

No. 775,017.

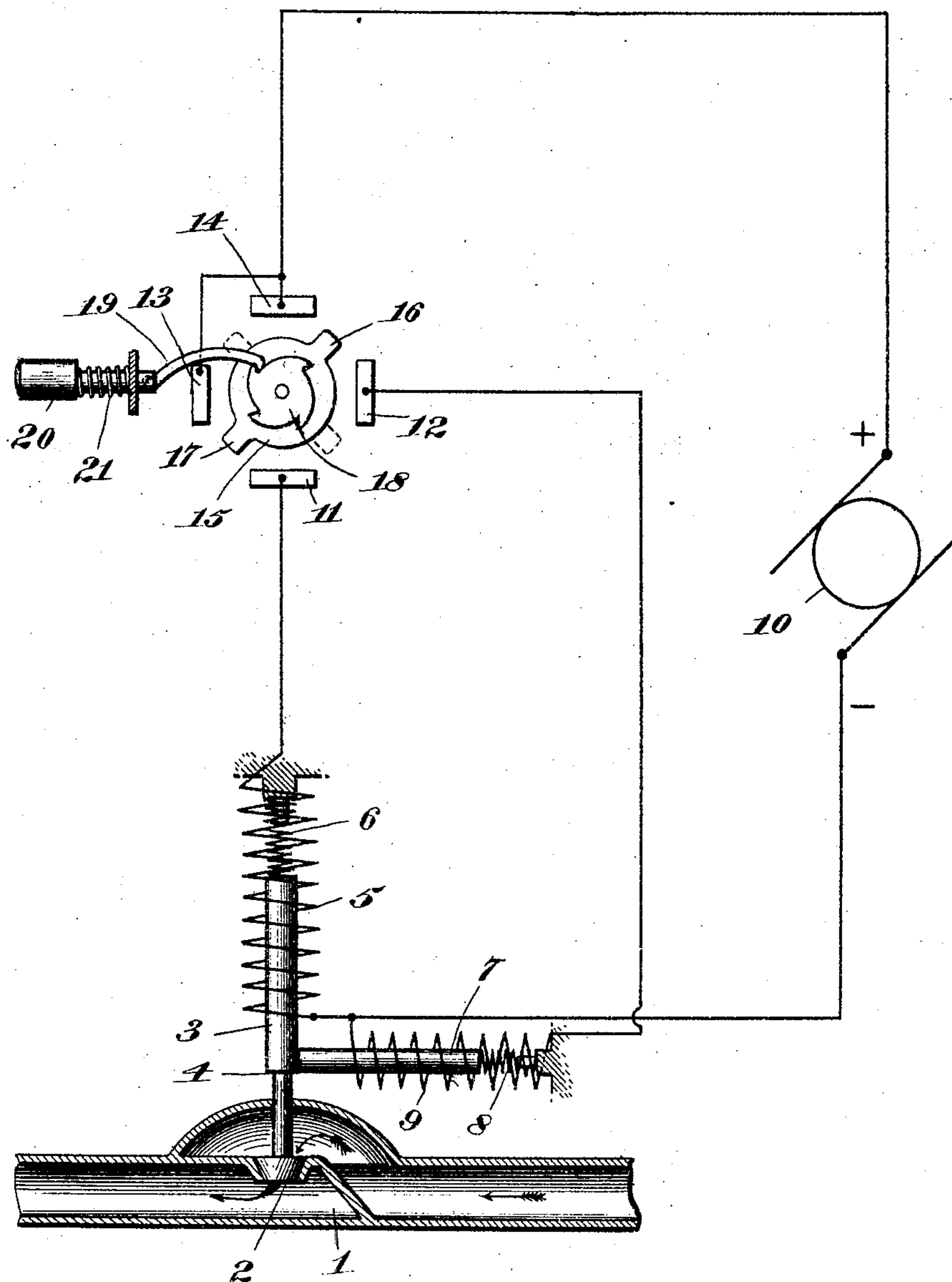
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I. G. WATERMAN.

ELECTROMAGNETIC VALVE CONTROLLING MECHANISM.

APPLICATION FILED MAY 11, 1903.

NO MODEL;



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UNITED STATES PATENT OFFICE.

ISAAC G. WATERMAN, OF SANTA BARBARA, CALIFORNIA.

ELECTROMAGNETIC-VALVE-CONTROLLING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 775,017, dated November 15, 1904.

Application filed May 11, 1903. Serial No. 156,671. (No model.)

To all whom it may concern:

Be it known that I, ISAAC G. WATERMAN, a citizen of the United States, residing at Santa Barbara, in the county of Santa Barbara and State of California, have invented new and useful Improvements in Electromagnetic-Valve-Controlling Mechanisms, of which the following is a specification.

The present invention relates to electromagnetic-valve-controlling mechanisms.

In my copending applications, Serial No. 146,975, filed March 9, 1903, and Serial No. 146,976, filed March 9, 1903, I have disclosed electromagnetic valves which are opened on sending a current through the valve-opening magnet-coil and then automatically locked and afterward closed by sending a current through an unlocking magnet-coil to release the valve and permit it to close. These electromagnetic valves are, as set forth in the aforesaid applications, designed to operate on a momentary current, so that the necessity for maintaining a current in the coils while the water is flowing is obviated.

In my copending applications, Serial No. 146,977, filed March 9, 1903, and Serial No. 149,561, filed March 25, 1903, I have disclosed certain electric switches designed for making a temporary current—that is, connecting with the switch-contacts only momentarily—as contradistinguished from switches commonly known to the art in which the movable switch-contact remains on the contacts permanently. These switches are designed for use in connection with the electromagnetic valves of my applications Serial No. 146,975 and Serial No. 146,976.

In the present application my purpose is to claim the combination of the form of electromagnetic valve of my applications Serial No. 146,975 and Serial No. 146,976, with means for sending temporary or momentary currents through the magnet-coils, thus providing a valve-controlling mechanism entirely novel, so far as I am aware. For the current-supplying means I will by preference employ a switch such as shown in my said applications Serial No. 146,977 and Serial No. 149,561; but I do not restrict myself to these switches for accomplishing the sending of

momentary or temporary currents, as other means might be employed to as good advantage; nor do I limit the application of the invention to an electrically-operated valve of the type set forth herein, as my invention resides, broadly, in the operation of an electrically-operated valve by a switch adapted to send a temporary or momentary current to the valve to operate the latter.

The details of the invention appear more fully hereinafter, and the novel features are embodied in the appended claims.

The accompanying drawing illustrates the invention diagrammatically.

A suitable valve-casing is shown at 1, while 2 is a valve to which is connected a magnetizable core 3, having a shoulder 4 and arranged within a magnet-coil 5. A spring 6 may be employed to assist the natural gravitation of the valve 2 and core 3 in effecting seating of valve when released.

To lock the valve in open position, I employ a magnetizable core or plunger 7, adapted by the pressure of a spring 8 to snap under the shoulder 4 when the core 3 is raised. The core 7 is retracted by the magnetic action of a coil 9, into which it is drawn. The electromagnetic valve just described embodies the principles of the valve constructions set forth in my applications Serial No. 146,975 and Serial No. 146,976, before referred to.

One terminal of the coils 5 and 9 leads to a generator 10. The other terminal of coil 5 is connected to switch-point 11, and the remaining terminal of coil 9 is connected to switch-point 12. There are two other switch-points, 13 and 14, connected to the other pole of generator 10.

The switch embodies the principles of the switches set forth in my applications Serial No. 146,977 and Serial No. 149,561 and has a rotary tumbler 15, provided with the contact projections 16 and 17. Secured to the tumbler is a ratchet-wheel 18, operated by a pawl 19, movable with a push-button 20 by a spring 21.

Assuming the tumbler 15 to be in the position shown by full lines and the valve to be seated, on pushing in the button 20 the pawl will ride idly on ratchet-wheel 18 and engage

a tooth thereof, and on releasing the push-button the spring will quickly snap the tumbler to the position shown by dotted lines, meanwhile causing the contacts 16 and 17 to momentarily engage the switch-points 11 and 14 while in transit, thus completing the circuit through the coil 5, raising the core 3 and opening the valve, which is then held open, though the current in coil 5 has ceased, by the plunger or core 7. It will be understood that the contact is only temporary and the current in the coil 5 but momentary. When the push-button is again pushed in, the operation is repeated; but the tumbler now turns another quarter-revolution in advance and momentarily engages the contacts 12 and 13 and again assumes the position shown by full lines, but with the contact 17 now where the contact 16 was in the first instance. When the contacts 12 and 13 are thus bridged, a current is sent through coil 9 and the core 7 is retracted, thus permitting the core 3 to descend and the valve 2 to become seated.

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

1. In an electromagnetic valve, the combination with a valve, of an electromagnet for opening the valve, means for locking the valve when opened, circuit connections to the electromagnet, a snap-switch controlling the circuit connections which is adapted, on being operated, to temporarily or momentarily energize the circuit connections and send a momentary or temporary current through the electromagnet, and means for releasing the locking means aforesaid.

2. The combination with an electromagnetic valve comprising an electromagnet, a valve opened thereby, a locking device for locking the valve when opened, and an electromagnet for operating the locking device, of circuit connections, and a snap-switch adapted, on being operated, to automatically close and open the circuit connections and send a momentary

or temporary current through the circuit connections, said switch being adapted on alternate complete operations to alternately energize the respective electromagnets, whereby one operation of the switch opens the valve and a succeeding operation closes the valve.

3. The combination with a valve, of electrically-operated means for operating the valve, circuit connections thereto, a snap-switch controlling the circuit connections which is adapted, on being operated, to temporarily or momentarily energize the circuit connections and send a momentary or temporary current through the valve-operating means.

4. The combination with a valve, of independent electromagnets, one of which causes opening of the valve and the other causing closing of the valve, circuit connections to said electromagnets, and snap-switch mechanism controlling the circuit connections of the respective electromagnets which is adapted, on being operated, to temporarily or momentarily energize the circuit connections and send a momentary or temporary current through either electromagnet.

5. The combination with a valve, of independent electromagnets, one of which causes opening of the valve and the other causing closing of the valve, circuit connections to said electromagnets, and a snap-switch controlling the circuit connections to the respective electromagnets and adapted, on alternate operations to alternately temporarily or momentarily energize the circuit connections of the respective electromagnets, whereby alternate operations of the snap-switch open and close the valve.

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

ISAAC G. WATERMAN.

Witnesses:

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E. S. PILLARD.