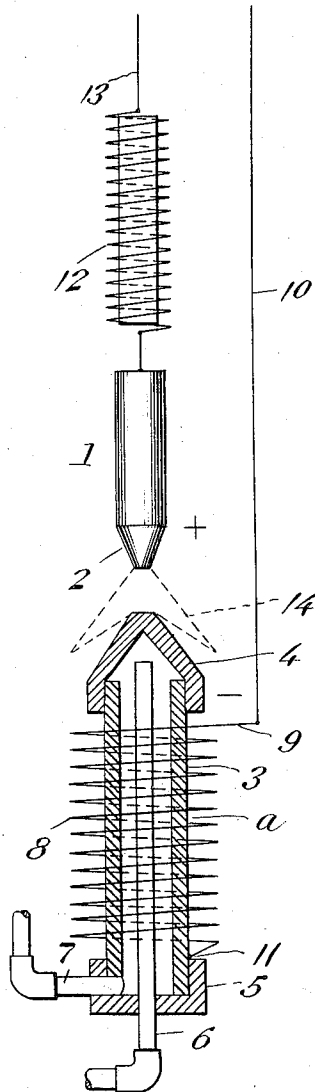


E. S. BECK.
CURRENT INTERRUPTER.
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1,039,011.

Patented Sept. 17, 1912.



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Witnesses

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EDGAR S. BECK, OF TREICHLERS, PENNSYLVANIA.

CURRENT-INTERRUPTER.

1,039,011.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDGAR S. BECK, a citizen of the United States, residing at Treichlers, in the county of Northampton and State of Pennsylvania, have invented new and useful Improvements in Current-Interrupters, of which the following is a specification.

This invention relates to a device for producing interruptions in an electric current which is derived from a suitable source that supplies direct current at an electromotive force of about five hundred volts, although, of course, different voltages may be used.

The invention has for one of its objects to provide an exceedingly simple, inexpensive and reliable interrupter of novel construction which is characterized by the use of a pair of electrodes of copper and iron, respectively, connected in circuit with inductance, the iron electrode being preferably magnetized and having its tip or point kept cool so as to insure the continuance of the arc interruptions at the gap between the electrodes.

With such and other objects in view, the invention comprises the various novel features which will be hereinafter more fully described and set forth with particularity in the claims appended hereto.

In the drawing, which illustrates one embodiment, is shown diagrammatically the current interrupter.

Referring to the drawing, 1 represents the positive electrode of the interrupter that is in the form of a pencil having a frusto-conical tip 2 that forms one element of the arc gap, said electrode being preferably made of copper. Disposed in line with the electrode 1 is the negative electrode 3 which is preferably of iron or equivalent magnetic material. The negative electrode has a frusto-conical tip 4 which forms the other element of the arc gap, and this tip is desirably kept at a suitably low temperature so that the continuity of the arc interruptions will not be broken, as would be the case if the temperature of the negative tip rises too high. To cool the negative electrode, the same is formed hollow and a circulation of water is maintained therein. Specifically the negative electrode consists of a tubular body *a* on which is fastened the tip 4 at one end and a cap or head 5 at the other end so that a

closed chamber will be obtained. Pipes 6 and 7 communicate with the chamber of the negative electrode, and one pipe is connected with a source of supply, while the other pipe forms an outlet. The pipe 6 terminates within the tip 4 so that the cool water or medium will come in contact with the tip 4 in circulating, thus insuring the effective cooling of the said tip. To further insure effective operation of the device, the negative electrode is preferably magnetized while the interrupter is in operation. For this purpose, the magnetizing coil 8 surrounds the negative electrode so as to produce a strong magnetic field at the tip. This coil has one terminal 9 connected with the lead 10 while the other terminal 11 is grounded on the negative electrode so that the current traverses the winding 8 which is in series with the electrodes of the interrupter. In series with the negative electrode is an inductive resistance 12 which is connected with the other lead 13 of the circuit, said leads 10 and 13 being connected with a suitable source of direct current at the required voltage.

In order to start the interrupter, the electrode 1, which, in practice may be moved in any suitable obvious manner, is brought into engagement with the negative electrode so that current will pass through the inductive winding 12, electrode 1, electrode 3, winding 4, and lead 10. The supply of water will, of course, be opened so as to circulate through the negative electrode. The movable electrode is now separated one-eighth of an inch more or less, and as the result interruptions of a high rate will be produced continuously as long as the required electro-motive force is impressed on the circuit, the arc produced between the electrodes having the shape indicated by the dotted lines 14.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative,

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and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention, what I claim is:—

5 1. In a current interrupter, the combination of a copper electrode, an iron electrode, means for magnetizing the iron electrode, a circuit including the electrodes, and an inductance in series with the electrodes.

10 2. In a current interrupter, the combination of a copper electrode, an iron electrode, means for magnetizing the iron electrode, a circuit including the electrodes, an inductance in series with the electrodes, and means for cooling the iron electrode.

15 3. In a current interrupter, the combination of positive and negative electrodes, means for producing a magnetic field at the

tip of the negative electrode, means for cooling the negative electrode, and a circuit for the electrodes including an inductance in series relation to the latter.

4. In a current interrupter, the combination of a positive copper electrode, an inductive resistance in series therewith, a magnetic negative electrode, a magnetizing winding in inductive relation to the negative electrode and having one terminal connected therewith, and circuit leads connected with the said resistance and magnetic winding.

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In testimony whereof I affix my signature in presence of two witnesses.

EDGAR S. BECK.

Witnesses:

J. O. BRADER,
WILLIAM QUEEN.