(No Model.) 2 Sheets—Sheet 1.

J. E. MEEK & F. L. POWERS.

SWITCH FOR ELECTRIC HEATING DEVICES.

No. 568,783. Patented Oct. 6, 1896.

Fig. 1.

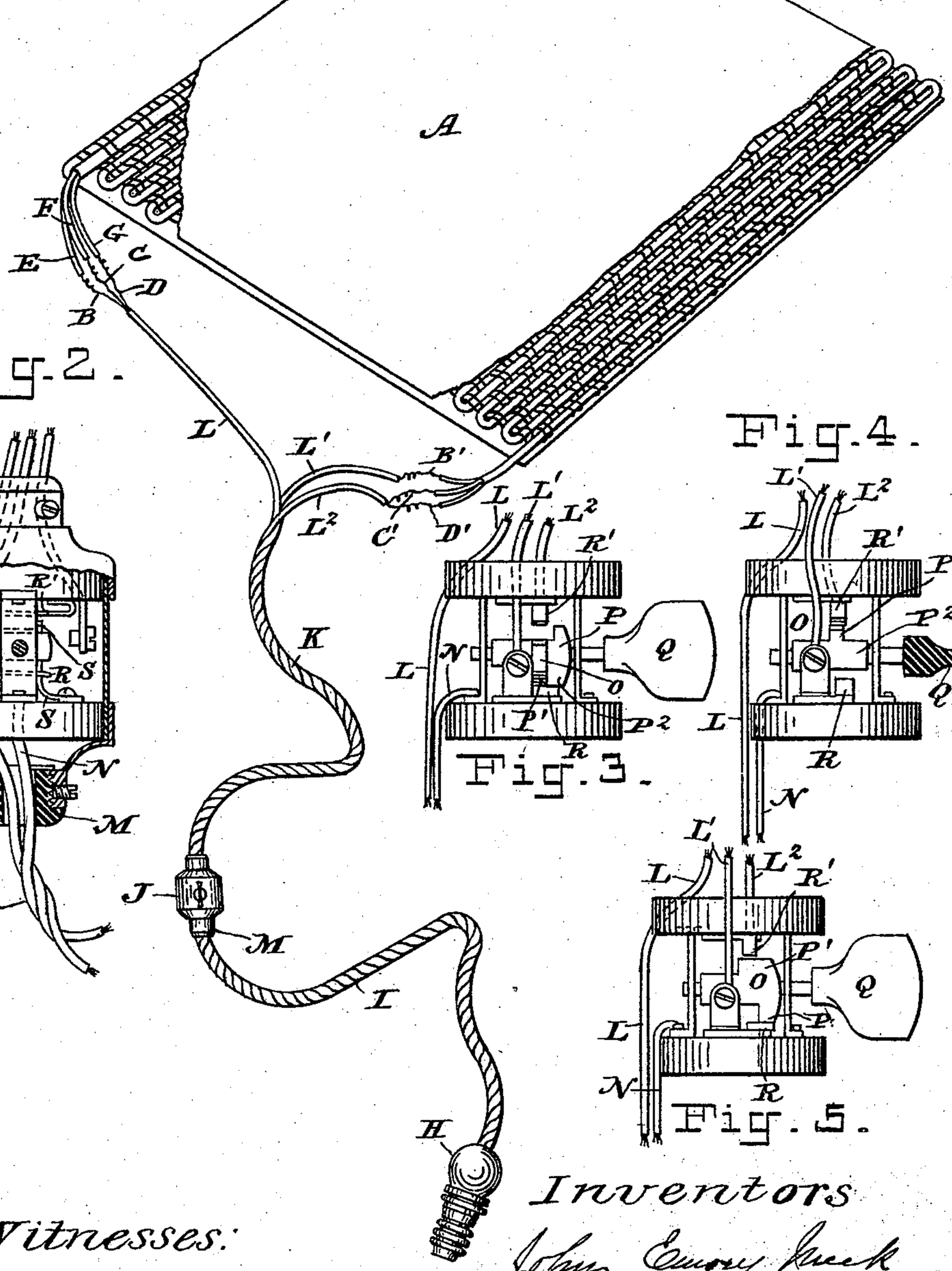

Fig. 2.

Fig. 4.

Fig. 3.

Fig. 5.

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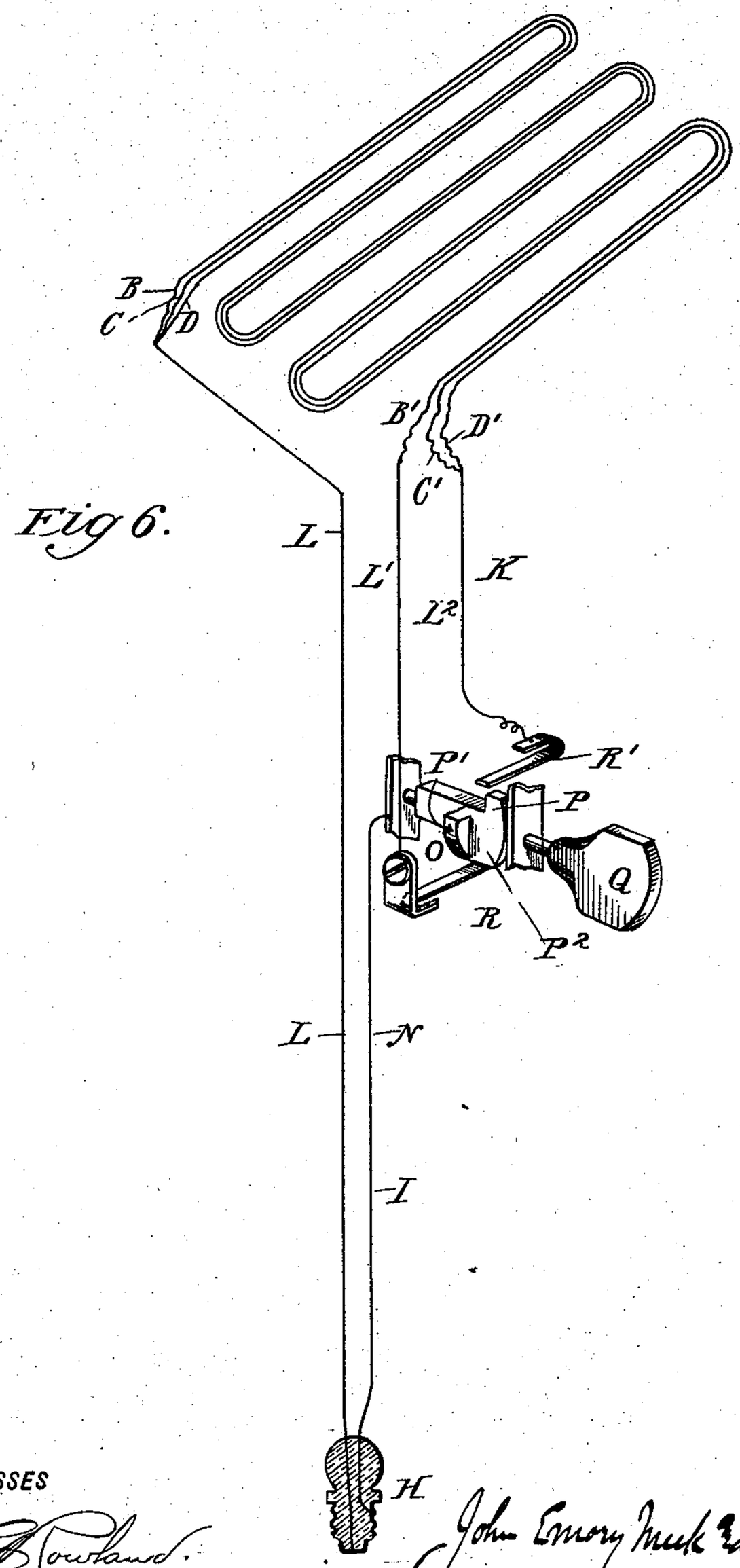

Fig 6.

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UNITED STATES PATENT OFFICE.

JOHN EMORY MEEK, OF NEW YORK, AND FREDERICK L. POWERS, OF BROOKLYN, NEW YORK, ASSIGNORS TO THE H. W. JOHNS MANUFACTURING COMPANY, OF NEW YORK, N. Y.

SWITCH FOR ELECTRIC HEATING DEVICES.

SPECIFICATION forming part of Letters Patent No. 568,783, dated October 6, 1896.

Application filed May 13, 1895. Serial No. 549,055. (No model.)

To all whom it may concern:

Be it known that we, JOHN EMORY MEEK, of New York, and FREDERICK L. POWERS, of Brooklyn, New York, citizens of the United States, have invented certain new and useful Improvements in Electric Heating Devices, of which the following is a specification.

The invention relates to an electric switch particularly intended to be used under circumstances where rheostats have heretofore been employed, although the invention is not limited to that use. On the contrary it is adapted to a variety of electrical apparatus.

The use of rheostats is objectionable in many instances for the reason that they are, in effect, mere resistances to the passage of the current, and consequently they frequently become heated to such a degree that manual manipulation of them is impossible, and they frequently become a source of danger. The function of the rheostat being to act as an obstruction to the passage of the current, the energy barred or dammed against passage through the circuit of which the rheostat is a part is dissipated in heat. Consequently, from an economical standpoint, it is obviously injudicious to generate energy which accomplishes no useful purpose and which can only be disposed of by a transformation into waste heat.

To overcome the difficulties and dangers attending the use of a rheostat, we have invented the improved switch below, by the use of which the current may be directed and controlled as desired, provided the plurality of conductors, substantially as hereinafter explained, be present. The improved switch is shown in connection with an electrical heating device for which an application for Letters Patent is now pending and in which the necessary conductors are employed whereby the improved switch can carry out its purposes. It should be understood, however, that this invention is not limited to use in conjunction with an electrical heater. It is so illustrated because that is a good example of a "multiconductor" device, with which the invention is adapted to be used. Any electrical apparatus, structure, or mechanism in which the conductors are present may be employed.

In the drawings hereof, Figure 1 illustrates a perspective of a heater, showing one arrangement of the parts taken conjointly. Fig. 2 illustrates a partially sectional view of the switch. Fig. 3 illustrates an elevation of the operative interior parts of the switch, showing the several devices in one of their positions. Fig. 4 illustrates a view the same as Fig. 3, excepting that the position of the switch is changed. Fig. 5 illustrates a view the same as Figs. 3 and 4, excepting that the switch is in still a different position. Fig. 6 illustrates a diagrammatical and perspective view of the switch and portion of a heater, showing the different circuit-wires and the connections at the heater.

A illustrates the body of the flexible heater, which need not here be described, because such devices generally are now well known, and the details of the one shown are, as stated, the subject of a pending application for Letters Patent. It comprises, generally speaking, a woven fabric the warp-threads whereof are composed of asbestos or other suitable insulating and non-conducting material, and the filling-threads are composed of asbestos or other like material having continuous wires or conductors forming part of and woven with them. In the instance illustrated three separate wires are shown, B, C, and D, each of them inclosed in a suitable insulating-wrapper E, F, and G, whereby they are insulated from each other.

H illustrates a suitable contact-plug or other means for securing the current.

I may be an ordinary two-strand cable, which connects the plug or source of supply with the switch J.

K is a three-strand cable composed of the strands L, L′, and L^2. The strand L is connected with the induction end of the apparatus, whatever it may be, (shown in this instance as the heater A,) and all three of the conductors B, C, and D are connected with the conductor of the strand L or may themselves constitute that conductor. The strands L′ and L^2, however, connect with the educ-

tion end of the apparatus, and one of them, L′, connects with a single conductor B′, which may be considered as a continuation of the induction-conductor B, and the other, L^2, connects with two of the conductors C′ and D′, which may be considered as continuations of the two induction-conductors C and D.

At the switch J the cable I, as shown in Fig. 2, enters through an insulating-plug M, and inside of the switch one of the strands, L, passes straight through and proceeds to the induction end of the heater. The other strand, N, connects with the return-contacts within the switch and completes the circuit.

O is a rotary metallic circuit-closing device which is provided with three contact-points. (Best seen in Fig. 3.) They are P P′ P^2.

Q is the ordinary insulated thumb-nut for turning the device O.

The parts P P′ P^2 during the rotation of the circuit-closer connect, respectively, with the spring-contacts R R′, and the strand L′ of the cable K, which carries the return-wire B′, connects with the contact R, and the strand L^2 of the cable K, which carries the return-wires C′ and D′, connects with the spring-contact R′.

S (see Fig. 2) is a spring, which confines the circuit-closer O in its several positions by engagement with squared surfaces on it.

The operation of the device is as follows: The current passes from the source of supply, through the plug H and strand L of the cable I, past the switch to the induction end of the heater or other electrical apparatus, where it connects with all of the three wires B, C, and D. When the circuit-closer O is in the position shown in Fig. 2, the circuit is broken because it does not engage with either of the spring-contacts R or R′. When, however, the circuit-breaker is turned a quarter-turn into the position shown in Fig. 3, then the contact-surface P^2 engages with the spring-contact R, and the single wire B′ is put into circuit. Consequently one of the three continuous conductors in the apparatus is heated by the passage of the current through it, and a moderate or mild heat is generated in the apparatus. Upon turning the circuit-breaker another quarter-turn, in other words, completing a half-revolution, as shown in Fig. 4, then the contact-surface P^2 is moved away from the spring-contact R, and the contact-surface P′ is brought into contact with the spring-contact R′, and this contact connects with the strand L^2 of the cable K, which carries the two wires C′ and D′. Consequently these two are now thrown into circuit, and a greater heat is generated in the device. Upon turning the device another quarter-turn, in other words, three-fourths of a complete revolution, then the surface P of the circuit-closer makes contact with the spring contact-finger R, and the contact-surface P′ still retains its connection with the spring-finger R′, because the surface P′ is somewhat in the form of a cam; that is to say, it is partially continuous and concentric with the shaft of the circuit-breaker. Consequently both of the strands L′ and L^2 are thrown into circuit, and all three wires B′, C′, and D′ then carry the current, and the device is heated to its maximum degree. Now, upon turning the circuit-breaker another quarter-turn, in other words, completing its revolution, it is returned to its position, as shown in Fig. 2, in which no part of it engages with either the spring-contacts R and R′, and the circuit is broken.

In Fig. 6 a diagrammatical representation in perspective of the circuits is shown, and the connections at the switch will be easily understood. The switch is shown in the position which the parts occupy in Fig. 3, above referred to.

It will be observed that the above-described switch is inclosed within an exterior casing the body part whereof is cylindrical, and the two ends are composed of substantially conical insulating-plugs, which may be of porcelain or other suitable material, and that the axis of the make-and-break-circuit device is transverse to the axis of the casing. This construction renders the switch, as a whole, peculiarly adapted to use in connection with certain forms of electrical apparatus, and it forms a part of the invention.

It will readily be understood by those who are familiar with this art that the features embodied in this switch may be constructed in different forms.

Having described the invention, we claim—

1. A switch for electrical apparatus, comprising a rotatable make-and-break-circuit device, inclosed within an exterior casing, the axis whereof is transverse to the axis of the make-and-break-circuit device, for the purposes set forth.

2. A switch for electrical apparatus, comprising a rotatable make-and-break-circuit device, inclosed within an exterior casing, the axis whereof is transverse to the axis of the make-and-break-circuit device, and insulating-plugs which close the ends of the exterior casing, for the purposes set forth.

3. A switch for electrical apparatus, comprising a rotatable make-and-break-circuit device, inclosed within an exterior casing, the axis whereof is transverse to the axis of the make-and-break-circuit device, and insulating-plugs which close the ends thereof, having rounded exterior surfaces, for the purposes set forth.

Signed at the city of New York, in the county and State of New York, this 30th day of April, A. D. 1895.

JOHN EMORY MEEK.
FRED. L. POWERS.

Witnesses:
F. J. JEWETT,
FRED. W. SHEPHEARD.