

E. O. SCHWEITZER & N. J. CONRAD.
 AUTOMATIC HIGH VOLTAGE CIRCUIT BREAKER.
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1,050,493.

Patented Jan. 14, 1913.

Fig. 1.

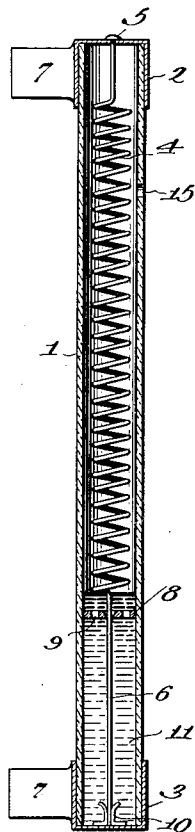
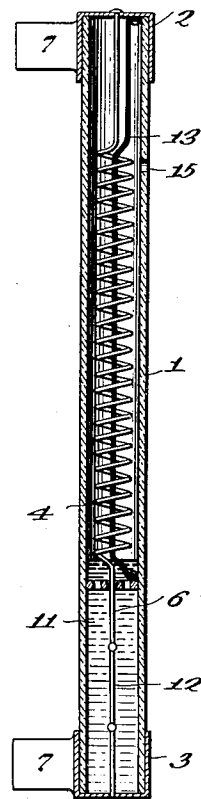


Fig. 2.



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UNITED STATES PATENT OFFICE.

EDMUND O. SCHWEITZER AND NICHOLAS J. CONRAD, OF CHICAGO, ILLINOIS.

AUTOMATIC HIGH-VOLTAGE CIRCUIT-BREAKER.

1,050,493.

Specification of Letters Patent.

Patented Jan. 14, 1913.

Application filed March 18, 1910. Serial No. 550,219.

To all whom it may concern:

Be it known that we, EDMUND O. SCHWEITZER and NICHOLAS J. CONRAD, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Automatic High-Voltage Circuit-Breakers, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates to automatic high voltage circuit breakers and has for its object the provision of an improved circuit breaker which shall, when it is desired to rupture the circuit, actually open it without causing or allowing to flow a large amount of current at the same time of said rupture.

In high voltage circuit breaking, the difficulty has frequently been presented in that, when the fusible element opens, a gas is formed which permits a large flow of current provided, of course, the system has a considerable generating capacity.

In the preferred form of our invention we actually open the circuit and at the same time under certain conditions, open this circuit in an oil bath, although our invention is not limited absolutely to such opening. In the preferred form of the invention, furthermore, we use a spiral coil of wire whose convolutions do not touch, but which is so arranged that when a large amount of current flows through said convolutions that the magnetic pull between said convolutions tends to contract the said spiral element, thereby to open the circuit in any of a plurality of suitable ways.

We will describe our invention more in detail by reference to the accompanying drawing illustrating several embodiments thereof, in which;

Figure 1 is a sectional view of our improved circuit controlling device; and Fig. 2 is a modification thereof.

Referring more particularly to Fig. 1, we show a cylinder of glass or other suitable insulating material 1, which has two end caps 2 and 3. The end cap 2 has a spiral spring 4 soldered to it or otherwise secured thereto at 5, and this spiral spring has a

straight vertical extension 6. The cup shaped heads 2 and 3 may be provided with wings 7—7 for ready attachment to mounting devices. The portion 6 extends through the diaphragm 8, which is provided with openings 9. Said member 6 is designed to project into a spring clip 10 attached to the lower cup 3. A suitable bath of oil 11 may be provided. The partition 8 allows the oil to escape slowly from the fuse chamber upon rupture of the fuse, rapidly enough to prevent breakage of the tube, but slowly enough to retain enough oil to extinguish the arc. When the current passing through the device unduly increases in volume the pull exerted by the coiled member 4 is increased on account of the magnetic pull between its convolutions and serves to exert a pull upon the member 6, withdrawing it from the spring clip 10 and breaking the circuit, in this instance under oil as shown. The high voltage of the circuit thus will have no injurious effect when the circuit is broken.

In the modification shown in Fig. 2, the fusible element 12 is provided in a lower chamber of the tube 1 and only one spiral element is used. We provide, however, a guide 13, which may hold the convolutions in their proper positions, which guide, of course, should be of insulating material. Again the rupture may take place under oil as shown at 11. We thus make use of the principle that convolutions of a coil carrying a current tend to attract each other. The partition 8 is preferably so made that the element 6, when once drawn upward, will not fall down to its original place.

We have herein shown and particularly described various forms of our novel circuit controlling device, but of course, do not mean to say that the embodiments herein shown are the only ones in which our invention may take practical form as many modifications thereof may be easily made and yet be within the scope of our invention and—

What we therefore claim as new and desire to secure by Letters Patent is:

A device of the class specified, comprising a tubular casing made of insulating material, terminals at the ends of said tubular casing, a fuse and a cooperating spiral

spring in said tubular casing and connected to the terminals at the ends thereof, and a bath of arc extinguishing liquid in said casing normally immersing said fuse, the casing
5 being provided with a partition, for retarding the flow of liquid from the space occupied by the fuse.

In witness whereof, we hereunto subscribe

our names this 15th day of March A. D., 1910.

EDMUND O. SCHWEITZER.
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Witnesses:

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