

No. 744,093.

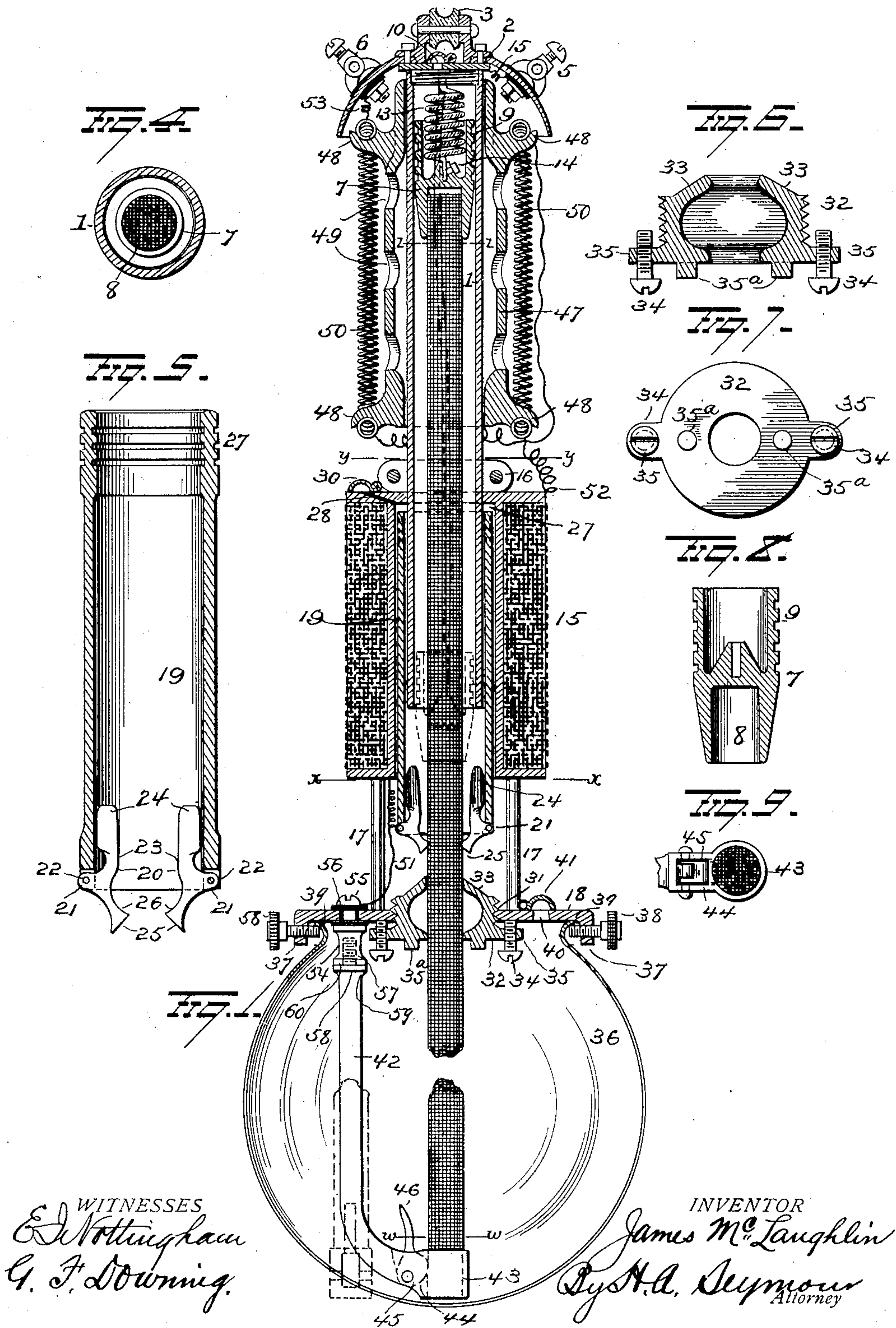
PATENTED NOV. 17, 1903.

J. McLAUGHLIN.  
ELECTRIC ARC LAMP.

APPLICATION FILED JULY 26, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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Fig. 2.

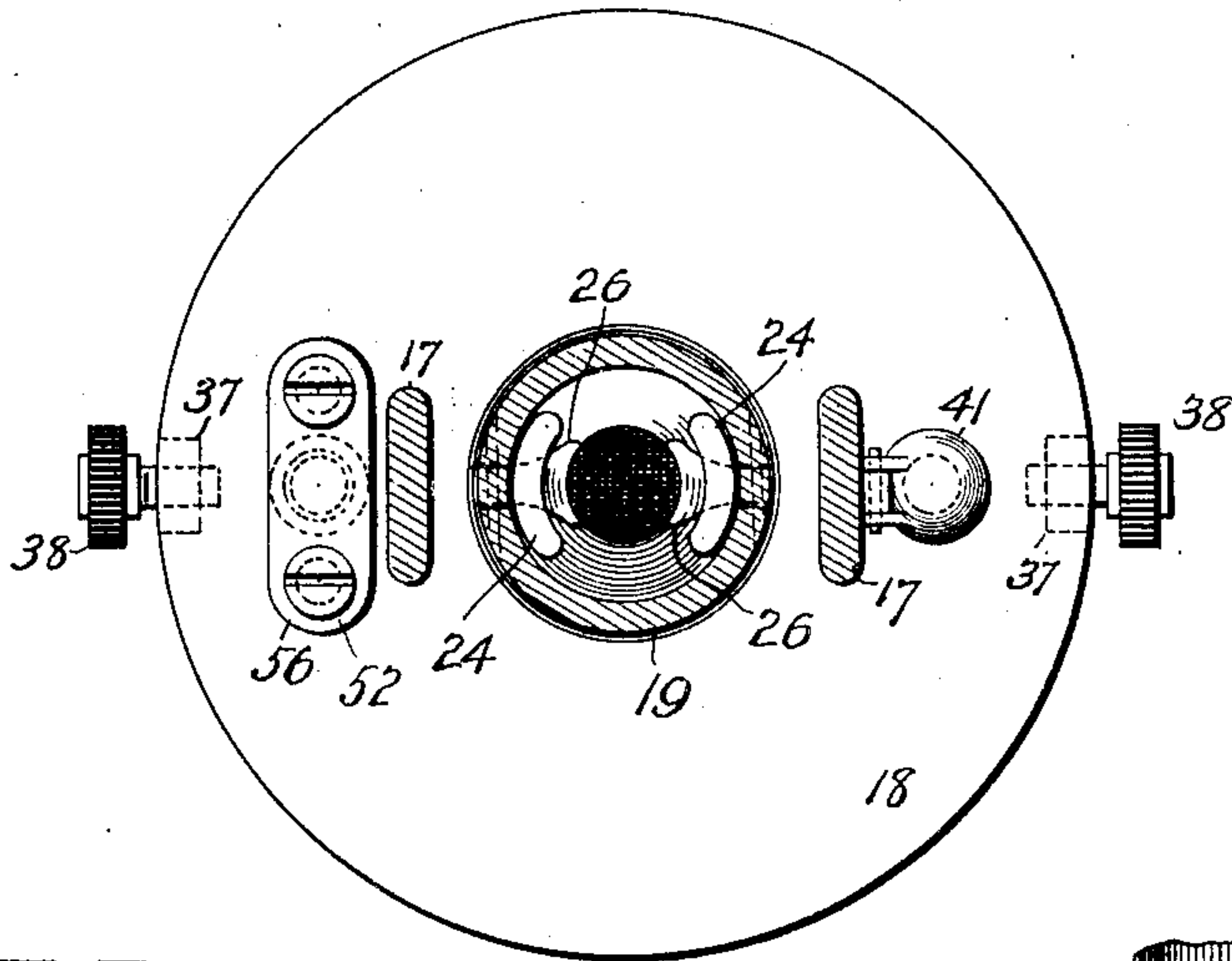


Fig. 3.

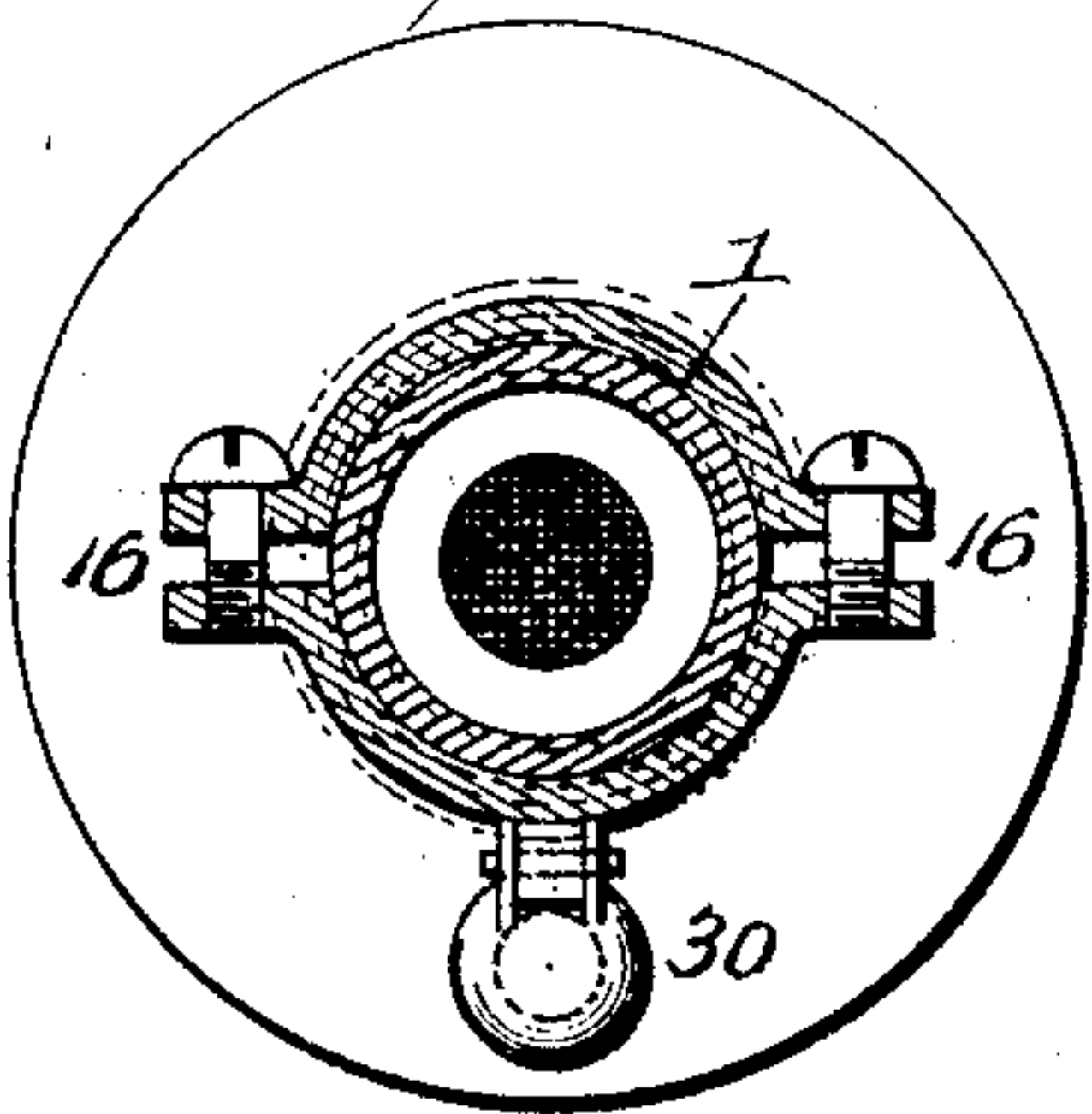


Fig. 4.

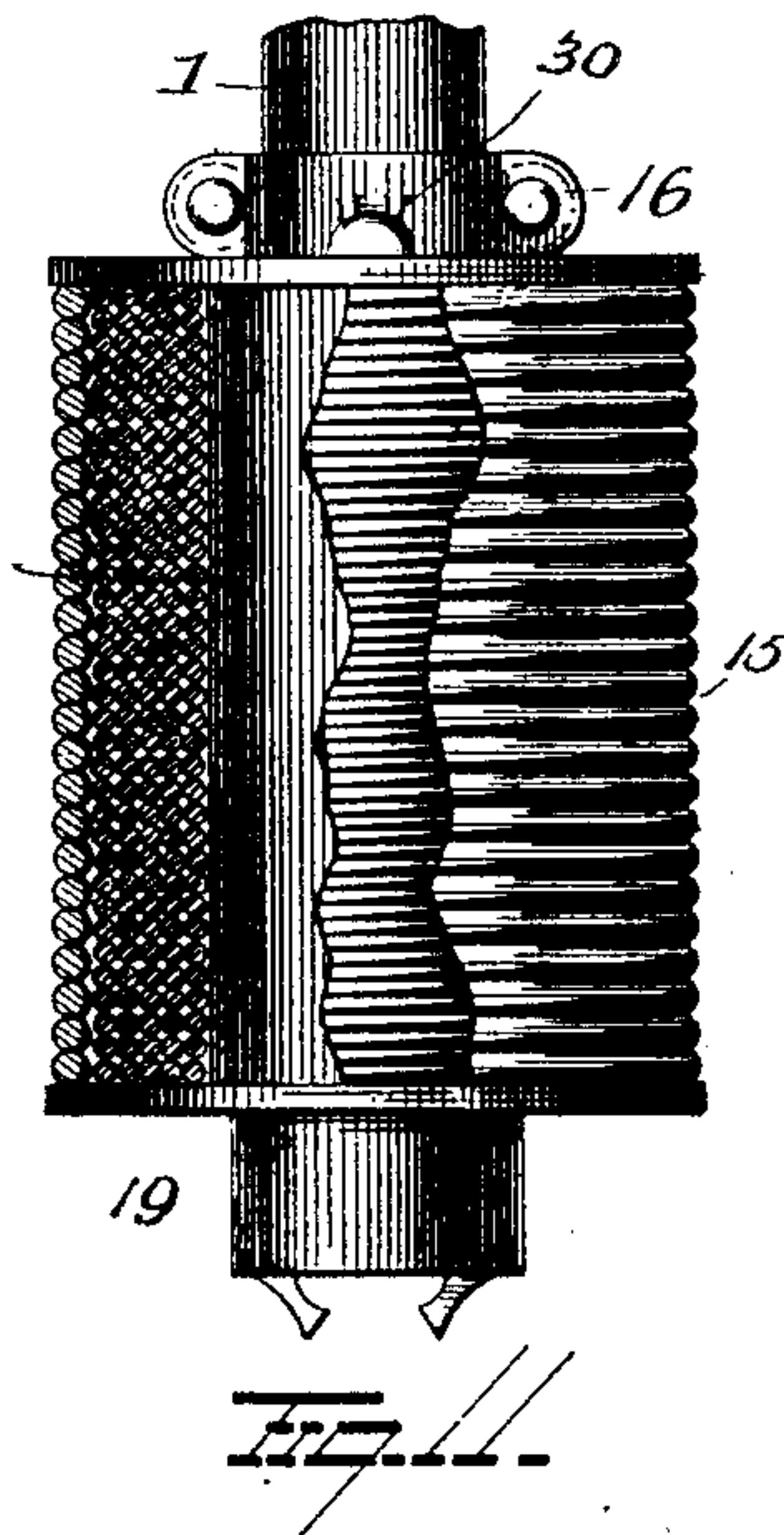


Fig. 1.

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# UNITED STATES PATENT OFFICE.

JAMES McLAUGHLIN, OF NEW YORK, N. Y.

## ELECTRIC-ARC LAMP.

**SPECIFICATION** forming part of Letters Patent No. 744,093, dated November 17, 1903.

Application filed July 26, 1902. Serial No. 117,177. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES McLAUGHLIN, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric - Arc Lamps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in electric-arc lamps, and more particularly to such as are adapted for use on constant-potential circuits, one object of the invention being to provide simple and efficient means for regulating and adjusting the length and amperage of the arc and to so locate said means as to render the same readily accessible without necessitating the removal of a hood or cover or any other device except the globe.

A further object is to provide means whereby the upper carbon will be held fixed when it shall have become consumed to a predetermined extent, thus preventing injury to parts of the lamp by breaking the arc and thereby opening the lamp-circuit.

A further object is to construct an electric-arc lamp in such manner that ready access can be had to the moving parts of the mechanism for the inspection, repair, or removal thereof by the removal of a single nut and without the necessity for the provision of doors or other means to render such access to the regulating mechanism necessary.

A further object is to increase the efficiency of the regulator magnet or solenoid and also to so construct the same as to result in economy of separate resistance-wire.

A further object is to produce an electric-arc lamp which shall be simple, light, and durable in construction, which shall comprise few parts, and which will avoid the use of weights, springs, and levers in the regulating mechanism and hinged doors in the casing.

A further object is to construct the regulating mechanism so as to prevent the flickering of the light and the clattering of the carbons.

A further object is to provide simple and efficient means for cushioning the feeding of

the upper carbon, and thus insuring a steady unflickering light.

A further object is to so construct the lamp that the expense and objections incident to two globes can be avoided and to so attach a single round globe of comparatively small size, which the rays of light from the arc will readily penetrate and become diffused, resulting in a saving in globes and current and an increase of light.

A further object is to provide simple means for protecting such a globe from injury which might result from pressure therein.

A further object is to so construct and arrange the regulating mechanism of an electric-arc lamp that it will be effectually protected from dust and insects and so that clogging and sticking will be effectually prevented.

A further object is to simplify and improve the construction of electric-arc lamps in various other respects and to produce a lamp which shall occupy small space and be effectual in the performance of its functions.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical sectional view of a lamp embodying my improvements. Fig. 2 is a transverse sectional view on the line *xx* of Fig. 1. Fig. 3 is a similar view on the line *yy* of Fig. 1. Fig. 4 is a cross-section on the line *zz* of Fig. 1. Fig. 5 is a sectional view of the core of the solenoid and the clutch-dogs. Fig. 6 is a detail sectional view of the adjustable nut. Fig. 7 is a bottom face view of the same. Fig. 8 is a detail view of the combined carbon-holder and air-pot plunger. Fig. 9 is a sectional view on the line *ww*, Fig. 1, showing the lower-carbon holder. Fig. 10 is a detail view of one of the valves; and Fig. 11 is a detached view of the solenoid, showing its covering of iron wire.

1 represents a tube which constitutes the backbone of the lamp and which serves to support the various parts of the lamp structure, including the regulating mechanism. The upper end of the tube 1 is closed by means



of a removable plug or cap 2, and to this cap an insulator 3 is attached to receive means for suspending the lamp. The plug or cap 2 is also provided with a hood 4, (preferably of insulating material,) to which binding-posts 5 6 are secured and insulated therefrom.

A socketed piece 7 is located within the tube 1 and its lower portion constitutes a holder for the upper carbon 8 of the lamp. The upper portion of the piece 7 is made cylindrical and constitutes an air-pot plunger 9, the tube 1 acting as the cylinder of said air-pot in which the plunger moves. To permit the entrance into and exit of air from the tube or cylinder 1 above the plunger 9, the cap or plug 2 is provided with a duct 10, and to control the passage of air through this duct into and from the tube or cylinder 1 a valve 11 is located upon the top of the plug or cap 2 and adapted to close downwardly over the duct 10. From this construction and arrangement of parts it will be observed that when a carbon rod is inserted into the holder 8 and the combined carbon-holder and plunger pushed up to a point approximating the cap or plug 2, as shown in full lines in Fig. 1, air in the tube 1 above the plunger will be expelled through the duct 10, the valve 11 automatically rising to permit its escape. During the descent of the plunger and carbon, however, the movement thereof will be retarded and cushioned by the partial vacuum formed in the tube 1, the valve 11 in such case serving to retard the entrance of air into the tube. Thus the feeding of the upper carbon will be uniform, its descent cushioned, and slipping and clattering thereof will be avoided.

A lug projects upwardly within the hollow plunger 9 and is provided with a socket 12 for the reception of one end of a flexible conductor 13, which is secured therein by means of a suitable screw 14. The conductor 13 is adapted to coil in the hollow plunger, as shown in Fig. 1, and project above the same, its upper end being attached to the cap or plug 2 and connected by an insulated wire 15 with the positive binding-post 5 of the lamp. In this way the positive terminal of the lamp is electrically connected in an efficient manner with the upper carbon of the lamp. As the upper carbon descends the flexible conductor 13 uncoils, and said conductor is of such length that when it has fully uncoiled, as shown in dotted lines in Fig. 1, the lower end of the holder 8 will be disposed a short distance above the clutches and further descent of the carbon will be prevented, said carbon being held suspended by the flexible conductor. In this way the falling of the carbon after having been consumed to a sufficient or desirable extent and the possible short-circuiting of the lamp and injury to the regulating mechanism are effectually avoided, because when the carbon has descended to an extent determined by the length of the flexible conductor 13 and its further feeding pre-

vented the arc will break shortly after the carbon has reached this limit of downward movement and the lamp will be open-circuited.

A regulator-magnet or solenoid-spool 15 is removably secured to the lower portion of the tube 1 by means of a clamp 16, and from the lower end of the frame of this solenoid-spool legs 17 depend, the lower ends of said legs being secured to and serving to support a horizontal bottom plate 18, to which further allusion will be hereinafter made. The solenoid-spool is so located relatively to the tube 1 that said tube will extend partially through the same, or, in other words, so that the solenoid-spool will depend below the lower end of the tube 1. The bore of the solenoid-spool is of such diameter relatively to the external diameter of the tube 1 that an annular space or chamber 29 will be formed between these parts, and into this space or chamber the tubular core 19 of the solenoid projects, as shown in Fig. 1. The tubular core 19 is of sufficient length to depend below the lower end of the solenoid-spool, and to its lower end (at diametrically opposite points) clutch-dogs 20 are pivoted. Each clutch-dog is provided between its ends with a lug 21 to enter a notch in the lower end of the tubular core, in which it is pivotally supported by a pin 22. The upper arm 23 of each dog projects upwardly within the tube, approximately parallel with the inner face thereof, and is provided at its upper end with a soft-iron armature 24 to be attracted by the core when the latter is energized. The lower arm of each clutch-dog is made with a beveled lower face 25, at the inner end of which a tooth 26 is formed to bite the upper carbon rod. The upper end of the tubular core 19 is made to form an annular plunger 27, which moves in the upper portion of the annular chamber 29 between the tube 1 and the wall of the bore of the solenoid-spool. A duct 28 in the upper end of the spool permits the passage of air into and from the upper end of the annular chamber 29, and this duct is normally closed by a valve 30, located upon the spool, said valve acting automatically to permit the free exit of air from the annular chamber and retard the entrance of air into said chamber. From this construction it will be observed that while the core 19 and clutch-dogs can move freely in an upward direction to separate the carbons and establish the arc their downward movement will be retarded by the action of the air-pot construction formed by the annular chamber 29 and the plunger at the upper end of the core. This retardation of the core 19 and clutch-dogs 20 will cooperate with the air-pot construction at the upper end of the tube 1 and assist the latter in cushioning the downward movement of the upper carbon and in preventing the clattering of the same, as well as insuring its steady and accurate feed, as hereinbefore explained.

The bottom plate 18 of the lamp structure



is provided centrally with a hole 31 of sufficient size to permit access through it to the moving parts of the regulator mechanism. The wall of this hole is threaded for the accommodation of a nut 32, which is preferably made hollow and provided at its top and bottom with alined holes for the passage of the upper carbon. The upper end of the nut 32 is made with a conical external surface 33 for the purpose of actuating the clutch-dogs 20—that is to say, when the arc between the carbons lengthens and its resistance correspondingly increases the current flowing through the solenoid-coil will fall and the core be thus permitted to descend until the beveled lower ends of the clutch-dogs 20, engaging the conical upper portions of the nut 32, will cause said dogs to turn on their pivots and loosen their grip on the upper carbon, and thus permit said carbon to feed. By moving the nut 32, so that its conical upper end will project a greater or less distance upwardly above the plate 18 the point at which the clutch-dogs will be tripped can be accurately adjusted, and in this way the length of the arc, as well as its amperage, can be regulated to a nicety without the necessity of adjusting or disturbing the resistance-coil of the lamp or any other part of the lamp mechanism. In order to secure the regulating-nut 32 at any desired adjustment, set-screws 34 are employed, said set-screws passing upwardly through lugs 35, projecting from said nut and engaging the under face of the plate 18. When no current is flowing through the lamp, the carbons will be in contact with each other, the clutch-dogs being held released from the upper carbon by the regulating-nut 32. When current enters the lamp and energizes the solenoid, the armatures of the clutch-dogs will be attracted by the magnetized core of the solenoid and said dogs made to grip the carbon. The solenoid-core will also be drawn upwardly within the spool, thus raising the clutch-dogs and the carbon and establishing the arc. By removing the nut 32 access can be had to the movable parts of the regulator mechanism for the purpose of inspecting, repairing, or removing the same, and thus all necessity for the provision of doors in the lamp-casing is avoided. A lamp-casing quite ornamental in appearance can therefore be provided and kept permanently closed. To facilitate the removal of the nut 32, it is provided on its lower face with lugs 35 for the reception of a wrench. The horizontal plate 18 also serves as a cover and holder for the globe 36, for which purpose the plate is provided with lugs 37 to receive screws 38, the inner ends of which are engaged by the lip 39 on the globe. Heretofore it has been customary in arc-inclosed lamps to provide two globes—one small globe to inclose the arc and a large globe inclosing the smaller one. Such use of two globes is found to be objectionable, because they tend to interfere with the perfect diffusion and radiation of the light-

rays, necessitating the latter to penetrate and be diffused by two globes widely separated and resulting in the consumption of an excessive amount of current. To avoid these objections, I provide a single globe, preferably spherical in form and of a size larger than the arc-inclosing globes heretofore employed, but considerably smaller than the outer globes now in use with arc-inclosed lamps. In order to relieve excessive pressure in the globe 36, its cover (the plate 18) is provided with a vent 40, normally closed by an outwardly-opening valve 41, pivoted upon said plate or cover 18. The plate or cover serves not only to support the globe 36 and the regulating-nuts 32, but also the lower-carbon holder. For this purpose an arm 42 is secured to but insulated from the plate 18 through the medium of a block 54 and depends therefrom into the globe 36, terminating near the bottom thereof, where it is bent or curved laterally and provided with a socket 43 for the reception of the lower carbon. The block 54 is secured to the plate 18 by means of screws 55 passing through lugs 56 on the block, said screws and block being insulated from the plate in any suitable manner. The block 54 is provided with a threaded socket 57, opening at the lower end thereof for the reception of a shank 58, projecting upwardly from the arm 42, the upper end of said arm forming a shoulder 59 to normally abut against a similar shoulder 60 at the lower end of the block 54 when the arm is in its operative position. By this construction I am enabled to move the lower-carbon holder out of line with the hole in the plate 18, through which the upper carbon passes, to permit the ready removal through said hole of movable parts above the plate 18. To thus move the lower-carbon holder laterally, it is simply necessary to turn the arm 42 to the position shown in dotted lines, and as the lower end of the arm is curved or bent laterally said arm can be readily turned by grasping the lower curved portion without the use of a wrench or other tool. Adjacent to the socket 43 the arm 42 is made with a hollow enlargement 44, communicating with the socket, and in said hollow enlargement a cam 45 is pivoted near its lower end, the upper end of said cam being provided with a handle 46, by means of which to operate it. With a clamp for the lower carbon thus constructed the carbon can be inserted from the bottom, and after being adjusted properly in the socket a slight downward pressure on the carbon will cause the cam to clamp the carbon automatically and effectually prevent its escape.

A cylinder 47, of insulating material, is secured on the upper portion of the tube 1 and provided at or near its respective ends with hook-shaped lugs 48 for supporting a resistance-coil or several resistance-coils in series. The intermediate portion of the cylinder 47 is offset from the tube and provided with perforations 49 for ventilating purposes.



In order to reduce the amount of resistance-wire in the coil or coils 50, the solenoid is wound with resistance-wire, and I employ an inner tube, of insulating material, on which  
 5 the resistance-wire is wound to prevent injury from heat generated in the wire. I also use as a covering for said solenoid and insulated from the resistance-wire 62 a layer or layers of iron wire closely wound as a shield  
 10 or keeper for the magnetism, which helps to increase the magnetism and cushions and strengthens the magnetic action of the coil on the core of the solenoid, which is very beneficial in maintaining a uniform arc.

15 The circuit through the lamp can be readily traced from the positive binding-post through the flexible conductor to the upper-carbon holder, thence through the upper carbon to the lower carbon, thence by the arm  
 20 42 and a conductor 51 to the spool of the solenoid, thence by a conductor 52 to the resistance-coil, and from the latter by a conductor 53 to the negative terminal of the lamp.

25 Various slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope, and hence I do not wish to limit myself to the precise details herein set  
 30 forth.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

35 1. In an electric-arc lamp, the combination with the tubular movable core of a solenoid, of clutch-dogs adapted to be closed by magnetic attraction, said dogs pivoted at the lower end of the tubular core and projecting there-into, and an adjustable device with which  
 40 the lower ends of said dogs coöperate to open them.

45 2. In an electric-arc lamp, the combination with a pair of clutch-dogs pivotally connected with the hollow core of the solenoid and having portions projecting upwardly into said core, the upper ends of said dogs constituting armatures constructed and arranged to be attracted by the core and cause the lower ends of the clutch-dogs to grip the carbon, of an ad-  
 50 justable device adapted to simultaneously separate the gripping ends of the clutch-dogs and release the carbon, substantially as set forth.

55 3. In an electric-arc lamp, the combination with a frame and a movable solenoid-core, of pivoted clutch-dogs carried by said core, said frame having a hole of sufficient diameter to permit the removal of said core and clutch-dogs and an adjustable nut in said hole and  
 60 provided with a part to coöperate with said dogs for disengaging them from the carbon.

65 4. In an electric-arc lamp, the combination with the tubular core of a solenoid and a pair of clutch-dogs pivoted to the lower end of the core, the upper arms of the clutch-dogs extending upwardly within the tubular core and their lower and gripping arms depend-

ing below the core, of an adjustable device for actuating the clutches and releasing them from the carbon, substantially as set forth. 70

5. In an electric-arc lamp, the combination with a pair of pivoted clutch-dogs, and means for actuating said dogs to grip the upper carbon and for raising said dogs to separate the carbons, each of said dogs having a beveled  
 75 face at its lower end, each beveled face terminating in a tooth to grip the upper carbon, of an adjustable nut having a conical upper end to engage the beveled faces at the lower ends of the clutch-dogs and move the latter to  
 80 disengage their teeth from the upper carbon.

6. In an electric-arc lamp, the combination with a pair of pivoted clutch-dogs to engage the upper carbon, and means for raising said dogs to separate the carbons, of a fixed plate  
 85 having a large central opening through which access to the interior of the lamp mechanism can be had, and an adjustable and removable nut in said opening, said nut having a conical upper end to separate the clutch-dogs  
 90 from the carbon.

7. In an electric-arc lamp, the combination with a solenoid having a movable tubular core, of a pair of clutch-dogs pivoted to the lower end of said core and provided with armatures  
 95 projecting upwardly into said core to be attracted thereby, and an adjustable device for separating the clutch-dogs from the carbon to release the latter.

8. In an electric-arc lamp, the combination 100 with a solenoid having a movable tubular core, of clutch-dogs pivoted between their ends to the lower end of the tubular core and provided at their upper ends with armatures disposed within and adapted to be attracted by  
 105 the core, and an adjustable device to enter between the lower ends of said dogs to release them from the carbon.

9. In an electric-arc lamp, the combination 110 with a solenoid having a movable tubular core, of a pair of clutch-dogs pivoted between their ends to the lower end of said core, each of said dogs having an arm projecting upwardly within the core and provided with an armature to be attracted by the core, the de-  
 115 pending arms of said dogs having teeth to grip the upper carbon and an adjustable device to enter between the lower ends of said dogs and move their teeth away from the carbon to release the latter. 120

10. In an electric-arc lamp, the combination 125 with a solenoid, and a tube located within the solenoid, of a movable core constructed and arranged to reciprocate within the annular space formed between the solenoid and tube, said core being provided with a plunger for  
 130 retarding its descent, and clutch-dogs pivotally connected to said core, substantially as set forth.

11. In an electric-arc lamp, the combination 135 with a solenoid provided with an interior annular space, of a movable core constructed and arranged to reciprocate within said annular space, a clutch connected with said core



and a valve at the upper end of said annular space for permitting the air to escape therefrom when the core is raised, substantially as set forth.

5 12. In an electric-arc lamp, the combination of a solenoid provided with a movable core, and a clutch carried by said core, said solenoid provided interiorly with a valved air-chamber and a plunger at the upper end of  
10 the core operating in said chamber to retard the descent of said core.

13. In an electric-arc lamp, the combination with a solenoid and a tube located inside the solenoid and arranged to form an annular  
15 air-space between the tube and bore of the solenoid, of a movable core constructed at one end to snugly fit against the bore of the solenoid and the outer surface of said tube, and a valve for permitting of the ready es-  
20 cape of air from the upper end of said annular air-space, substantially as set forth.

14. In an electric-arc lamp, the combination with a solenoid and a tube located therein and adapted to form an annular space between  
25 its outer surface and the bore of the solenoid, of a movable core the upper end of which is provided with annular grooves on its inner and outer surface, and adapted to engage the walls of said annular space, and a valve for  
30 permitting of the ready escape of air from the upper end of said annular air-space, substantially as set forth.

15. In an electric-arc lamp, the combination with a solenoid and core, of a pair of clutch-  
35 dogs pivoted to the lower end of the core, the upper arms of the clutches arranged to project upwardly into the core and constituting armatures, and the lower arms being out-  
wardly beveled and a vertically-adjustable  
40 nut provided with a beveled upper surface with which the lower arms of the clutch-dogs engage in feeding the carbon, substantially as set forth.

16. In an electric-arc lamp, the combination  
45 with a tube provided at its upper end with a self-closing valve, and a carbon-holder adapted to snugly fit the bore of the tube and thereby retard the descent of the holder, of a so-  
lensoid-spool having a valved air-chamber in  
50 its upper part and a solenoid-core having clutch-dogs connected therewith, said core constituting a plunger in the air-chamber for retarding the descent of the core, substan-  
tially as set forth.

17. In an electric-arc lamp, the combination  
55 with a tube provided at its upper end with an air-chamber and a self-closing valve therefor, of a carbon-holder provided with a lower recess for the reception of the end of a carbon  
60 and with an upper recess for the reception of a flexible conductor, the upper portion of the holder being provided with exterior annular recesses to constitute a plunger in said air-chamber, substantially as set forth.

18. In an electric-arc lamp, the combination  
65 with the holder for the upper carbon, an air-pot for retarding its descent and a valve for

permitting it to be quickly raised, of a mov-  
able solenoid-core having a carbon-clutch con-  
nected therewith, an air-pot for checking the  
70 descent of the core, said core constructed at its upper end to constitute the plunger of said air-pot, and a valve for permitting it to be quickly raised, substantially as set forth.

19. In an electric-arc lamp, the combination  
75 with a tube having an air-chamber therein and means for retarding the entrance of air into the upper end of the latter, of a carbon-holder in said tube, a hollow plunger above the carbon-holder, and a conductor secured  
80 in the plunger and adapted to coil therein, the other end of said conductor secured to the upper end of the tube.

20. In an electric-arc lamp, the combination  
85 with a tube and a carbon-holder therein, of a flexible conductor attached at one end to the carbon-holder and at the other end to the tube, said flexible conductor being of such length as to stop the holder and suspend the  
carbon carried thereby in a fixed position  
90 when said carbon shall have been consumed to a predetermined extent, whereby the arc will be broken and the lamp open-circuited before the lamp can be short-circuited by the dropping of the upper carbon.

21. In an electric-arc lamp, the combination  
95 with a solenoid wound with resistance-wire and a shield of iron wire inclosing the resistance-wire, of upper and lower carbons in series with the solenoid-winding, and a clutch  
100 for the upper carbon carried by the core of the solenoid.

22. In an electric-arc lamp, the combination  
of a horizontal plate and means for support-  
ing the same, said plate having a central hole,  
105 a regulating-nut passing through said hole, a clutch adapted to engage said nut to release the upper carbon, means for operating said clutch, a single globe removably attached to  
said horizontal plate, and a valved outlet in  
110 said plate to relieve pressure in the globe.

23. In an electric-arc lamp, the combination  
of a horizontal plate and means for support-  
ing the same, said plate having an opening  
for the passage of the upper carbon, and hav-  
115 ing a separate opening, a downwardly-closing valve over said separate opening, an arm depending from said plate, a clamp for the lower-carbon holder at the lower end of said  
arm, and a single globe inclosing the carbons  
120 and attached at its upper end to said horizontal plate.

24. In an electric-arc lamp, the combination  
with a supporting-plate, of a block secured  
thereto, an arm adjustably secured to said  
125 block and depending therefrom and terminating in a vertical socket open at both ends for the reception of the lower carbon of the lamp, a hollow enlargement on said arm communicating with said socket, a cam pivoted  
130 near its lower end in said hollow enlargement and adapted to engage the carbon in said socket and a handle on said cam.

25. In an electric-arc lamp, the combination



with a tube, of a solenoid surrounding the tube and supported solely thereby, a clamp removably securing the solenoid to the tube, a movable core located between the tube and  
5 spool of the solenoid, and a carbon-clutch connected to the movable core, substantially as set forth.

26. In an electric-arc lamp, the combination of a tube, means attached thereto for suspending the same, a regulating-magnet encircling the tube, a clamp removably securing the magnet to said tube, a frame or cylinder of insulating material encircling the upper portion of said tube, resistance-wire on  
15 said frame or cylinder and included in series with the regulator-magnet and a clutch controlled by said regulator-magnet.

27. In an electric-arc lamp, the combination with a solenoid and hollow movable core, of  
20 clutch-dogs pivoted to the lower edge of the core, said dogs being provided with long arms that extend upwardly between the carbon and inner surface of the core, and with short arms that grip the carbon, substantially as set  
25 forth.

28. In an electric-arc lamp, the combination with a supporting-frame and a horizontal plate at the lower end thereof, said horizontal plate having a central hole for the removal of  
30 movable parts from above said plate, of a removable nut in said hole, said nut constitut-

ing a guide for the upper carbon, an arm having a lower-carbon holder at its lower end and an adjustable connection between said arm and horizontal plate to permit the arm to be  
35 turned and the lower-carbon holder to be moved out of line with the hole in the horizontal plate.

29. In an electric-arc lamp, the combination with a plate for supporting the globe, said  
40 plate having a large screw-threaded hole centrally disposed therein, of a nut adapted to fit within and to be vertically adjusted in said hole, flanges and set-screws for securing the nut against rotary displacement, the upper  
45 portion of the nut being conically shaped to actuate the clutches, an opening being formed through the nut for guiding the feeding-carbon, substantially as set forth.

30. In an electric-arc lamp, the combination  
50 with a plate and globe removably secured to its lower side, of a nut for regulating the length of the arc, and means for adjusting the nut from the under side of the plate.

In testimony whereof I have signed this  
55 specification in the presence of two subscribing witnesses.

JAMES McLAUGHLIN.

Witnesses:

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GEO. E. SCHEFFLER.