

(No Model.)

W. B. POTTER.
EXTINGUISHING ELECTRIC ARCS.

No. 568,459.

Patented Sept. 29, 1896.

FIG. 1.

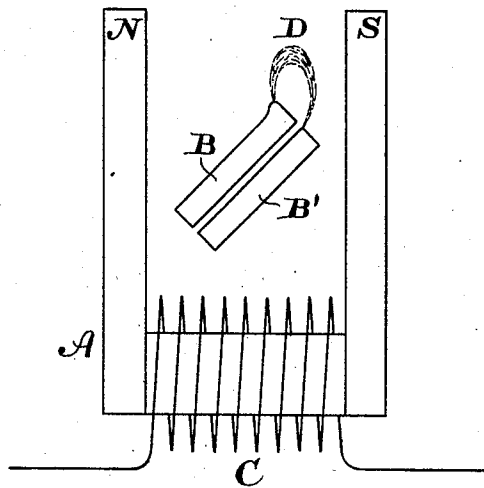


FIG. 2.

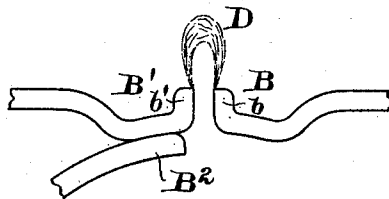
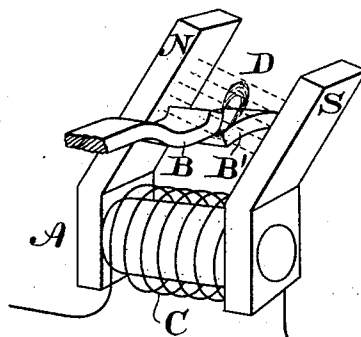


FIG. 3.



WITNESSES.

A. H. Bell.

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UNITED STATES PATENT OFFICE.

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EXTINGUISHING ELECTRIC ARCS.

SPECIFICATION forming part of Letters Patent No. 568,459, dated September 29, 1896.

Application filed June 20, 1896. Serial No. 596,245. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. POTTER, a citizen of the United States, residing at Schenectady, in the county of Schenectady, State of New York, have invented certain new and useful Improvements in Extinguishing Electric Arcs, (Case No. 385,) of which the following is a specification.

My invention relates to improvements in the art of rupturing arcs formed by separating contacts carrying an electric current, and has for its object to localize the arc in such a way that its destructive effect may be confined to a particular part of the apparatus where it will be least damaging and where, if it be otherwise desirable, renewable portions may be located.

My invention therefore consists not so much in a particular type of apparatus as in the utilization of the arc-rupturing agencies in a peculiar way; and while I have illustrated contacts of ordinary kinds my invention is generally applicable to any form of contact in which it may be found useful.

To accomplish the purposes pointed out, I locate the contacts between which the arc may be formed, preferably, in a field of force generated by a magnet or electromagnet, although other arc-rupturing devices, such as a stream of insulating liquid or a blast of air, may be utilized to a greater or less extent in the same way; and I so arrange the direction of the lines of force that they will act first to propel the arc along the contact to a particular point and will there rupture it. I prefer for the purposes of my invention an electromagnetic arc-rupturing device, inasmuch as its energy is proportioned to the volume of current in the arc, and also because the lines of force may be readily controlled and directed. I have therefore illustrated my invention as utilized in that way in the accompanying drawings, in which—

Figure 1 is a diagram showing an electromagnet and a pair of contacts. Fig. 2 shows a different form of contact, and Fig. 3 is a perspective diagram illustrating the principles of the invention.

A is the electromagnet; B B', contacts between which the arc D is produced. C is the coil energizing the electromagnet, the poles of which are marked, respectively, N S. The

lines of force proceed directly across from one pole to the other; but the line upon which the arc will be formed between the contacts B B' is inclined to the lines of force of the field. I have shown this inclination as approximately forty-five degrees; but it may be more or less than this and still fulfil the object of the invention, which is to blow the arc to the side of the contacts, so that only a single point upon each one will be exposed to its destructive effect.

In Fig. 2 I have not shown an arc-rupturing means, but have shown a different form of contact. B B' are, as before, sliding contacts, B² being a bridging-piece. In this case the contacts are formed with upturned ends b b', and upon the ends of these lugs or upturned portions the arc is formed and ruptured.

In Fig. 3 I have shown in perspective, for more clear apprehension, an arrangement substantially like that in Fig. 1. In this case the pole-pieces N S of the magnet A are inclined to the base or yoke around which the coil C is wound. The lines of force proceed in the shortest line from one of the pole-pieces to the other, and the contacts B B' are so located that the arc moves along toward the right corner and is there localized and blown out.

Many useful applications of the invention will readily occur to those skilled in the art. It is particularly useful in the cylindrical switches commonly used for controlling motors in street-car work and in some other forms of switching mechanism. I do not, however, mean to limit its application to any particular position or class of contact to be protected. It will be seen that by thus localizing the destructive effect of the arc I preserve the greater part of the contact area unimpaired for transmitting current. Heretofore, when the arc is broken first at one point and then at another upon the contacts, these become roughened, so that after some manipulation of the switch one or more of the contacts cannot carry current without undue heating on account of its lessened area. It is the particular object of my invention to obviate this difficulty, and for that object I utilize that improvement in the art of extinguishing arcs which consists in causing the lines of force from the arc-rupturing means

of whatever type may be selected to localize the arc at a certain approximately definite point upon the contacts, and after it has been brought to that position to rupture it by the same lines of force.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The art of extinguishing electric arcs, which consists in causing the lines of force of an arc-rupturing means to localize the arc at approximately a given point of the contacts, and then to rupture it, as herein set out.

2. The art of extinguishing arcs, which consists in causing the lines of force from a magnet or electromagnet to force the arc to a certain approximate point upon the contacts and then to rupture it.

3. In combination, contacts or circuit-ter-

minals at which an arc may be formed, and an arc-rupturing means, the lines of force of which are so projected as to force the arc to a certain definite position upon the contacts or terminals, and there rupture it.

4. In combination, contacts or terminals at which an arc may be formed, and an electro-magnet the lines of force from which are so projected as to localize the arc at an approximately definite position upon the contacts or terminals, and there rupture it.

In witness whereof I have hereunto set my hand this 15th day of June, 1896.

WILLIAM B. POTTER.

Witnesses:

B. B. HULL,

E. W. CADY.