

No. 759,915.

PATENTED MAY 17, 1904.

M. VON RECKLINGHAUSEN.

ELECTRIC SWITCH.

APPLICATION FILED APR. 22, 1902.

NO MODEL.

Fig. 1

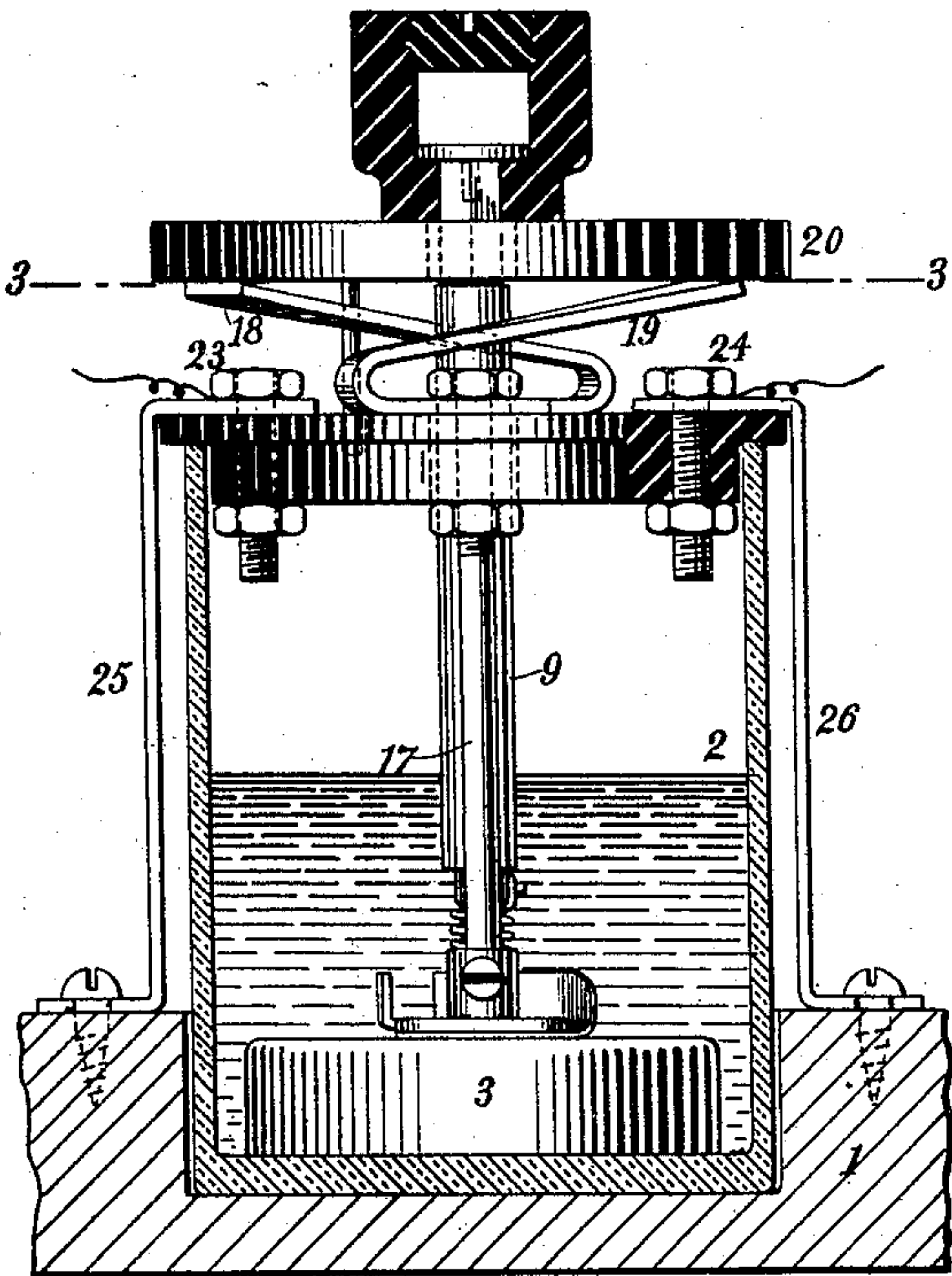


Fig. 2

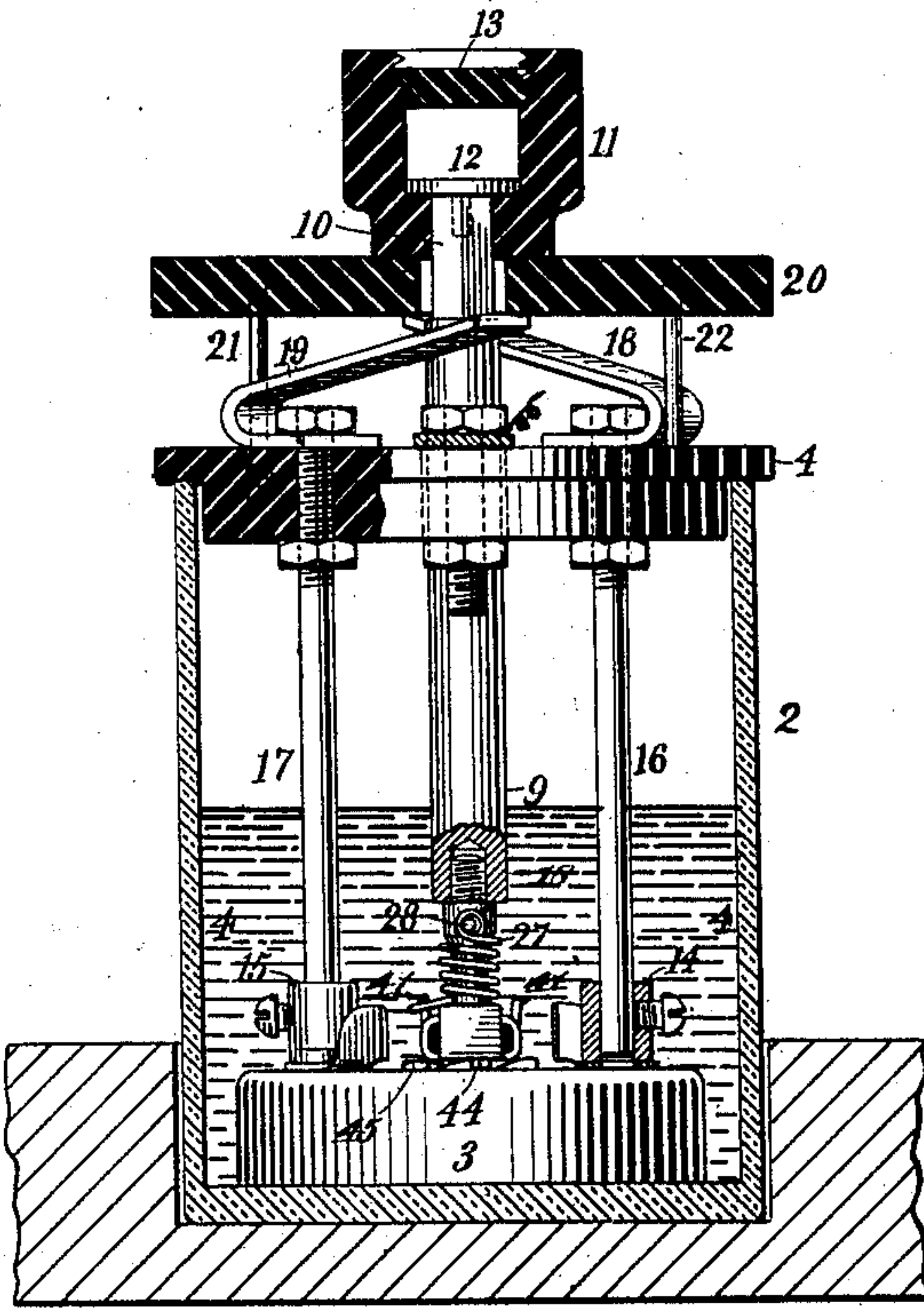


Fig. 3

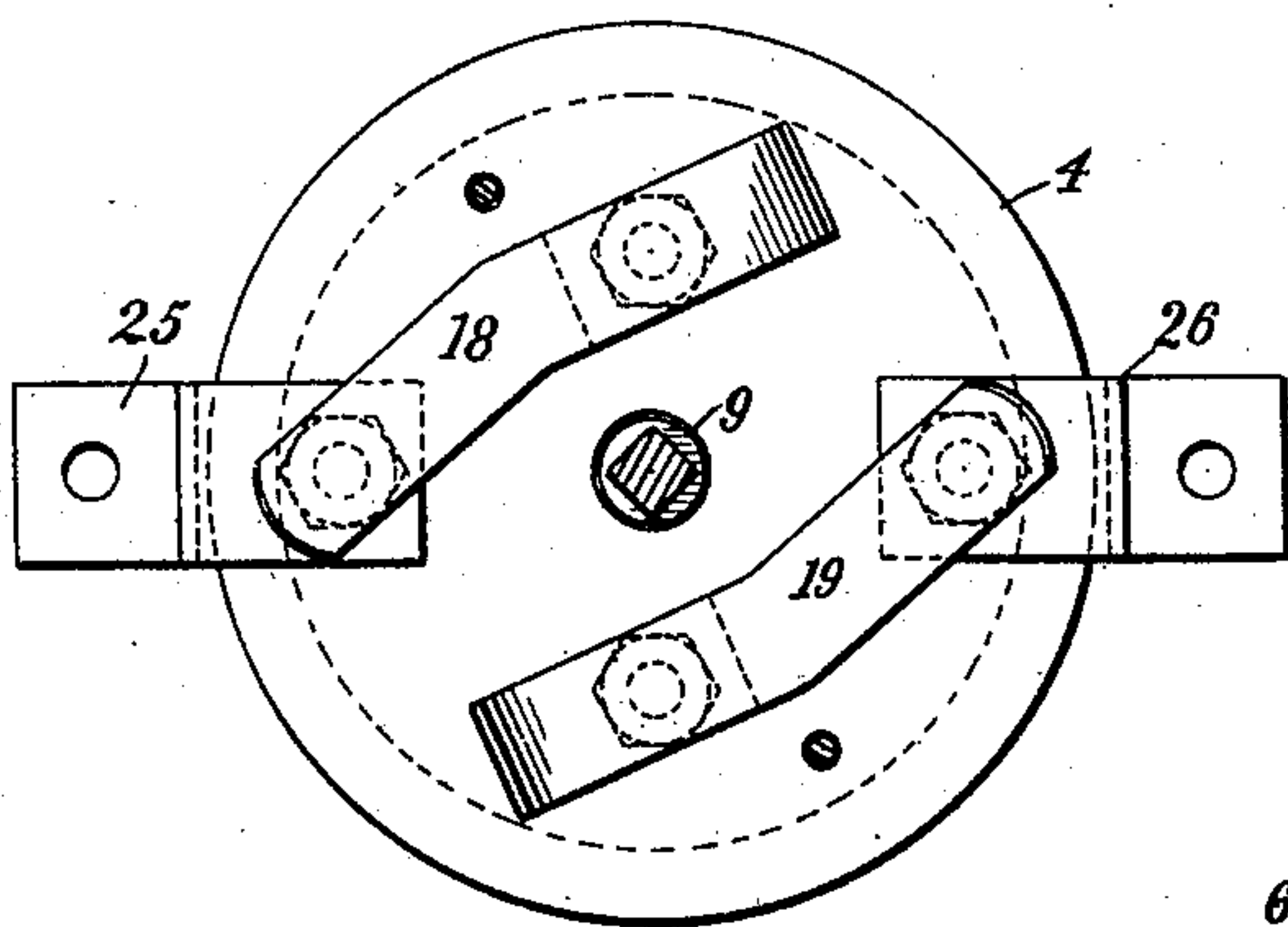


Fig. 4

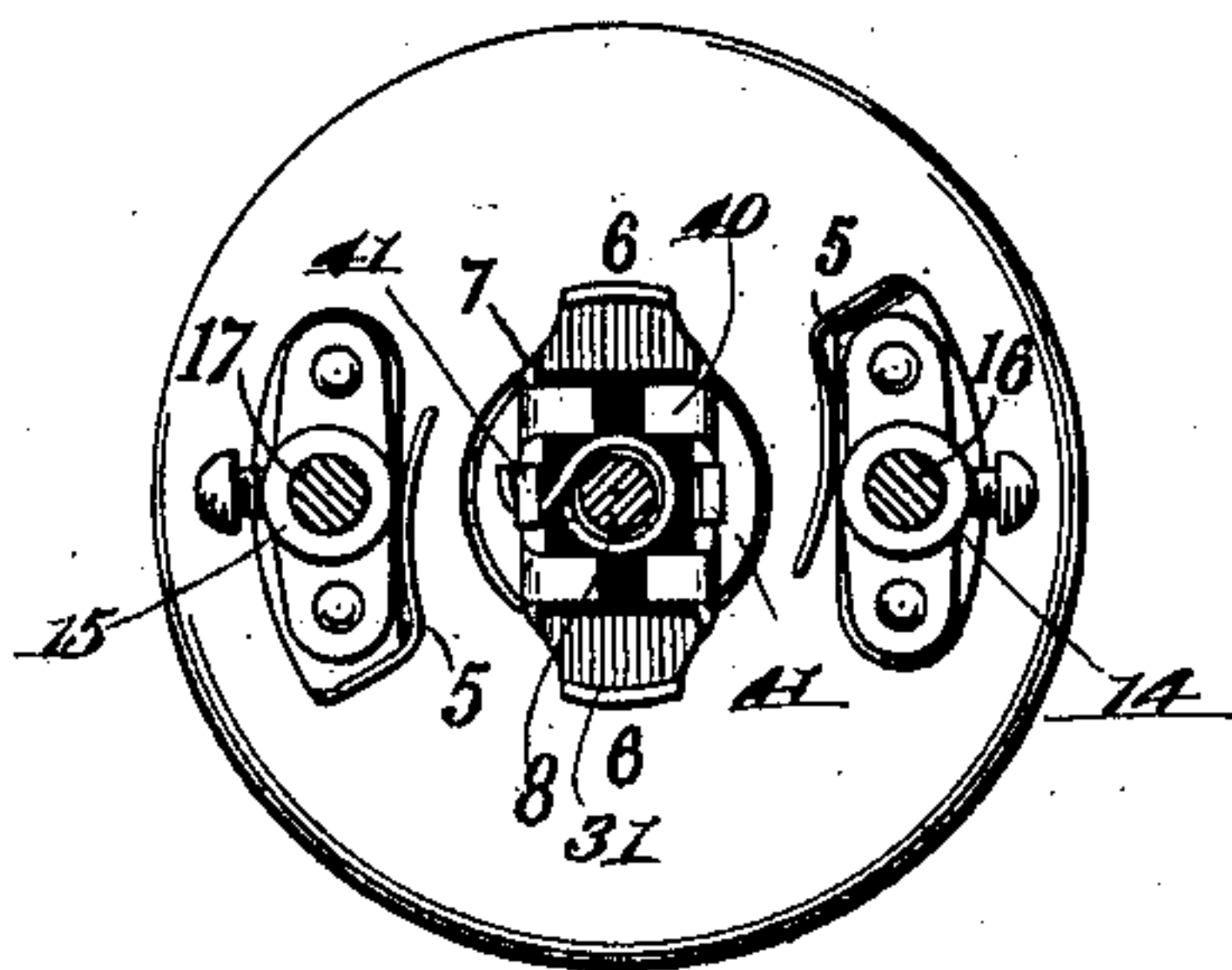
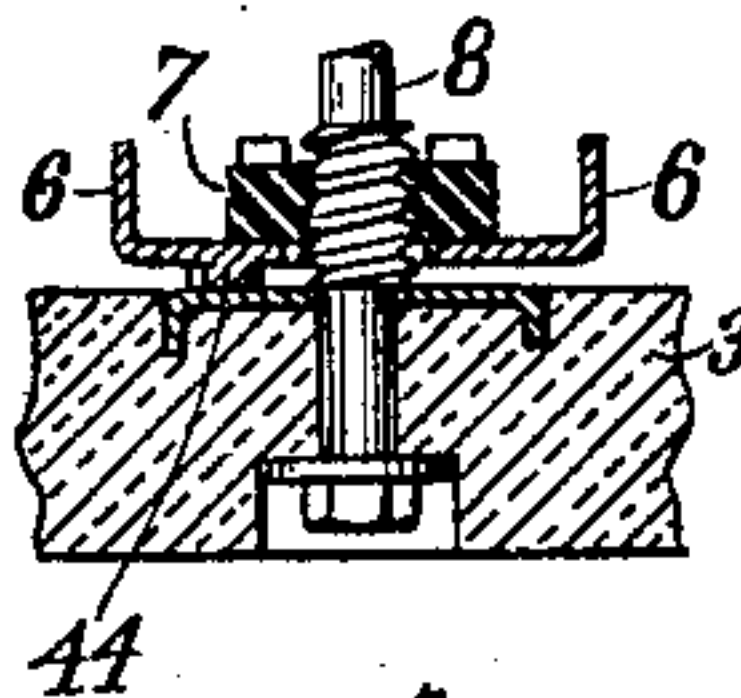


Fig. 5



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.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 759,915, dated May 17, 1904.

Application filed April 22, 1902. Serial No. 104,210. (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 Electric Switches, of which the following is a specification.

My invention relates to improvements in that class of electric switches wherein it is desired to break an electric circuit by a sudden movement while the contacts are immersed in a liquid, such as oil.

The invention was originally designed to be applied to switches for making a quick rupture of the starting-circuit for gas or vapor electric lamps of the Cooper Hewitt type; but it is applicable to a great variety of uses, and I do not wish to limit myself to the single application mentioned.

The special feature of the present invention is that of providing means whereby it is impossible to leave the switch-circuit closed after it has done its work.

My invention will be clearly understood by reference to the accompanying drawings, in which—

Figure 1 is a vertical section of my switch, some of the parts being shown in elevation. Fig. 2 is a similar view of my switch looked at from a position at right angles to the view shown in Fig. 1. Fig. 3 is a section along the line 3 3 looking downward, and Fig. 4 is a horizontal section along the line 4 4 in Fig. 2, and Fig. 5 is a detail view.

The switch forming the subject of my invention may conveniently be mounted upon a suitable base 1, provided with a socket, in which the main body 2 of the switch rests. This main portion of the switch may be made of metal, glass, or porcelain or any suitable rigid material. In the present instance I have shown the body 2 as being made of glass or porcelain.

The body 2 is a liquid-tight cylindrical holder, on the bottom of which rests the por-

celain base 3 of an ordinary snap-switch. The mouth of the vessel 2 is tightly closed by a cap 4 of insulating material, and the vessel will generally be wholly or partly filled with a liquid, such as oil. The switch contact-plates are mounted in the usual way upon the base 3, the stationary spring-contact pieces being shown at 5 5 and the movable contact-pieces at 6 6. The contact-pieces 6 6 are formed at the opposite ends of the plate 31, surrounding the central operating-shaft 8 of the switch. This plate has arms or extensions 40 at its sides, which arms are bent up and over, so as to hold a block 7 of insulating material, also surrounding the shaft. Other lugs 41 are bent up from the plate 31, and within a notch in one or the other of these lugs a spring 27 is adapted to rest, the other end of the spring being secured to the shaft 8 by means of a pin 28. Below the plate 31 is a ratchet 45, having teeth ninety degrees apart. A pin 44, projecting downward from the plate 31, engages with one of the teeth except when released, as will be described farther on. The central operating-shaft is connected by its screw-threaded upper end with an enlarged continuation 9 of the shaft, the latter being extended upward through the cap 4 and being provided near its upper end with a squared portion 10, over which a button 11 of insulating material fits.

At the top of the squared portion 10 is a cap-piece 12, which sets into an opening in the button 11 and prevents the withdrawal of the latter from the top of the shaft. I may set into the opening in the button 11 a central piece 13 of insulating material, the same being supplied with a slot, by means of which it may be screwed into place within the button, so as to make a generally smooth upper surface to the button. The cap 12 may be secured to the top of the shaft 9 by any suitable means.

The insulating-piece 7 and the plate 31, one or both, are internally screw-threaded, as shown in Fig. 5, to engage with a corresponding screw-thread on the shaft 8. The reason for this will appear hereinafter.

When the parts are in the positions illustrated in Figs. 2 and 4, the switch-circuit is broken between the contact-pieces 5 5 and 6 6, while in a position at ninety degrees there-
 5 from the contacts 6 6 will engage with the contacts 5 5 and close the switch-circuit at those points.

The stationary switch-contacts 5 5 are suitably secured to binding posts or hubs 14 15, and the latter are respectively connected, by means of conducting-posts 16 17, with conducting-springs 18 19, secured to the top of the cap 4. The upper ends of the springs 18 and 19 extend beneath an insulating-plate 20,
 15 loosely surrounding the shaft 9, and resist any downward movement of the said plate. The plate 20 is perforated at two or more points to receive vertical posts 21 22, which serve to guide the plate when it is pushed down-
 20 ward against the force of the spring.

Underneath the free ends of the springs 18 19 are placed binding-posts 23 24, constituting the main switch-terminals. To the same binding posts or screws straps 25 26, run-
 25 ning to the base 1 and suitably secured thereto, may conveniently be attached for holding the switch as a whole firmly in place on the base.

The action of the switch will now be described. By turning the button 11 to the right the shaft 9 and its continuation 8 will be correspondingly rotated; but such rotation will not at first cause an angular movement of the contacts 6 6. It will simply cause a lifting
 30 of the plate 31 and its connected parts by the action of the screw-threads. (Shown in Fig. 5.) A continued rotation of the shaft, however, will cause the end of the pin 44 to slip past the tooth with which it was engaging, where-
 40 upon the force stored in the spring 27 will suddenly turn the switch into a position of contact between the parts 5 5 and 6 6, while a still further continuation of the rotation will break contact again also by a sudden move-
 45 ment. During these forward movements under the influence of the spring the plate 31 and the parts connected therewith wind down upon the screw-threaded shaft and bring the pin 44 successively into engagement with other
 50 teeth on the ratchet 45. So long, however, as the upper part of the switch is in the position illustrated in Figs. 1 and 2 the described action will have no effect upon the circuit. In order to really operate the switch
 55 effectively, it is necessary to press down upon the button 11 until the springs 18 and 19 are brought into contact with the binding screws or posts 23 24. Then if the button be rotated to the right the switch will act as a controller
 60 of the circuit, the entire circuit through the switch when the lower contacts are together being as follows: by way of the binding-screw

23, spring 18, conducting-post 16, hub 14, spring-contact 5, contacts 6 6, spring-contact 5; hub 15, conducting-post 17, spring 19, and
 65 binding-screw 24.

When the vessel is supplied with oil, the described switch constitutes a means for rupturing the circuit under oil by a quick move-
 ment. At the same time the vessel is well
 70 protected against leakage, and the moment the hand of the operator releases the switch the springs 18 19 act to break the circuit.

It is easily possible to arrange the switch in such a way that the springs 18 and 19 and
 75 their corresponding or coöperating contacts shall also be within the oil-receptacle, so that the break which takes place when the hand releases the switch-handle may also prevent the formation of any injurious arcing between
 80 the contact-pieces.

Some of the features of the present switch are applicable to any class of electric switches, whether the contacts are to be submerged in
 85 a liquid or not.

The details of the quick-break portion of the switch are merely illustrative, as any preferred type of snap-switch can be substituted
 90 for the type shown.

I claim as my invention—

1. In an electric circuit, a plurality of sets of electric terminals, the members of each set being relatively movable, means for operating all the sets to close the circuit, means for operating one or more of the sets to break the
 95 circuit by a quick movement, and positive means for separating the terminals of one of the sets on the release of the described operating means for all the sets.

2. In an electric circuit, a plurality of sets of electric terminals, the members of each set being relatively movable, means for operating all the sets to close the circuit, means for operating one or more of the sets to break the
 100 circuit by a quick movement, the set or sets adapted for quick operation being immersed in a suitable liquid, and positive means for separating the terminals of one of the sets on the release of the described operating means
 105 for all the sets.

3. In an electric circuit, an electric switch of the snap or quick-break type comprising a quick-break set or sets of terminals, and one or more additional sets of terminals, a suitable liquid surrounding the quick-break set or
 110 sets of terminals, a switch-handle controlling the various sets of terminals, and positive means for restoring the switch-handle on its being released.

4. In an electric switch of the snap or quick-break type, a set of terminals adapted to be
 115 operated by a sudden movement, a second set of terminals adapted to be held apart when the switch is not in operation and adapted to

be brought together at will when the switch is in operation.

5 5. In an electric switch of the snap or quick-break type, a set of terminals adapted to be operated by a quick movement under a suitable liquid, a second set of terminals for the said switch, positive means for holding the circuit open at the second set of terminals when the switch is not in operation, and means

for closing the circuit at such terminals when it is desired to operate the switch.

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:

WM. H. CAPEL,

GEORGE H. STOCKBRIDGE.