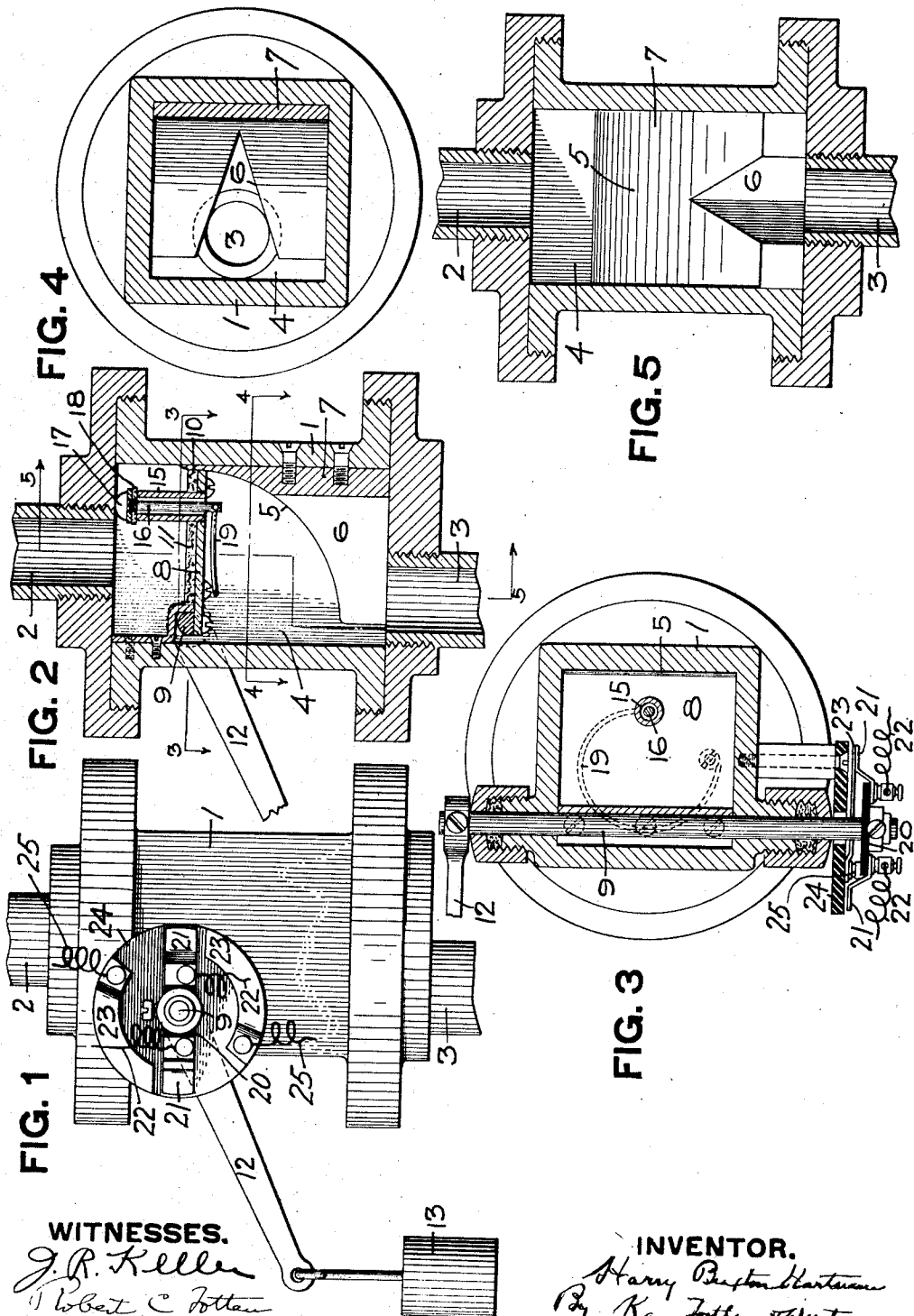


H. B. HARTMAN.
 AUTOMATIC CIRCUIT CONTROLLER FOR WATER PURIFYING APPARATUS.
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948,648.

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WITNESSES.

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AUTOMATIC CIRCUIT-CONTROLLER FOR WATER-PURIFYING APPARATUS.

948,648.

Specification of Letters Patent.

Patented Feb. 8, 1910.

Application filed October 18, 1907. Serial No. 398,092.

To all whom it may concern:

Be it known that I, HARRY B. HARTMAN, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Automatic Circuit-Controllers for Water-Purifying Apparatus; and I do hereby declare the following to be a full, clear, and exact description thereof.

10 This invention relates to electrolytic water purifying apparatus and more especially to a device for automatically making and breaking the circuit to the electrodes when the water is turned on and off.

15 The object of the invention is to provide a simple device whereby the electric current is automatically established as soon as the service faucet is opened and water begins to flow through the purifying device, and also, whereby whenever the water is shut off the current is automatically broken. By means of the device the current flows only while water is flowing through the purifying apparatus, thereby effecting a great saving of current.

25 The invention comprises a shutter located in the supply pipe and actuated by the flow therein, together with a V shaped seat with which the same coöperates in order to prevent the too sudden movements of the shutter and prevent water hammer and vibration of the circuit closer.

35 A further improvement consists in constructing the device so that friction is largely overcome and the pressure of the water is not materially reduced.

40 In the accompanying drawing Figure 1 is a side view of the improved device; Fig. 2 is a vertical section through the same; Fig. 3 is a horizontal section on the line 3-3, Fig. 2; Fig. 4 is a similar section on the line 4-4, Fig. 2; and Fig. 5 is a vertical section on the line 5-5, Fig. 2.

45 The device comprises a suitable casing 1 having the inlet 2 through one head and the outlet 3 through the other head. In the casing is a substantially rectangular chamber 4 provided with a curved wall 5, shown in Fig. 2, provided with a V shaped passage 6 communicating with the outlet 3. The wall 5 is formed in a block 7, but if desired it may be formed by an integral part of the casing.

50 In a chamber 4 is a shutter 8 pivotally

55 mounted, as on the shaft 9, and completely bridging the chamber 4 and having its free edge 10 adapted in the swinging movement of the shutter to move along the curved wall 5 and over the opening 6 through the latter. In the opening movement of this shutter it first uncovers the apex of the V shaped passage 5, and as it swings farther open it uncovers a larger and larger area of said opening, as will be apparent, while in its closing movement the reverse is effected. The consequence is that the flow of water is gradually established and gradually cut off, thereby preventing the too sudden movement of the shutter and preventing water hammer, vibrations and other disadvantages due to a sudden opening or closing of the shutter and preventing vibration of the circuit maker and breaker. The shutter is provided with a leather or other packing 11 to give it a water tight fit in the casing.

65 The shutter 8 is arranged normally to stand horizontally or across the passage through the casing, that is, to remain in the position shown in Fig. 2. This is effected by connecting to the pivot 9 of the shutter an arm 12 provided with a counterweight 13, of merely sufficient weight to overcome the friction of the shutter and effect its closing when the pressure is balanced on its opposite sides.

75 In the closing of the shutter, as soon as it passes the apex of the V shaped groove 7 it is apparent that communication between the two sides of the shutter is interrupted and that it will not swing to its position transversely of the passage and insure a complete interruption of the circuit until a part of the water above the same has passed to the opposite side. In order to permit this without necessitating leaking around the edges of the shutter, I provide in the shutter a suitable check valve, shown as a tube 15, passing through the shutter and having therein a stem 16 of smaller diameter than the tube and provided with a head 17 and packing 18 adapted to seat on the end of the tube 15 and close the opening through the latter.

85 A light spring 19 is arranged to hold the check valve open, that is, with the packing 18 out of contact with the end of the tube 15. In the closed position of the valve the head 18 abuts against the head of the casing, as shown in Fig. 2, thus closing the

check valve. When the shutter opens, this check valve is held closed due to the water pressure acting against the head 18, but when the pressures on the two sides of the shutter are balanced, which occurs as soon as the shutter is fully open, the spring 19 opens the check valve, and said check valve remains open during the closing movement of the shutter and permits the water on the two sides to equalize after the shutter has passed the apex of the V shaped passage 6. The check valve, however, is closed when the head 18 strikes the head of the casing.

The shutter 18 actuates a suitable circuit controller. As shown, this circuit controller consists of a double pole switch comprising an insulating member 20 connected to one end of the pivot member 9 of the shutter and carrying metallic spring arm contacts 21 to each of which is connected a circuit wire 22. The coöperating contacts 23 are metallic spring members secured to a disk 24 of insulation suitably secured to the casing, said contacts 23 having secured thereto the circuit wires 25. The contacts 23 are of sufficient length so that they are contacted by the spring arms 21 as soon as the edge of the shutter reaches the apex of the V shaped passage 7 so that the electric circuit is established as soon as water begins to flow through the casing. In the further opening of the shutter the arms 21 merely ride along the contacts 23, keeping the circuit closed. As soon, however, as the shutter is fully closed the circuit is broken, as shown in Fig. 1. The arms 21 and contacts 23 are thin plates of spring metal, such as copper or brass, and offer very little friction on each other.

In order to prevent water flowing through the purifying apparatus without being acted on by the electric current it is necessary that the circuit be closed before the shutter uncovers the apex of the V shaped opening 6. Consequently in the reverse movement the current is not broken until after the shutter leaves the opening 6, and the check valve, in the shutter is important in permitting the shutter to move and break the circuit after it entirely cuts off the passage through the casing. The V shaped opening 6 establishes and interrupts the flow of water so gradually as to avoid all hammer and vibrations, so doing away entirely with vibrations of the circuit maker and breaker and the consequent fluctuations of the current.

The mechanism shown operates with minimum friction and imposes very little resistance to the flow of the water, so as not to materially reduce the pressure in the house system. It will be understood that this device will be placed in the pipe either leading to or leading from the electric water purifying apparatus and that the circuit which is controlled by the switch leads

to the electrodes of the latter. Consequently, no current flows through the water purifying apparatus unless and until the water flows through the purifying apparatus, which takes place when the supply faucet is opened. The consequence is that there is great economy in the amount of current used.

What I claim is:

1. A circuit controller operating device for liquid purifying apparatus, comprising a conduit, a valve therein arranged to be actuated by the liquid pressure and to normally close said conduit, and a circuit closer operated from said valve and arranged to close the electric circuit before the valve opens the conduit and to break the electric circuit after said valve closes the conduit.

2. A circuit controller operating device for liquid purifying apparatus, comprising a conduit, a shutter pivoted therein and arranged to be actuated by the liquid pressure and normally to stand across said conduit, and a circuit controller operated from said shutter and arranged to close the electric circuit before the shutter opens the conduit and to break the electric circuit after the shutter closes the conduit.

3. A circuit controller operating device for liquid purifying apparatus, comprising a conduit having therein a seat provided with a V shaped opening, a movable shutter coöperating with said seat and arranged in opening to pass from the apex toward the base of said V shaped opening, and a circuit controller operated from said shutter.

4. A circuit controller operating device for liquid purifying apparatus, comprising a conduit having therein a curved seat provided with a V shaped opening, a pivoted shutter coöperating with said seat and arranged in opening to pass from the apex toward the base of the V shaped opening, and a circuit controller operated from said shutter.

5. A circuit controller operating device for liquid purifying apparatus, comprising a conduit having a curved valve seat, a shutter pivoted therein and arranged normally to stand across said conduit, a circuit controller operated from said shutter, and a spring actuated check valve through said shutter arranged to equalize the liquid on opposite sides thereof.

6. A circuit controller operating device for liquid purifying apparatus, comprising a conduit having a curved seat provided with a V shaped opening, a pivoted shutter coöperating with said seat and arranged in opening to pass from the apex toward the base of said V shaped opening, and a check valve in said shutter arranged to equalize the pressure on opposite sides thereof.

7. A circuit controller operating device for liquid purifying apparatus, comprising a casing having therein a curved valve seat,

a hinged shutter cooperating with said seat, means for normally closing said shutter, a check valve controlling an opening through said shutter, a spring arranged to hold said check valve open, and an abutment arranged to contact with said check valve and close the same.

8. A circuit controller operating device for liquid purifying apparatus, comprising
 10 a conduit having a seat provided with a V shaped opening, a movable shutter cooperating with said seat and arranged in opening to pass from the apex toward the base of said V shaped opening, means for normally
 15 closing said shutter, a check valve controlling an opening through said shutter, a spring arranged to normally hold said check valve open, and an abutment for contacting with said check valve and closing the same
 20 when the pivoted shutter is fully closed.

9. A circuit controller operating device for liquid purifying apparatus, comprising
 a conduit having a curved seat provided with an opening, a pivoted shutter cooperating with said seat, and arranged to be
 25 actuated by the liquid pressure, and a circuit controller operated from said shutter, the parts being so arranged that the circuit will be closed before the shutter uncovers
 30 the opening in the seat and will not be broken until after said shutter covers said opening.

10. A circuit controller operating device for liquid purifying apparatus, comprising
 35 a conduit having therein a valve seat provided with an opening therethrough, a valve arranged to control said opening, and arranged to be actuated by the liquid pressure, and a circuit controller operated from said valve, the parts being so arranged that the circuit will be closed before the valve uncovers the opening in the seat and will not be broken until after the valve covers said opening.

11. A circuit controller operating device for liquid purifying apparatus, comprising
 a conduit having therein a valve seat, a valve cooperating with said valve seat and arranged to normally close said conduit, a circuit controller operated from said valve, and
 40 a check valve in an opening through said valve and arranged to be closed by the liquid pressure and when open to equalize the liquid on opposite sides thereof.

12. A circuit controller operating device for liquid purifying apparatus, comprising
 a conduit provided with a valve seat therein, a valve cooperating with said valve seat and arranged to normally close said conduit, an equalizing passage through said valve, a
 50 spring controlled check valve controlling said equalizing passage, and a circuit controller operated from said shutter.

In testimony whereof, I the said HARRY B. HARTMAN have hereunto set my hand.

HARRY BUXTON HARTMAN.

Witnesses:

F. W. WINTER,
 ROBERT C. TOTTEN.