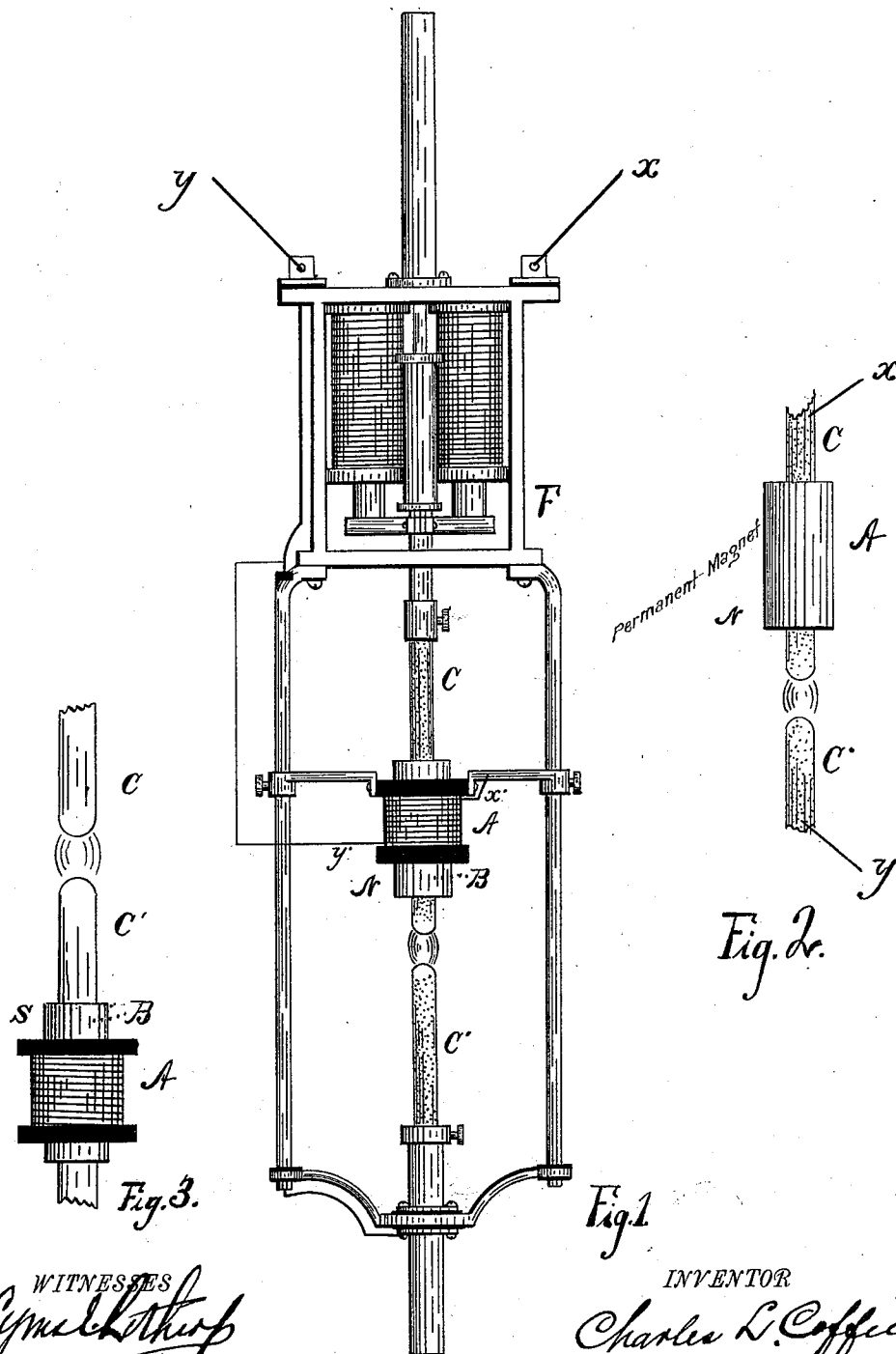


(No Model.)

C. L. COFFIN.
ELECTRIC ARC LAMP.

No. 560,476.

Patented May 19, 1896.



WITNESSES
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ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 560,476, dated May 19, 1896.

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To all whom it may concern:

Be it known that I, CHARLES L. COFFIN, of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Improvement in Apparatus for Magnetically Affecting the Counter Electromotive Force of the Voltaic Arc of an Electric-Arc Lamp, of which the following is a specification.

My invention consists in an apparatus for magnetically affecting the counter electromotive force of the voltaic arc of an electric-arc lamp, hereinafter fully described and claimed.

It is well known that when a current of electricity is caused to flow across a gap between two electrodes an effect of great heat and light is produced, which we will call a "voltaic arc," and that the production of this arc is attended with considerable resistance to the flow of said current. I believe that this resistance is not due solely to the imperfect conductivity of that part of the circuit in which the arc is formed, but that the voltaic arc itself exerts a distinct, positive, and powerful influence or counter electromotive force against the flow of the current which produces the arc, and that if means can be found for wholly or partially neutralizing this counter electromotive force the size of the voltaic arc produced by a given current can be considerably increased. I have discovered that if a magnet be placed in such relation to a voltaic arc that the lines of its field of force are parallel with and in the same direction as the current producing the arc—that is, if the positive carbon of an electric lamp be encircled by a magnet whose north pole is nearest the end of said carbon—the effect of said magnet will be to increase the size of the arc formed between said carbon and the negative carbon with a given current.

To illustrate my invention I have shown a single-carbon lamp, Figure 1 being an elevation of said lamp, and Figs. 2 and 3 being elevations of part of the two carbons.

F represents the frame of the lamp, C and C' the positive and negative carbons, respectively, and A an electromagnet having a core B, (shown in this case as a hollow core,) large enough to allow carbon C to pass through it and supported by a yoke on the two uprights

of the frame F. The lamp-circuit is the same as in the well-known "Brush" lamp or in any other electric-arc lamp, and magnet A is connected in shunt with the arc by the conductors $y' x'$.

X and Y represent the line-wires.

In Fig. 2 A represents a hollow permanent magnet embracing positive carbon C. N represents the north pole of the magnet A. A solenoid or coil of conductor through which current passes may be used for the purposes of this invention.

In Fig. 3 I have shown the magnet arranged with relation to the negative electrode, being still with the lines of its field of force parallel with and in the same direction as the current producing the arc, the south pole in this case being nearer the arc and the north pole farther removed from the arc. This arrangement performs the same function as the arrangement in Figs. 1 and 2; but it is not so good where the arc is to be used merely for its light-producing effect, as the presence of the magnet below the arc would give rise to shadows. With this arrangement the lines of the field of force in core B, Figs. 1 and 3, or in magnet A, Fig. 2, will be parallel with and in the same direction as the current passing through the positive carbon C, and the said magnet will to a large extent neutralize the counter electromotive force of the voltaic arc between carbons C and C' and materially increase the length of the arc.

I have found that with a current which without the magnet will only maintain an arc of one-fourth of an inch in length I can with the magnet arranged as shown maintain an arc of one-half of an inch in length, and have maintained it nearly, if not quite, three-fourths of an inch in length.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The herein-described mode of magnetically affecting an electric-arc lamp, consisting in subjecting the arc to the influence of a magnet in which the lines of the field of force are substantially parallel with, and in the same direction as, the current producing said arc for the purpose of reducing the counter electromotive force of the arc.

2. The combination with a positive electrode of an electric-arc lamp of a magnet hav-

ing the lines of its field of force substantially parallel with, and in the same direction as, the current passing through said positive electrode, and having its north pole presented to the arc, the arrangement being such as to reduce the counter electromotive force of the arc.

3. The combination with an electrode of an electric-arc lamp, of a magnet having the lines of its field of force substantially parallel with and in the same direction as, the current passing through said electrode, and having its polar extremity presented to the arc, whereby the counter electromotive force of the arc is reduced substantially as shown and described.

4. The combination with the two carbon electrodes of an arc-electric lamp and means for maintaining a voltaic arc between them,

of a magnet having its lines of force substantially parallel with, and in the same direction as the arc-producing current the arrangement being such as to reduce the counter electromotive force of the arc, substantially as and for the purposes set forth.

5. The combination with the negative electrode in a mechanism for maintaining a voltaic arc, of a magnet having the lines of its field of force substantially parallel with and in the same direction as the current passing through said negative electrode, and having its south pole presented to the arc whereby the counter electromotive force of the arc is reduced.

CHARLES L. COFFIN.

Witnesses:

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