

No. 775,020.

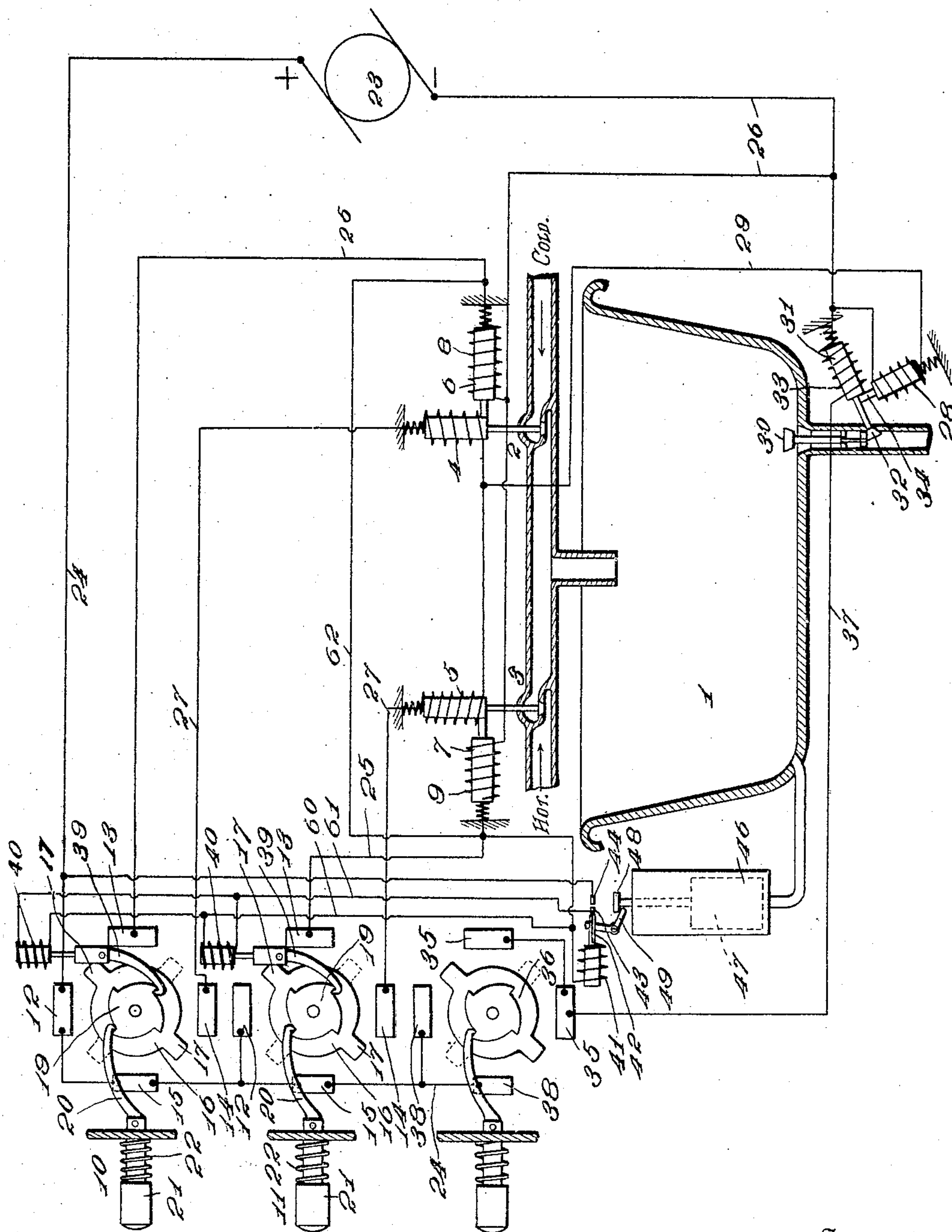
PATENTED NOV. 15, 1904.

I. G. WATERMAN.

ELECTROMAGNETIC VALVE CONTROLLING SYSTEM.

APPLICATION FILED JUNE 25, 1903.

NO MODEL.



Witnesses

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ELECTROMAGNETIC-VALVE-CONTROLLING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 775,020, dated November 15, 1904.

Application filed June 25, 1903. Serial No. 163,133. (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 Systems, of which the following is a specification.

This invention relates to electromagnetic-valve-controlling systems.

In an application which I filed May 11, 1903, Serial No. 156,672, I disclosed an electromagnetic-valve-controlling system embracing electrically-controlled supply-valves, an electrically-controlled waste-valve, manually-operated temporary contact-switches having electrically-operated mechanism to automatically throw the switches, and a float having an electrically-operated mechanism controlling the automatic throw-off mechanism of the switches.

The present invention is designed as an improvement on the system of my application filed May 11, 1903, Serial No. 156,672, aforesaid, and has for its object the quicker operation of the automatic switch-throw-off mechanism and a slower operation of the float-contact mechanism, so that the electrical closing mechanisms of the valves will receive their proper quota of current and have time to act in a more reliable manner.

Having the foregoing object in view, the invention embraces those novel features and combinations set forth in detail hereinafter and recited in the appended claims.

The accompanying drawing illustrates the invention diagrammatically.

1 designates the water-receptacle, such as a bowl or bath-tub which has the hot and cold water supply pipes, controlled by self-closing valves, 2 and 3 opened by the electrical energization of the coils 4 and 5. The valves close by gravity supplemented by spring action, if desired, and are locked when opened by spring-pressed cores or plungers 6 and 7, which are retracted to allow the valves to close when their coils 8 and 9 are electrically energized. The electrically-operated valves are similar in principle to the valves of my applications Serial Nos. 146,975 and 146,976.

The numerals 10 and 11 designate switches for operating the valves. These switches are similar in principle to the switches set forth in my applications Serial Nos. 146,977 and 149,561 and have the four contacts or switch-points 12, 13, 14, and 15, rotary tumbler 16, having contact projections 17, and a ratchet-wheel 19, operated by the engagement of a pawl 20, movable with a push-button 21, retracted by a spring 22. When the push-button 21 is pushed in against the action of spring 22, the pawl 20 slips into engagement with a succeeding tooth of the ratchet-wheel 19, and upon the release of the push-button the spring 22 snaps the push-button out, thereby snapping the rotary switch 16 and causing the projection 17 to momentarily engage the contacts 12 and 14 and complete the circuit. On the next operation of the push-button the foregoing action will be repeated, except that the contact projections 17 will temporarily engage with the contacts 13 and 15.

From the generator 23 a wire 24 runs to contacts 12 and 15. From contact 13 a circuit 25 runs to the coils 8 and 9 and thence by return-feeder 26 to the generator 23. Circuits 27 run from the contact 14 to the coils 4 and 5 and thence to the releasing-coil 28 of the waste-valve by a circuit 29, thence to feeder 26. The waste-valve proper is shown at 30. The numeral 31 designates a core having a coned head 32, on which the waste-valve 30 rests. When the core 31 is drawn into the magnet-coil 33, which surrounds it, the coned head 32 raises the valve 30, so that the water drains from receptacle 1, and the core 31 is locked in this position by a core 34 in coil 28. The coil 33 is connected to feeder 26 and to the contacts 35 of a switch 36 by circuit 37. The switch 36 has two other contacts 38, connected to wire 24.

In conjunction with the switches 10 and 11 I provide an armature 39, adapted to engage and turn the switch-tumbler, and a magnet-coil 40 for attracting said armature.

A float-tank 46 has a pipe connection with the bath-tub 1. In the float-tank is a float 47, having a contact-head 48, adapted to engage the contacts 43 and 44 when the float has risen sufficiently by reason of the water reaching

the level at which it is desired to stop the flow. The contacts 43 and 44 are carried on an armature 42, which is controlled by a magnet-coil 41. A bell-crank lever 49 coöperates with the contact-head and the core, so that when the float drops the bell-crank lever projects the core from the magnet-coil.

The invention as thus far described is substantially the same as shown in my application filed May 11, 1903, Serial No. 156,672.

Instead of connecting the magnet-coils 40 as before I connect them in "parallel" on the circuit 60 61, which is itself connected in parallel on the magnet-coil 41, one branch, 60, of said circuit leading to one end of the coil 41 and the other branch, 61, leading to the normally "dead" contact 43.

The branch 60 is connected to the near ends of coils 8 and 9 by a circuit branch 62.

To cause the coils 40 to receive more current, and hence make their armatures respond more quickly to their influence than the armature 42 responds to the influence of the coil 41, the coils 40 are wound with considerably coarser wire than the coil 41, and hence take a greater amperage and do higher duty. In the system set forth in my application Serial No. 156,672, filed May 11, 1903, heretofore referred to, there is a tendency for the coil 41 to act so quickly that when the circuit is broken at the contacts 43 44 by the attraction of said coil 41 the coils 40 have not received sufficient current to throw the switches properly to send the necessary current through the coils 8 and 9 to release the valves and allow them to close. The present improvements completely overcome this objection.

Assuming the valves and switches to be in the positions shown and cold water is desired, the button 21 of switch 10 is pushed in and released. The pawl 20 rides on the ratchet-wheel 19 and on the return of the push-button engages said wheel and snaps the tumbler to the position indicated by dotted lines, meanwhile causing the contact projections 17 17 to momentarily engage the contacts 12 and 14, thus sending a temporary current through coil 4 and opening valve 2, which is then locked open by core 8. The current also traverses coil 28 and unlocks core 31, which then drops and allows waste-valve 30 to close by gravity. The water will continue to flow into receptacle 1 until the push-button of switch 10 is again operated and contacts 13 and 15 temporarily bridged by the tumbler, whereupon a temporary current will flow through coil 9, which will unlock valve 3 and allow it to close and cut off the water.

The water will remain in the receptacle 1 until the switch 36 is operated to momentarily bridge contacts 35 and 38 and send a temporary current through coil 33, whereupon the core 31 will be drawn up and locked by core 34 and in doing this will elevate the waste-

valve 30 and hold it open. The action of valve 2 and the waste-valve is the same as the action of valve 3 and is controlled by switch 11. When the water reaches the predetermined level, the contact-head 48 bridges contacts 43 and 44, thereupon completing the circuit through coils 40 and 41. The coils 40 act more quickly than the coil 41, and before the coil 41 has attracted the armature 42 sufficiently to break the circuit at contacts 43, 44, and 48 the switches have been snapped and currents sent through the coils 8 and 9 to close the valves.

In this application I lay no claim to the system, except in regard to the invention involved in maintaining the circuit of the electrical switch-throwing means until said means can properly snap the switches to close the valve or valves and thereafter opening said circuit, as other features of novelty involved in the present disclosures are claimed in my copending applications Serial Nos. 156,672, 156,673, and 156,674.

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

1. The combination with a fluid-receptacle, of an electrically-operated valve controlling the fluid-supply thereto, a switch controlling the valve, mechanism for electrically operating the switch to operate the valve, and independent mechanism, operated when the fluid in the receptacle assumes a predetermined position, to complete the circuit of the electrical switch-operating mechanism and maintain said circuit closed until the switch-throwing mechanism completes its operation and means to then open said circuit.

2. The combination with a fluid-receptacle, of an electrically-operated valve controlling the fluid-supply thereto, a switch controlling the valve, a coarse-wound magnet for throwing the switch to operate the valve mechanism, operated when the fluid in the receptacle assumes a predetermined position, adapted to complete the circuit of the coarse-wound magnet, and a fine-wound magnet adapted to automatically open the said circuit of the coarse-wound magnet after the said coarse-wound magnet has thrown the switch.

3. The combination with a fluid-receptacle, of an electrically-operated valve controlling the fluid-supply thereto, a switch controlling the valve, a quick-acting magnet for throwing the switch to operate the valve, mechanism operated when the fluid in the receptacle assumes a predetermined position, adapted to complete the circuit of the quick-acting magnet, and a slow-acting magnet adapted to automatically open the said circuit of the quick-acting magnet after the said quick-acting magnet has thrown the switch.

4. The combination with a fluid-receptacle, of an electrically-operated valve controlling

the fluid-supply thereto, a switch controlling
the valve, mechanism for electrically-operat-
ing the switch to operate the valve, means,
operated when the fluid in the receptacle as-
5 sumes a predetermined position, adapted to
complete the circuit of the electrical switch-
operating mechanism and maintain said cir-
cuit closed until the electrical switch-throwing
mechanism completes its operation, and elec-
10 trically-operated means acting on the com-

pletion of the action of said electrical switch-
throwing mechanism to open said circuit.

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

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Witnesses:

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