No. 613,858. Patented Nov. 8, 1898.

C. E. HARTHAN.

CAP FOR INCLOSED ARC LAMPS.

(Application filed Apr. 23, 1898.)

(No Model.)

FIG. 1.

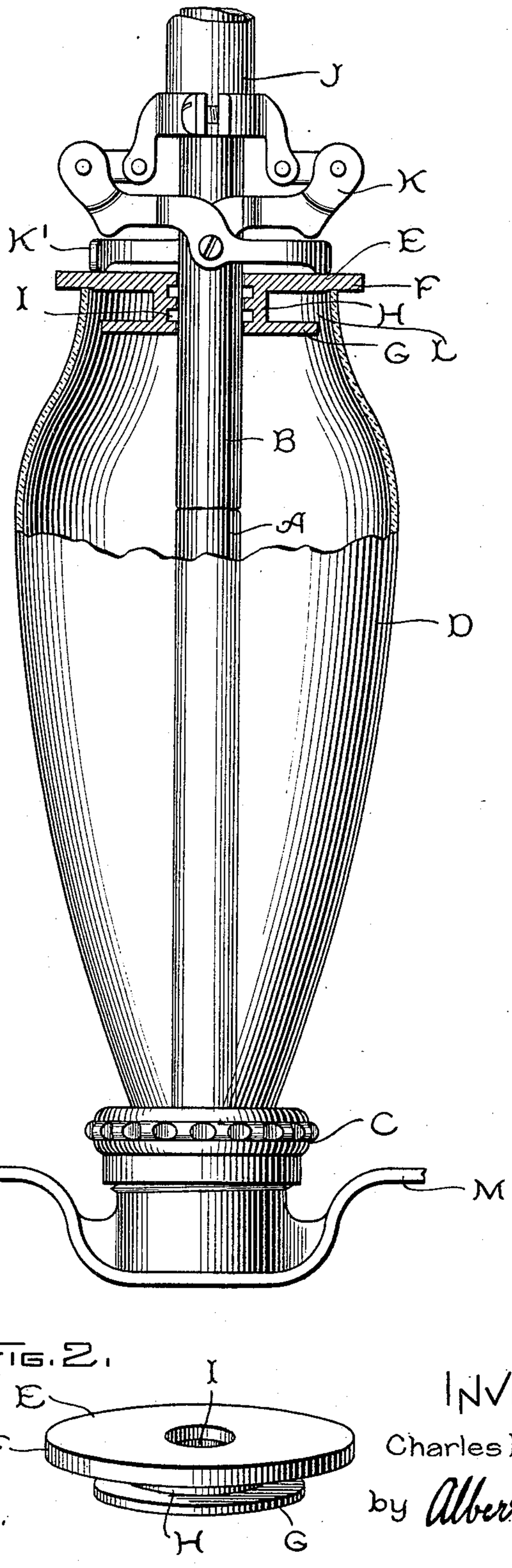

FIG. 2.

WITNESSES.
A. H. Abell.
A. F. Macdonald.

INVENTOR.
Charles E. Harthan,
by Albert G. Davis
Atty

UNITED STATES PATENT OFFICE.

CHARLES E. HARTHAN, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE GENERAL ELECTRIC COMPANY, OF NEW YORK.

CAP FOR INCLOSED ARC-LAMPS.

SPECIFICATION forming part of Letters Patent No. 613,858, dated November 8, 1898.

Application filed April 23, 1898. Serial No. 678,550. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. HARTHAN, a citizen of the United States, residing at Lynn, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Caps for Inclosed Arc-Lamps, (Case No. 808,) of which the following is a specification.

This invention relates to the cap which surrounds the upper carbon of electric-arc lamps and rests on the top of the small globe or cylinder surrounding the arc.

The object of my invention is to provide a cap for the arc-inclosing cylinder which will properly regulate the admission of air to the globe and at the same time withstand the heat to which it is subjected.

In the accompanying drawings, which show an embodiment of my invention, Figure 1 is a side elevation, partially in section, of an inner globe with the cap in section; and Fig. 2 is a perspective view of the cap.

The lower carbon A is mounted in a suitable holder carried by the lower portion of the frame M. The upper carbon B is situated directly above the lower carbon and in line therewith. Surrounding the entire lower carbon and a portion of the upper carbon is a small globe or cylinder D, designed to protect the arc from currents of air and also to prolong the life of the carbons. The cylinder is held in place by a suitable holding device C, which also prevents the entrance of air to or the exit of gases from the cylinder. Situated on top of the cylinder is a cap E, having a flange F, which is finished on the under side, where it rests on the cylinder; but no attempt is made to make an air-tight joint at this place, the air being prevented from entering in a manner hereinafter described. The flange being larger than the cylinder and flat on its under side the cap is free to adjust itself slightly to compensate for slight irregularities in the carbon. Situated below the flange F and connected thereto by a hub H is a flange G, which is somewhat smaller than the inside of the cylinder, and these flanges, with the cylinder D, form walls of a circular chamber L, containing a mixture of gas from the arc and pure air, which prevents the sudden rush of air into the cylinder.

The center of the cap is bored out slightly larger than the carbon, so as to permit the latter to pass freely up and down. Surrounding the carbon and formed in the hub H are two or more circular chambers I, containing a mixture of air and gas, preventing the sudden admission of pure air to the cylinder. In the present instance two small circumferential chambers I are employed, as this is sufficient to check the flow of air in the particular type of lamp shown; but for other types of lamps I may employ three or even more chambers.

It has been customary heretofore to surround the upper carbon by a single large circular chamber containing a much larger amount of mixed air and gas than the chambers I; but I have found the arrangement shown to be much more satisfactory, the small chambers tending to interrupt the influx of pure air more effectually than one large chamber.

So far as I am aware I am the first to provide a cap having a chamber surrounding the upper carbon for preventing the unlimited entrance of air at this point with a circumferential chamber formed in the outer edge of the cap near the point where it rests on the cylinder for preventing the free entrance of air at this point. I am also the first to provide a cap for an inclosing arc-lamp, which has a plurality of small chambers surrounding the carbon, with a large circumferential chamber near the outer edge of the cap for preventing the free entrance of air at this point, the outer and inner chambers being independent of each other.

Situated above the cap and carried by a suitable support J is a clutch K, which grips the carbon and moves it up and down. The clutch is provided with tripping-jaws K′, which under certain conditions strike on the top of the cap and permit the carbon to feed downward.

In my statement of invention I have outlined what I at present believe to be the mode of operation of the improved construction described and claimed. I do not wish, however, to imply that the theoretical statements made are to be construed as limitations, as the improvement is an incident of the con-

struction in whatever way it may hereafter be found to operate.

The action of my invention is as follows: As the upper carbon B moves up and down it creates local eddy-currents in the circular chambers I, which oppose the free passage of pure air into the cylinder, and air is prevented from entering the cylinder around the edge of the cap by the eddy-currents created in the chamber L, due to the difference of pressure between the inside and outside of the cylinder.

I find that by properly proportioning the internal chambers I and the external chamber L the mixture of gases and oxygen in the cylinder is such that the carbons will be consumed slowly and the life of the carbons correspondingly increased.

This cap is very simple in construction, requires only a very small amount of machine-work, and is capable of successfully regulating the admission of air to the cylinder.

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

1. In a cap for the cylinder of an inclosed arc-lamp, the combination of an opening for the carbon to pass through, an air-chamber surrounding the opening and in communication therewith, the chamber acting to prevent the free entrance of air around the carbon, and a second chamber formed in the cap near the inner periphery of the cylinder for preventing the free entrance of air around the top of the cylinder.

2. In a cap for the cylinder of an inclosed arc-lamp, the combination of an opening for the carbon to pass through, a plurality of small air-chambers surrounding the opening, each in communication therewith, the said chambers acting to prevent the free entrance of air around the carbon, and an additional chamber also formed in the cap near its outer periphery for preventing the free entrance of air around the top edge of the cylinder, the said chamber having no direct communication with the small air-chambers.

3. In a cap for the cylinder of an inclosed arc-lamp, the combination of a flange which rests on the top of the cylinder, a second flange situated below the first, a hub connecting the two flanges and acting with the flanges to form a chamber, a carbon-opening in the hub, and a plurality of small chambers also formed in the hub, which surround and communicate with the carbon-opening.

4. In a cap for the cylinder of an inclosed arc-lamp, the combination of a flange which is greater in diameter than the top of the cylinder and rests thereon, a second flange parallel with the first which is less in diameter than the inside of the cylinder, a hub connecting the two flanges, but at the same time separating them so as to form a circular air-chamber, a carbon-opening formed in the hub, and a plurality of small circular air-chambers surrounding and communicating with said opening.

In witness whereof I have hereunto set my hand this 20th day of April, 1898.

CHARLES E. HARTHAN.

Witnesses:
H. P. CROSBY,
DUGALD MCKILLOP.