No. 760,400. PATENTED MAY 17, 1904.

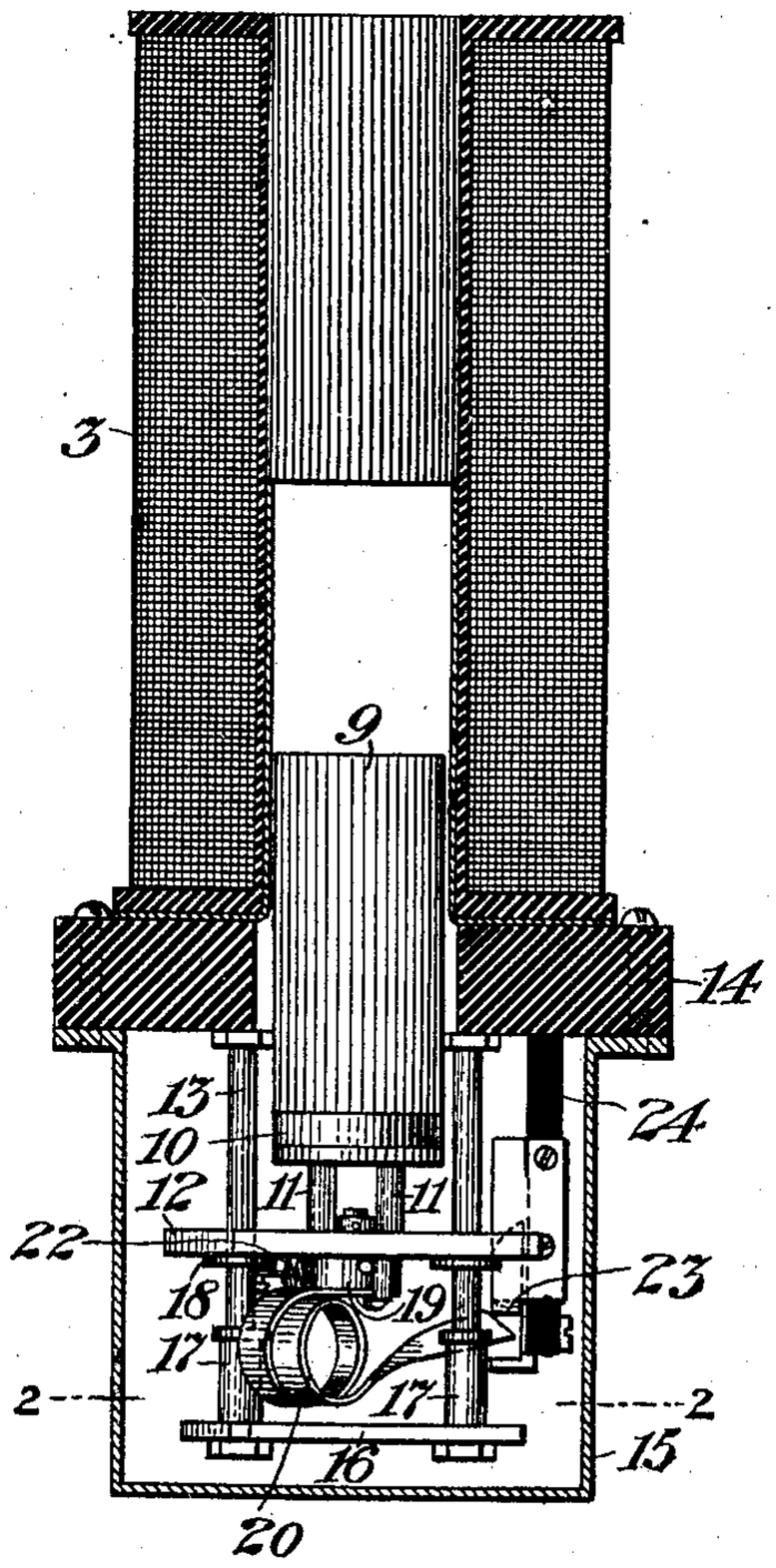
M. VON RECKLINGHAUSEN.

AUTOMATIC OIL SWITCH.

APPLICATION FILED JAN. 6, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1



Witnesses
Chas. F. Clagett
W. B. Capel

Inventor
Max von Recklinghausen
By his Attorney
Charles A. Terry

No. 760,400. PATENTED MAY 17, 1904.

M. VON RECKLINGHAUSEN.

AUTOMATIC OIL SWITCH.

APPLICATION FILED JAN. 6, 1904.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2

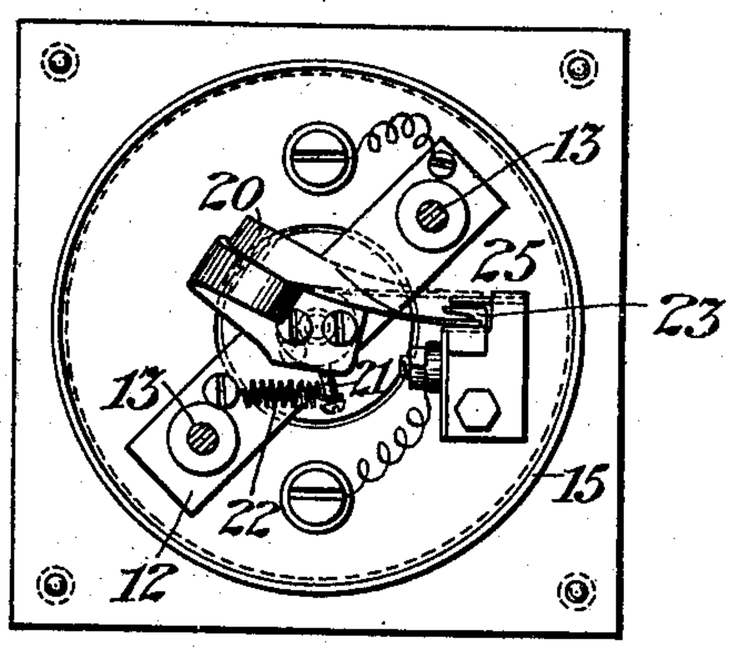


Fig. 3

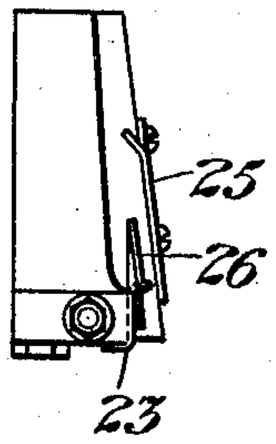


Fig. 4

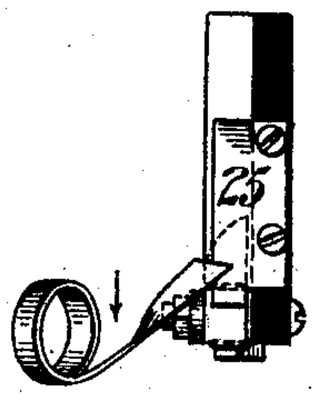


Fig. 5

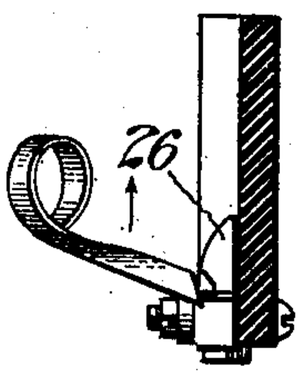
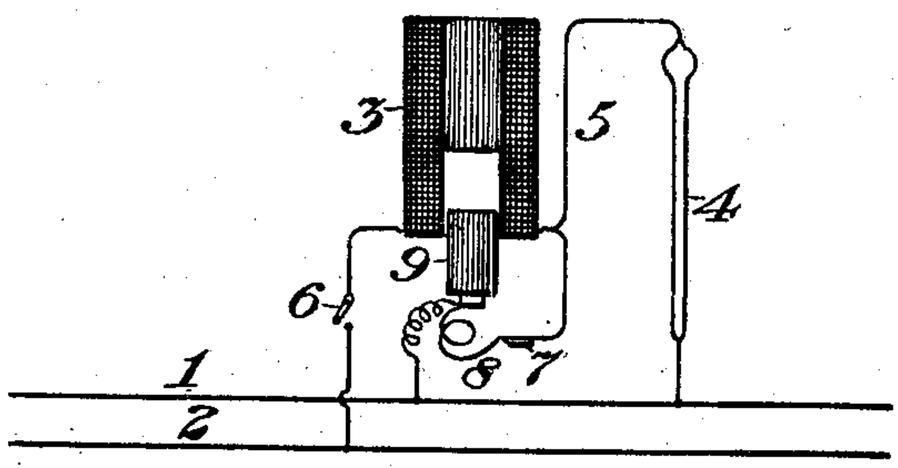


Fig. 6



Witnesses
Chas. F. Clagett
Wm. H. Capel

Inventor
Max von Recklinghausen
By his Attorney
Charles A. Terry

No. 760,400. Patented May 17, 1904.

UNITED STATES PATENT OFFICE.

MAX VON RECKLINGHAUSEN, OF NEW YORK, N. Y., ASSIGNOR TO COOPER HEWITT ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

AUTOMATIC OIL-SWITCH.

SPECIFICATION forming part of Letters Patent No. 760,400, dated May 17, 1904.

Original application filed April 22, 1902, Serial No. 104,212. Divided and this application filed January 6, 1904. Serial No. 187,895. (No model.)

To all whom it may concern:

Be it known that I, MAX VON RECKLINGHAUSEN, a subject of the Emperor of Germany, and a resident of New York, county of New York, State of New York, have invented certain new and useful Improvements in Automatic Oil-Switches, of which the following is a specification.

My invention relates to improvements in automatic electric switches, its primary object being to provide a switch of this character which shall be suited to operate the starting-circuit for a gas or vapor electric lamp—say of the Cooper Hewitt type. When acting in this capacity, my switch may serve also as a reactance device for furnishing the initial electrical impulse for starting such a lamp, or it may merely operate to break the circuit of a separate reactance device, the rupture of the circuit in both instances being made by the quick movement of a contact piece or terminal away from a coöperating piece or terminal.

In the accompanying drawings, illustrating my invention, Figure 1 is a vertical section of my switch. Fig. 2 is a view taken along the line 2 2 in Fig. 1 looking upward. Figs. 3, 4, and 5 are detail views, and Fig. 6 is a diagram of circuits including a Cooper Hewitt lamp and my switch.

Referring first to the diagrams, 1 and 2 are circuit-wires connected with any suitable source of electricity. 3 is a magnet or solenoid forming part of my switch and included in a shunt-circuit in series, with a Cooper Hewitt lamp shown at 4. The shunt-circuit 5 includes a switch 6, which may be operated to close the circuit when it is desired to start the lamp. A branch from the wire 5 includes switch-terminals 7 and 8, which it is the function of my switch to separate by a quick movement through the action of the solenoid 3 upon its core 9.

When the switch 6 is closed, the circuit first passes, by way of wires 2 and 5, through the solenoid 3 and the branch circuit to the switch-terminals 7 and 8 and thence to the wire 1. By the energizing of the solenoid 3, due to the passage of the current in this way, the core 9 is lifted, the action being such that a quick separation of the terminals 7 and 8 takes place, as will be described hereinafter. At the same time an electrical impulse of high tension is created in the coils of the solenoid 3, which now acts as a reactance device and discharges the impulse through the lamp 4, thus starting the lamp into operation.

Such being the general features of the system, I will now describe, by reference to the earlier figures of the drawings, the means by which the attraction of the solenoid-core (for which a magnet-armature might be substituted) causes a sudden rupture of the branch circuit and the means whereby on the release of the core the switch-terminals are made to resume their original relation.

Connected with the lower end of the core, but insulated from the main body thereof by an insulating-disk 10, are two posts 11 11, which extend downward and are suitably joined to a horizontal plate 12. The latter is adapted to move up and down with the core, being guided by two posts 13 13, which are secured to a thick insulating-plate 14, on which the solenoid 3 rests. Most of the parts described are contained within a cylindrical flanged receptacle 15, secured to the under side of the insulating-plate 14. This receptacle is liquid-tight and intended to contain a liquid, such as oil, so that the rupture of the circuit may take place in a medium which will prevent excessive sparking.

The lower ends of the posts 13 13 are joined by a cross-piece 16, above which are sleeves 17 17 on the posts, the same serving, through their enlarged tops, to limit the downward movement of the core by receiving the plate 12 as it descends. I have shown collars formed below the plate 12 at 18 18 to furnish a wider bearing for the plate in its upward and downward movement.

Within the plate 12, at the center thereof, a hub 19 is pivoted, and to the bottom of this hub is secured a spiral spring 20, of good conducting material, the outer end of the spring constituting one of the terminals of my switch. By means of a screw-stud 21, secured to the

hub 19, support is made for one end of a spring 22, the other end of which is secured, as shown in Fig. 2, to the plate 12. The spring 22 is a retractile spring and tends to draw the pivoted hub into a position such that it will throw the outer end of the spring 20 against the corresponding or coöperating switch-terminal 23 and make good electrical contact between the two.

The contact piece or terminal 23 is supported in any suitable manner upon a block 24 of insulating material. This block is bolted to the insulating-plate 14 or otherwise connected therewith. On the same block 24 is supported a metallic piece 25, a portion of which projects past the edge of the block and is bent over, as shown in Fig. 3, into the path of the spring 20 when it moves upward with the core 9.

In Fig. 5 the end of the spring 20 is shown as it appears when the core is drawn up, just before the end of the contact-spring 20 starts to leave its coöperating contact 23. This is its position just before the core has reached the limit of its upward motion, whereas any further movement of the core in the same direction will cause the end of the spring-contact 20 to slip off and fly upward with a quick movement, owing to the resiliency of the spring itself. In order to maintain a good contact until the last moment, I provide a tongue 26, forming an extension of the contact-terminal 23, and I so arrange the parts that the end of the spring 20 will wipe along this tongue until it leaves it suddenly at its upper extremity.

It will be understood that in passing from the position shown in Fig. 1 to a point near the limit of its upward motion the core 9 will continually act upon the spring 20 to put it under tension, causing it to pass from the position illustrated in Fig. 1 to that shown in Fig. 5. The final step in the movement of the core causes the end of the spring 20 to slip off, as already described, and to wipe along the tongue 26 until it finally breaks contact therewith by a quick separation. The end of the spring 20 continues its upward movement until it passes the inwardly-projecting end of the metallic strip 25, whereupon it falls back outside the same or remains above the same in such a position that its end is outside the said strip. The parts remain in this position so long as the lamp-circuit is closed and the solenoid 3 is energized. When, however, the lamp is extinguished and the solenoid deënergized from that or any other cause, the core falls by gravity, carrying with it the spring 20, which then slides down outside the strip 25 and when it reaches the bottom of the strip falls into place again in contact with the terminal 23. In this way I have provided an automatic self-restoring switch which can be utilized for any class of circuits. As stated, however, it is especially designed to operate the starting-circuits for gas or vapor electric lamps, and it is also particularly intended to operate contacts which are submerged under a suitable liquid.

In another application filed April 22, 1902, Serial No. 104,212, of which this application is a division, claims are made upon a system to which the switch herein described is particularly applicable.

I claim as my invention—

1. A snap or quick-break electric switch inclosed within a liquid-tight receptacle, a solenoid outside the said receptacle, and a core for the said solenoid mechanically connected with one of the switch-terminals, the core being itself wholly inclosed in a receptacle which is liquid-tight and which forms part of the liquid-tight receptacle containing the switch.

2. In a snap or quick-break electric switch, the combination with an elastic movable element and means for moving the same, of a coöperating stationary contact element, the same forming a detent for resisting the release of the elastic element throughout a certain distance, a conducting-tongue connected with the stationary element and arranged alongside the path of movement of the elastic contact element after it is released, the arrangement being such that any further movement of the elastic contact element will permit the release thereof and cause it to slide along the said tongue.

3. A snap or quick-break electric switch inclosed within a liquid-tight receptacle, a solenoid outside the said receptacle, and a core for the said solenoid, the said core being itself wholly inclosed in a portion of the liquid-tight receptacle, and being mechanically connected with one of the switch-terminals, and the receptacle being partially filled with a suitable liquid.

Signed at Berlin, in the city of Berlin, Germany, this 8th day of December, A. D. 1903.

MAX VON RECKLINGHAUSEN.

Witnesses:

WALTER PHILLIPS,

FREDERICK HESSENBERG.