No. 775,053. PATENTED NOV. 15, 1904.

I. G. WATERMAN.

ELECTRIC SWITCH.

APPLICATION FILED JUNE 29, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

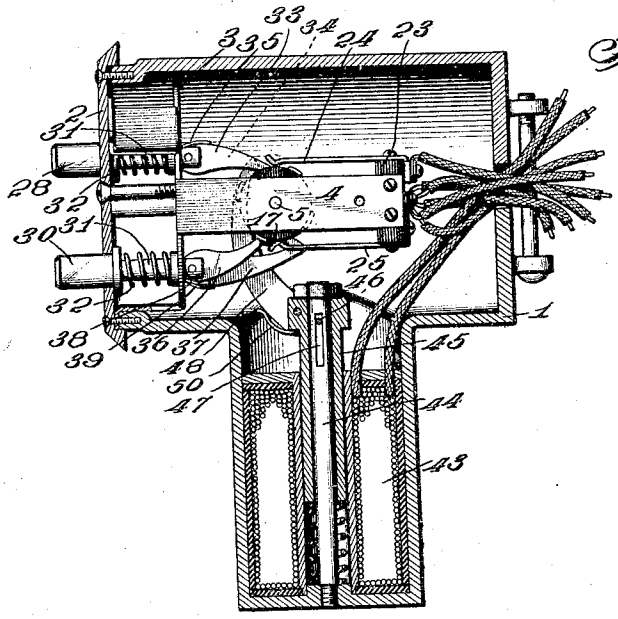
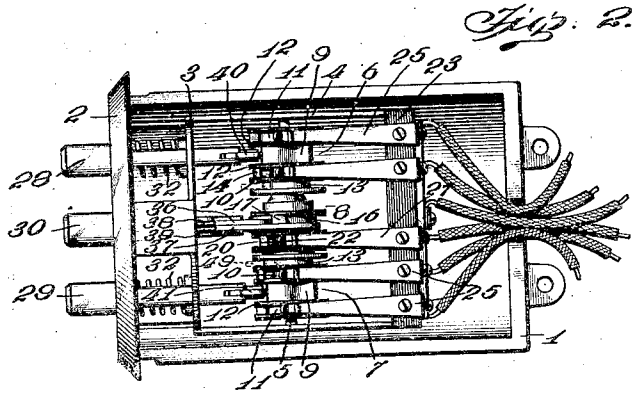


Fig. 2.



Witnesses
L. Bousford Hands
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No. 775,053. PATENTED NOV. 15, 1904.

I. G. WATERMAN.

ELECTRIC SWITCH.

APPLICATION FILED JUNE 29, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

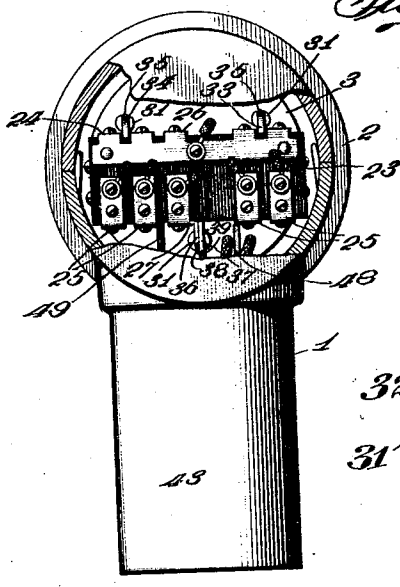


Fig. 7.

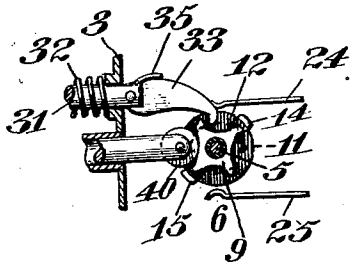


Fig. 4.

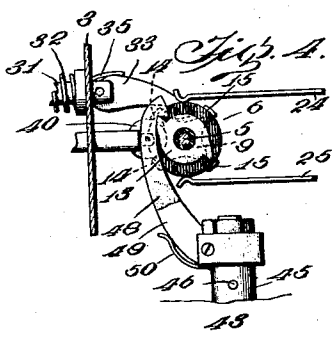


Fig. 5.

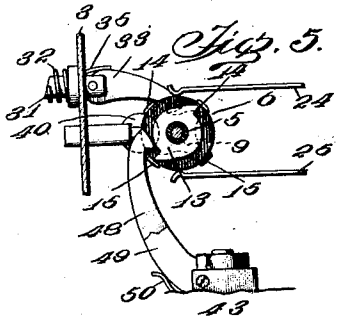
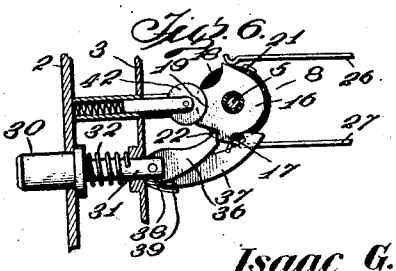


Fig. 6.



Witnesses

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No. 775,053. Patented November 15, 1904.

UNITED STATES PATENT OFFICE.

ISAAC G. WATERMAN, OF SANTA BARBARA, CALIFORNIA.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 775,053, dated November 15, 1904.

Application filed June 29, 1903. Serial No. 163,534. (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 Electric Switches, of which the following is a specification.

This invention relates to electric switches.

In my application filed May 11, 1903, Serial No. 156,671, I have shown an electrical system with certain electromagnetic valves, automatic cut-off float, and switches for controlling the flow of water to and from bath-tubs and lavatories. In the operation of that system three switches are used, one being for the control of the hot water, another to control the cold water, and a third to control the waste-valve. Heretofore I have constructed these switches as independent switches, those controlling the hot and the cold water being combined in one switch, and the waste-valve-controlling switch being separately made. In the present invention I propose to combine in one switch the switches for operating the hot and cold water valves and the switch for controlling the waste-valve, thereby obtaining a more compact and cheap system of switches and saving time and labor in installing the switch mechanism.

Another object is to provide an improved electromagnetic mechanism for throwing the switches used for controlling the hot and cold water.

A further object is to provide an improved oscillatory switch for controlling the waste-valve.

Having the foregoing objects in view, the invention consists of certain improved features and novel combinations of parts set forth in detail hereinafter and recited in the appended claims.

In the accompanying drawings, Figure 1 is a vertical section showing the mechanism in elevation; Fig. 2, a bottom plan view with the lower part of the shell removed. Fig. 3 is an end elevation; Figs. 4 and 5, detail views of the electromagnetic-switch-throwing mechanism; Fig. 6, a detail view of the waste-valve-operating switch; Fig. 7, a detail of one of the ratchet-wheels 9.

The mechanisms and electromagnet are inclosed in an iron shell 1, the horizontal part of which is formed in sections to permit easy access to the mechanisms.

The numeral 2 designates the face-plate having the back plate 3, to which the frame 4 is secured.

Extending across the frame 4 is a shaft 5, on the end portions of which are journaled the duplicate rotary switches 6 and 7, intermediate which is the rotary switch 8. The rotary switches 6 and 7 each consists of a central ratchet-wheel 9, contact-tumblers 10 and 11 on opposite sides thereof and separated therefrom by insulation 12, and a two-pointed ratchet-wheel 13. The tumblers 10 and 11 each have contact projections 14 and 15 disposed diametrically and set "quartering" to the contact projections on the other tumbler.

The intermediate oscillatory switch 8 has a disk 16, provided with a single tooth or lug 17 and two rounded notches 18 and 19. Disposed alongside the disk 16 and connected thereto is a contact-tumbler 20, having the diametrically-disposed contact projections 21 and 22.

On the frame 4 is an insulating-block 23, to which is secured pairs of upper and lower contact-fingers 24 and 25, positioned to be engaged by the contact projections 14 and 15, and other contact-fingers, 26 and 27, are employed which are adapted to be engaged by the contact projections 21 and 22.

Slidable through face-plate 2 are push-buttons 28, 29, and 30, having stems 31 slidable through the back plate 3 and encircled by springs 32, which keep the push-buttons normally projected. Pivoted to the ends of the stems of push-buttons 28 and 29 are actuating pawls or dogs 33 and 34, held in engagement with the ratchet-wheels 9 of the rotary switches 6 and 7 by springs 35.

Pivoted to the end of the stem of push-button 30 are two actuating pawls or dogs 36 and 37, adapted to engage opposite sides of the lug 17 of the intermediate oscillatory switch

8, said pawls being pressed by the respective springs 38 and 39. The teeth of these pawls are each disposed a little distance away from the lug 17, in consequence of which only one of them, 36, engages the lug 17 when the push-button is pressed in, and then on the return movement of the push-button the other pawl, 37, engages said lug. Consequently the contact projections 21 and 22 remain for an instant against the contact-fingers 26 and 27 when the push-button is pressed in and are then snapped backwardly off of said fingers to their former position. By this improved switch I obtain a somewhat longer contact than with the other switches or those other "temporary-contact" switches set forth in certain applications which I have previously filed.

The rotary switches 6 and 7 are held where snapped by spring-pressed rollers 40 and 41 entering the interdental spaces of the ratchet-wheels 9, and it will be understood that these switches are of the "snap" type and make only a momentary or temporary engagement with their contact-fingers. The oscillatory switch 8 is held where snapped by a spring-pressed roller 42, adapted to enter either the notch 18 or notch 19.

The numeral 43 designates a solenoid in which is a stationary slotted guide-rod 44, on which slides the armature 45, which has a pin 46 movable in the slot 47 of the rod 44, whereby the armature is prevented from turning. The armature has two pawls or dogs 48 and 49 pivoted to its head, which are pressed by springs 50 into engagement with the respective two pointed or toothed ratchet-wheels 13 on the rotary switches 6 and 7.

In using the invention with a system such as shown in my copending application filed May 11, 1903, Serial No. 156,671, the rotary switches 6 and 7 control the circuits of the hot and cold water electromagnetic valves and the oscillatory switch 8 the circuit of the electromagnetic waste-valve. The purpose of the electromagnet or solenoid and the pawls 48 and 49 is to automatically throw the rotary switches 6 and 7 when a current is sent through said solenoid. In my system set forth in the application, Serial No. 156,672, filed May 11, 1903, the current for the solenoid is controlled by certain automatic electrical contact-controlling float mechanism.

In the present application I lay no claim to the switch mechanisms 6 and 7 and their push-button actuating devices *per se*, as similar switch mechanisms are claimed in substance in other applications which I have filed heretofore.

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

1. The combination with a movable switch-contact and another contact arranged so that the movable contact will only temporarily engage therewith when actuated, of an electromagnet, an armature therefor, and a pawl carried by the armature adapted for actuating the movable contact.

2. The combination with a rotary switch-contact and another contact arranged so that the rotary contact will only temporarily engage therewith when actuated, of engageable members on the contact, an electromagnet, an armature for the electromagnet, and a pawl on the electromagnet adapted to engage either of the engageable members aforesaid to turn the rotary contact.

3. The combination with a rotary contact, of an actuating member for manually operating said rotary contact, step by step, an electromagnet, and an armature adapted to rotate the rotary contact independently of the actuating member aforesaid.

4. The combination with a rotary contact, of an actuating member for manually operating said rotary contact, step by step, an electromagnet, an armature therefor, and a pawl on the armature adapted to rotate the rotary contact independently of the actuating member aforesaid.

5. The combination with independently-movable contacts, of means for manually operating said contacts independently, an electromagnet, an armature therefor, and independent pawls on the armature adapted to independently coöperate with the movable contacts to operate them.

6. The combination with a movable contact, of another contact for engagement therewith, and an actuating device for said movable contact adapted to move it back and forth on each actuation, said actuating device having two members, one adapted to engage the movable contact to move it in one direction on the initial movement of the actuating device and the other adapted to engage the movable contact to move it back to normal position on the final movement of the actuating device.

7. The combination with a movable contact having a lug or projection, of another contact for engagement with the movable contact, and an actuating device having two pawls adapted to alternately engage said projection to move the contact back and forth.

8. The combination with a movable contact having a lug or projection, and another contact for engagement with the movable contact, and an actuating device having two pawls positioned to engage opposite sides of the lug or projection to move the contact back and forth, said pawls being each movable back and forth relatively to the projection or lug at the points where they are adapted to engage said lug.

9. The combination with a contact adapted to move back and forth on each actuation, of

another contact for engagement therewith, means to engage the contact at the limits of its movement, a spring-pressed actuating member, and devices carried thereby adapted to alternately engage the movable contact and move it back and forth on each actuation of the spring-pressed actuating member.

10. The combination with a contact adapted to move back and forth and having two notches, of a locking device adapted to enter said notches to limit the play of the movable contact, a lug on the contact, a spring-pressed actuating member, and pawls carried by the actuating member adapted to engage the lug to move the contact back and forth.

11. The combination with a switch-contact, of a rotary contact movable step by step in one direction and adapted to pass on and then off the switch-contact when actuated, and an electromagnet and armature for actuating the rotary contact to cause momentary or temporary engagement of said rotary contact with the switch-contact.

12. The combination with a movable switch-contact, and another contact relatively arranged so that the movable contact will only temporarily engage therewith when actuated, of an actuating member for manually actuating said movable switch-contact, and an electromagnet and armature adapted to actuate the movable switch-contact independently of the manually-operated actuating member aforesaid.

13. The combination with a rocking switch-contact, and another contact arranged so that the rocking switch-contact will be adapted to engage therewith, of a spring-actuated push-button, and means carried with said push-button adapted by the movements of the push-button to positively rock the rocking switch-contact back and forth to cause it to temporarily engage the other contact.

14. The combination with a movable contact, of another contact for engagement with the movable contact, and a slidable spring-actuated push-button having two pawls adapted to alternately engage the movable contact to move said contact back and forth.

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

ISAAC G. WATERMAN.

Witnesses:
WALLACE R. SEAVEY,
ELMER SEAVEY.