

No. 770,373.

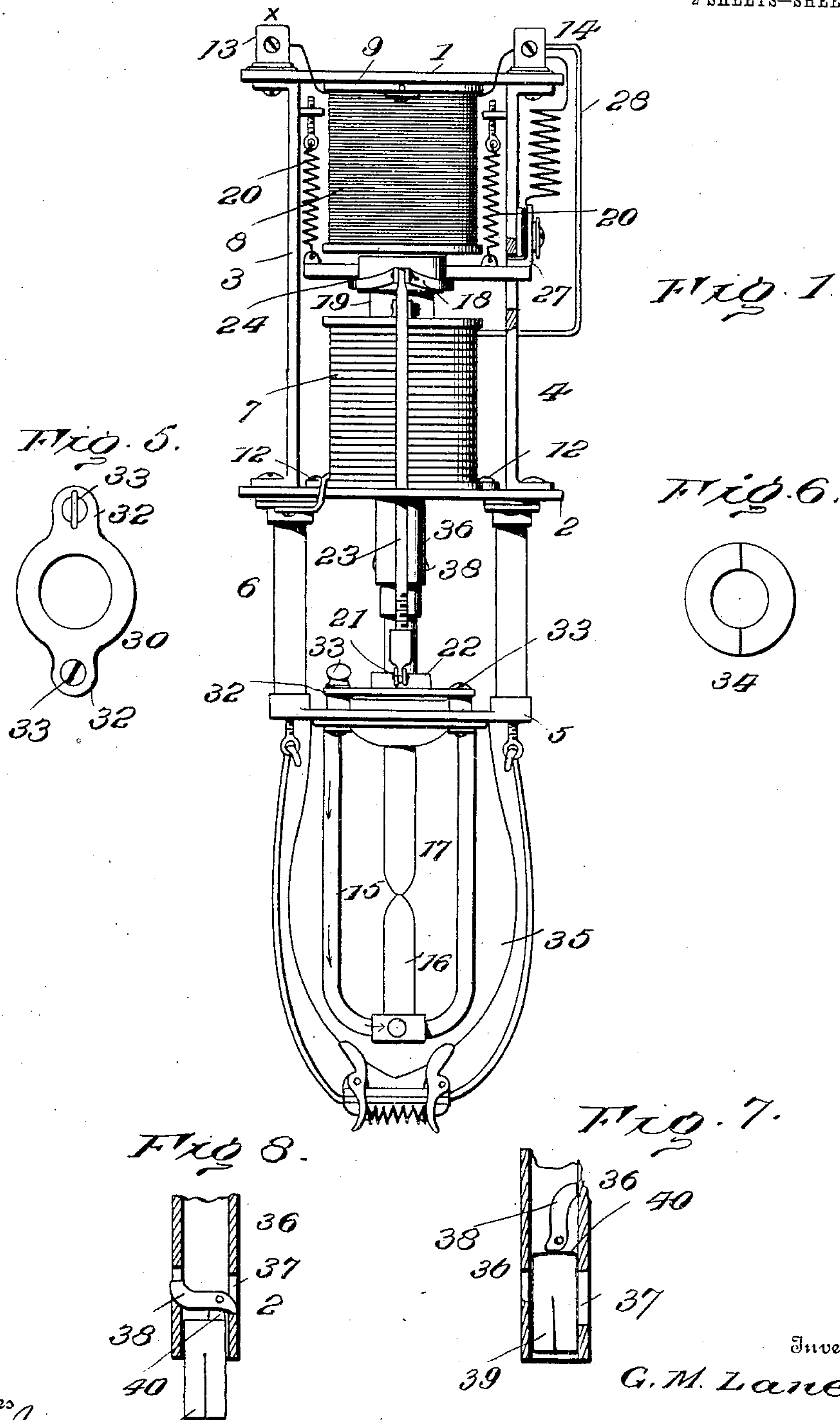
PATENTED SEPT. 20, 1904.

G. M. LANE.
ELECTRIC ARC LAMP.

APPLICATION FILED NOV. 21, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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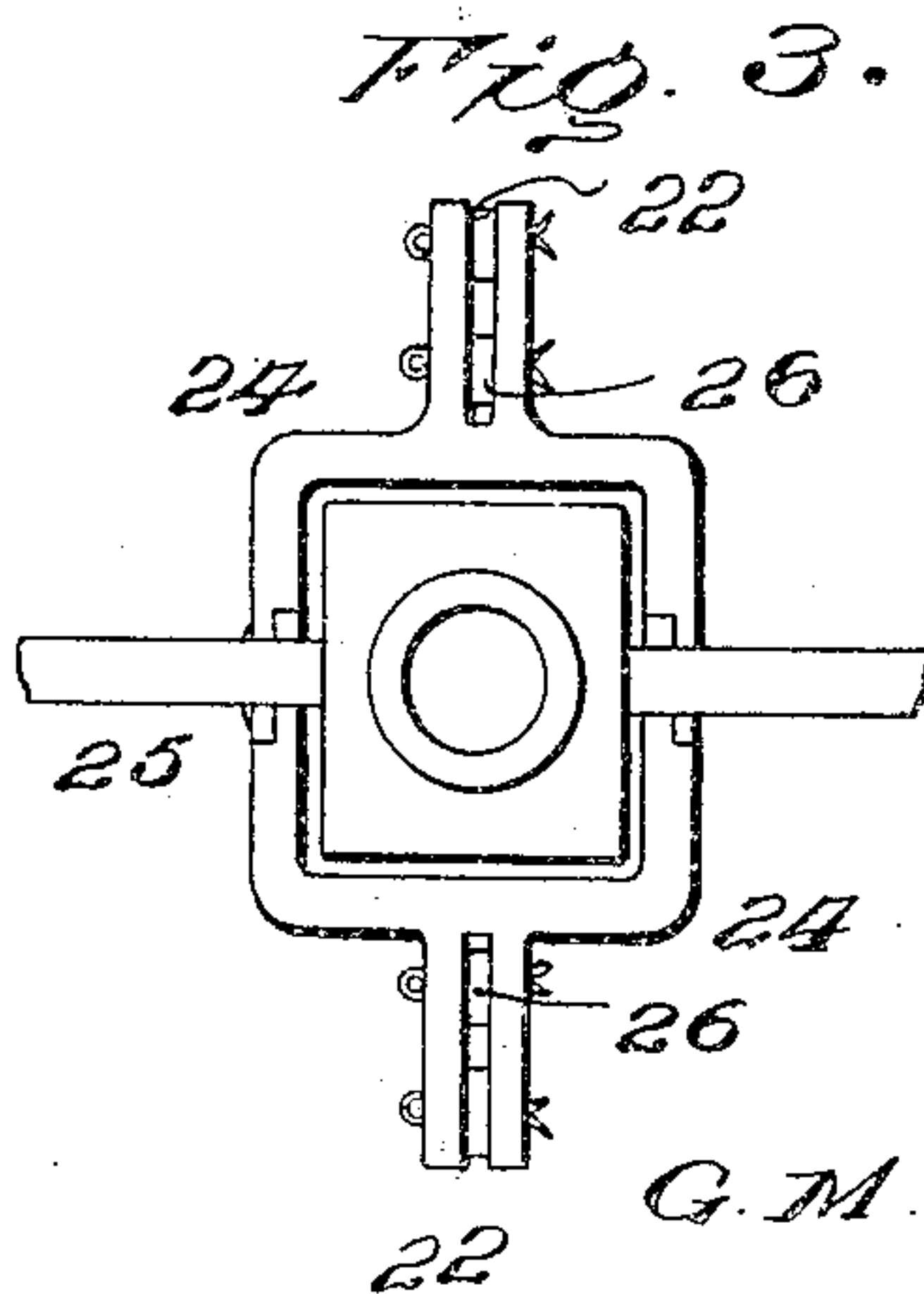
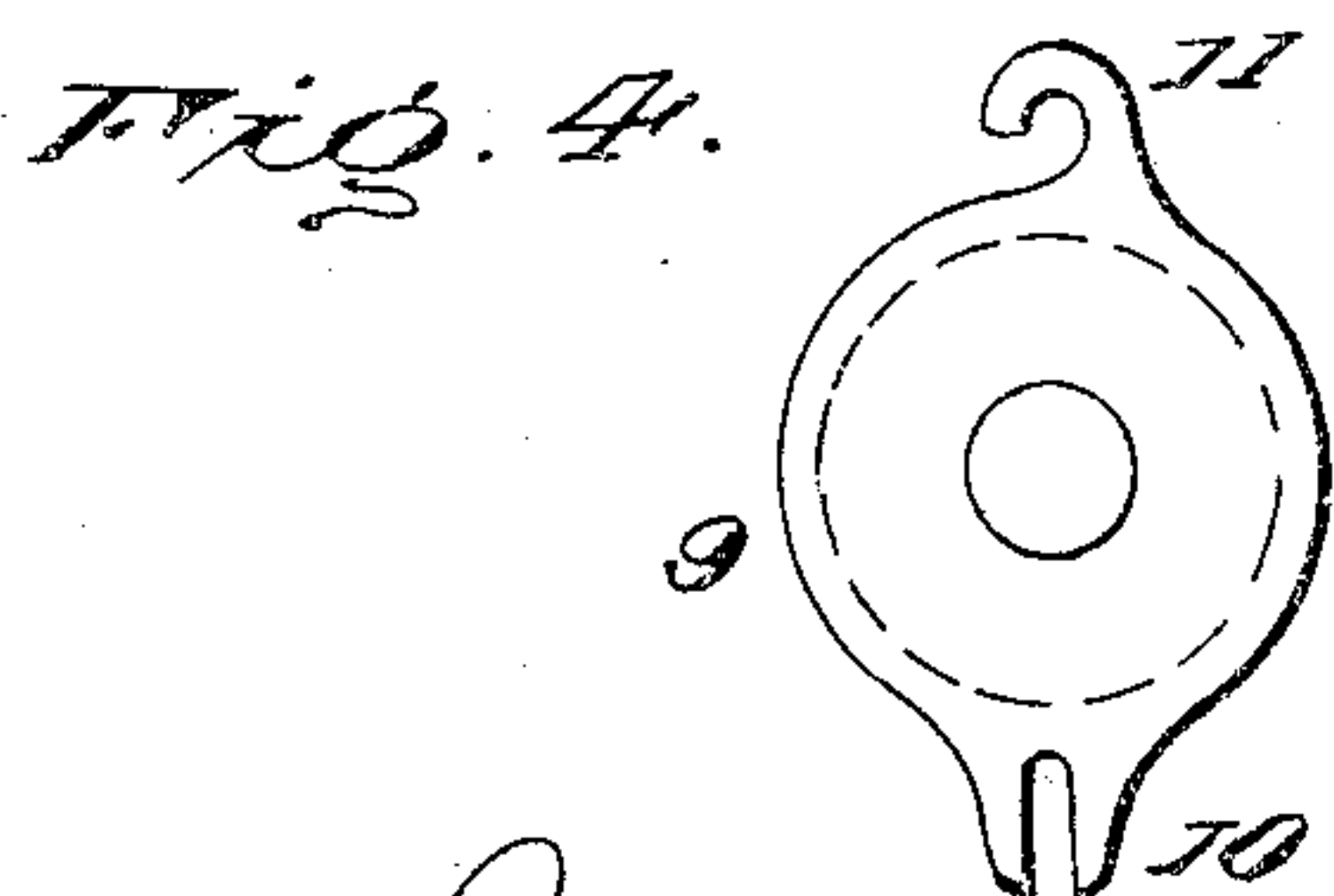
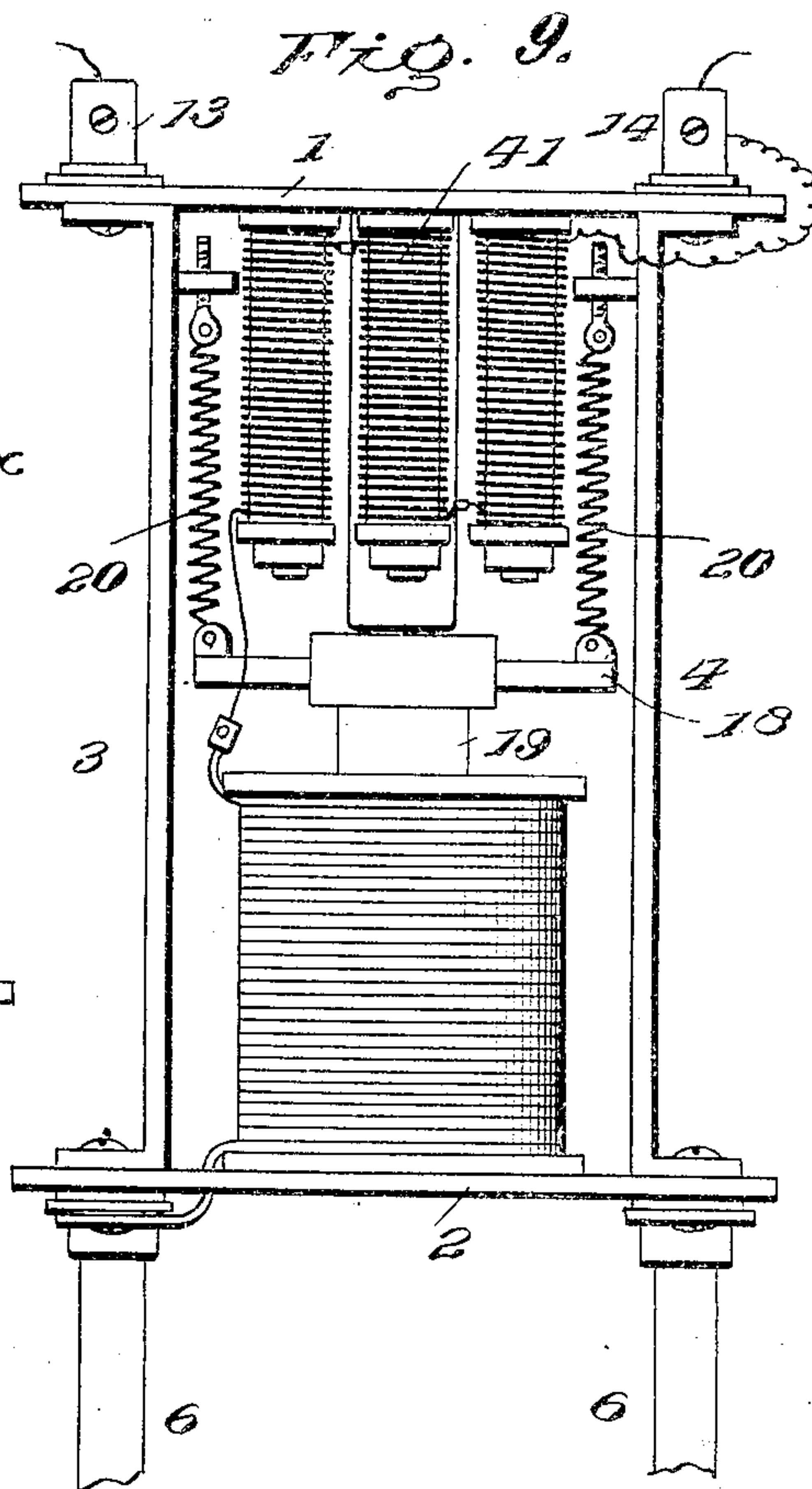
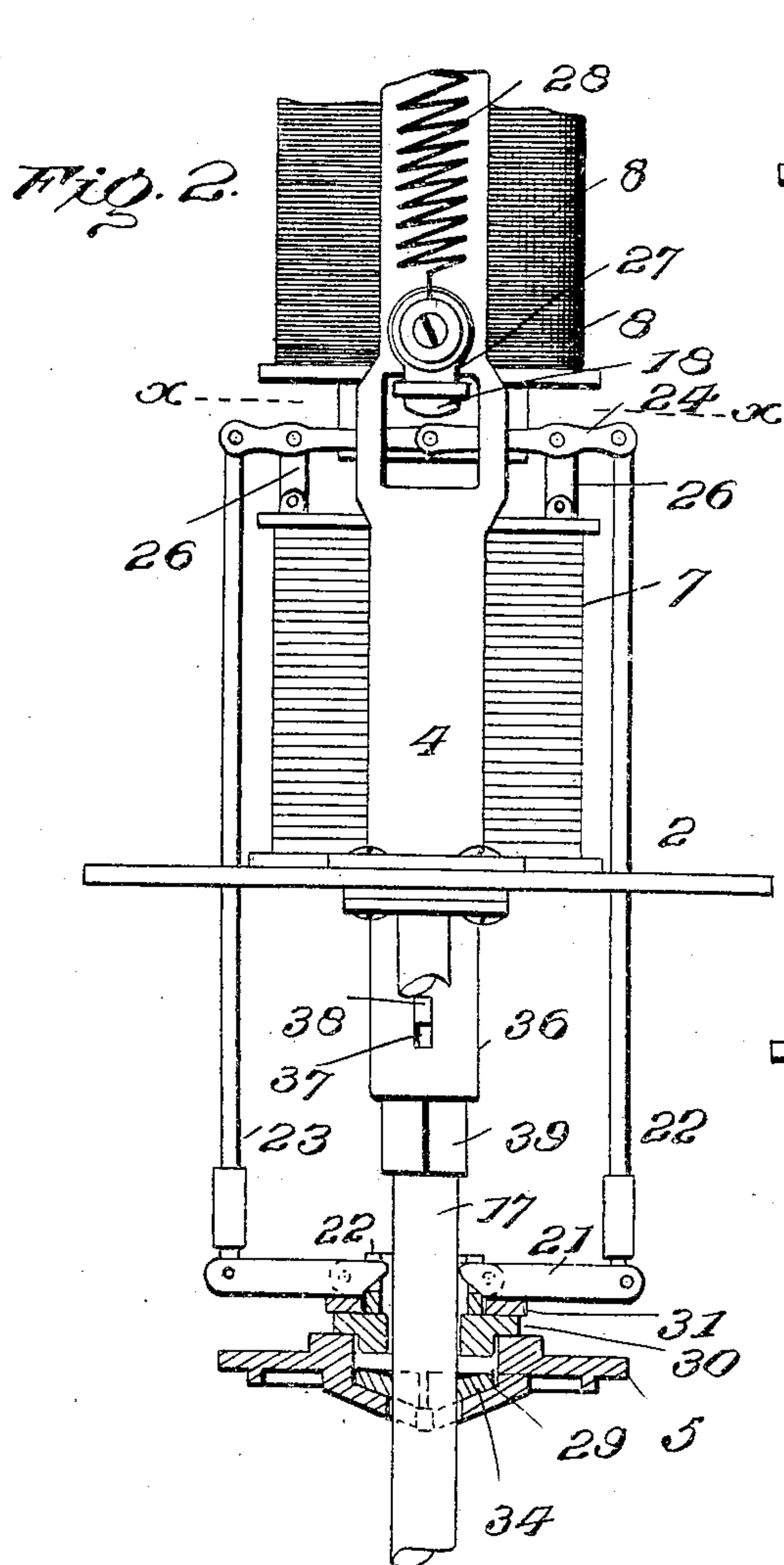
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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE M. LANE, OF ASBURY PARK, NEW JERSEY, ASSIGNOR OF THREE-FOURTHS TO JOSEPH ACKERMAN, JAMES D. CARTON, AND BENJAMIN ALBERTSON, OF ASBURY PARK, NEW JERSEY.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 770,373, dated September 20, 1904.

Application filed November 21, 1903. Serial No. 182,163. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. LANE, a citizen of the United States, residing at Asbury Park, in the county of Monmouth and State of New Jersey, have invented certain new and useful Improvements in Arc-Lamps, of which the following is a specification.

This invention relates to lamps for electric-arc lighting, and has for its object to improve the general construction; to render the feed mechanism more responsive to variation of strength between the main and shunt magnets, with the result that the light is practically free from flickering and burns uniformly; to insure cutting the lamp out of circuit in the event of the carbon breaking or the feed becoming inoperative; to provide for alining of the carbons when trimming the lamp, yet maintaining a close joint between the upper carbon and the plate through which it passes; to facilitate placing of the electromagnets in position or the removal thereof, as may be required, and to devise novel means for limiting the downward movement of the upper carbon when at its lowest position and to secure the upper-carbon holder against vertical or angular movement when placing a new pencil in position.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result, reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a front view of an electric-arc lamp embodying the invention. Fig. 2 is a side view thereof, the upper and lower portions being broken away and the plate against which the globe is held and the adjunctive parts being in section. Fig. 3 is a horizontal section on the line X X of Fig. 2. Fig. 4 is a detail view of the electromagnet base-plate. Fig. 5 is a detail view of the clamp-plate for

securing the guide-ring in an adjusted position with reference to the globe-closing plate. Fig. 6 is a detail view of the ring for maintaining a close joint between the upper carbon and the globe-closing plate. Fig. 7 is a detail view of the guide-tube and the upper-carbon holder, showing the position of the catch when free to move in said tube. Fig. 8 is a view similar to Fig. 7, showing the upper-carbon holder at its lowest position and the catch in positive engagement with the guide-tube. Fig. 9 is a detail view of a modification, showing the lamp adapted for an incandescent circuit, the shunt-magnet being replaced by resistance-coils.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The frame of the lamp comprises upper and lower plates 1 and 2, bars or uprights 3 and 4 connecting said plates, a globe-closing plate 5 and posts 6 connecting the plate 5 with the lower plate 2. The main magnet 7 is secured to the lower plate 2, and the shunt-magnet 8 is in vertical alinement with the main magnet and is connected to the upper plate 1. To enable these magnets to be easily placed in position and readily removed as may be required, the base-plate 9 of each is provided at diametrically opposite points with extensions 10 and 11, one of the extensions being radially slotted and the other having an angular or L slot to provide a hook. As shown, the extension 10 has the straight slot open at its outer end, and the extension 11 is formed with the L-slot, which opens laterally. Upon loosening the fastening-screws 12, by means of which the plates 9 are secured to the plates 1 and 2, connection of the magnets may be made with the respective plates 1 and 2 by slipping the extension 10 beneath the head of one of the fastenings 12 and engaging the other extension, 11, with the opposite fastening and moving the plate 9 to bring portions of the extensions 10 and 11 under the heads of the respective fastenings 12, which are tightened to hold the parts in place. The

electromagnets are removed by loosening the fastening-screws 12 and manipulating the base-plate 9 in a manner to disengage the extensions 10 and 11 from the said fastenings.

5 The terminals of the shunt-magnet 8 are connected to the binding-posts 13 and 14. One terminal of the main magnet 7 is connected to the binding-post 14, and the opposite terminal is in electrical connection with
10 one of the posts 6, the circuit being through an arm or bar of the frame 15, thence through the lower carbon 16, upper carbon 17, and upper portion of the frame to the binding-post 13. A bar 18 is connected to the core or
15 armature 19 and is suspended by springs 20, tensioned to hold the armature of the carbon, the feed mechanism, and adjunctive parts in equipoise. The core or armature 19 is hollow, so as to receive the upper carbon and
20 provide for free movement thereof.

The clutch-levers 21 are fulcrumed near their inner ends to the ring 22, and their outer ends are connected by rods 23 with the outer ends of vibrating levers 24, having their inner ends pivotally connected to opposite extensions 25 of the armature or core and fulcrumed intermediate of their ends to links 26, pivotally connected to the electromagnet 7 or other convenient portion of the frame.
30 When the force of the electromagnet 7 predominates, the armature or core 19 is drawn downward and the outer ends of the clutch-levers 21 upward, with the result that the upper carbon 17 is gripped and moved upward
35 with the clutch-levers, so as to establish the arc. As the arc lengthens the force of the electromagnet 7 proportionately decreases and the force of the shunt-magnet 8 correspondingly increases until it exceeds that of the main
40 magnet and attracts the armature or core and moves the inner ends of the vibrating levers 24 upward and the outer ends of the clutch-levers 21 downward, thereby releasing the upper carbon and permitting it to descend or feed
45 by gravitative force in the well-known manner. Should the upper carbon fail to feed from any cause or become broken, the armature or core is moved upward by the attractive force of the shunt-magnet until the lamp
50 is cut out of circuit by the bar 18 making electrical connection with the contact 27, secured to the upright 4 and in electrical connection with one terminal of the resistance-coil 28, the opposite end being in electrical
55 connection with binding-post 14.

The globe-closing plate 5 is provided with a centrally-disposed socket 29, the bottom of which is downwardly inclined toward the central opening, through which the upper carbon 17 passes. A guide-ring 30 closes the
60 upper end of the socket 29 and is outwardly flanged to overlap the rim of said socket extended upward from the plate 5. This ring 30 may be of lava or other non-conducting
65 material, or if of metal is electrically insulated

from the plate 5. The guide-ring 30 has a limited movement with reference to the socket 29 to admit of alining the carbons 16 and 17 when trimming the lamp. The clamp-plate 31 for securing the guide-ring 30 so as
70 to hold the upper carbon in the adjusted position is provided with opposite extensions 32, apertured to receive clamp-screws 33, by means of which the plate 31 is secured to the plate 5 after the parts have been properly
75 adjusted. A packing-ring 34 is fitted in the lower portion of the socket 29, and its lower side is inclined to conform to the inclination of the bottom of said socket, with which it makes a close joint to maintain the predetermined pressure within the globe 35. The
80 packing 34 may be of any desired material and is split, so as to adapt itself to any inequalities of the upper carbon 17, yet preserve a close joint therewith. 85

The guide-tube 36, pendent from the plate 2, is provided at opposite sides near its lower end with slots 37 to receive the end portions of the pivoted catch 38, connected to the upper-carbon holder 39. The catch 38 is pivoted
90 near one end to a projection 40 at the upper end of the carbon-holder 39 and near one side thereof, and one arm of the catch is longer than the other to insure positive engagement of opposite ends of the catch with the guide-
95 tube 36 by dropping into the slots 37 when the upper carbon reaches the lowest position, as indicated most clearly in Fig. 8. When the carbon-holder is in the position shown in Fig. 8, it can neither be pushed upward nor
100 turned laterally when fitting the electrode or carbon pencil thereto. After the carbon 17 has been attached to the holder 39 the latter may be moved upward through the tube 36 by pressing inward and upward upon the long
105 arm of the catch 38, so as to withdraw both ends from engagement with the slots 37, as will be readily comprehended.

The lamp herein particularly described is designed for a current of high voltage or potential, but when constructed for use upon a circuit of incandescent lamps the shunt-magnet 8 is dispensed with and replaced by the resistance-coils 41, as shown most clearly in Fig. 9, the remaining parts being substantially the same as herein described. 115

Having thus described the invention, what is claimed as new is—

1. In an electric-arc lamp, the combination of the armature or core of the controlling-electromagnets, the movable carbon, clutch-levers pivoted near their inner ends, vibrating levers pivoted intermediate of their ends and having their inner ends connected to each other and to the armature for movement therewith, and means connecting the outer ends of the vibrating levers with the corresponding ends of the clutch-levers, substantially as set forth. 120 125

2. In an electric-arc lamp, the combination 130

of the armature or core of the controlling-electromagnets, the movable carbon, clutch-levers pivoted near their inner ends, vibrating levers connected at their inner ends to each other and to the armature for movement therewith, means connecting the outer ends of the vibrating levers with corresponding ends of the clutch-levers, and links pivotally supporting the vibrating levers intermediate of their ends, substantially as specified.

3. In an electric-arc lamp, the combination of the movable carbon, the electrically-controlled armature, clutch-levers connected with said armature for movement therewith, a counterbalanced bar connected with the armature and included in the circuit, a fixed electric contact adapted to cut the lamp out of circuit by contact of said counterbalanced bar therewith, and a resistance-coil between the line-wire and said electric contact, substantially as set forth.

4. In an electric-arc lamp, the combination of framework, an electromagnet, a base-plate having the electromagnet connected thereto and having opposite extensions, the one provided with a straight slot open at its outer end and the other having an L-slot, and headed fastenings applied to the framework and adapted to cooperate with said slotted exten-

sions to admit of the electromagnet being readily placed in position or easily removed, substantially as set forth.

5. In an electric-arc lamp, the combination of the upper-carbon holder, a guide-tube therefor having slots or openings at opposite points, and a catch pivoted to the carbon-holder and adapted to have its end portions enter the slots of the tube but limit the downward movement of the holder and to prevent turning or upward displacement thereof when applying the carbon thereto, substantially as described.

6. In an electric-arc lamp, the combination of the globe-closing plate provided with a socket in its upper side having its bottom downwardly converged toward a central point, a packing arranged in said socket and having its bottom side inclined to conform to the bottom of the socket, a guide-ring for closing the upper end of the socket, and means for securing the guide-ring in an adjusted position, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE M. LANE. [L. s.]

Witnesses:

JOHN W. BOSTICK,
LOUIS R. ROSE.