(No Model.)

C. J. VAN DEPOELE.

ELECTRIC LAMP.

No. 286,093. Patented Oct. 2, 1883.

Fig. 2

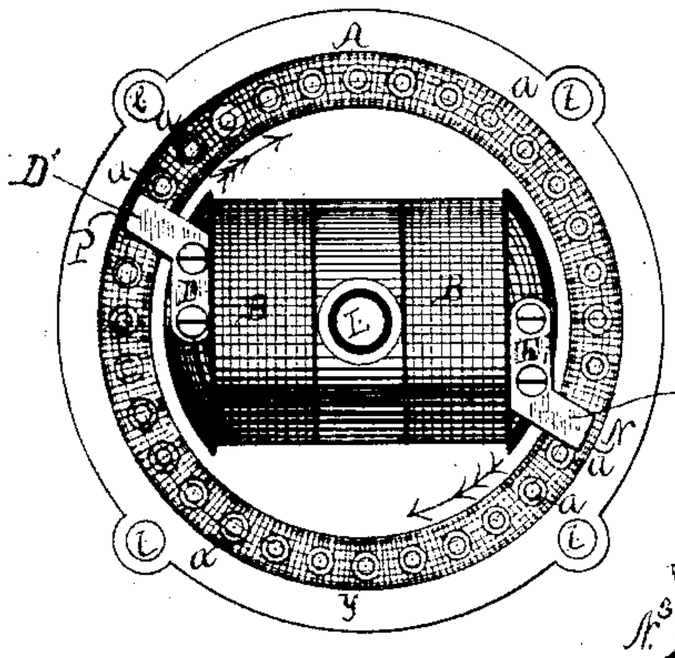


Fig 1

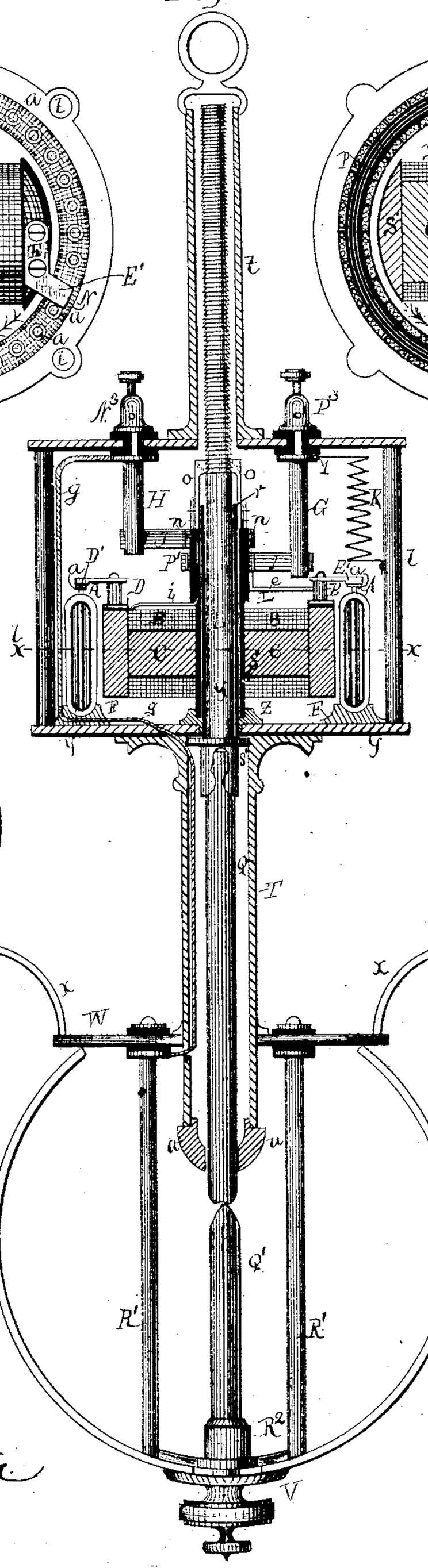


Fig. 3

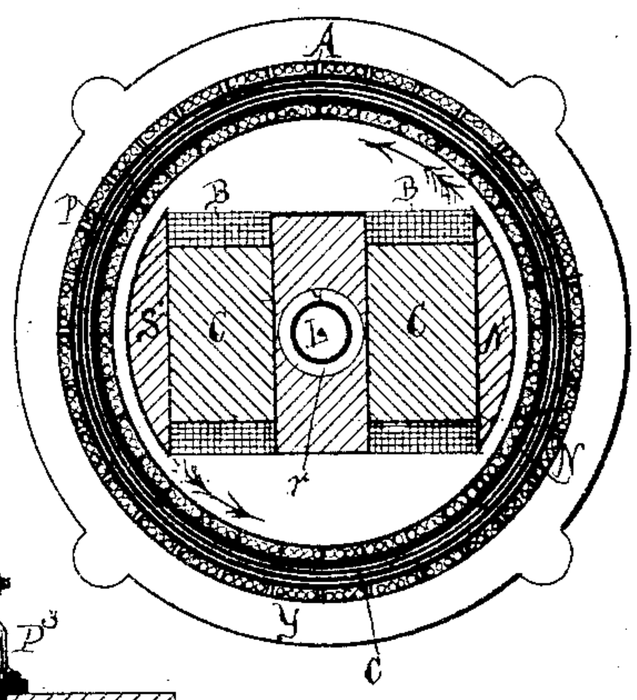


Fig 4.

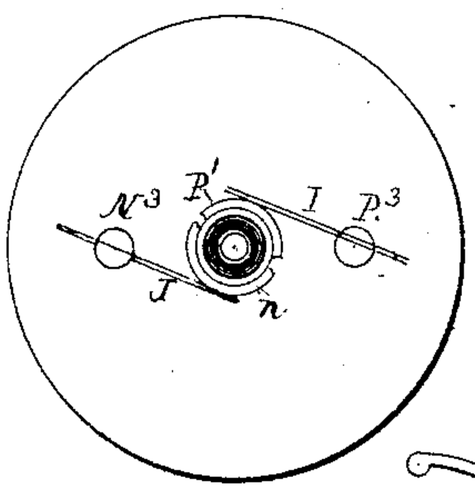
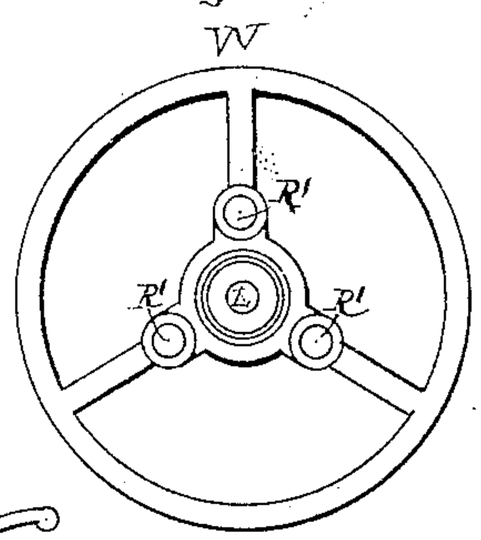


Fig 5.



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CHARLES J. VAN DEPOELE, OF CHICAGO, ILLINOIS.

ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 286,093, dated October 2, 1883.

Application filed May 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. VAN DEPOELE, of Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Electric Lamps; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to certain new and useful improvements in electric-arc lamps, by means of which a derived circuit is employed to produce a regular feed of the electrodes.

The invention consists in the peculiar construction of the different parts and their various combinations and mode of distributing the current through the same, as more fully hereinafter described.

In the accompanying drawings, Figure 1 is a vertical section through the center of the lamp. Fig. 2 is a plan of the armature and magnets. Fig. 3 is a horizontal section through the line *x x*. Fig. 4 is a detail of the brushes and commutator, and Fig. 5 is a top view of a spider to receive the tripod connected to the lower-carbon holder.

Fig. 1 is a vertical section through the center of the lamp. A is an annular electro-magnet, set stationary in the supports F F. *a a* are contact-points bringing the terminal ends of the armature-coils outward. B B are coils of fine wire in derivation between the carbons of the lamp. C C is an iron core centrally pivoted around a suitable tube, *r*, and provided with recesses to receive the fine wire of the coils B B. D is a post in metallic contact with all positive parts of the lamp, and carries a contact-brush, D′. E is a post insulated from the positive parts of the lamp, and in contact, by a suitable conductor, *e*, with an insulated ring, P′, capable of revolving with the armature C C. The post E carries also a contact-brush, E′. I is a contact-brush bearing upon the ring P′. G is a support to the brush I, and in contact with the positive pole of the lamp. K is an adjustable resistance, intended to regulate the amount of current which is to pass into the electro-magnet A. One end is attached to the positive post of the lamp at 1, and the other end to the top part or positive part of the lamp at post *l*. H is a support to the brush J, and is in connection with the negative pole of the lamp. J is a brush bearing upon an insulated ring, *n*, in electrical contact with the coils B B by a suitable conductor, *i*. The other end of the coils B B is soldered to the core C C at S, and thus is in contact with the positive part of lamp. L is a rod, with a running screw cut the whole length, into which the jaws O O engage. O O are two jaws, forming a divided nut, mounted on suitable springs, revolving with armature C C, and fitted to the screw in the rod L. As seen, the screw-thread is cut at an angle which will allow the rod to be raised without running the armature C C. Q Q′ are the positive and negative carbons. S′ is a carbon-clamp having three jaws, between which the carbon is held by the spring in the jaws. W is a plate, forming, with the rods R′, an inverted tripod, holding the lower carbon, and forms the negative part of the lamp, being suitably insulated from the spider W. T is a tube suitably fixed to the bottom part of the lamp. V is a flange, provided with a screw engaging in the bottom of the tripod R′, thus holding up the glass globe. W is a spider fastened to the tube T, and holds up the tripod R′ R′ R′. X is a reflector. Y Y is the bottom plate of the top part of the lamp. *t* is a tube fixed to the top part of the lamp, and protecting the rod L, and from which the lamp can be hung. Z is a socket-bearing, in which the tube *r* is fastened. P^3 and N^3 are the poles of the lamp, and *g* is the negative conductor to the bottom part of the lamp.

In Fig. 2, A is the annular electro-magnet, fixed stationary to the plate Y. *a a* are the terminals to the coils in the annular electro-magnet A. B B are the coils in derivation between the poles of the lamp. D′ is an adjustable contact-spring conveying the current from the coils of A. D is in contact electrically with the whole top part of the lamp, and thus positive. E′ is the contact-spring communicating current to the electro-magnet A. E is insulated electrically from the top part of the lamp, and in communication with the positive pole of the lamp by means of *e*, P′, I, and G. *l l l l* are four posts holding up the top part of the lamp. L is the rod.

In Fig. 3, A is the annular electro-magnet. C C is the iron core pivoted centrally around the tube *r*. Y is the bottom plate.

Fig. 4 shows the two circular insulated rings. N^3 is in electrical contact by J with the ring *n*, which gives passage to the current from B B by means of the conductor *i*. P^3 is in contact with the ring P′ by means of I, and the current is thence led to E by the conductor *e*.

Fig. 5 shows the spider W provided with holes, through which the rods R′ pass, to support the lower carbon and glass globe. The open space between the arms of the spider allows the heat from the lamp to readily pass away, and the iron forms a bearing for the globe and reflector.

Having described the different parts of my invention, I will now proceed to explain the operation of the lamp.

The current, on being established between the positive and negative terminals of the lamp, divides itself as follows: The current, entering at P^3, divides itself in two. One part is sent through the annular electro-magnet coils in the same way as in the Pacinotti armature, and comes out on the opposite side at *a a* to D′, which is in contact with all the metallic parts of the top of the lamp, and thus with L, which carries the positive carbon Q. Thence the current passes to the lower carbon, Q′, to R^2, and completes the circuit with the negative pole N by means of the conductor *g*, as shown in Fig. 1. The second circuit from P^3 is through the resistance K to the post *l*, which is in metallic contact with the positive carbon through the top frame. By giving K more or less resistance, the amount of current passing through A can be regulated, as desired. The derived circuit around the core C C is as follows: The current from the positive part of the lamp enters B B at S, where the terminal wire is soldered to C C. The current passes through both coils, comes out at *i*, and passes over to *n n*, to J, to H, and completes circuit at N^3. The wire around C C is so coiled as to magnetize its poles with the same polarity as that part of the annular electro-magnet A, under the influence of which it is in order to produce repulsion between the poles of A and C C. The circuit being understood, now let us connect the lamp properly with some source of electricity. The current, on passing through A, will produce a north pole at P and a south pole at N, Fig 2, as the current enters and leaves these opposite points by E′ and D′. Now, on considering C C, no current is yet passing through its coils B B, and consequently it is as yet neutral, and will be influenced by the poles in A and attracted in the direction shown by the arrows in Fig. 2, and C C will keep on rotating the same way as long as the carbons are too close together, on account of the current entering on points ahead of the center of attraction in C C; but soon the carbons are separated and a proportionate amount of current is now passing through B B, thus magnetizing the core C C in such a way that its polarity will be of the same name as in A, thus producing repulsion between P and S′ and between N′ and N, in Fig. 3, when C C will revolve in the direction indicated by the arrows in this figure. Thus the nut O O will revolve around L, which is kept from turning, and thus cause L to lower the carbon until the moment when the carbons are at their normal distance, when a balance will exist between C C and A.

It will be readily understood that whenever the carbons are too close together the polarity in A will tend to attract the revolving armature C C toward the place where the contacts D′ and E′ are standing; but since these revolve with the armature C C the polarity in A is always ahead of the longitudinal center of C C, causing the latter to revolve in the direction indicated by the arrows in Fig. 2 until B B, being in derivation between the two poles of the lamp, will allow more or less current to pass, according to the distance between the two carbons in the lamp, so that as soon as a certain distance between said carbons exists current enough will pass through B B and magnetize C C with the same polarity as in A; so A will repel C C in the direction shown by the arrows in Fig. 3. The action between A and C C will entirely depend upon the distance between the carbons in the lamp, so that it is impossible to hold any larger or smaller arc than what the lamp has been adjusted to, and this adjustment is determined once for all by giving the proper proportions between A and B B; so, practically, this lamp has no springs or anything else to adjust, thus requiring no trained hands to run or attend to it, and is not liable to be put out of order, all parts being simple and solid.

Instead of using a screw arrangement for raising and lowering the carbons, as here illustrated, any other device may be resorted to which, being actuated by the electro-magnetic device, will produce the feed of the carbons, without departing from the spirit of my invention.

I do not claim in the present application any of the subject-matter covered by the claims in Case B, filed June 18, 1883, Serial No. 98,525, or in Case C, filed July 23, 1883, Serial No. 101,614.

Having described the different parts and functions of my invention, I claim as new and desire to secure by Letters Patent—

1. In an electric-arc lamp, a stationary circular electro-magnet constructed to have its polarity shifted step by step by contact-brushes carried by a revolving armature, in combination with a centrally-pivoted armature operated by main and shunt currents, to produce the feed of the carbons in an electric-arc lamp, as described and set forth.

2. In an electric-arc lamp, a stationary circular electro-magnet, the terminals of its coils

provided with proper contact-points arranged around said electro-magnet, in combination with a centrally-pivoted armature carrying brushes or contact-springs so arranged as to allow the current to enter and leave the electro-magnet coils at points diametrically opposite each other, the contact-springs so placed upon the pivoted armature as to produce the highest point of attraction in the circular electro-magnet ahead of the center of attraction in the pivoted armature, so as to cause, upon the passage of the current, the pivoted armature to revolve in the direction above indicated, and so to raise the carbons in the lamp and produce the light, as above described and set forth.

3. In an electric arc-lamp, a stationary circular electro-magnet provided with proper means to allow the current to enter and leave the coils of the same at points diametrically opposite each other, as above described, in combination with a soft-iron centrally-pivoted armature which will be revolved in one direction by the attraction in the circular electro-magnet upon the passage of the current through the same, the soft-iron pivoted armature to be provided with coils in a derivation between the two terminals of the lamp, which coils will produce a polarity in the said armature similar to that in the circular electro-magnet with regard to the position in which the armature stands to the electro-magnet whenever the arc in said lamp becomes too long, and so to cause the pivoted armature to revolve in the opposite direction, and thus feed down the carbons in said lamp as fast as these are consumed, substantially as described.

4. In an electric-arc lamp, a feeding device operated by an annular stationary electro-magnet constructed to have its polarity shifted step by step by contact-brushes carried by a revolving armature operated by said magnet by means of main and shunt currents circulating therethrough, as specified, the said revolving armature constructed to react upon suitable mechanism which will separate the carbons when needed and feed the same down as fast as consumed, all as described and set forth.

5. In an electric-arc lamp, an annular stationary electro-magnet, A, and the circuit-connections, as described, in combination with a fixed resistance, K, through which the current is passing parallel to the current in A, the two being in derivation from one another, said resistance determining the proportion of current to be diverted through A to operate the feed mechanism of the lamp, substantially as set forth.

6. In an electric-arc lamp, a centrally-pivoted armature, in combination with an annular electro-magnet, inside of which the pivoted armature is intended to oscillate or revolve, the pivoted armature provided with brushes or contact-springs bearing upon the terminals of the coils in the annular electro-magnet, and thus allowing the current to pass through the coils of said electro-magnet, which, reacting upon the pivoted armature, will cause the latter to revolve either to the right or to the left, and so to produce and regulate the feed of the carbons in said electric lamp.

7. In an electric-arc lamp, and in combination with the circular electro-magnet A and armature C C, the insulated rings *n* and *p* and their connections, provided with contact-brushes I and J, which, being properly connected with the positive and negative poles of the lamp, will give passage to the current to the different parts of the lamp, substantially as described, and for the purpose set forth.

8. In an electric-arc lamp, the annular electro-magnet A and the pivoted armature C C, in combination with a two-part nut, O O, carried by said pivoted armature and actuating the rod L, substantially as described, the two-part nut to be held in place by suitable springs which will allow the rod to be slipped upward without revolving C C, all as shown and specified.

9. In an electric-arc lamp, the annular electro-magnet A, provided on its periphery with contacts *a a a* to its coils, in combination with the pivoted armature C C, wound with coils B B, suitably connected with ring *n* and negative pole N, and provided with the contact-springs D and E, adapted to communicate the proper current to A by means of contact-points *a a a*, &c., the contact E being suitably connected through a ring with the positive pole of lamp and suitable intervening mechanism actuated by said armature to feed the carbon, substantially as described.

CHARLES J. VAN DEPOELE.

Witnesses:
H. S. SPRAGUE,
E. W. ANDREWS.