(No Model.) 2 Sheets—Sheet 1.

S. BERGMANN & E. LAVENS.

ELECTRIC ARC LAMP.

No. 587,421. Patented Aug. 3, 1897.

FIG. 1.

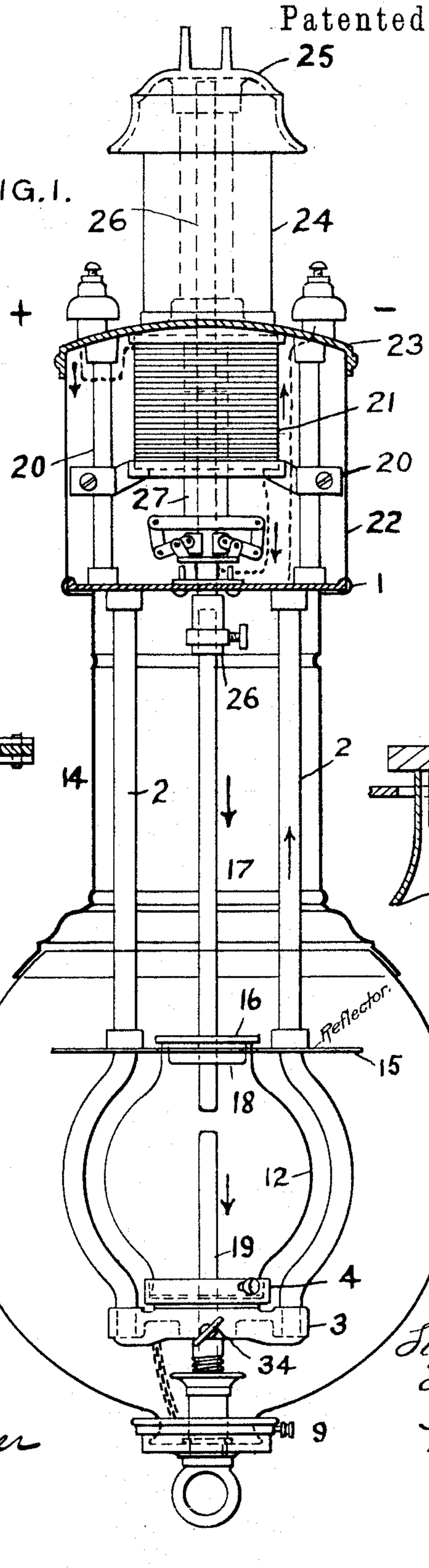


FIG. 2.

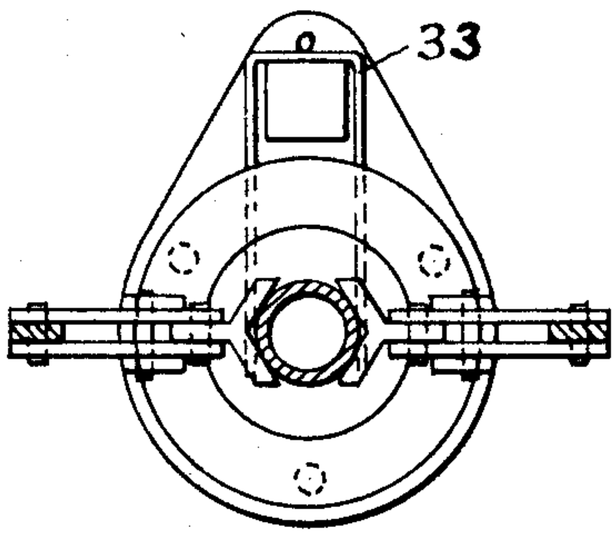
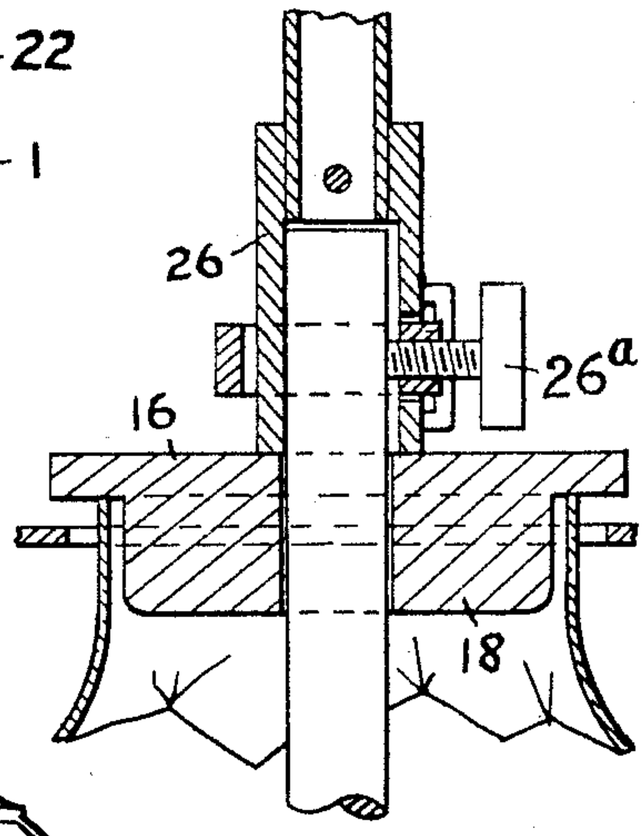


FIG. 3.



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(No Model.)

2 Sheets—Sheet 2.

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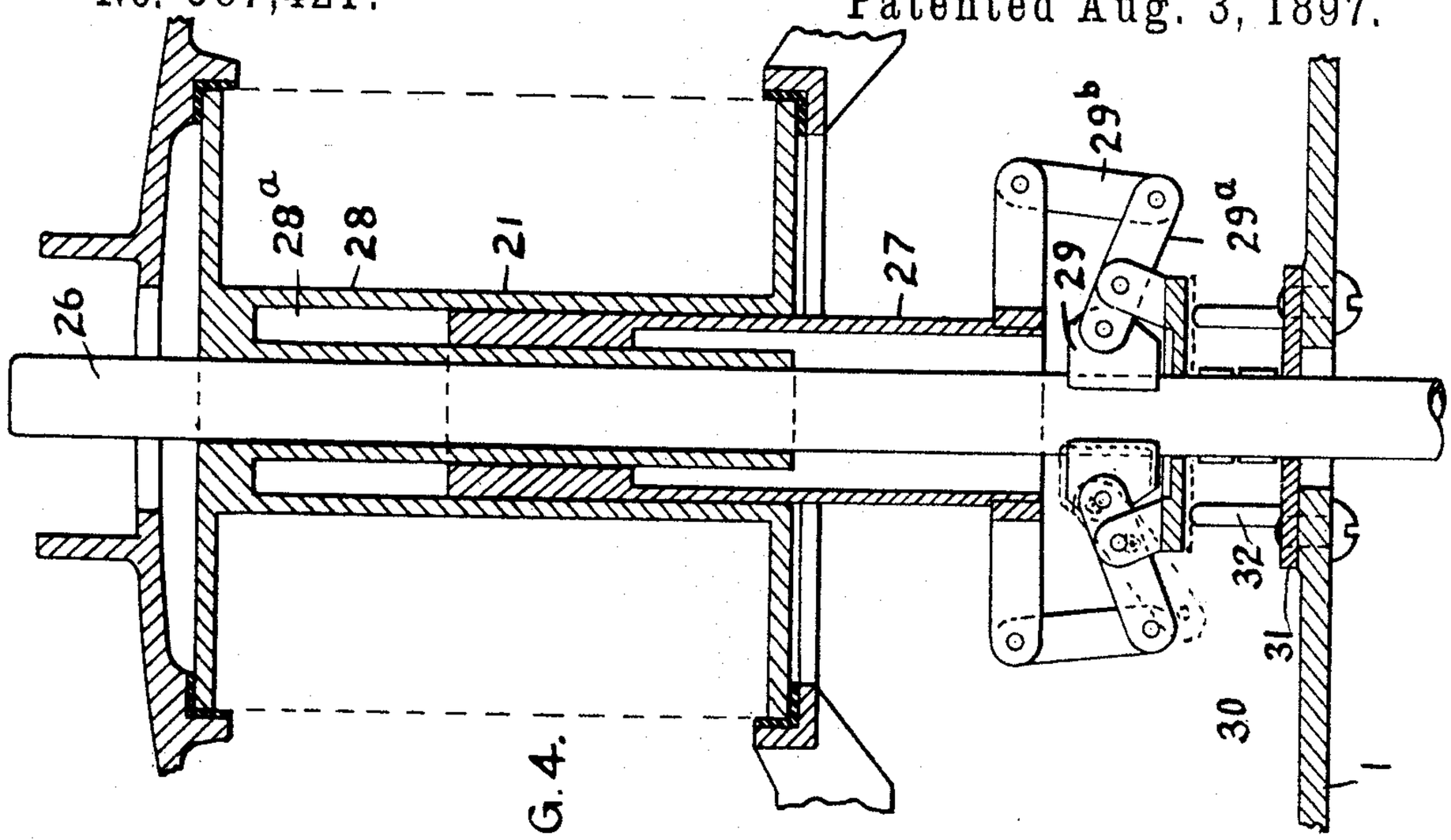

FIG. 4.

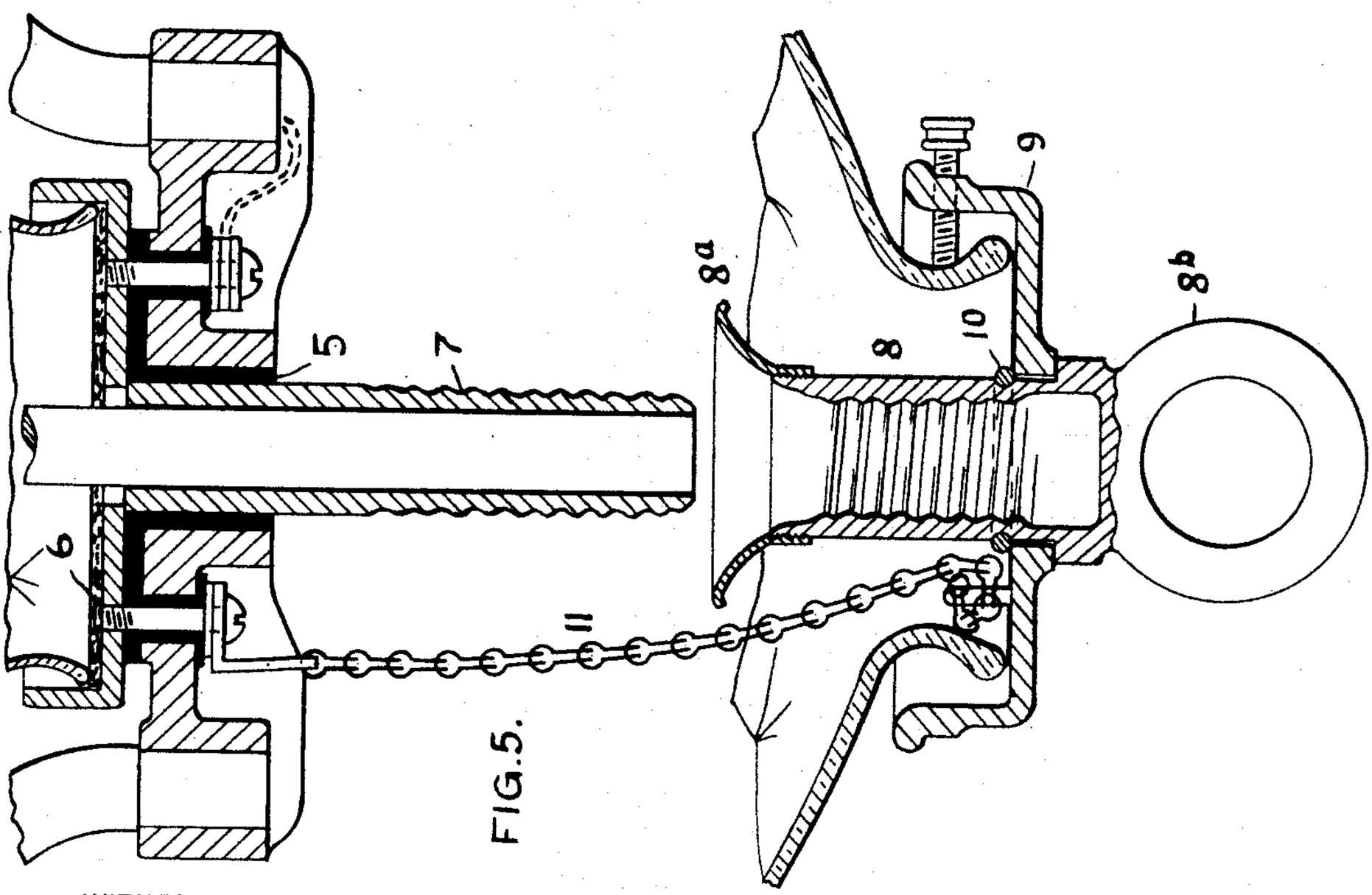

FIG. 5.

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UNITED STATES PATENT OFFICE.

SIGMUND BERGMANN, OF NEW YORK, AND ERWIN LAVENS, OF BROOKLYN, NEW YORK, ASSIGNORS TO THE GENERAL INCANDESCENT ARC LIGHT COMPANY, OF NEW YORK, N. Y.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 587,421, dated August 3, 1897.

Application filed February 7, 1896. Renewed June 15, 1897. Serial No. 640,911. (No model.)

To all whom it may concern:

Be it known that we, SIGMUND BERGMANN, residing at New York, and ERWIN LAVENS, residing at Brooklyn, in the State of New York, citizens of the United States, have invented Improvements in Arc-Lamps, of which the following is a specification.

Our invention relates to electric-arc lamps of the type in which the light-arc is maintained in an atmosphere composed wholly or in part of a carbonaceous gas derived from the combustion of the light-carbons in the arc.

Our invention consists of various details of construction whereby an efficient lamp may be constructed with but few working parts and at a low cost of manufacture.

In the accompanying drawings, which illustrate our invention, Figure 1 is a front elevation with the casing and globes shown in vertical section. Fig. 2 is a plan and partial section on the line *x x* of Fig. 1. Fig. 3 is a vertical section of the support for the upper carbon, small globe which incloses the arc, and cap of the globe and shows the relation of the parts when the carbon-support has reached its lowest position. Fig. 4 is a vertical section through the magnet-bobbin, armature, &c., illustrating the relation of the parts which form the clutch mechanism, dashpot, &c. Fig. 5 is a vertical section through the lower part of the lamp, illustrating how the parts of the lamp are separated to permit the introduction of new carbons, trimming, &c.

In the drawings similar numerals indicate like parts.

1 represents the base or floor of the lamp, which supports above it the regulating mechanism and below it the frames 2 2, which carry the globes and the lower carbon. The frames 2 2 are preferably arranged close together and curved near their bottom to approximately the shape of the small globe which includes the arc. These frames are fastened together at the bottom by a yoke 3.

4 is a saucer carried by the yoke, but insulated therefrom by the insulating material 5. In the floor of the saucer is a body of asbestos 6 or other similar material. Depending from the yoke 3 is a tube 7, screw-threaded over its lower end.

8 represents a correspondingly-threaded tube of greater diameter, having a flared mouth 8^a and ring 8^b at its lower end. The lower end of the tube 8 is closed. Carried by the tube 8 is a saucer 9, secured to the tube 8 by the ring 10 and in such a manner that the tube 8 may be revolved without rotating the saucer 9.

11 represents a chain that secures the saucer 9 to the yoke 3.

The object of making the lower portion of the lamp removable is for the purpose of permitting the introduction of carbons to supply the waste in the arc, as will hereinafter be more fully set forth.

12 represents a small globe which surrounds the arc; 13, a large globe which includes the small globe and the lower portion of the frame of the lamp. The small globe is carried by the saucer 4 and the large globe by the saucer 9.

14 is a metallic casing which surrounds and includes all that portion of the lamp below the base-plate 1 and the top of the globe 13 and is carried over the upper periphery of the globe 13.

15 is a reflector; 16, a cap which covers the upper orifice of the globe 12 and through which the upper carbon 17 moves. This cap is provided with a depending flange 18, slightly smaller in diameter than the upper orifice of the globe 12, the object of which arrangement is to compensate for any deviation in movement of the upper carbon from a straight line.

19 is the lower carbon.

It will be observed from the description as far as given that the lower part of the globe 12 is in effect hermetically sealed, whereas the upper part is only closed by the cap 16. Hence if there is any undue accumulation of gas within the cavity of the globe 12 the weight of the cap will be overcome and this gas allowed to escape into the cavity of the globe 13. The arrangement of the cap 16, however, is such that ingress of air from the outside is not possible.

It will be further observed that the whole of the lower part of the lamp is included within the casing 14 and globe 13. It is preferable in constructing a lamp to leave a slight

space between the flange at the casing 14 and the upper part of the globe 13 to permit the escape of accumulated gases.

Referring now to the portion of the lamp above the plate 1, 20 represents columns which carry the magnet 21. 22 is the casing; 23, a cap on which is mounted the extension 24, upon the upper portion of which is provided the hanger-eye 25. The upper carbon is supported by the rod 26, Fig. 4, which projects through the magnet 21 and into the extension 24. On the lower end of this rod is a socket and screw 26^a for holding the upper carbon 17. The magnet 21 is formed with a hollow core, by reason of which its armature 27 acts as a dash-pot—that is to say, the core of the magnet is formed of two concentric tubes 28 and 28^a and having the space between them closed at the top. The upper end of the armature 27 is included between these tubes. Hence as the armature is drawn up into the core it forces the air before it and compresses it. Conversely, when the armature drops it expands the air so that motion in either direction is in effect cushioned. Mounted on the lower end of the armature 27 is the clutch mechanism, which consists of the pivoted shoes 29, connected to the armature by means of the links 29^a 29^b.

30 is an annular plate pivoted to the arms 29^a.

Mounted upon the plate 1 is an annular plate 31, from which project upwardly pins 32.

The operation of the clutch mechanism is as follows: When the armature is drawn in by the action of the magnet, the jaws 29 grip the rod 26 and raise the upper carbon. As the resistance of the arc increases the armature moves downward until the plate 30 strikes the pins 32, which moves the inner edges of the links 29^a upward and carries the shoes 29 out of engagement with the rod 26, thereby allowing the rod to drop until the upper and lower carbons are in contact, at which moment the armature 27 is again drawn into the magnet, the clutch engages the rod 26, and the arc is reëstablished.

We do not limit ourselves in any wise to the particular construction of the magnet-core and armature, which together form the dash-pot. Neither do we limit ourselves to the special construction of the clutch mechanism, as both instrumentalities may be modified to accomplish the same result without in any wise departing from the intent of our invention.

The circuit through the lamp is as follows: From the + binding-post through magnet 21, springs 33, Fig. 2, carbon-support 26, carbon 17, carbon 19, through conductor inclosed in the frame 2 at right-hand side of the lamp, to + binding-post.

When it is desired to trim the lamp, the ring 8^b is rotated until the tube 8 leaves the tube 7. This will permit the outer globe to descend and allow the introduction of the carbons through the cavity of the tube 7. The upper carbon can then be placed in the carbon-holder and fastened therein by screw 26^a, after which the lower carbon can be introduced and secured by means of the screw 34 and the tube 8 replaced on the tube 7.

Having thus described our invention, we claim—

1. In an arc-lamp, and in combination with the light-carbons, a globe closed at the bottom and having an aperture at the top, and a cap for said aperture adapted to fit the upper carbon, and provided with a depending flange slightly smaller in diameter than the aperture, thus serving to permit lateral play of the carbon, while holding said cap in place, substantially as described.

2. In a carbon-holder for the movable carbons of arc-lamps, a solenoid for controlling the movable carbon, a pair of links pivoted to the movable member of said solenoid, a pair of jaws adapted to hold the carbon, links pivoted to said first-named links to which said jaws are in turn pivoted, a disk through which the carbon extends, pivotally hung to said last-named links, and one or more stops under said disk, substantially as described.

In testimony whereof we affix our signatures in the presence of two witnesses.

SIGMUND BERGMANN.
ERWIN LAVENS.

Witnesses:
S. WERTHEIMER,
E. H. FOSTER.