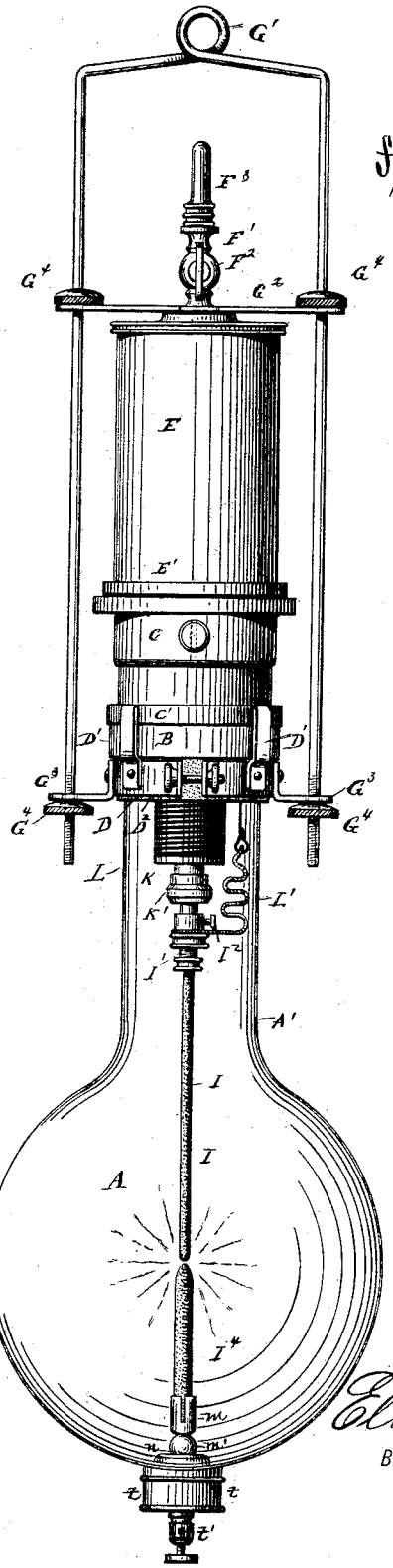
(No Model.) 2 Sheets—Sheet 1.

E. C. OHMART.

ELECTRIC LAMP.

No. 383,411. Patented May 22, 1888.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

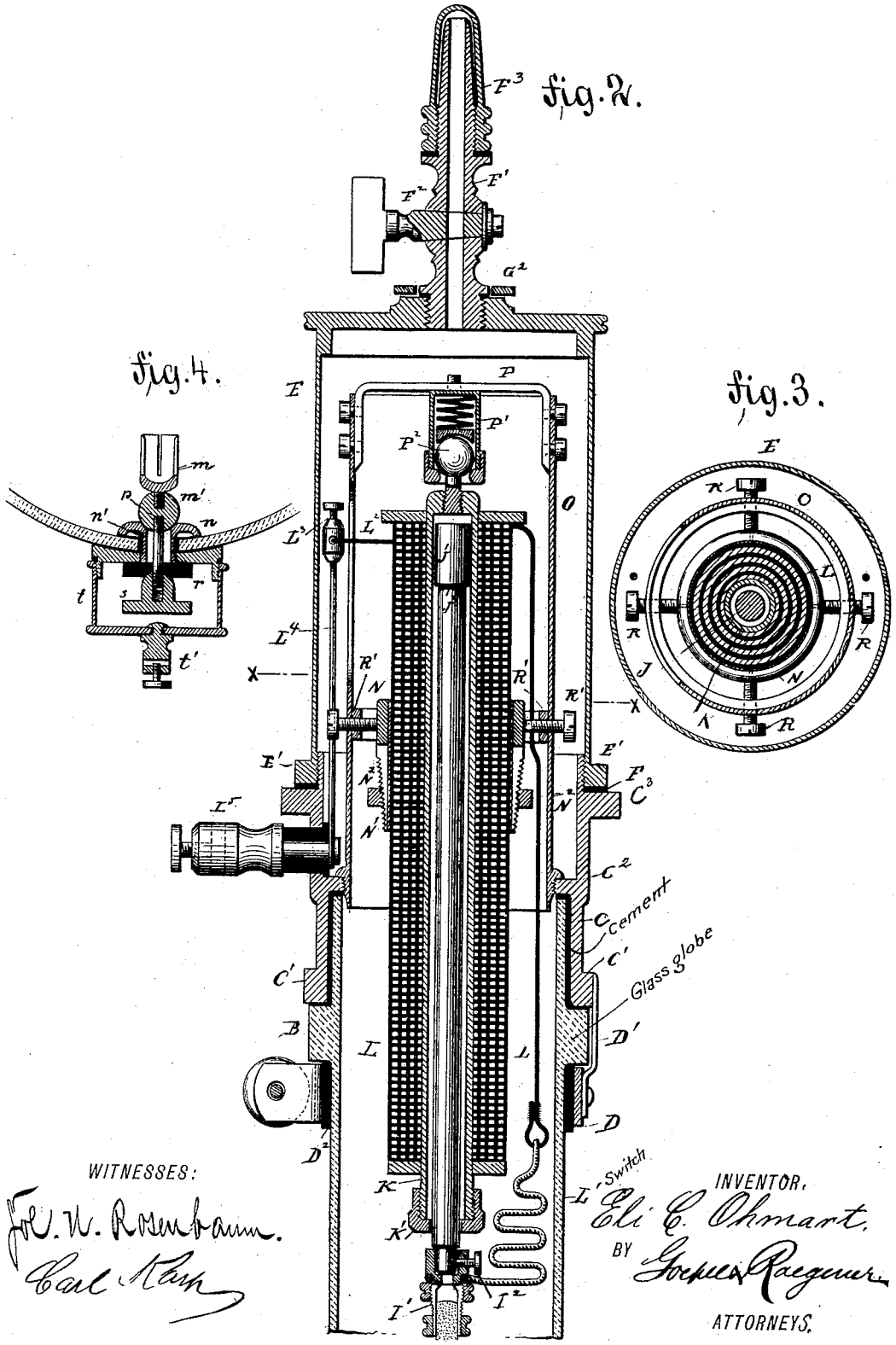

Fig. 4.

Fig. 3.

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UNITED STATES PATENT OFFICE.

ELI C. OHMART, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE OHMART-HOMANS ELECTRIC LIGHTING COMPANY, OF NEW YORK.

ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 383,411, dated May 22, 1888.

Application filed March 6, 1886. Serial No. 194,262. (No model.)

To all whom it may concern:

Be it known that I, ELI C. OHMART, of the city, county, and State of New York, have invented certain new and useful Improvements in Electric Lamps, of which the following is a specification.

This invention relates to certain improvements in that class of lamps in which carbons are burned within a globe from which atmospheric air is excluded.

The object of my invention is to simplify the construction of the regulating devices of the lamp, and also to facilitate adjusting the carbons and exhausting the globe and charging it with gas that does not combine chemically with the carbons, and then sealing the lamps to prevent any leakage therefrom.

The invention consists in the construction and combination of parts and details, as will be fully described and set forth hereinafter, and then pointed out in the claims.

In the accompanying drawings, Figure 1 is a face view of my improved electric lamp. Fig. 2 is a longitudinal sectional view of the same on an enlarged scale. Fig. 3 is a sectional plan view of the same on line *x x*, Fig. 2. Fig. 4 is a detail cross-sectional elevation of the lower-carbon holder.

Similar letters of reference indicate corresponding parts.

The glass globe A is provided with an upwardly-projecting neck, A′, provided near its upper end with an exterior collar, B. That part of the said neck A′ above the collar is fitted and cemented into a metal cylinder or ring, C, provided on its outer surface with a bottom flange, C′, which rests on and is cemented to the top edge of the collar B. The said cylinder C is also provided with an interior screw-threaded collar, C^2, against which the upper end of the neck A′ is rested and cemented, as shown in Fig. 2, the heavy black lines representing the cement. The cylinder C is thus connected hermetically with the neck A′, and at the same time is held rigidly and firmly on the same.

To prevent the weight of the globe from causing a downward strain on the layer of cement, a ring, D, is clamped around the neck A′ below the collar B. To the ring D the tongues D′ are riveted or otherwise fastened and passed over the collar B, and their upper ends are soldered or otherwise suitably secured to the bottom exterior flange, C′, of the cylinder C, so that the neck and globe are suspended from the cylinder C by means of the tongues D′ independently of the cement. A packing piece or strip, D^2, of asbestus, paper, or fabric, is interposed between the ring D and the neck A′.

The cylinder C is provided near its upper end with an exterior collar, C^3, and above the said collar the cylinder is provided with an exterior screw-thread. A cylindrical cap, E, closed at its upper end, is provided at its lower end with an exterior collar, E′, and with an interior screw-thread, which can engage with the screw-thread on the outer surface of the cylinder C above the collar C^3. A packing-ring, F, preferably of rubber or of any other suitable packing material, is placed on the collar C^3. The cap E is screwed on the upper end of the cylinder C, the flange or collar E′ being pressed firmly on the packing-ring F, thus forming an absolutely tight and hermetically-closed joint between the cylinder C and the cap E. A nozzle, F′, provided with a stop-cock, F^2, is screwed into and projects from the top of the cap E, and on said nozzle the cap F^3 is screwed.

An inverted U-shaped bail, G, provided in the middle of its closed end with a loop, G′, is passed through apertures in the end of the cross-piece G^2, resting on the upper closed end of the cap E, and the lower ends of the said bail are passed through apertures in necks G^3, projecting from the ring D. Nuts G^4 are then screwed on the shanks of the bail and drawn up tightly, for the purpose of holding the bail rigidly to the cross-piece G^2, and thus connecting it firmly with the hooks, &c., from which the globe is suspended.

The upper carbon, I, is clamped in a socket, I′, held by a binding-screw, I^2, on the lower end of a rod, J, which is passed into a tube, K, of metal, glass, or any other suitable material, and the said rod J is provided at its upper end with a head, J′, forming an offset or shoulder, J^2. On the lower end of the tube K an apertured cap, K′, is screwed, the aperture

of which is of such size that the rod J can pass through the same, but not the head J′, so that as long as the cap is screwed onto the tube K the rod cannot be withdrawn entirely or dropped out of the tube K. The tube K is surrounded by a series of spiral layers of insulated wire, L, one end of which is connected by a switch-wire, L′, with the upper-carbon holder. The other end, L^2, of the helix or coils of wire is connected by a binding-screw, L^3, with a wire, L^4, which in turn is connected with the binding-post L^5 for the line-wire. The line-wire, the wire L^4, wire L, and switch-wire L′ thus form one continuous connection with the upper carbon, I, no shunt-circuit being provided.

The lower carbon, I′, is held fixed in a carbon-holder, M, in the bottom of the globe, which carbon-holder M is provided with a socket, *m*, for receiving the lower end of the carbon, which socket is screwed into the ball *m′*, resting in the recess m^2 of the ring *n*, placed on the upper surface of the bottom of the globe and provided with a downwardly-projecting neck, *n′*, which passes through the aperture in the bottom of the globe, and on the lower end of said neck the nut *o* is screwed, suitable packing material being introduced between the edges of the plate and the upper surface of the nut *o*, and the outer surface of the neck *n′* and the surface of the globe. A stem, *p*, is screwed into the bottom of the ball *m′*, passes through the neck *n′*, and through a washer, *r*. On the lower end of said rod *p* a nut, *s*, is screwed, which is provided with a round upper edge fitting into the corresponding surface of the washer *r*. A cap, *t*, is secured on the nut *o*, and is provided with a binding-screw, *t′*, for the line-wire. When the nut *s* is loosened, the washer *r* can be shifted to either side, and with it the rod *p*, which is thus inclined more or less, and thus the desired inclination can be given to the socket *m*, which holds the lower carbon, and thus the said lower carbon can be inclined to one side or the other, as may be necessary.

On the outside of the helix L a split ring, N, is clamped, said ring being provided with a downwardly-tapering screw-threaded part, N′, on which ring N is screwed, whereby said downwardly-projecting parts can be pressed firmly against the outside of the helix, thus serving to hold the ring N firmly in position on the helix.

The helix is placed within a tubular casing, O, provided at its lower end with a screw-thread, which is screwed into the screw-threaded inner collar, C^2, of the cylinder C, whereby the casing O is held in place on the cylinder C. On the upper end of the casing O a cross-piece, P, is secured, from which a socket, P′, projects downward for receiving a ball, P^2, projecting upward—that is, secured to the upper end of the tube K, on which the helix-wire is wound. Within the socket a spring is contained, which presses a plate on the upper end of the ball; or the socket may be filled with any suitable packing material, or with metal filling or like material, for the purpose of preventing the ball from moving too freely within the socket. Three or more screws, R, are screwed through the casing O and an internal collar, R′, of the same, and their inner ends rest against the ring N, clamped on the helix. If desired, the tube K and the helix on the same may be secured to the top of the cap E; or, if desired, the tube or cylindrical casing O may be secured to the cap E, instead of to the cylinder C.

The lamp is adjusted in the following manner: A tube is coupled to the nozzle F, the cock F^2 is opened, the air is exhausted from the lamp, and then the lamp is charged with nitrogen or any other gas that will not combine chemically with the carbons. The nitrogen cannot escape, as the lamp is sealed effectually, not only by the packing-ring F, but also by the cock F^2 and the packing-ring placed below the cap F^3. To adjust the carbons in such a position that the upper carbon, I, is vertically above the lower carbon, I′, the cap E must be removed, and thus such adjustment can only take place when the lamp is not charged. The screws R on one side or the other are loosened and the screws on the opposite side are tightened, and thus the tube K and the helix of the same can be inclined in any desired manner, so as to bring the upper carbon directly over the lower carbon. For example, the left-hand screw R is withdrawn from the ring N and the right-hand screw R drawn up tight, whereby the ring N and the helix on which it is placed, with the rod J and carbon-holder on the same, are moved to the left and gradually brought in the proper position. Fig. 3 shows the position of the adjusting-screws R.

The carbon-regulating helix can easily be removed from the lamp. After the cap E has been removed, the wire L^2 is discontinued from the wire L^4, and the casing O is unscrewed from the neck C^2 of the cylinder C. Fresh carbons can then be fastened in the carbon-holders.

The current passing through the helix L magnetizes the same, and thereby the rod J, to which the upper carbon is connected, is raised. When the lamp is burning, the greater part of the current is consumed in forming the light-arc, and thus the strength of the magnet is weakened to such an extent that it permits the rod J, holding the upper carbon, to drop, so as to bring the upper and lower carbons the desired distance from each other, according to the current used. The helix must be so adjusted that when the lamp is burning sufficient electro-magnetic force remains in the helix to hold the carbon points at the required distance from each other. The helix is adjusted by providing it with a greater or less quantity of wire, and for each different current such quantity must be adjusted. As the carbons

are consumed, more of the current is required in the arc as the same increases in size, and thus the electro-motive force of the helix is decreased for the moment and the carbon-holders permitted to drop and bring the points to the desired distance from each other.

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

1. In an electric lamp, the combination, with a tube surrounded by a helix, of a carbon-holding rod sliding in said tube and provided at its upper end with a head, and of a stop on the lower end of the tube to prevent the head passing out of the tube, the rod forming the core of the solenoid, substantially as shown and described.

2. In an electric lamp, the combination, with a globe and mechanism for holding and regulating the upper carbon, of the socket *m* for the lower carbon, the ball *m'*, on which the socket *m* is fastened, the plate *n*, having the neck *n'*, the rod *p*, passed through said neck, the washer *r*, through which the rod *p* is passed, and the nut *s*, screwed on the lower end of said rod *p*, substantially as shown and described.

3. In an electric-arc lamp, the combination of a helix formed of the wire through which the entire lighting-current is conducted, said wire being provided with an insulating covering, with an iron rod within the bore of said helix, which rod is the upper carbon holder, and of a wire connecting the wire forming the helix with the above-mentioned carbon-holding rod, the current passing from the wire of the helix through said connecting-wire to the upper carbon, substantially as shown and described.

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

ELI C. OHMART.

Witnesses:
OSCAR F. GUNZ,
SIDNEY MANN.