

No. 626,787.

Patented June 13, 1899.

W. E. IRISH.
ELECTRODE.

(Application filed Jan. 3, 1898.)

(No Model.)

Fig. 1

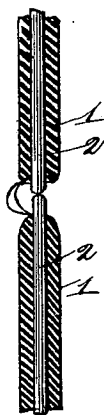


Fig. 2

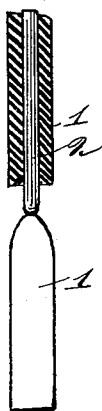


Fig. 3

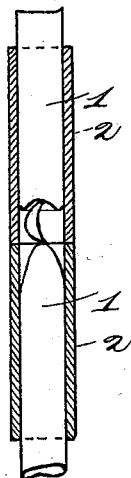
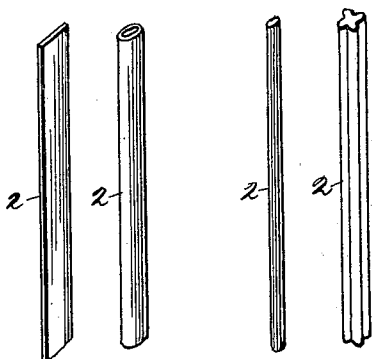


Fig. 4. Fig. 5. Fig. 6. Fig. 7.



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ELECTRODE.

SPECIFICATION forming part of Letters Patent No. 626,787, dated June 13, 1899.

Application filed January 3, 1898. Serial No. 665,327. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. IRISH, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Electrodes, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in electrodes for electric lighting and heating purposes; and the object of the invention is to obtain from the arc formed between electrodes of high conductivity the requisite heat to produce conductivity in a medium which offers a very high resistance when cold, but becomes a good conductor when heated to incandescence, this medium being introduced into the circuit and finally forming a part thereof.

I exemplify my invention in several ways, as hereinafter described, shown in the accompanying drawings, and pointed out in the claims.

In the accompanying drawings, Figure 1 shows a sectional view of two carbon electrodes, and the incandescing medium is shown as a core passing loosely through each carbon and meeting at the central point between them. Fig. 2 shows a similar view of electrodes with one strip of the incandescing medium placed as a core in one of them. Fig. 3 shows the medium sheathed over the carbons, and Figs. 4, 5, 6, and 7 show forms into which the incandescing medium can be molded.

In the drawings, 1 are the conducting electrodes.

2 is a medium of less conductivity than the carbons and refractory and incandescing under heat.

As shown in the drawings, the electrodes of carbon or other highly-conducting material are hollow and a core or filling of a material or composition of much less conductivity than the carbons, but becoming conductive when heated to incandescence is inserted therein, the cores touching one another at all times. These cores under the heating effects of the arc to which they are directly exposed will become incandescent without much loss of material from disintegration or

consumption. As soon as incandescent the cores will become conductive and the entire current will pass through them, thus immediately cutting out the arc, which will be extinguished. The current will flow through the core thereafter, maintaining its heat and conductivity meanwhile, until cut off from the lamp, since its resistance to the current will cause it to become incandescent.

I believe myself to be the first to substitute in a lamp an incandescing medium for the arc, the arc itself contributing to heat the medium to conductivity, and thereby extinguishing itself while the current flows through the medium.

It is well known that many of the oxids of rare metals—such as zirconium, thorium, magnesium, or calcium—are highly refractory under heat and when cold offer a high resistance to the electric current, but when heated become good conductors of electricity. I therefore employ highly-refractory oxids of these characteristics for my incandescing medium, which when cold offer resistance to the current, but when heated by the closely-adjacent arc become sufficiently conductive to maintain the circuit to the exclusion of the arc and are maintained by the current in a state of incandescence, the light obtained thereby being greater than that obtainable from the carbon on account of the greater heat possible without volatilizing the medium. I also produce in this manner an automatically-lighting lamp.

I claim—

1. In an arc-lamp, means for substituting an incandescent medium for the arc consisting of; the combination with the carbons; of a connecting-core between the carbons, the said core being composed of substances normally non-conductive of the electric current but adapted to become conductive under the influence of heat; substantially as and in the manner described.

2. In an arc-lamp; means for substituting an incandescent medium for the arc, consisting of the combination with the carbons; of a core of incandescing and refractory material connecting the carbons, the said core being composed of normally, partially non-conductive material, but which becomes conductive under the influence of the arc, and thereupon

conveys the current and maintains the lamp-circuit to the exclusion of the arc; substantially as and in the manner described.

3. The heretofore-described method of substituting an incandescent medium for an arc in an arc-lamp, consisting in; first turning the circuit through the arc; heating by means of the arc an incandescing medium connecting the carbons, and thus making the medium conductive, when previously partially

non-conductive; and finally maintaining the circuit through the medium to the exclusion of the arc, and maintaining the incandescence of the medium thereby; substantially as described.

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Witnesses:

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