No. 620,665. Patented Mar. 7, 1899.

M. S. OKUN.

ELECTRIC ARC LAMP.

(Application filed Jan. 16, 1896. Renewed Aug. 11, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

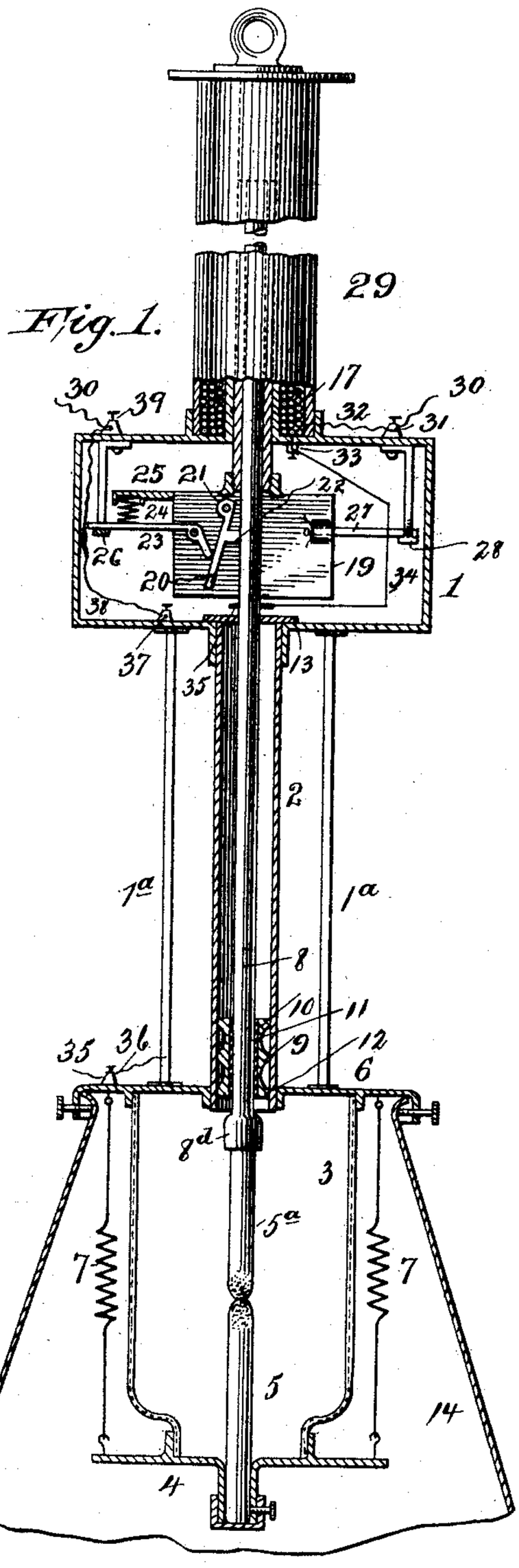
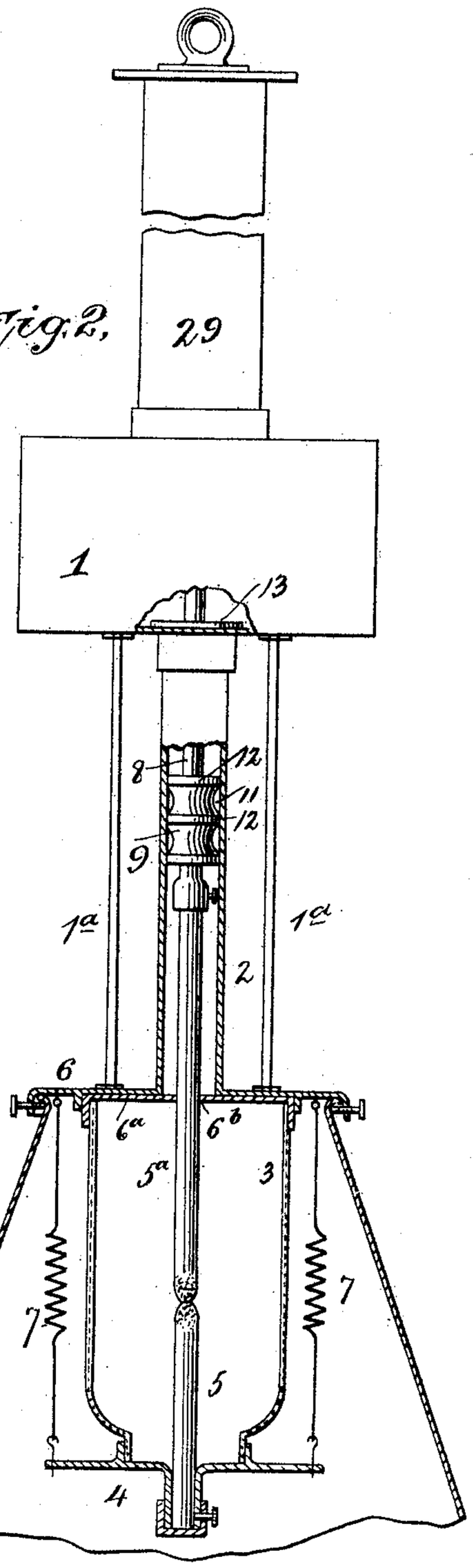


Fig. 2.



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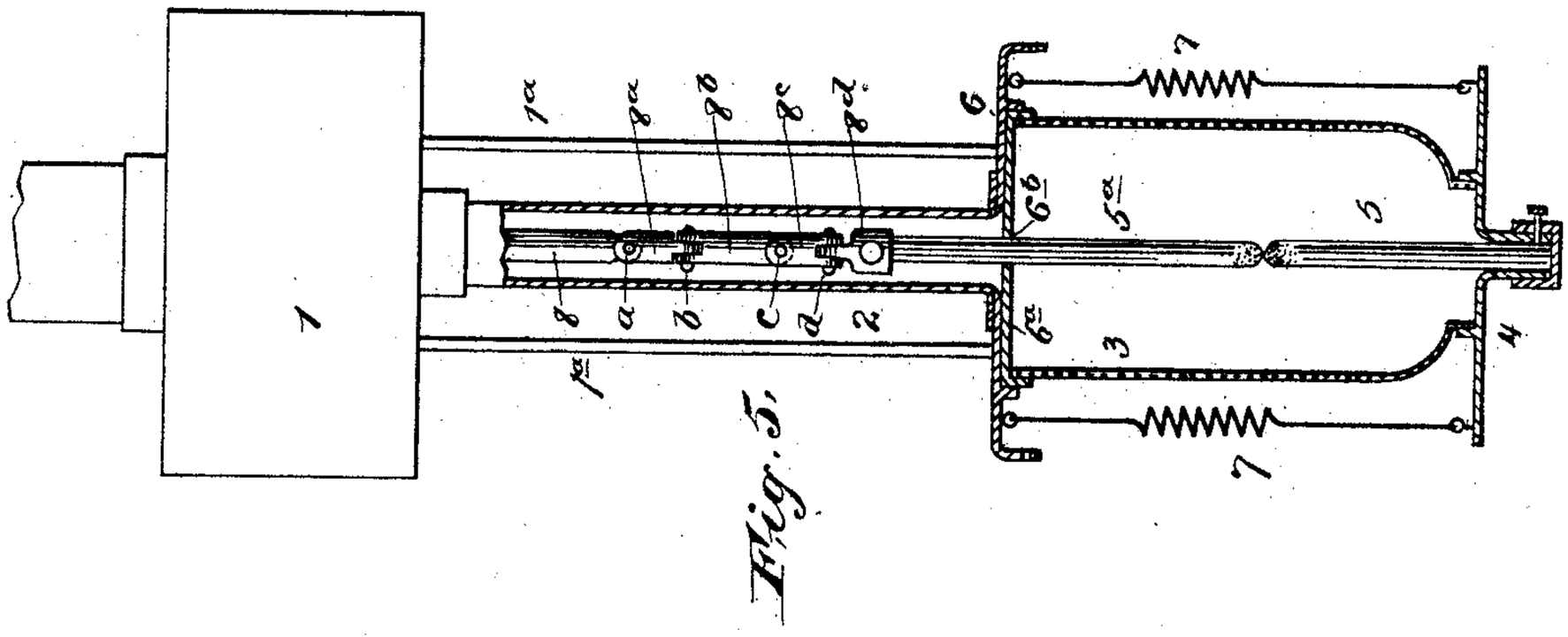

Fig. 3.

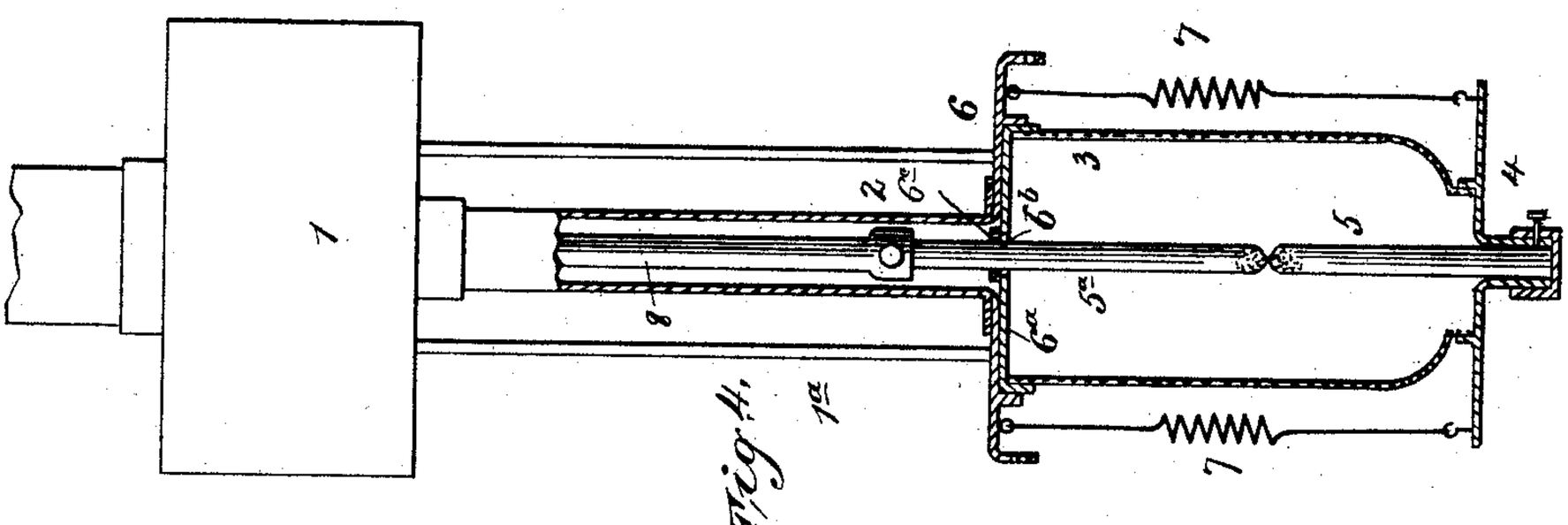

Fig. 4.

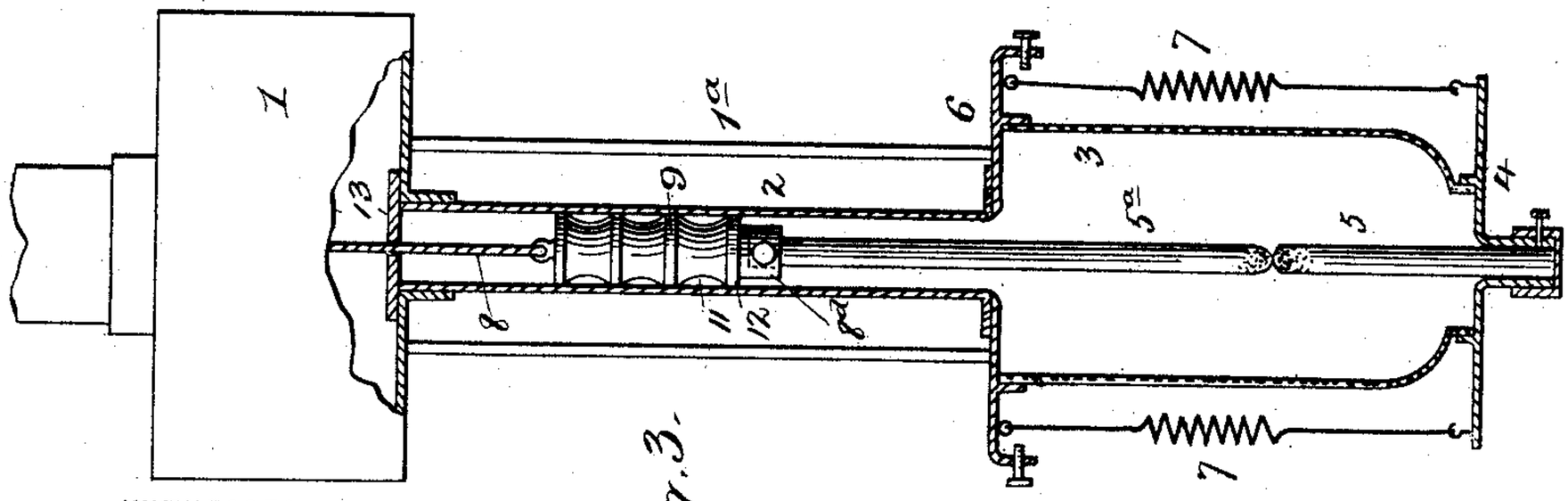

Fig. 5.

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ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 620,665, dated March 7, 1899.

Application filed January 16, 1896. Renewed August 11, 1898. Serial No. 688,403. (No model.)

To all whom it may concern:

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

My invention relates to the class of arc-lamps having closed globes and also to improved carbon-feeding mechanisms; and one of the objects of my invention is to provide improved means for keeping gases in the presence of the carbons, while permitting proper feeding of the carbon. This portion of the invention consists in the combination of a globe closed below the arc with a tube communicating therewith, a carbon-feeder and a plug, plunger, or enlargement carried thereby and fitting snugly in said tube, so that it can travel therein and yet retard the passage of air and gases into and from the globe. The upper end of this tube is closed by a laterally-movable apertured plate through which the carbon-feeder passes, and said tube leads to a tightly-closed mechanism-box.

The improved carbon-feeding mechanism consists of a solenoid and a core having a bore to receive the carbon-feeding rod, a support or plate carried by said core, a pivoted finger or dog carried by said support, a lever also pivoted on said support and adapted to act on said finger or dog, and an abutment to act on said lever to regulate the pressure of said lever or dog on said carbon-feeding rod.

The invention also consists in the combination, with a carbon-clutching mechanism, of a solenoid and core and an iron casing inclosing said solenoid and fitting snugly thereto to increase the magnetic action thereof.

The invention also consists in the novel details of improvement and the combination of parts that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming parts hereof, wherein—

Figure 1 is a vertical section, partly in elevation, of an arc-lamp embodying my improvements. Fig. 2 is a partly-sectional side elevation of a lamp, showing a slight change in detail. Fig. 3 is a sectional view of the lamp, showing my improvements applied to a flexible carbon-carrier; and Figs. 4 and 5 are sectional views showing other details.

In the accompanying drawings, in which similar numerals of reference indicate corresponding parts in the several views, the number 1 indicates a box or casing from which a tube 2 extends downwardly, and 3 is a globe with which said tube communicates. The globe 3 is closed below the arc and may be so closed by a plate or disk 4, which supports the lower carbon in any desired manner. The upper end of the globe 3 is closed by a cover or plate 6, through which the tube 2 communicates with the interior of the globe. 1^a are rods connecting box 1 with plate 6. The plate 4 and globe 3 are shown supported from the cover or plate 6 by suitable springs 7, which also serve to draw the parts together to make a tight fit between the globe and said plates.

In Figs. 1 and 3 the tube 2 is shown opening directly through the plate 6 into the globe to permit the carbon 5^a to feed into the globe.

8 is a carbon rod or carrier, which may be actuated by suitable mechanism, and it supports the carbon in suitable manner to feed the upper carbon. This rod or carrier 8 carries a plug, plunger, or disk 9, which fits snugly in the tube 2 to retard the passage of air or gas and yet in such manner that it can readily travel in said tube. The plug or disk 9 may be insulated from the carrier 8 by suitable insulation 10, Fig. 1, or may be made of insulating material. This plug or disk 9 may be provided with one or more annular recesses 11, by which annular rims 12 are formed, whereby air can be checked from passing. To further prevent the passage of air and gases into and from the tube 2 and globe 3, I place an apertured plate or washer 13 over the upper end of tube 2 and within the box 1, through which plate the carbon rod or carrier 8 passes. This plate or washer 13 has lateral movement to reduce friction on the carbon rod or carrier and yet retards the passage of air and gas. The box or casing 1 is preferably air-tight, with suitable provision, as a door, to permit access to its contained mechanism.

By means of the devices above described the life of the carbons will be prolonged in well-known manner, and the upper carbon can have free feeding movement through the

tube 2 and in the globe 3. Furthermore, a short globe can be used and most of the upper carbon can be consumed when the tube 2 opens directly into the globe 3, as the carbon-holder has free passage into the globe.

In Figs. 2, 4, and 5 the globe 3 is provided with a supplemental cover 6^a, fitting directly on the globe and beneath the cover 6, and the cover 6^a is provided with an aperture 6^b, which is alined with the tube 2 and through which the carbon 5^a passes and fits snugly therein to retard the passage of air and gas. With this arrangement the plug or disk 9 is confined in the tube 2, as the cover 6^a prevents it from passing into the globe. By these means a double protection is afforded against the passage of air and gas. On the cover 6^a I may place an apertured plate or washer 6^c, through which the carbon 5^a passes snugly, the opening 6^b being larger than the carbon. The plate or washer 6^c has lateral movement to reduce friction on the carbon.

In Figs. 1 and 2 I have shown a globe or shield 14, suspended from the cover or plate 6 and surrounding the globe 3 to protect the latter.

In Fig. 3 the disk or plug 9 is carried by a flexible support or carbon-carrier 8 and travels in the tube 2, thereby acting as a guide for the carbon 5^a, which is suitably connected with said plug or disk.

In Fig. 4 the carbon feeds as in Fig. 2 and the disk or plug is dispensed with, the tightly-closed tube 2 serving to retard the passage of air and gas.

In Fig. 5 the devices are substantially as in Fig. 4, excepting that I have illustrated means for reducing the friction between the carbon and the feed-aperture 6^b in the cover 6. For this purpose the carbon-carrier is shown made in jointed sections 8^a 8^b 8^c, the carbon-holder 8^d being jointed to the section 8^c. It will be seen that the pivots *a c* extend in one direction and the pivots *b d* extend in the opposite direction, the direction of said pivots alternating. This jointed carbon-carrier provides a feeding medium that will positively feed the carbon in a downward direction and yet permit free movement of the carbon in its aperture 6^b.

It will be understood that the upper carbon can be operated by any suitable mechanism in all of the illustrations given. In Fig. 1, however, I have shown an improved carbon-feeding mechanism which will produce accurate feeding of the carbon.

16 is a solenoid, shown mounted on the top of box 1, and 17 is its core, which passes through an opening in the top of the box into the latter. This core is hollow and receives the carbon-feeding rod, and said core carries a depending support or plate 19, on which is pivoted a finger or dog 20, which acts on the rod 8. The finger or rod 20 depends from its pivot 21 and has a toe or plug 22, which bears on the rod 8.

23 is a lever which is pivoted between its ends on the support or plate 19, the inner ends of said lever acting on the dog 20 to press the latter against the rod 8. The outer end of the lever 23 is pressed by a spring 24 to cause the dog 20 to bind on the rod 8, and said spring is shown located between the lever 23 and a projection 25 on the support or plate 19. The lever 23 is adapted to act on an abutment 26, carried by the box 1, to reduce and regulate the action of the spring 24 on the lever 23. The arrangement is such that when no current is passing the core 18 will descend until lever 23 encounters abutment 26, which tilts said lever so that the dog 20 is relieved from pressure on the rod 8, and the latter descends until the carbons touch. As soon as current traverses the solenoid it will draw in its core, thus lifting the support 19, dog 20, and lever 23. The spring 24 now acts on said lever, causing it to press dog 20 against rod 8, thereby gripping the latter, and thus lifting it and the carbon 5^a to strike the arc. When the arc becomes too strong, the core sinks and the lever 23 bears on the abutment 26 to reduce the spring pressing on said lever, thereby reducing the grip of the dog on rod 8, thus allowing the rod to feed until the arc is brought to the proper condition, whereupon the core rises, the dog again firmly grips the rod 8, and the carbon is held in the proper position, and so on, as the lamp continues to burn.

27 is a projection carried by the support 19, which engages an abutment 28, carried by the box 1 to limit the downward movement of the core 18.

29 is an iron sleeve fitting closely around the solenoid 17 to increase its magnetic action.

The course of the current may be traced as follows: The main wire 30 leads to a binding-post 31 on box 1, then by wire 32 to solenoid 17, which connects with a binding-post 33, from which a wire 34 leads to a brush 35, which engages the carbon-carrier 8, and thence through the carbons to the plate 4, (the spring 7 being insulated from plate 6.) The current may then traverse one spring 7 to a binding-post 35, carried by and insulated from the plate 6. One of the rods 1^a may be utilized as a conductor, in which case it will be insulated from the plate 6 and from the box 1, and a wire 36 will connect said rod with post 35. The rod 1^a connects with a binding-post 37 in box 1, from which a wire 38 extends to a binding-post 39, with which the main wire 30 connects; but the course of the current may traverse otherwise, if desired.

Having now described my invention, what I claim is—

1. In an arc-lamp a globe closed below the arc, a tube leading thereto and connected tightly therewith, a carbon carrier or feeder passing into said tube, a plug or plunger carried by said carrier or feeder and fitting

snugly in said tube so as to travel therein, and carbon regulating or feeding mechanism, substantially as described.

2. In an arc-lamp, the combination of a globe closed below the arc, with a tube leading thereto and tightly connected therewith, a carbon carrier or feeder, a plug or plunger carried by the latter and fitting snugly in said tube, means for closing the upper end of said tube, and carbon-regulating mechanism, substantially as described.

3. In an arc-lamp, the combination of a globe closed below the arc, with a tube leading thereto and tightly connected therewith, a carbon carrier or feeder, a plug or plunger carried by the latter and fitting snugly in said tube, an apertured plate or washer closing the upper end of said tube, said carbon carrier or feeder fitting snugly in the aperture in said plate or washer, and carbon-regulating mechanism, substantially as described.

4. In an arc-lamp, a globe closed below the arc, a cover thereon having an aperture in which a carbon can snugly fit, and a tube leading to said aperture, combined with a carbon carrier or feeder, a plug or plunger carried thereby and fitting snugly in said tube so that it can feed therein, and carbon-feeding mechanism, substantially as described.

5. In an arc-lamp, a globe closed below the arc, a cover thereon having an opening, a laterally-movable apertured plate or disk thereover, and a tube leading to said aperture, combined with a carbon carrier or feeder, a plug or plunger carried thereby and fitting snugly in said tube so as to feed therein, and carbon-feeding mechanism, substantially as described.

6. In an arc-lamp, with combination of globe, a plate at its lower end, a cover or plate on said globe, springs connecting said plates, a mechanism-box, a tube connecting said top plate and box, carbon-feeding mechanism, and means for closing said tube while permitting the carbon to feed, substantially as described.

7. In an arc-lamp, the combination of a globe, a plate at its lower end, a cover or plate on said globe having an opening, an apertured plate or washer thereover to receive a carbon, springs connecting said plates, a tube alined with the opening in the cover of the globe, a mechanism-box, a carbon-feeder in said tube, and carbon-feeding mechanism, substantially as described.

8. In an arc-lamp, a carbon-feeding mechanism comprising a solenoid and core, a carbon-feeding rod, a support carried by said core, a finger or dog carried by said support and extending substantially vertically to act on said rod, a lever also carried by said support to act on said finger, and an abutment to act on said lever, substantially as described.

9. In an arc-lamp, a solenoid and core, a carbon-feeding rod, a support carried by said core, a finger or dog having a toe and pivotally carried by said support, a lever also pivotally carried by said support to act on said finger or dog, and an abutment for said lever, substantially as described.

10. In an arc-lamp, a solenoid and a core having a bore, a carbon-feeding rod in said bore, a support carried by said core, a finger or dog pivotally carried by said support and having a toe to act on said feeding-rod, a lever also carried by said support to act on said finger or dog, a spring acting on said lever and against a projection on said support, and an abutment for said lever, substantially as described.

11. In an arc-lamp, a globe closed below the arc, a tube leading thereto and connected tightly therewith, a carbon carrier or feeder, a plug or plunger carried thereby, said plug or plunger having an annular groove forming an air-check and carbon feeding or regulating mechanism, substantially as described.

12. A carbon rod or feeder having a plurality of sections pivoted together, two of the pivots extending in one direction and two in the opposite direction, and a carbon-holder pivotally connected with one of said sections by one of said pivots, substantially as described.

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