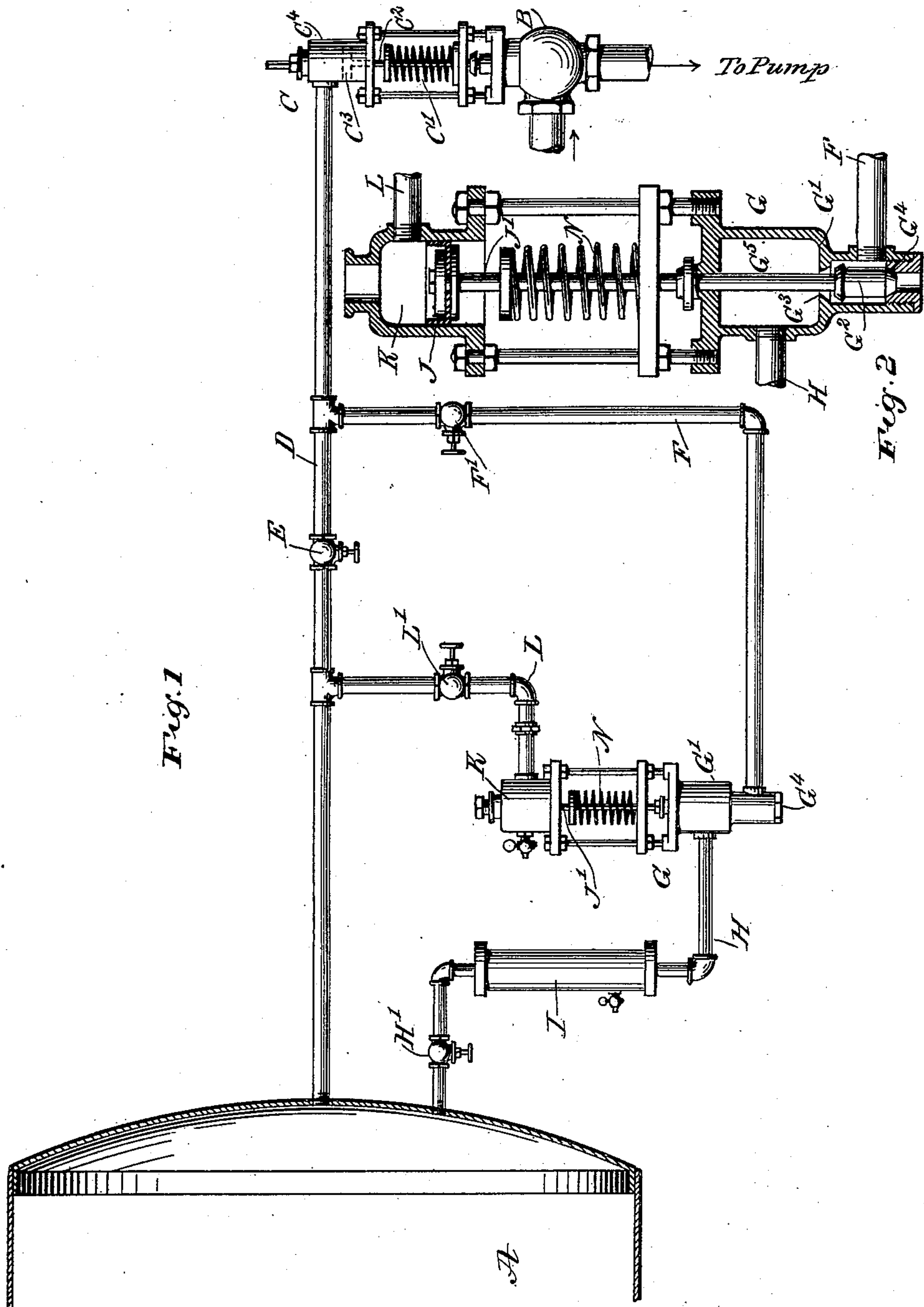
No. 711,843.

Patented Oct. 21, 1902.

T. P. FORD.
CONTROLLING DEVICE.

(Application filed Mar. 1, 1902.)

(No Model.)



WITNESSES :

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UNITED STATES PATENT OFFICE.

THOMAS P. FORD, OF HACKENSACK, NEW JERSEY.

CONTROLLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 711,843, dated October 21, 1902.

Application filed March 1, 1902. Serial No. 96,332. (No model.)

To all whom it may concern:

Be it known that I, THOMAS P. FORD, a citizen of the United States, and a resident of Hackensack, in the county of Bergen and State
5 of New Jersey, have invented a new and Improved Controlling Device, of which the following is a full, clear, and exact description.

The invention relates to steam engineering; and its object is to provide a new and improved controlling device designed for automatically controlling elevator-tank pressures and the like by opening and closing the admission-valve of a steam-pump or a series of pumps discharging into the same tank either
15 gradually or quickly, according to the work required by the pump.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and
20 then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.
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Figure 1 is a side elevation of the improvement as applied to the admission-valve of a steam-pump employed for supplying an elevator-tank with water used for operating
30 elevators, the tank being shown in section; and Fig. 2 is an enlarged sectional side elevation of the three-way valve and a means for working the same.

As shown in Fig. 1, the controlling device is applied to an elevator-tank A used for supplying water under pressure to the cylinder of the elevator-operating mechanism, the said tank receiving air-pressure in the usual manner from a suitable air-compressor, and it receives
40 the water from a suitable steam-pump having a steam-admission valve B, controlled by the operating mechanism C, consisting, essentially, of a spring C', pressing the piston-rod C², attached to the stem of the admission-valve B, the said piston-rod carrying a piston C³, mounted to reciprocate in a cylinder C⁴, connected by a pipe D, having a valve E, with the tank A. The spring C' normally holds the admission-valve B open, so that the pump is actuated
50 and pumps water into the tank A. When the

pressure in the tank A increases beyond the normal or working pressure required for operating the elevator, then the pressure on the piston C³ overcomes the tension of the spring C', and consequently the piston moves
55 downward, and with it the piston-rod C² and the valve, to close the admission-valve and stop the pump. When the pressure in the tank falls below the required pressure, then the spring C' overcomes the pressure on the
60 piston C³, and consequently the piston and valve are moved upward, so that the admission-valve again opens to admit steam to the pump to operate the same and refill the tank until the normal pressure is again reached.
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The foregoing description relates to the arrangement now generally employed—that is, for controlling the admission-valve B by one pressure; but when it is desired to work the admission-valve B by two pressures—that is,
70 an additional pressure higher than the one above referred to—I provide the following arrangement: The pipe D, between the valve E and the cylinder C⁴, is connected by a pipe F, having a valve F', with the valve-casing G'
75 of a three-way valve G, connected by a pipe H with the tank A, the said pipe H having a mud-drum I, of any approved construction, and a valve H' for closing the pipe H whenever it is desired to do so. The valve G²
80 of the three-way valve G is preferably in the form of a slide-valve adapted to be seated either on a valve-seat G³ or on a valve-seat G⁴, leading to the atmosphere, the said valve G² when seated on the seat G⁴ connecting the
85 pipes H and F with each other for the passage of the water from the tank A to the cylinder C⁴. When the valve G² is seated on the valve-seat G³, then the pipes H and F are disconnected and the pipe F is connected with
90 the atmosphere by way of the valve-seat G⁴, so that the spring C' holds the admission-valve B in an open position. The stem G⁵ of the valve G² is attached to the rod J' of a piston J, mounted to reciprocate in a cylinder K,
95 connected at its upper closed end by a pipe L with the pipe D between the valve E and the tank A. The pipe L is provided with a valve L' for closing the pipe L whenever it is desired to do so. A spring N presses the pis-
100

ton-rod J' in an upward direction, so as to normally hold the valve G² against the seat G³ and off the valve-seat G⁴, so that the admission-valve B remains open for the time being.

- 5 Now presuming that the spring C' is set to one hundred pounds and the spring N to one hundred and fifty pounds and the valve E is closed and the valves L', F', and H' are open, then the pump will pump water into the tank
- 10 A until the pressure in the tank reaches one hundred and fifty pounds, and as the direct connection between the tank A and the cylinder C⁴ by way of the pipe D is now cut off, owing to the closing of the valve E, it is evident that the admission-valve B remains open
- 15 until at least one hundred and fifty pounds pressure are in the tank A—that is, when the pressure reaches this amount it acts on the piston J, so as to force the same downward against the tension of the spring N to move
- 20 the valve G² off the seat G³ and onto the seat G⁴ to close the pipe F to the atmosphere and to connect the pipes H and F with each other, so that the pressure now passes through the
- 25 pipe F and the end portion of the pipe D into the cylinder C⁴ to suddenly move the piston C³ therein downward to close the admission-valve B.

From the foregoing it will be seen that the

30 pump keeps on working until one hundred and fifty pounds pressure is obtained in the tank A, notwithstanding that its spring C' is only set to one hundred pounds. Working the elevators under a higher pressure is especially serviceable during the night when the

35 elevators run less frequently, the lower pressure first described being used during the day, when the pressure in the tank is constantly under the control of the engineer in charge.

40 It is evident from the foregoing that the controlling device may be readily used for controlling a plurality of pumps discharging into the same pressure-tank A.

Although I have particularly described the

45 use of the controlling device for elevator-tank pressure, I do not limit myself to this, as it may be employed for other purposes.

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

50 Patent—

1. A device for controlling a pressure-actuated operating mechanism for an admission-valve, comprising a valve normally connecting the said operating mechanism with the

55 atmosphere, and a pressure device for operating said valve to close the said operating mechanism to the atmosphere and connect it with a fluid-pressure, as and for the purpose set forth.

60 2. A device for controlling a pressure-actuated operating mechanism for an admission-valve, the said device comprising a spring-pressed three-way valve normally connecting said operating mechanism with the atmosphere and a cylinder containing a piston con-

65 nected with the said three-way valve, the said

piston being controlled by the pressure of the fluid intended to be passed through the three-way valve, and serving to move the said valve against the tension of its spring to close the

70 connection of said operating mechanism with the atmosphere and connect it with the fluid-pressure, as set forth.

3. A controlling device between the pressure-supply and a machine for replenishing

75 the pressure-supply having a pressure-actuated starting and stopping mechanism, comprising a spring-pressed three-way valve for connecting the starting and stopping mechanism with the pressure-supply, and cutting

80 off such connection and placing said starting and stopping mechanism in communication with the atmosphere, a cylinder connected with the pressure-supply, and a piston in the cylinder for moving the three-way valve

85 against the tension of its spring, as set forth.

4. A controlling device for controlling elevator-tank pressures supplied with water from a pump, comprising an actuating mechanism for the admission-valve of the pump,

90 the actuating mechanism being controlled in one direction by a spring and in the other direction by pressure from the said tank, a supplementary connection between the tank and the said actuating mechanism, a three-way

95 valve in the said supplementary connection, and normally connecting the actuating mechanism of the admission-valve with the atmosphere, and a cylinder and piston under the influence of the tank-pressure to close the

100 admission-valve-actuating mechanism to the atmosphere and to connect the tank with the said valve-actuating mechanism, as set forth.

5. A controlling device for controlling elevator-tank pressures supplied with water from a pump, comprising an actuating mechanism for the admission-valve of the pump,

105 the actuating mechanism being controlled in one direction by a spring and in the other direction by pressure from the said tank, a supplementary connection between the tank and the said actuating mechanism, a three-way

110 valve in the said supplementary connection, and normally connecting the actuating mechanism of the admission-valve with the atmosphere, a cylinder and piston under the influence of the tank-pressure to close the admission-valve-actuating mechanism to the atmosphere and to connect the tank with the

115 said valve-actuating mechanism, and a spring pressing the said piston, to move the three-way valve into an open position, the spring being set to a higher tension than the spring of the actuating mechanism, as set forth.

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6. In a controlling device of the character described, the combination with a tank, a spring-pressed admission-valve of a pump, a cylinder having a valved connection with the

130 tank, and a piston in the cylinder and connected with said valve, of a valve-casing connected with the tank and cylinder, said cas-

ing having two valve-seats, one of which opens
to the atmosphere, a spring - pressed valve
adapted to be seated on either of the seats of
the casing, a cylinder having a valved con-
5 nection with the tank, and a piston in the
cylinder and connected with the said valve,
as set forth.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

THOMAS P. FORD.

Witnesses:

THEO. G. HOSTER,
EVERARD BOLTON MARSHALL.