(No Model.) 2 Sheets—Sheet 1.

G. S. YOUNG & R. J. HATTON.

ELECTRIC ARC LAMP.

No. 262,718. Patented Aug. 15, 1882.

FIG. 3.

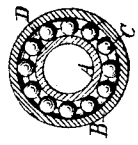


FIG. 4.

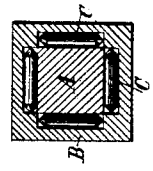


FIG. 2.

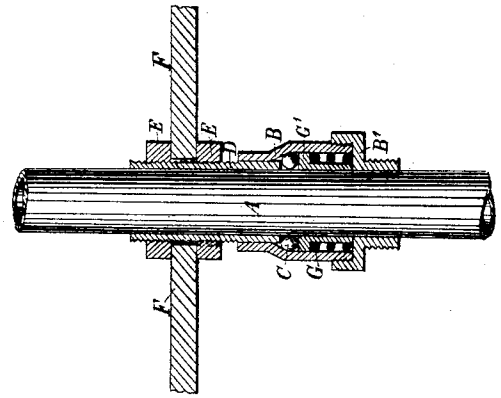
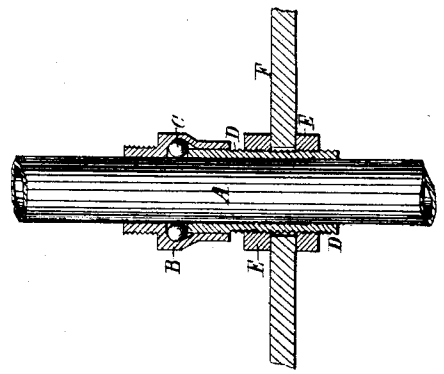


FIG. 1.



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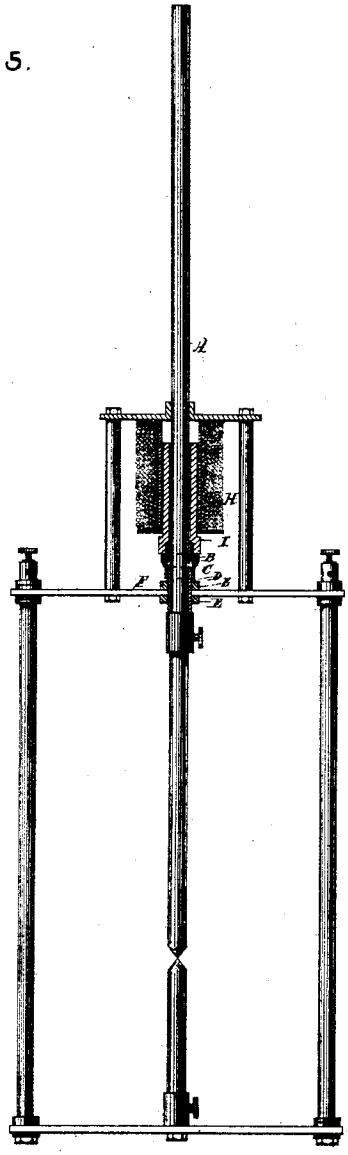
(No Model.) 2 Sheets—Sheet 2

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FIG. 5.



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UNITED STATES PATENT OFFICE.

GEORGE S. YOUNG, OF BLACKWALL, COUNTY OF MIDDLESEX, AND ROBERT J. HATTON, OF STRATFORD, COUNTY OF ESSEX, ENGLAND.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 262,718, dated August 15, 1882.

Application filed May 27, 1882. (No model.) Patented in England April 6, 1882, No. 1,689.

To all whom it may concern:

Be it known that we, GEORGE SCHOLEY YOUNG and ROBERT JAMES HATTON, residing respectively at Blackwall, in the county of Middlesex, and Stratford, in the county of Essex, England, have invented new and useful Improvements in Electric-Arc Lamps, (for which we have obtained a patent in Great Britain, dated the 6th April, 1882, No. 1,689,) of which the following is a specification.

The main object of this invention is to provide a simple and efficient means for automatically regulating the arc or distance between the electrodes in an arc-lamp or semi-incandescent lamp. For this purpose we provide the carbon or other electrode or electrodes requiring to be fed with a kind of brake or feed appliance which is acted on by an electro-magnet or solenoid, or equivalent means. This brake consists of a chamber containing balls or rollers, all so arranged that the balls or rollers are made to jam the balls between the inner circumference of the chamber and the electrode (or it may be its holder or part connected therewith) and to move it (the electrode) into the proper position for forming the arc when the said chamber or part is acted on by the solenoid or electro-magnet or its armature, and to retain it in that position until the arc requires adjustment, whereupon the chamber is released by the solenoid or electro-magnet, the balls being released from the electrode by coming against a stop tube or ring on or connected to the lamp-framing. The electrode being thus allowed to be fed, the arc is readjusted, the electro-magnet or solenoid again repeating the action before described.

Convenient modes of carrying this invention into effect are illustrated by the accompanying drawings.

Figure 1 is a section showing its application when the electrode is fed downward. Fig. 2 is a section showing application when the electrode is fed upward or in any other direction. Fig. 3 is a cross-section through a round chamber, B, containing balls. Fig. 4 is a cross-section through a square chamber, B, containing rollers. Fig. 5 is an elevation partly in section of a lamp fitted with our invention.

A, Fig. 1, is a tube or rod to which the upper electrode of an electric lamp is attached; or it may be considered to represent such electrode itself.

B is the chamber, containing a number of balls, C C, as shown at Fig. 3; or, instead of balls, we may use rollers C′ C′, as shown at Fig. 4, where the electrode or electrode-holder A is shown of a square section.

D is an adjustable stop in the form of a guide-tube.

E E are nuts for adjusting the stop D on the frame F of the lamp.

The chamber B is, by its upper screwed end, attached to the armature of an electro-magnet or soft-iron core of a solenoid or equivalent appliance. (Not shown on the drawings.) When the current is applied the chamber B is made to move in the direction required to separate the electrodes—that is, as regards the arrangements shown in Fig. 1, the chamber B is raised. This motion jams the balls C C′ between the inner side of chamber B and the rod or electrode A, thereby raising the latter and forming the arc, the length of which may be regulated by the adjustable tube or stop D. While the balls C or rollers C′ are not in contact with the tube or stop D the motion of the electrode coincides with that of the chamber B, and is governed by the magnet, solenoid, or equivalent appliance; but when the armature is released—that is, when the arc requires adjustment—the electrode, with the chamber B and balls C or rollers C′, will move down so far that the balls or rollers come into contact with the stop tube or ring D. The rod A is thereby relieved from the jam of the balls or rollers and allowed to feed or drop the required distance. The descent of the armature may be assisted by a spring when required, especially where the electrode is arranged in a slanting direction. As regards the arrangement shown in Fig. 2, where the electrode is to be fed in an upward vertical or slanting direction, the armature of the electro-magnet or the soft-iron core of a solenoid is connected to the lower screw part, B′, of the chamber B.

To keep the balls or rollers in proper position we employ one or more springs; or it may be an elastic material.

G shows a helical spring acting upon a sleeve,

G′. D is the stop-tube. When the chamber B is attracted downward by the armature or soft-iron core the balls C (or rollers C′) will be jammed between the rod A and the inside of the chamber B, and carry the rod A and electrode down with it; but when the arc thus established requires adjustment the armature will be released. The rod A, with chamber B, will be raised by a spring or equivalent means acting on the armature until the balls C or rollers C′ come in contact with the bottom of the adjustable stop-tube D, whereby the balls or rollers will release their grip on the rod A and allow it to feed the required distance. This mode of adjustment is applicable to lamps having the electrode or electrodes moving in every direction, either by gravity or by any motive power.

In Fig. 5 we have, as an example, shown our invention applied to a vertical arc-lamp in which the positive electrode or its holder A is fed downward.

H is a solenoid, and I its soft-iron core, which is screwed onto the chamber B, which contains a number of balls C, which surround the holder A and grip it when the core I raises the chamber B and with it the holder A, thus forming or regulating the arc. D is the stop-tube, which is also a guide-tube for the holder A or electrode.

We do not claim broadly a roller or ball within an inclined chamber at one side of the carbon-holder, nor chambers at opposite sides of the carbon-holder, with rollers in said chambers, as these have been proposed; but their action is not uniform, and the carbon-holder is liable to be held by friction and not to feed when required.

Having thus described and ascertained the nature of this invention and the manner of carrying the same into effect, we declare that we claim—

1. The combination, in an electric lamp, of the electrode-holder, a sleeve thereon, formed with inclined interior, and a range of balls which surround and grip the said holder, a magnet in the circuit to the lamp for moving the sleeve, and a stop-tube on the lamp-frame for relieving the grip of the balls on the holder when the latter requires adjustment, substantially as set forth.

2. The combination, in an electric lamp, of the electrode A, a sleeve, B B′, thereon, formed with inclined interior, and range of balls C, which surround and grip the said holder, an electro-magnet in the circuit to the lamp, a stop-tube D on the lamp-frame F for relieving the grip of the balls C on the holder when the latter requires adjustment, and a sleeve, G′, with spring G for supporing the balls, substantially as set forth.

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