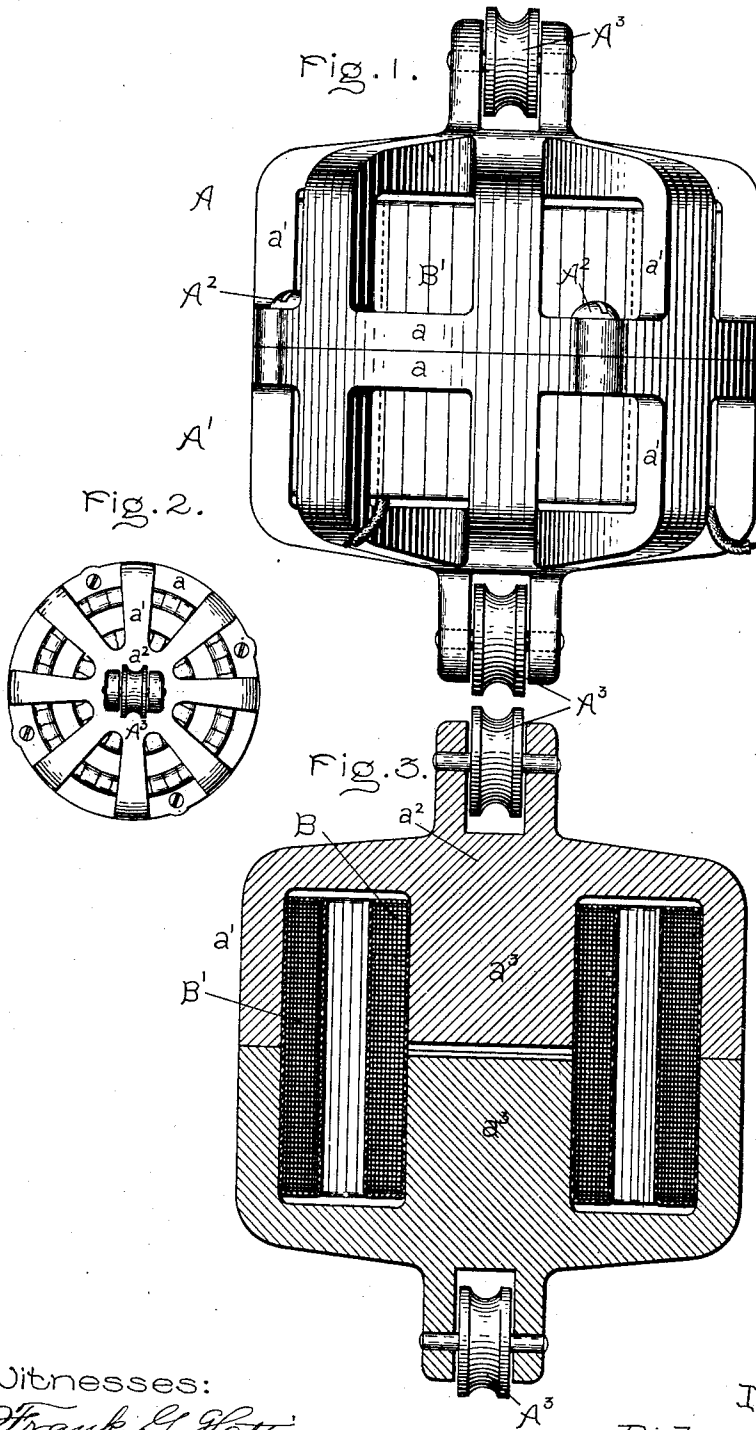


R. FLEMING.
ELECTRIC ARC LAMP.

(Application filed Dec. 8, 1900. Renewed Jan. 2, 1902.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

Frank G. Hattie.

Alex F. Macdonell.

Inventor:

Richard Fleming,

By *Albert H. Davis*
Att'y.

R. FLEMING.
ELECTRIC ARC LAMP.

(Application filed Dec. 6, 1900. Renewed Jan. 2, 1902.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 4.

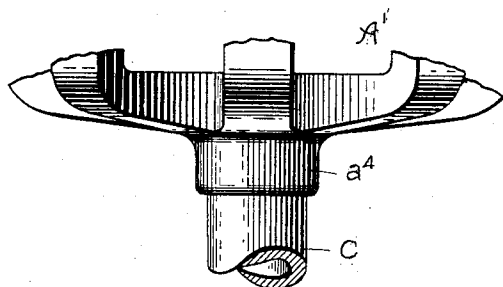
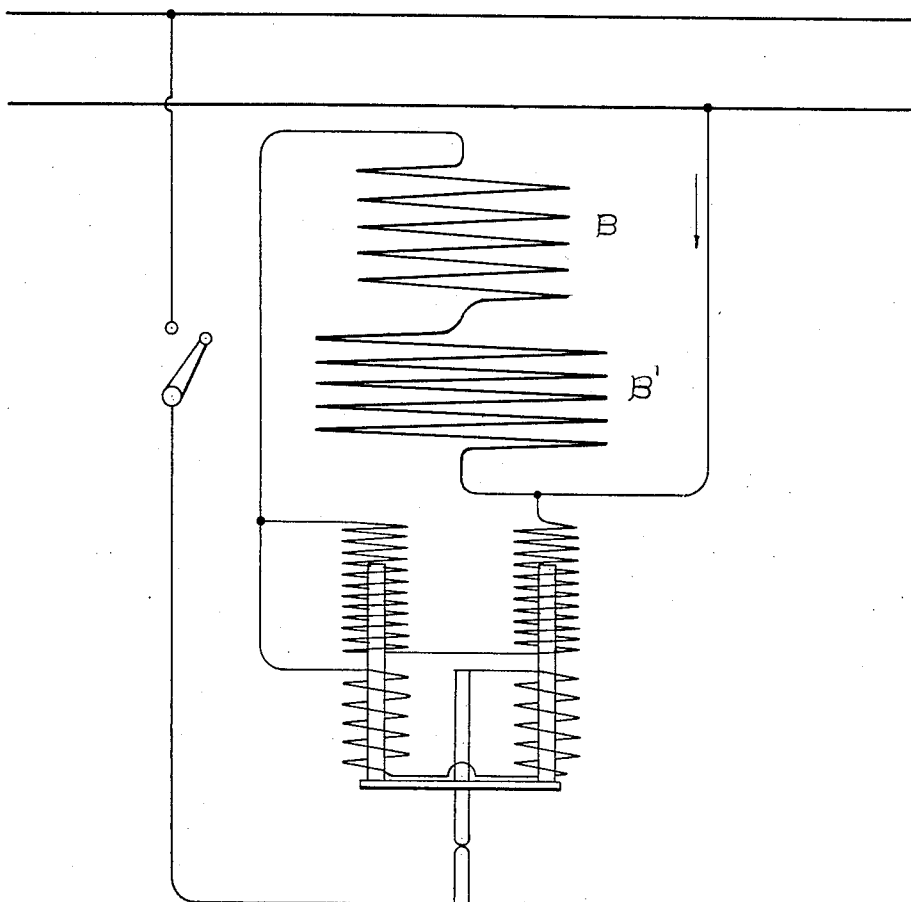


Fig. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

RICHARD FLEMING, OF SWAMPSCOTT, MASSACHUSETTS, ASSIGNOR TO
GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 708,182, dated September 2, 1902.

Application filed December 6, 1900. Renewed January 2, 1902. Serial No. 88,058. (No model.)

To all whom it may concern:

Be it known that I, RICHARD FLEMING, a subject of the Queen of Great Britain, residing at Swampscott, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Electric-Arc Lamps, (Case No. 1,971,) of which the following is a specification.

This invention relates to electric-arc lamps; and its object is to enable the reactance-coil to be placed in or close to the upper part of the lamp-casing instead of at a distance from the lamp, as has heretofore been necessary in some kinds of arc-lights. The stray magnetic field of a hedgehog reactance—for instance, such as is commonly used with the so-called "Higham lamp"—seriously affects the arc if the reactance-coil is too near it. Hence it has been necessary in such lamps to place the reactance-coil several feet away from the lamp proper, which is inconvenient and expensive. By my invention I enable the coil to be located just above or in the upper part of the lamp-casing, like the ordinary resistance-coils. I accomplish this result by inclosing the reactance-coil in a magnetic casing or cage with a central core provided with an air-gap.

In the accompanying drawings, Figure 1 is a side elevation of my improved reactance-coil. Fig. 2 is a top plan view on a similar scale. Fig. 3 is a vertical central section of Fig. 1. Fig. 4 shows a modified construction, and Fig. 5 is a diagram of the circuits.

The coil shown in Figs. 1, 2, and 3 is designed to be placed just above the lamp-casing. The frame of the coil consists of a magnetic cage composed of two similar parts A A', joined at the middle and held together by screws A². Each part is composed of an open-work structure, preferably a ring α , from which rise arms α' , the upper ends of which turn radially inward and unite in a central hub α^2 , from which a core α^3 projects toward the middle plane, on which the two parts A A' join. The opposing inner ends of the two cores do not touch, an air-gap being left between them, as shown in Fig. 3. An insulating suspension-ring A³ is attached to each part A A' at the hub α^2 , the upper one serving to suspend the coil and the lower one the

lamp proper. The reactance-coil is preferably made in two annular sections B B', one of greater diameter than the other. The smaller one fits closely to the cores α^3 , while the larger one fits closely inside the arms α' , an annular space being left between them for ventilation, which is assisted by the open spaces between the arms α' . Any other equivalent mode of constructing and arranging these parts to accomplish the desired ends may be employed, if desired. In case the coil is to be placed in the upper end of the lamp the lower part A' of the cage may have a central hub α^4 to receive the upper end of the tubular backbone C of the lamp, which may be secured therein in any suitable manner.

The diagram Fig. 5 shows that the two sections of the coil are connected in series and that the circuits are the same as those set forth in the application of Daniel Higham, Serial No. 37,259, filed November 21, 1900, now patented as Reissue No. 11,930, September 3, 1901.

The cage forms a closed circuit for the lines of magnetic force, so that there is no external stray field to affect the arc. The air-gap between the ends of the cores increases the reluctance at that point, and hence the coil offers a greater resistance to fluctuations in the current, and consequently the resistance of the arc forms a very small percentage of the total resistance. This tends to protect the arc against small fluctuations in the line-current and makes the lamp run much steadier.

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

1. A reactance-coil composed of an open-work cage of magnetic material having central cores separated by an air-gap, and a coil concentric with the cores and inside the cage.

2. A reactance-coil composed of a cage of magnetic material made in two similar parts united at the middle, and each carrying a central core, the ends of the cores being separated by an air-gap, and a coil concentric with the cores and inside the cage.

3. A reactance-coil composed of an open-work cage of magnetic material, having central cores separated by an air-gap, and a coil made in two sections concentric with the

cores and having an annular space between them.

4. A frame for a reactance-coil for an arc-lamp, composed of the two similar parts A, 5 A', each having a ring a , arms a' uniting in a hub a^2 , and a core a^3 concentric with the ring a , the opposing ends of the cores having an air-gap between them.

5. The combination with a frame of mag- 10 netic material composed of the two parts A, A', having rings a , arms a' hubs a^2 , cores a^3 having an air-gap between them, screws A^2 , and insulating suspension-rings A^3 , of the coil made in two sections B, B', one fitting 15 the cores and the other inside the arms, with a space between the coils.

6. In an electric-arc lamp, the combination of a cage or frame of magnetic material having central cores separated by an air-gap, a coil concentric with the cores mounted inside 20 the cage or frame, and a tubular backbone depending from said cage or frame.

7. In an electric-arc lamp, the combination of a cage of magnetic material, a coil within the cage, and a tubular backbone secured to 25 and depending from said cage.

In witness whereof I have hereunto set my hand this 4th day of December, 1900.

RICHARD FLEMING.

Witnesses:

DUGALD MCK. MCKILLOP,
JOHN A. McMANUS.