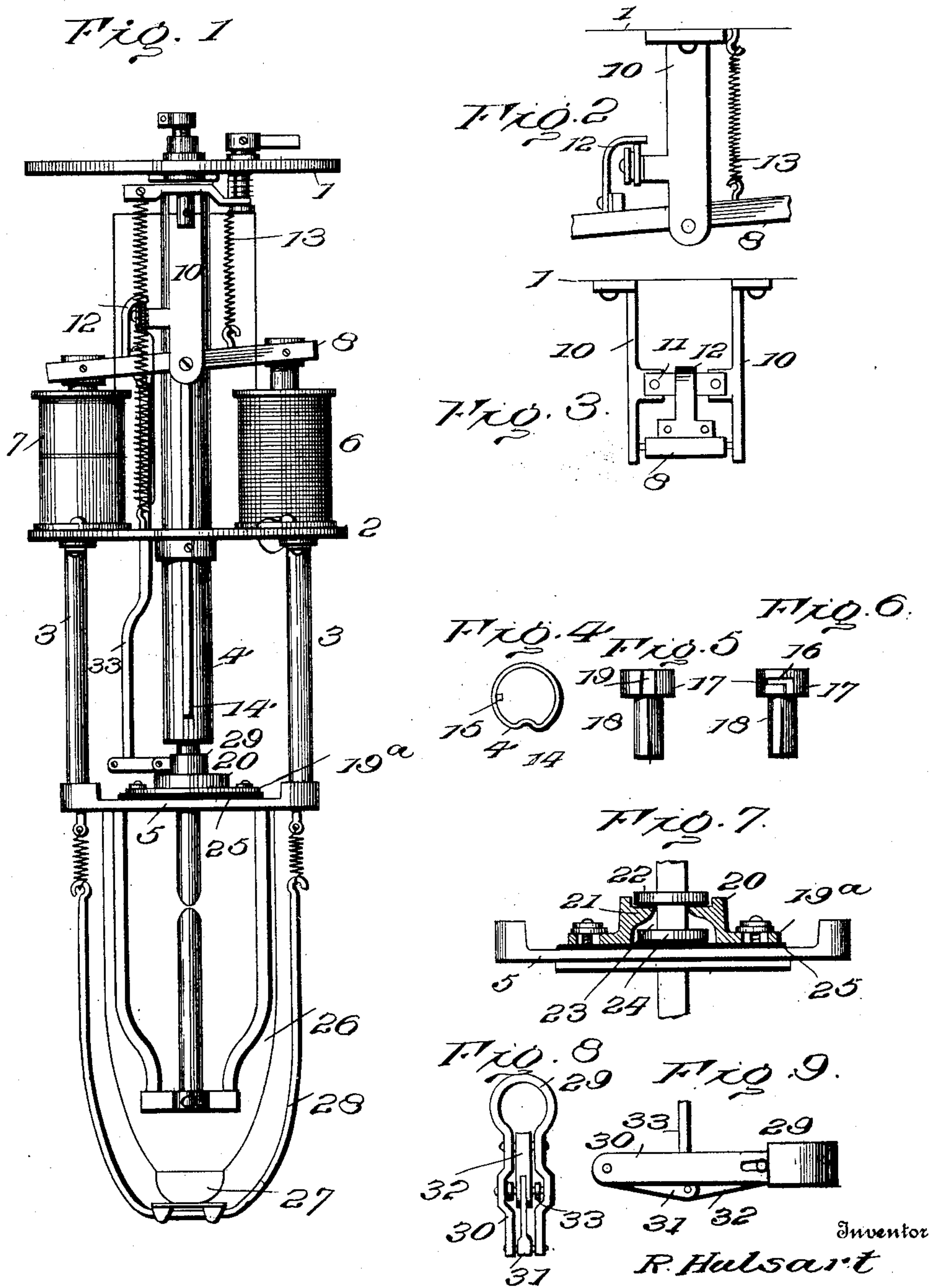


No. 745,622.

PATENTED DEC. 1, 1903.

R. HULSART.  
ELECTRIC ARC LAMP.  
APPLICATION FILED MAR. 20, 1903.

NO MODEL.



Witnesses

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# UNITED STATES PATENT OFFICE.

RANDOLPH HULSART, OF BROOKLYN, NEW YORK, ASSIGNOR TO INTER-STATE ELECTRIC AND MANUFACTURING COMPANY, A CORPORATION OF NEW YORK.

## ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 745,622, dated December 1, 1903.

Application filed March 20, 1903. Serial No. 148,753. (No model.)

*To all whom it may concern:*

Be it known that I, RANDOLPH HULSART, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

It is the purpose of this invention to provide novel means for coöperation with the feed and cut-out devices to render more certain and effective their operation, as well as to simplify and cheapen the general construction.

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, the casing inclosing the operating mechanism being omitted. Fig. 2 is a detail view of the cut-out on a larger scale. Fig. 3 is a view of the parts shown in Fig. 2 turned one-quarter around. Fig. 4 is a transverse section of the tube containing the upper carbon, showing the relative position of the holder. Fig. 5 is a side view of the upper-carbon holder, showing the notch in the head thereof for receiving the inner rib of the guide-tube. Fig. 6 is a side view of the upper-carbon holder turned to disclose the bayonet-slot formed in the head thereof. Fig. 7 is a detail view of the plate suspended from the casing and against which the globe is held, showing the valve-plate attached thereto and in section, the parts being on a larger scale. Fig. 8 is a plan view of the clutch. Fig. 9 is a side view of the clutch.

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 head 1, lower head 2, pendent rods 3, tube 4 connecting heads 1 and 2, and plate 5 con-

necting lower ends of rods 3 and supported thereby. The working parts are housed or inclosed by a casing (not shown) applied to heads 1 and 2 in the usual manner. The operating parts of the lamp comprise main magnet 6, shunt-magnet 7, vibrating lever or frame 8, and clutch connected with vibrating lever 8 and coöperating with the upper carbon or electrode 9 in the well-known manner. The shunt-magnet 7 is composed of sections to facilitate repair in the event of burning up.

A bracket 10 is pendent from head 1 and comprises companion members and is located at one side of guide-tube 4 and pivotally supports vibrating lever or frame 8 at its lower end. A bar 11 is secured at its ends to the members of bracket 10 and constitutes a terminal of the cut-out, the coöperating terminal 12 being attached to vibrating lever or frame 8 and having its upper end curved, so as to extend over part 11 and cut the lamp out of circuit under abnormal conditions, as in the event of the arc becoming too long and the upper carbon failing to feed. Under these conditions the electromagnet 7 in the shunt-circuit overcomes the force of the main magnet 6 and attracts its armature and causes the corresponding end of lever or frame 8 to descend, whereby terminals 11 and 12 are brought into electrical contact and the lamp cut out of circuit. Spring 13 exerts an upward pull upon the end of lever 8, carrying armature of main magnet 6, thereby supplementing the action of the shunt-magnet and holding the cut-out in action.

The guide-tube for the upper electrode or carbon is provided with an inner rib 14, formed in any manner, preferably by pressing inward a longitudinal element of the tube. The rib 14 terminates a short distance from the lower end of tube 4 for a purpose presently to be explained. A pin 15 extends inward from the lower end of tube 4 and is arranged out of line with rib 14 and is adapted to enter a bayonet-slot 16, formed in a side of the head 17 of upper-carbon holder 18. Head 17 is provided in a side with a vertical notch or groove 19 to receive rib 14 to direct the upper carbon or electrode in its movements and prevent turning thereof. When the carbon-holder 18 reaches the lower end



of tube 4 and its head clears lower end of rib 14, it is supported by pin 15 entering the vertical member of bayonet-slot 16, and upon turning carbon-holder 18 pin 15 enters the horizontal member of slot 16, thereby holding part 18 against vertical displacement either upwardly or downwardly, thereby admitting of a new carbon being placed in position without necessitating removal of carbon-holder 18 or upward movement thereof when pressing the carbon into the holder. After the upper carbon has been fitted to carbon-holder 18 the latter is turned to bring notch or groove 19 in line with rib 14 and pin 15 in line with vertical branch of bayonet-slot 16, when the carbon and holder may be moved upward to the required position.

A valve-plate 19<sup>a</sup> is placed upon plate 5 and electrically insulated therefrom and is provided with a centrally-disposed collar or rim 20, having inner flange 21 a short distance from the upper edge to form a seat for valve 22, which is a washer or apertured disk snugly fitting carbon 9 without interfering with free movement thereof. Chamber or air-space 23 is formed below inner flange 21 and receives valve 24, similar in construction to valve 22 and normally resting upon insulation 25, interposed between plates 19 and 5. The valves 22 and 24 serve to direct carbon 9 in its vertical movements, as well as to close the space between carbon 9 and plates 5 and 19 under normal conditions, and move upward to admit of any excessive pressure of gas within the globe 26 escaping before a critical point is reached. The globe 26 is snugly fitted at its upper end against plate 5, and its lower end rests in cup 27, applied to spring-hanger 28.

The clutch for gripping carbon 9 comprises band 29, stem 30, projected laterally therefrom, toggle-levers 31 and 32, and rod 33, connecting the toggle-levers to the vibrating lever or frame 8. Toggle-lever 31 is pivoted at its outer end to stem 30, and toggle-lever 32 is pivoted near its inner end to stem 30, adjacent to band 29, and projects into the latter a short distance, so as to bear against a side of carbon 9 and make positive engagement therewith when rod 33 is lifted, due to main magnet 6 attracting its armature upon establishing a circuit through the lamp.

The parts being assembled substantially as set forth and the lamp being trimmed, the

main magnet 6 is energized upon closing the circuit and attracting its armature causes lever 8 to vibrate and pull upward upon rod 33, whereby a separation of the carbons is effected to establish the arc, and the cut-out is thrown out of action by part 12 being moved away from part 11. When the lamp is in working condition, the upper carbon is gradually fed by vibration of lever or frame 8 in the well-known manner. Should the parts stick or the lamp fail to work, the cut-out is closed and comes into play through the combined action of spring 13 and shunt-magnet 7, thereby cutting the lamp out of action, as will be readily understood.

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

1. In an electric-arc lamp, a guide-tube having an inner rib terminating a distance from its end, a pin projected into the tube and a side thereof at a point beyond said rib and out of line therewith, and a carbon-holder slidably mounted in said tube and having a head portion provided in one side with a groove to receive the rib and having in another side a bayonet-slot for coöperation with the aforesaid pin, substantially as set forth.

2. In an electric-arc lamp, and in combination with the plate adapted to support the globe at one end, a second plate secured to the first-mentioned plate and electrically insulated therefrom and provided with a collar or vertical rim having an inner flange near its upper end to form a seat and having a chamber below said flange, and valves for coöperation with the upper carbon, the one seated upon said inner flange and the other located within said chamber and seated upon the insulation separating the two plates, substantially as specified.

3. In an electric-arc lamp, and in combination with the movable carbon and vibrating lever, a clutch, same comprising a band, a stem projected laterally from said band, toggle-levers pivoted near their outer ends to said stem, and a rod connecting the toggle-levers to the vibrating lever, substantially as set forth.

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

RANDOLPH HULSART. [L. S.]

Witnesses:

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