

No. 759,916.

PATENTED MAY 17, 1904.

M. VON RECKLINGHAUSEN.  
QUICK BREAK OIL SWITCH.

APPLICATION FILED APR. 22, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig.1

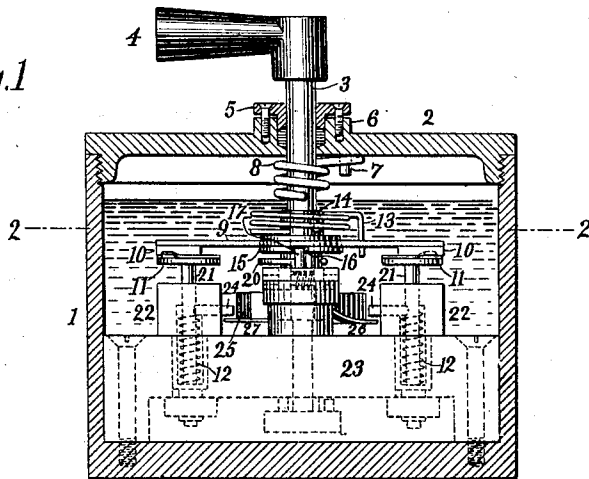


Fig.2

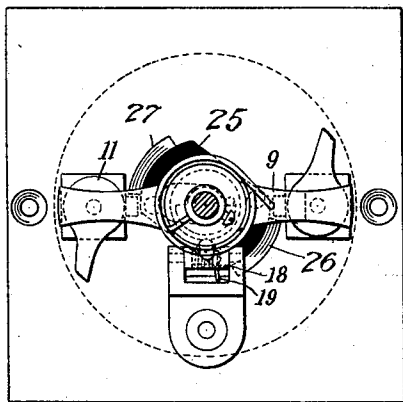


Fig.3

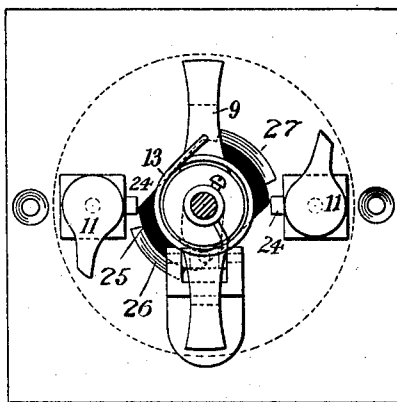


Fig.4

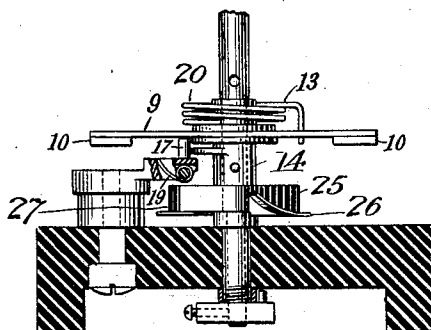
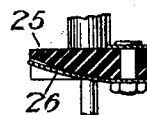


Fig.5



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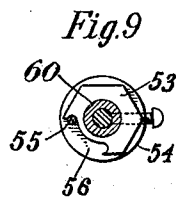
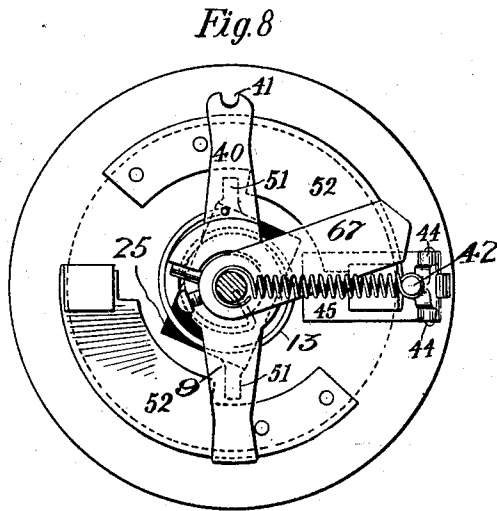
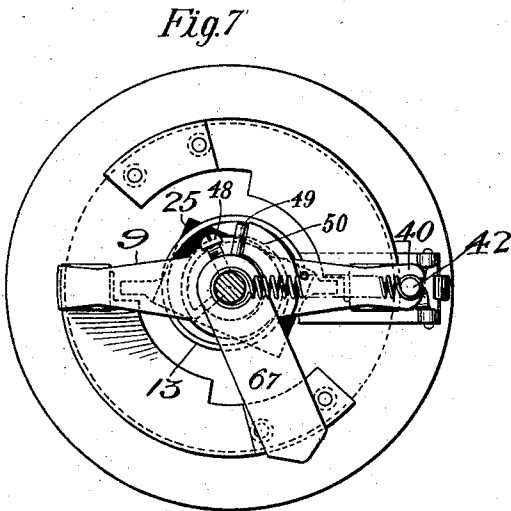
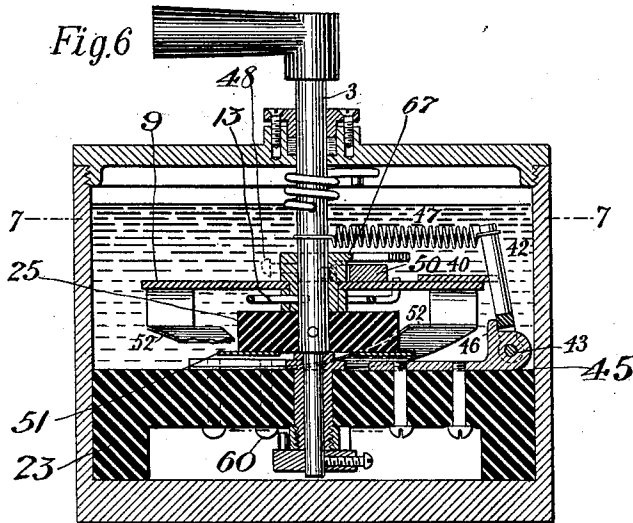
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2 SHEETS—SHEET 2.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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

## QUICK-BREAK OIL-SWITCH.

SPECIFICATION forming part of Letters Patent No. 759,916, dated May 17, 1904.

Application filed April 22, 1902. Serial No. 104,211. (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, in the county of New York and State of New York, have invented certain new and useful Improvements in Quick-Break Oil-Switches, of which the following is a specification.

The present application is intended to describe different novel mode of embodying the principle of a snap or quick-break electric switch, the principal object being to provide such an embodiment as adapts itself to the purposes of an oil or liquid switch—that is, a switch in which the contacts are submerged in a liquid, such as oil, for the purpose of preventing abnormal arcing when the contact-pieces are separated.

In the drawings, Figure 1 is a vertical section of one embodiment of such a switch. Fig. 2 is a horizontal section along the line 2 2 in Fig. 1. Fig. 3 is a similar view showing the switch-contacts ninety degrees removed from the position illustrated in Fig. 2. Fig. 4 is a side elevation of some of the inner parts of the switch. Fig. 5 is a detail view. Fig. 6 is a vertical section of a different embodiment of my switch. Fig. 7 is a horizontal section along the line 7 7 in Fig. 6. Fig. 8 is a similar view showing the movable contact-pieces in a position ninety degrees from that illustrated in Fig. 7, and Fig. 9 is a detail view.

In the earlier figures of the drawings, 1 is a vessel or receptacle adapted to contain oil or some other suitable liquid for the purposes mentioned. This vessel may be of metal or of some suitable insulating material, such as glass or porcelain. It is provided with a cap 2, tightly fitted to its top, this cap being pierced at its center to receive the operating-shaft 3, to which a suitable handle 4 is fastened. The shaft 3 is also surrounded near its top by a button or washer 5, which is socketed in an opening in the cap 2 and is secured by screws to a boss or hub 6, formed on the cap, the whole forming a packing-box. To the lower side of the cap 2 is secured a stud 7, forming

a support for one end of a spiral spring 8, the other end of which is secured, as shown in Fig. 1, to the shaft 3.

The movable switch-terminals are formed or mounted on the opposite ends of a conducting-bar 9, which is loosely mounted on the shaft 3. The terminals themselves are designated by the characters 10 10. Cooperating with these terminals are spring-pressed contact-pieces 11 11, the tendency of the springs 12 12, which act upon them, being to press these contact-terminals upward and form good contact with the movable terminals 10 10 when the latter are in the proper position.

A spring 13, connected at one end to the shaft 3 or to a hub 14, secured thereto or formed thereon, is connected at its opposite end to the bar 9, as shown. The said bar 9 is itself formed with a hub 15, in the edge of which a notch 16 is formed. This notch is in line with a pin or detent 17, projecting from a pivoted bar 18, the latter being pressed by a spring 19 in such a direction as to tend to enter the slot 16 when the pin and the slot register with each other. The disengagement of the pin or detent 17 from the notch 16 may, however, be brought about by means of a cam 20, formed on the hub 14 or projecting therefrom.

The spring-pressed contact-pieces 11 11 are mounted on vertical stems or posts 21 21, adapted to reciprocate in standards 22 22, mounted on a base 23, of slate or other good insulating material, within the receptacle 1. From the stems or posts 21 arms 24 24 project through the standards 22 22 in the direction of the shaft 3 or the hub 14 thereon. This shaft or hub carries an insulating-block 25, having upon its under side cam-faces covered with pieces of metal 26 27. The metallic pieces extend beyond the ends of the block of insulating material and are adapted when moving in one direction to pass under the arms 24 24 and lift the contact-pieces 11 11 and while passing in the opposite direction to ride above the arms 24 24 and press the terminals 11 11 downward.

The normal position of the parts is that shown in Fig. 3, where the switch-circuit is open. To operate the switch, the handle is turned to the left, thus putting tension on the spring 8, but not on the spring 13. During this movement the metallic pieces 26 and 27 ride over the arms 24 24 and press the contact-pieces 11 11 downward. At the moment, however, when the pin 17 enters the slot 16 the metallic cam-shaped pieces 26 and 27 pass off the arms 24 24 and allow the springs 12 12 to throw the contact-pieces 11 11 up into contact with the terminals 10 10. It will be seen that there is no resistance during this left-handed motion of the shaft 3 to the movement of the arm 9 with the shaft. At least there is nothing more than a slight frictional resistance. The operator now releases the handle 4, whereupon the spring 8 exerts its force, winds the spring 13 by moving the shaft 3, and when this movement of the shaft has continued long enough to press the cam 20 against the pin 17, so as to throw the latter out of the notch 16, the arm 9 is released and is carried by the force of the spring 13 quickly away from the closed position. By the structure described a quick-making as well as a quick-breaking action is secured, and a good wiping movement of the contact-pieces during the breaking operation is obtained.

In Figs. 6, 7, 8, and 9 a modification of the switch already described is shown. In this modified structure a plate 40 is secured to the arm 9 and is provided with a notch 41, with which a pivoted pin or detent 42 engages or may engage. The pin 42 has its pivot 43 in bearings in the form of lugs 44 44 on a plate 45, secured to the base 23. The forward motion of the pin 42 is limited by a stop 46 on the plate 45. A spring 47, connected to the upper end of the pin 42 and to the shaft 3, tends to hold the pin against its stop; but owing to the rounded or beveled shape of the outer end of the plate 40 the pin 42 may be pushed back thereby until it reaches the notch 41, when it will be drawn into the notch by the spring 47. The spring 13 is in the present form of switch preferably located below the arm 9, while the tripping device is located above the same. This tripping device appears as an arm 67, secured to the shaft by a set-screw 48. The outer end of the tripping-arm is beveled, so that it will slide along the pin 42 when brought into the proper position and will ultimately force the pin out of the notch 41 and release the arm 9. The hub of the arm 67 has a pin 49 projecting from it, which pin engages with a segment 50, connected with the arm 9 by being riveted thereto, whereby the relative positions of the arms 9 and 67 are determined or limited. The insulating-block

25 in the present form of switch is flat at the bottom and carries projecting metallic pieces 51 51, which pass under the contact-terminals 52 52, the latter being secured to the base 23 at one end and being raised therefrom at the opposite end and free to be moved still farther away from the base by means of the arm 51. The parts 52 52 are made of spring metal, and when not acted upon by the arms 51 51 they fall down out of the path of the ends of the arm 9. When, however, the movement of the shaft 3 toward the left takes place, the free ends of the contact-pieces 52 52 are lifted into contact with the ends of the arm 9, which ends on the release of said arm pass off the contacts 52 52 by a wiping movement.

The structure shown in Fig. 9 appears in both forms of switch herein described, being located below the base 23. The part 53 serves as a nut on a sleeve 60, within which the lower end of the shaft may turn, while the part 54 is a collar secured by a set-screw to the lower end of the shaft and provided with an upwardly-projecting pin 55, adapted to travel from one end to the other of a slot 56, formed in the nut 53. By these means the rotary movement of the shaft 3 is limited.

The details of my switch may be varied in many ways without altering the principle of my invention.

A switch of either of the illustrated forms can easily be adapted to act as an automatic switch operated, say, by a solenoid or an electromagnet outside the receptacle, in which case the normal position of the parts would be that in which the switch-circuit is closed, the action of the magnet when it is energized being calculated to break the circuit, while the spring 8 would be arranged to restore the parts to closed position when the magnet or solenoid should be deenergized.

I claim as my invention—

In an electric switch, an operating handle and shaft and a pair of contact-terminals, means connected with the shaft for removing one member of the pair from the path of the other during the rotation of the shaft in one direction, means for releasing the aforesaid member into contact with the other when a certain limit of motion has been reached, and means for suddenly breaking contact between the members at a certain point in the return movement of the shaft.

Signed at New York, in the county of New York and State of New York, this 18th day of April, A. D. 1902.

MAX VON RECKLINGHAUSEN.

Witnesses:

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