(No Model.)

C. P. BREESE.

ARC LAMP.

No. 428,066. Patented May 20. 1890.

Fig. 1.

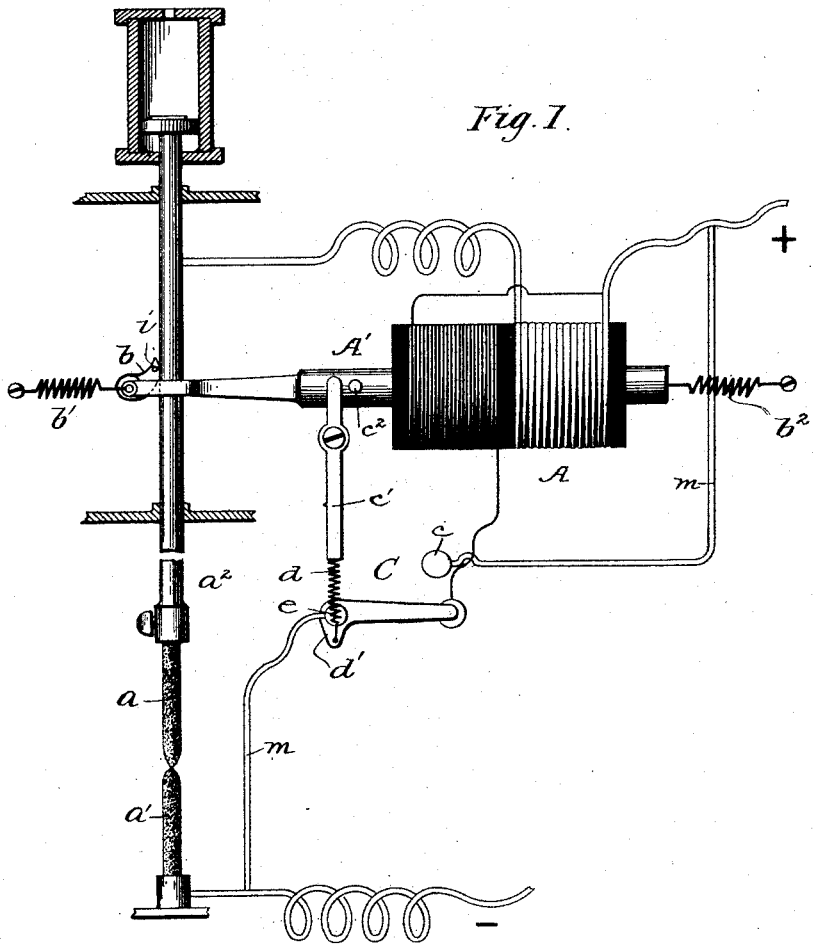
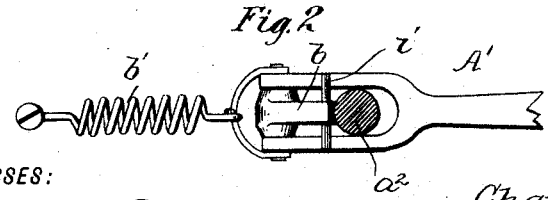


Fig. 2.



WITNESSES:

Frank S. Ober.

Thomas K. Trenchard.

INVENTOR

Charles P. Breese.

BY

W. J. Johnston

ATTORNEY.

UNITED STATES PATENT OFFICE.

CHARLES P. BREESE, OF NEW YORK, N. Y.

ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 428,066, dated May 20, 1890.

Application filed February 11, 1890. Serial No. 339,977. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. BREESE, a citizen of the United States, residing in New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

My invention relates to electric-arc lamps, its object being to provide what is known as a "single lamp" which shall be cheap of construction and efficient in operation.

The invention consists of the details of construction which are hereinafter described with reference to the accompanying drawings.

Figure 1 represents a conventional plan of the parts of the lamp and the circuits, and Fig. 2 a detail view of the clutch.

a and a' represent the upper and lower carbons, respectively. The upper carbon is clamped at the lower end of a metal rod a^2.

A represents a solenoid-magnet having wound upon it in opposite directions two coils of wire, one of which is coarse and the other fine wire. The coarse-wire coil is in series with the arc and the fine wire in a shunt thereto, as shown. The spool is set in a horizontal position, and its core therefore moves in a horizontal plane.

A′ represents the core. It has an axial extension, which is formed at its extreme end into a fork, the sides of which embrace the rod carrying the upper carbon. They extend beyond the rod and form the bearings for a pivoted cam b. The toe of this cam bears upon the rod, and the point of contact is slightly above the horizontal plane in which the fork is located. A spring b' is attached to the extension of the core, and its tendency is to pull the core out of the magnet, and thus allow the cam to drop. The movement of the cam is limited by pin i. The upper end of the rod plays in a dash-pot for the purpose of cushioning its movement. Attached to the opposite end of the core is another spring b^2, acting in opposition to b'.

The operation of the parts so far described is as follows: When the current is turned on, the solenoid is energized by the current flowing in the coarse coil, the core A′ is drawn in, and the pivot of cam b thereby brought nearer to the rod. This causes the toe of the cam to move up, and owing to its position against the rod the latter is moved up also, thus creating the arc between the carbon points. If the arc becomes too long, owing to consumption of the carbons or abnormal movement of the rod, the resistance thereby offered by the arc causes the current to flow through the shunt-circuit. This circuit includes the fine-wire coil on spool A wound in an opposite direction to the coarse-wire coil. The result, therefore, is to counteract the magnetism induced by the coarse-wire coil, and thus allow the spring b' to withdraw the core from the spool and the cam from the rod. The weight of the rod then carries it down until it is again stopped by the binding of the cam upon it.

I will now describe the automatic cut-out forming a part of my invention. A quick-acting switch C is placed in the shunt-circuit, and a second contact c is arranged so that when the switch-arm is in contact with it a short circuit through wires m m is formed around the whole lamp. This switch is operated by a pivoted lever c', which is arranged so that one end stands in the path of a pin c^2 on the core A′ of the solenoid. The lever is located so that there is a space between its end and the pin, which space is a trifle longer than the arc. The opposite end of the lever has attached to it a coil-spring d, which connects with an arm d' of the switch. This arm stands at right angles to the switch-arm and joins it at the pivotal point e. The spring is constantly under tension in a line passing through the pivot e and the lower end of lever e'. The operation of this cut-out is therefore as follows: When the current in the shunt becomes abnormally great, the core A′ is forced out to a greater distance than usual, causing the pin to strike the end of lever c' and move it to one side. This will carry the spring over the pivot of the switch-arm, and it will then exert its force to throw the switch quickly and close the short circuit, thus cutting out the lamp. The spring b^2 is made of such strength that the core is balanced just before the cam has been pulled free of the rod. If then the rod sticks, the increased strength of the shunt-coil transposes the functions of the springs b' and b^2, making b' the counterbalancing-spring, which latter snaps the switch. These two springs, acting at each end of the

horizontal core, will also help to sustain it, thereby doing away with frictionless bearings.

It will be observed that the devices herein described are of the simplest nature, thus providing a lamp which will cost but very little to build and which will rarely need repair. By locating the cut-out switch in the shunt-circuit I avoid extra circuits and connections.

Having thus described my invention, I claim—

1. In an arc lamp, a solenoid-magnet wound differentially with series and shunt coils, with its core standing approximately at right angles to the carbon rod, in combination with the carbon rod and a cam pivoted to the core and bearing against the carbon rod, for the purpose described.

2. In an arc lamp, a solenoid-magnet wound differentially with series and shunt coils, with its core standing approximately at right angles to the carbon rod and extending past the same, in combination with the carbon rod and a cam pivoted at the outer extremity of the core and resting in contact with the carbon rod, as and for the purpose described.

3. In an arc lamp, a solenoid-magnet wound differentially with series and shunt coils, with its core standing approximately at right angles to the carbon rod, in combination with the carbon rod and a cam pivoted to the core and bearing against the carbon rod, and two springs, one acting upon the core in opposition to the shunt-coil and one in opposition to the series coil of the solenoid, substantially as described.

4. The combination, with the solenoid-core provided with a pin or lug, of the lever c', the spring d, and the switch-arm, arranged in the manner and for the purpose set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

CHARLES P. BREESE.

Witnesses:

C. M. CORPENING,

J. M. STEWART.