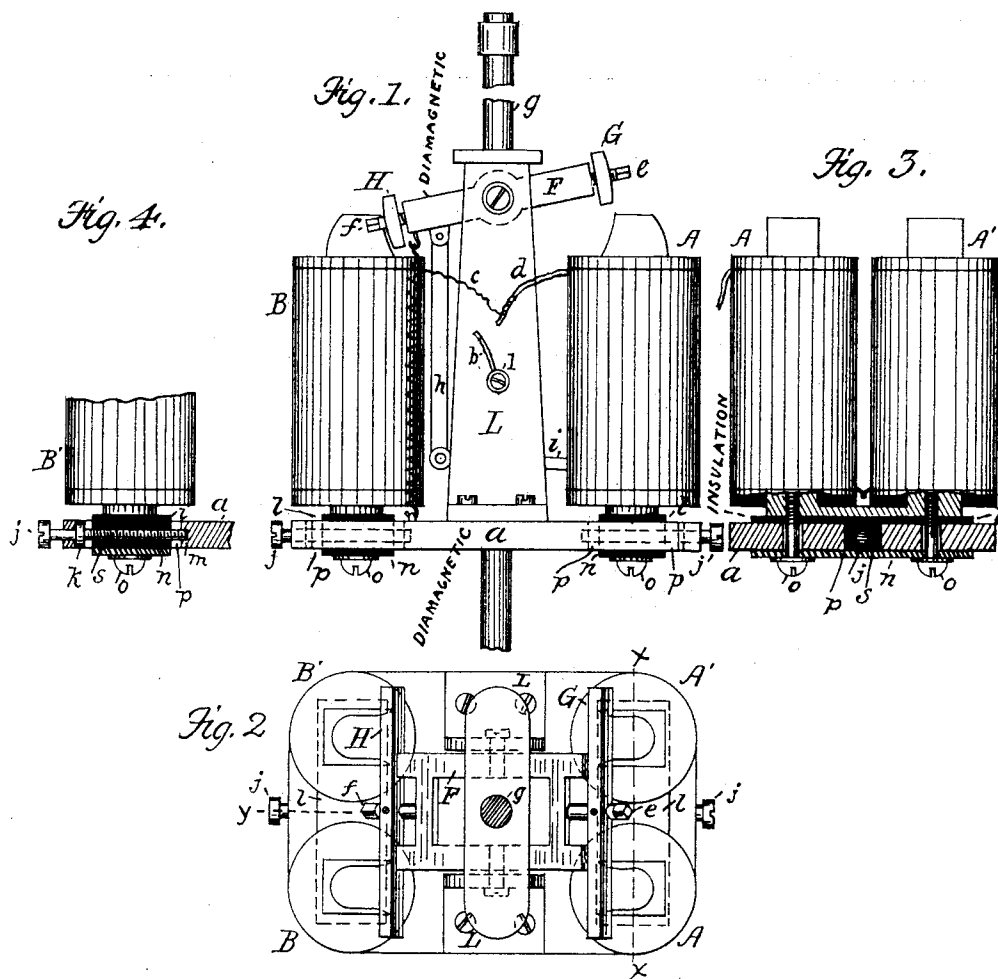


(No Model.)

H. DEWAR.
ELECTRIC ARC LAMP.

No. 471,234.

Patented Mar. 22, 1892.



WITNESSES

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HECTOR DEWAR, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO ALBERT W. ROUNDS, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 471,234, dated March 22, 1892.

Application filed September 15, 1891. Serial No. 405,768. (No model.)

To all whom it may concern:

Be it known that I, HECTOR DEWAR, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Electric-Arc Lamps, of which the following is a specification.

My improvement relates to electric-arc lamps, in which the arc between the positive and negative carbons is regulated and controlled by means of main and secondary or shunt magnets, and I have in view the following objects for the improvement of such lamps: As such lamps are ordinarily constructed the electro-magnets are arranged upon the upper part of the frame or floor, and as the substance of the said frame or floor is frequently used as a conductor of electricity in forming short circuits from one part of the lamp to another it happens that where two independent electro-magnets are employed in the regulation of the lamp and are secured to said frame or floor magnetic circuits are formed between the poles of the said two magnets, which very materially disturb the magnetic circuits of each electro-magnet and affect their working properly, and in lamps employing independent main and secondary or shunt magnets having a lever between them provided with armatures, which armatures are associated one with the main and one with the secondary or shunt magnets, it has been customary to make the said lever in one piece of magnetizable material, which soon becomes magnetized and its sensitiveness to the lines of force or attraction of the poles of the electro-magnets is impaired.

It is very desirable in arc lamps that the same lamp be so constructed that it can be placed in circuits of different amprage—for instance, to produce a lamp which will burn in one circuit with ten ampères and give a light of two thousand candles and which will also burn in another circuit with five ampères and give, say, a light of eight hundred candles without removing the coils or any part of the lamp. The arc lamps now in commercial use have their magnets wound for a specified amprage and candle-power, different lamps being used in circuits differing in amprage. By my invention I am enabled to effect this result.

My invention consists in so adjusting and proportioning the relations of the current passing through the lamp to the main and secondary magnets and their armatures and of the relations of the said magnets and armatures to each other that the arc between the carbons is regulated and maintained under the wide differences of amprage mentioned.

To this end Figure 1 represents a side elevation of the upper portion of an electric-arc lamp, showing the floor or platform upon which are the main and secondary or shunt magnets, the standard supporting the armature-lever, and the carbon rod. Fig. 2 is a plan view of the same. Fig. 3 is a sectional view on *x x* of Fig. 2, and Fig. 4 is a sectional view on line *y* of Fig. 2.

A A' are the main magnets, and B B' are the secondary or shunt magnets secured to the floor or platform *a*, but insulated therefrom by the insulating material *l* and *n*.

As the electro-magnets are insulated and connected to the floor in the same manner, a description of one will be sufficient, the reference-letters being the same for both.

I provide slots *p p* in the floor *a*, as shown, extending centrally of the electro-magnets. Extending longitudinally from the outside of the floor through the slots *p p* are the screws *j j*, having a bearing *m* at their ends and a collar *k*, which bears on the outer face of this slot *p*. A thin strip of insulating material *l* is interposed between the heels of the electro-magnets and the floor *a*, having a square projecting under portion *s* integral therewith, which fills the cross-section of the slot *p*, as shown in Fig. 3, but does not the longitudinal section, as shown in Fig. 4, there being slot-space at each end thereof. The portion *s* serves as a nut, the screw *j* extending through it. A strip *n* of insulating material under the floor *a* extends parallel with the piece *l*, having holes at each end, through which pass the screws *o o* into the cores of the electro-magnets. The holes in the floor *a*, through which the screws *o o* pass, are larger than the screws, and are slotted parallel to the slots *p p*.

The standard *L* is secured to the floor *a* and has pivoted at its upper end the lever *F*, made of non-magnetizable metal, as brass, and has

upon its ends armatures H and G of magnetizable metal, as soft iron. I have shown them as being adjustable to and from their pivot by means of screws *f* and *e*, as shown in the application of D. Houghton, Serial No. 378,184.

By making the lever F of non-magnetizable material I prevent the disturbance in the opposite armatures which is occasioned by its being of iron or other magnetizable material, the molecules of the armatures being free from all influence except that exercised upon them by the cores of their own magnet-spools, and are free to become oppositely polarized thereto and thereby.

The insulation *l s n* entirely separates the electro-magnets A A' and B B' from each other, so that there is no possibility of a magnetic circuit being formed between their separate cores through the floor *a*. To further the magnetic separation between the said electro-magnets, I construct the floor *a* of non-magnetizable material, as brass, and for magnetic separation this would in most cases be sufficient; but as I wish to separate them electrically as well I employ the insulation *l s n*.

In carrying out the second part of my invention—that of providing a lamp which can be used in circuits of widely-different amprage, as hereinbefore stated—I have shown in the drawings means which I will now explain.

It is well understood that when a certain current is passing through electro-magnets which have armatures arranged opposite their cores a certain and well-defined effect is produced upon a carbon rod through the clutch mechanism intermediate of the said magnets and carbon rod. The entire lamp is constructed to produce the said effect, and any difference in current beyond a slight variation will not operate the lamp. To permit any wide change of current—say from ten ampères to five or vice versa—it becomes necessary to alter the adjustments of the parts of the lamp to each other or to take out portions—such as coils which are wound for a certain definite current—and introduce others suitable to the current to be used. The means employed by me are such as to continue the lamp with all its parts intact and without the substitution of any. It is known that an armature which is adjusted to its magnet-core to enable it to perform its work has to be adjusted closer to the said core in

case the current is weakened. I am not aware that this principle has been applied to electric lamps—i. e., to secure the same work by the clutch mechanism under a weak current that has been performed by a stronger current by means of adjusting the relations of the armature and magnet to each other. Referring to the drawings, I show two independent ways of accomplishing this result—first, by adjusting the armatures to their cores, and, second, by adjusting the electro-magnet cores to their armatures. In the first way the armatures are moved toward or from their cores by means of the screws *f* and *e*, and in the second way the electro-magnets and cores are brought nearer to or carried farther from their armatures by the screws *j*, which have the abutments *m*, and the collar *k*, which prevents them from advancing or receding. By turning the screws *j* in the insulating-nut *s* the electro-magnets are adjusted to their armatures, as described. I may, if I choose, use both ways in the same lamp.

By the means described I have been able to place my lamps in circuits using such widely-differing amprage as five and ten ampères, respectively, and use them commercially.

I claim—

1. In an electric-arc lamp, the combination of a non-magnetic floor, magnets secured thereon, an insulating-strip between the magnets and the floor, having a depending block, and adjusting-screw mounted in the floor and passing through the said depending block.

2. In an arc lamp, a brass base-plate, a main magnet, the cores of which are connected by a bar or shoe insulated from the base-plate, and a secondary magnet, the cores of which are connected by a shoe or bar, insulated from the base-plate, in combination with a brass frame or bridge piece and a frame of non-magnetic material pivoted therein, the said pivoted frame having iron armatures.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 14th day of September, 1891.

HECTOR DEWAR.

Witnesses:

GEO. WILLIS PIERCE,
V. M. BERTHOLD.