

No. 731,711.

PATENTED JUNE 23, 1903.

J. A. RIGNON.
ELECTRIC ARC LAMP.
APPLICATION FILED APR. 14, 1902.

NO MODEL.

Fig. 1.

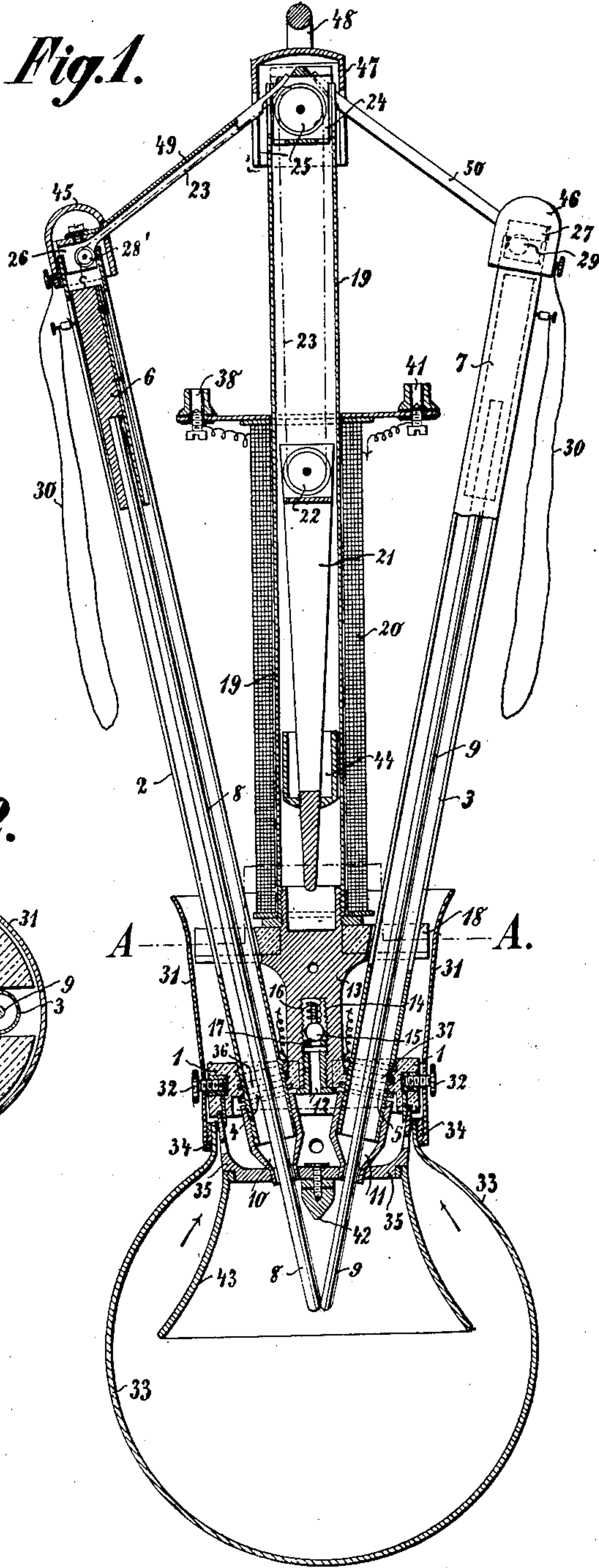
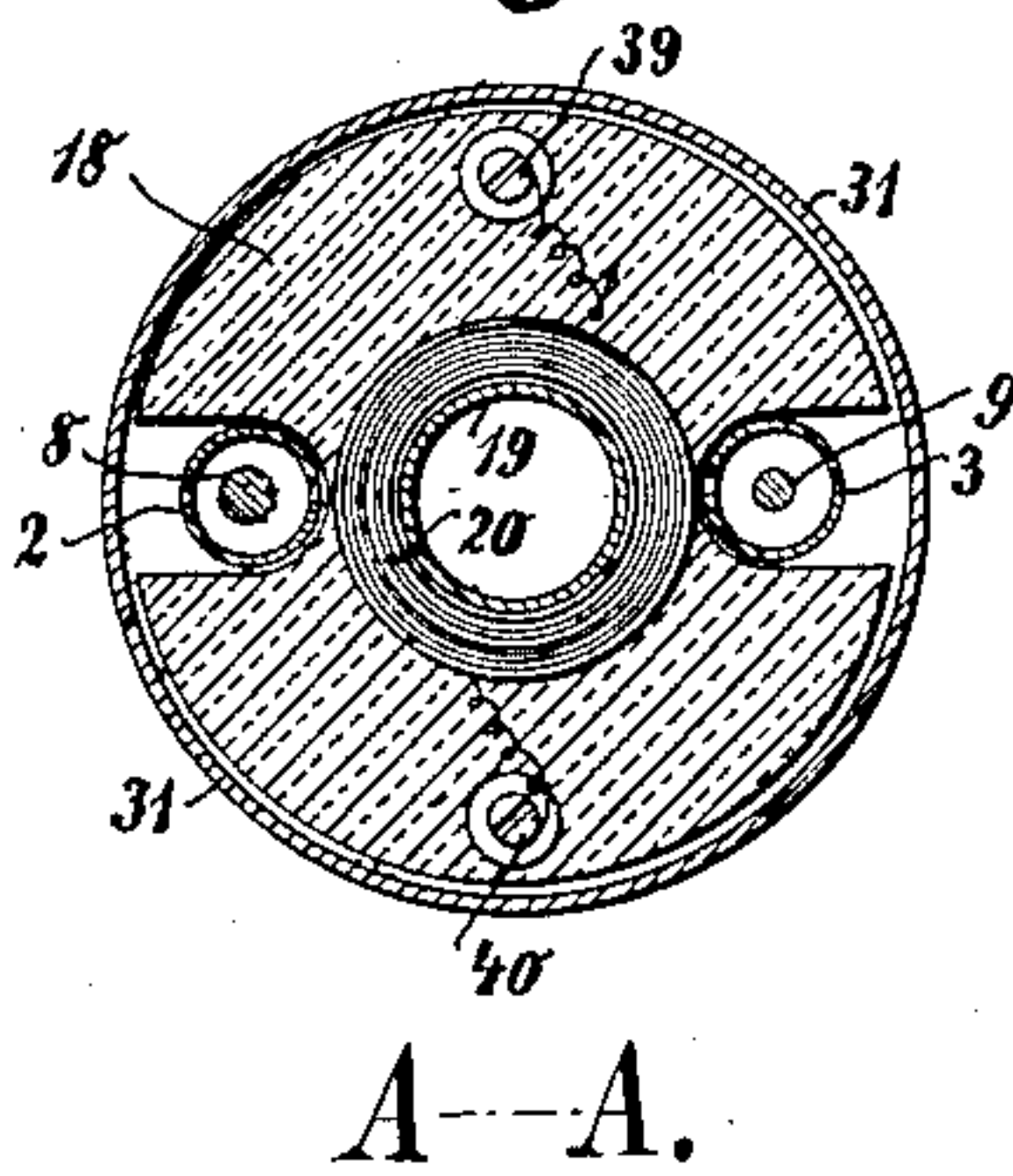


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOSEPH ALBERT RIGNON, OF BERLIN, GERMANY.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 731,711, dated June 23, 1903.

Application filed April 14, 1902. Serial No. 102,864. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ALBERT RIGNON, a subject of the King of Italy, and a resident of 91^A Lützowstrasse, Berlin, Germany, have
 5 invented certain new and useful Improvements in Continuous-Burning Arc-Lamps with Inclined Carbons; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will
 10 enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

15 This invention relates to an electric-arc lamp of that type in which the carbons are inclined relatively to each other.

One object of the invention is to produce an electric-arc lamp of simple and desirable
 20 construction in which the consumption of the carbons and of the electric current for the regulation of the lamp is reduced to the minimum.

Another object is to provide means for
 25 maintaining an almost perfect vacuum in the globe in which the arc is formed and for consuming the oxygen in the globe.

Other objects are to improve the lamps in other respects, as will appear from this specification.
 30

In the accompanying drawings, Figure 1 shows the lamp in sectional elevation, Fig. 2 being a cross-section on line A A of Fig. 1.

Two tubes 2 and 3 are secured, by means of
 35 screws 4 and 5, in a plate 1, made of porcelain or some other insulating and incombustible material. The carbon-holders 6 and 7, as well as the carbons 8 and 9, slide in the tubes 2 and 3, the carbons being guided in the end
 40 portions of caps 10 and 11, which are screwed onto the tubes. To the same plate 1 is secured by a screw 12 a support 13, provided with a bore 14, in which is arranged a ball-valve 15 with a spring 16, the tension of
 45 which can be regulated by means of a screw 17. This valve 15 enables the air which is heated and expanded when the arc is formed to escape. On the support 13 there is a second plate or disk 18, of porcelain or the like,
 50 provided with two binding-screws 39 and 40, from which the current passes to the tubes 2

and 3 through two rings 36 and 37. The support 13 carries also a tube 19, on which is placed the solenoid 20.

In the tube 19 slides an iron core 21, made
 55 of conical shape for the purpose of equalizing the action on it of the solenoid during the regulation of the lamp. The iron core 21 is provided with two wheels 22. A cord 23, passing over the wheels 22, over two wheels
 60 25, arranged in an insertion-piece 24, and over wheels 28 and 29, arranged in insertion-pieces 26 and 27, is connected to the two carbon-holders 6 and 7, so that the movement of the iron core 21 is transmitted to the carbons
 65 through the differential cord-gear. In this way the movement of the iron core causes twice as large a movement of the carbon-holder, and as the core substantially balances the carbon the consumption of energy for the
 70 regulation of the lamp is thereby reduced. The weight of the two carbon-holders 6 and 7 is slightly greater than that of the iron core 21, so that the latter is normally in the upper portion of the solenoid 20. An electric con-
 75 nection between the two tubes 2 and 3 and the carbon-holders 6 and 7 is effected in a reliable manner by means of two wires 30.

A casing 31 is secured to the plate 1 by two screws 32. To the bottom end of this casing
 80 is screwed a glass globe 33 by means of the screw-threaded ring 34, which ring comes close against the plate 1, and thus insures an almost air-tight joint.

In order to prevent the caps 10 and 11, the
 85 screw 12, and the valve 15 from becoming oxidized, there is provided a protective cap 35, acting at the same time as a reflector, made of porcelain. To this porcelain cap 35 is secured a porcelain head 42, preventing the
 90 electric arc from rising upward. In order to keep the electric arc between the points of the carbons 8 and 9, there is a second glass globe 43, which forces the heat-current to follow the path indicated by the arrows through
 95 the openings made in the porcelain cap 35 and through the valve 15 after overcoming the resistance of the spring 16 into the atmosphere. The tubes 2 and 3 are closed by metallic caps 45 and 46 and tube 19 by the
 100 metallic cap 47, provided with a ring 48 for suspending the lamp. These three caps are

connected together by means of tubular connection-pieces 49 and 50, which at the same time afford a guide for the cord.

The manner of working of the lamp is as follows: The current enters through the terminal 38, passes, through the solenoid 20, the binding-screw 39, and the small ring 36, into the tube 2, thence into the carbon-holder 6 and the carbon 8, and returns, through the carbon 9, carbon-holder 7, tube 3, and small ring 37, to the binding-screw 40, and thence direct to the return-terminal 41. As may be seen, the two carbons remain in contact as long as the lamp is out of circuit, for, as has already been mentioned, the weight of the two carbon-holders 6 and 7 is greater than that of iron core 21. As soon as the lamp is switched in the iron core 21 is drawn into the solenoid 20, the two carbons 8 and 9 draw away from each other, and an electric arc is immediately produced. According to the tension obtaining between the carbons 8 and 9 or according to the larger or smaller current in the solenoid 20 determined thereby, the iron core 21 is drawn more or less into the solenoid, the lamp being thus regulated and equilibrium being always produced between the attractive force of the solenoid and the carbon-holders acting by their gravity.

A plunger-piston 44, secured to the iron core 21 and moving together with it in the solenoid 20 or in the tube 19, acts to a certain extent as brake for the motion of the iron core by compressing the air contained in the tube 19. In this way all jerking is entirely avoided.

The construction of the lamp is a very simple one, so that it works with a very small current, (from one and a half to five amperes,) and consequently enables carbons of very small diameter (two to four millimeters) to be used. The resistance of these thin carbons is very great, causing a high degree of incandescence thereof and increasing the illuminating power of the lamp. The consumption of energy by the lamp is exceedingly small. With a tension of seventy to eighty volts it requires between the two carbons a current of from one and a half to five amperes. The illuminating power is also very great, amounting to about one hundred candles per ampere, and the duration of the burning of the lamp is from fifteen to twenty hours.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent of the United States of America, is—

1. In an electric-arc lamp, the combination of a tube suspended from above, a lamp-base connected to the lower end of said tube, carbon-guides supported by and diverging upwardly from said base, inclined carbons ar-

ranged to slide in said guides, a solenoid surrounding said tube, a core located inside of said tube, pulleys mounted at the upper end of said tube, pulleys carried by said core, and cords connecting said core and said carbons and running over said pulleys whereby said core and carbons are substantially balanced and a movement of said core produces a greater movement of said carbons, substantially as set forth.

2. In an electric-arc lamp, the combination of a base, a globe supported by said base, carbons extending into said globe through said base, guides for the inner ends of said carbons supported by and projecting inwardly from said base, a relief-valve mounted on said base for permitting the escape of heated air from said globe, a cap of non-combustible material located in said globe secured to said base inclosing and protecting said carbon-guides and valve, and regulating means for said carbons, substantially as set forth.

3. In an electric-arc lamp, the combination of a base, a globe supported by said base, carbons extending into said globe through said base, guides for the inner ends of said carbons supported by and projecting inwardly from said base, a cap of non-combustible material arranged in said globe, secured to said base and inclosing and protecting said carbon-guides, and a hollow deflector for the heated air secured to said cap surrounding the adjacent ends of said carbons and forming an annular space in said globe, said base and cap being provided with exit-openings for the heated air, substantially as set forth.

4. The combination of a globe, carbons having their adjacent ends extending into said globe, a hollow deflector for the heated gases surrounding the adjacent ends of said carbons and forming an annular space in said globe, and an exit-opening for the heated gases communicating with the annular space between the deflector and said globe, substantially as set forth.

5. The combination of a globe-support, a porcelain cap therefor, inclined carbons having their inner ends extending into said globe beneath said cap, a hollow glass deflector for the heated gases surrounding the adjacent ends of said carbons and forming an annular space in said globe, openings through said cap connecting with the annular space between said globe and said deflector, and a valve-controlled exit in said globe-support for the heated gases, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

JOSEPH ALBERT RIGNON.

Witnesses:

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HENRY HASPER.