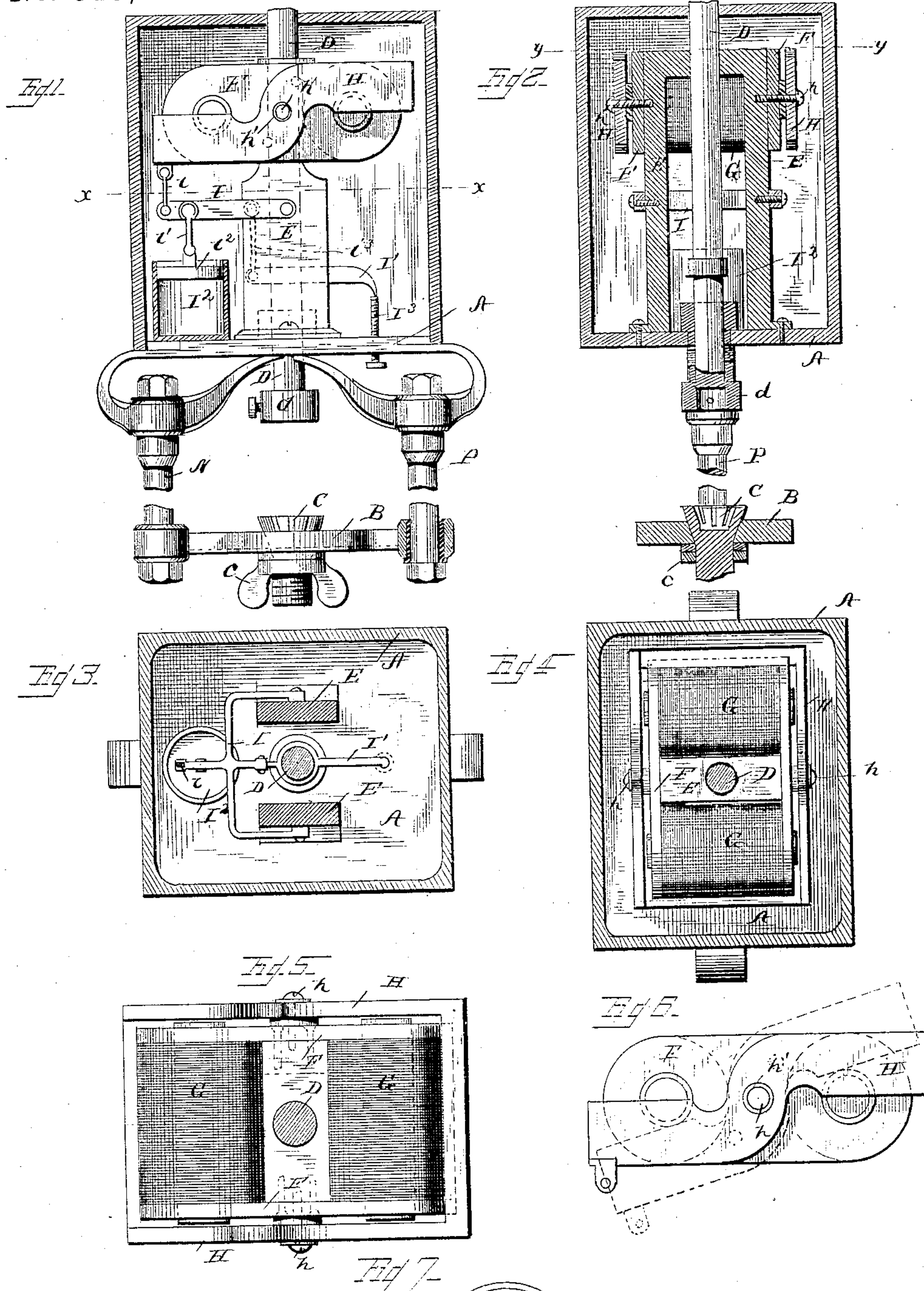


(No Model.)

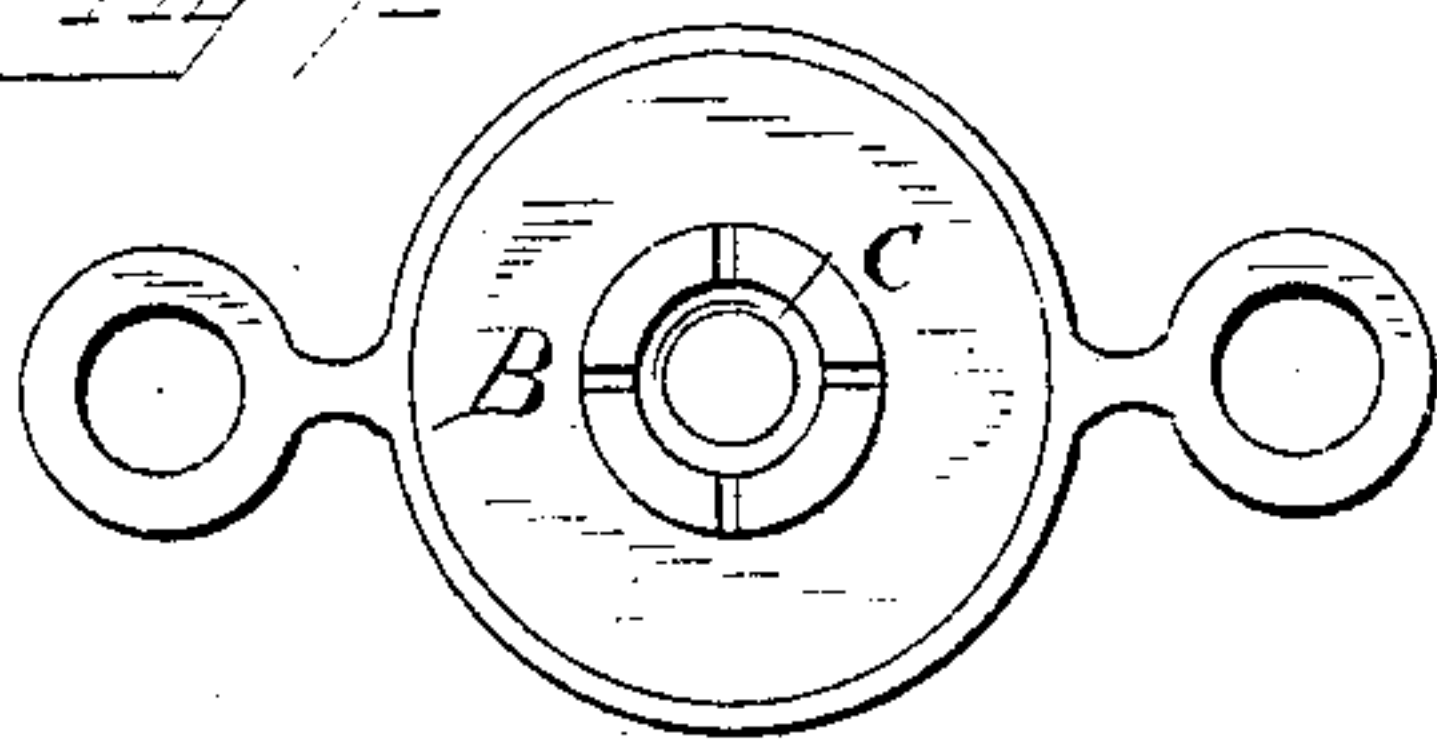
W. P. FREEMAN.
ELECTRIC ARC LAMP.

No. 313,487.

Patented Mar. 10, 1885.



WITNESSES
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ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 313,487, dated March 10, 1885.

Application filed March 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, WARREN P. FREEMAN, of the city, county, and State of New York, have invented a new and useful Improvement in an Electric-Arc Lamp; and I hereby declare the following to be a full and clear description thereof.

This invention relates to the device for regulating the moving of the upper carbon and the mechanism for accomplishing this regulated movement by means of a grip-clutch and a lever for moving the same actuated by a pair of electro-magnets and a vibrating armature.

The invention will be readily understood by reference to the accompanying drawings, of which Figure 1 is a side elevation of the machine or improved lamp, portions of the inclosing-box and the front of the dash-pot being broken out to more readily expose and illustrate the working parts. Fig. 2 is a transverse central sectional elevation of the improved lamp. Fig. 3 is a sectional plan on the line *x x* of Fig. 1. Fig. 4 is a sectional plan on the line *y y* of Fig. 2. Fig. 5 is a detail plan of the regulating electro-magnets and the vibrating frame forming the armature of magnets. Fig. 6 is a detail sectional elevation of the parts shown in Fig. 5, and Fig. 7 is a plan of the base-plate which carries the stationary carbon-holder.

This lamp, like others of its class, has a metallic case, A, which incloses its operative or working parts, and the bed-plate A' of the said case, from which the box or upper part is removable, is connected by two side rods, P and N, with the base-plate B, which carries the lower or stationary carbon-holder C. The plate A', which forms the bed-plate, on which is erected the operative parts of the lamp, is stationary, and a central aperture formed in it and neatly adjusted to the size of the upper or sliding carbon-holder, D, permits the said movable carbon-holder to easily slide up and down in it. The thumb-screws *c* and *d*, respectively, secure the holders C and D to the fixed and movable carbons. A U-shaped piece, E, is securely attached to the upper face of the bed-plate A', as shown clearly in Figs. 1 and 2, and a central aperture in the top part of the said piece E permits the sliding carbon-holder D to move easily up and down through the said piece, the said holes or apertures in

the parts A' and E forming perfect guides for the bottom and top ends of the sliding carbon-holder, thereby keeping it in its proper vertical line.

Near the upper end of the U-piece E, and securely fastened to its sides, are two short arms or bearers, F, between the outer projecting ends of which are held two electro-magnets, G G, as shown in Figs. 1 and 4. A rectangular frame, H, is made to inclose, without touching on either side, the arms F and their magnets G, and the said frame H is hung on pivot pins or screws *h*, which pass through the side bars of the frame H, and are screwed into the sides of the upright piece E through the intervening arms or beams F. These screws *h* have insulating bushings *h'* between them and the frame H, and the said frame is balanced evenly on said pivots, so it can be tipped easily up or down on either side. The side bars of the said frame H are used as armatures, which are acted on by the magnets G G in the proper manner to regulate the feed of the sliding carbon, as presently explained. The said side bars are curved, as shown in Fig. 6, so that when the frame is resting in a normal level plane the top faces of the side bars on one side of the pivots and the bottom faces of the side bars on the other side of the pivots are in the same plane as the centers of the cores of the magnets G G, thus causing both magnets to act equally on the frame to move it as desired. When an excess of electricity is passed through the lamp, it is shunted through the metal of the frame-work into the magnets G G, and these magnets thereby becoming highly magnetized act on the armature side bars of the frame H to draw them into this horizontal position, for the purpose presently explained. A bifurcated lever, I, has each of its U-shaped arms passed outside of and pivoted to the upright piece E, and the outer or moving end of the said lever is connected by means of the connecting-rod *i* with the bottom side of one of the end bars of the vibrating pivoted frame H. The lever I has also journaled to it another connecting-rod, *i'*, the lower end of which is attached to the piston *i''* of the dash-pot I'. Another connecting-rod, *i'''*, is journaled at its upper end to a central arm of the lever I, and at its lower end to the free or moving end of the clamp-lever I', which embraces and acts as

a grip-rod on the moving carbon-holder D. The other or relatively fixed end of the grip-rod I' is fulcrumed on an adjustable screw, I², which is threaded in the bed-plate A', and used
 5 to adjust the said grip-rod to the position required by moving its relatively-fixed support up or down, a thumb-nut at the bottom end of the said adjusting-screw being placed below the bottom side of the bed-plate A' and easily
 10 accessible for this purpose. All of these last-described parts are clearly shown in Figs. 1 and 3. An aperture through the grip-rod I' permits the carbon-holder rod D to easily slide up and down through it when the sides of the
 15 said hole are parallel with the sides of the said rod; but when the said grip-rod is raised or lowered more or less at one or the other end the upper and lower edges of the hole of the rod on opposite sides impinge more or less se-
 20 verely against the rod D, and consequently grip it and move the said rod up or down with the movement of the said lever or grip-rod. When an excess of electricity is sent through the carbon-holder D, the excess is shunted off
 25 to the electro-magnets G, and these, acting on the armature side bars of the frame H, raise the said frame to its level position, as shown by the full lines in Figs. 1 and 6, the said frame having previously been standing in the posi-
 30 tion indicated by the dotted lines in Fig. 6. The piston of the dash-pot I³, connected with the operating-lever I by the connecting-rod i', as above explained, acts in the usual manner of such devices to regulate and ease the move-
 35 ment of the parts.

By the arrangement and construction of the parts, as above described, the grip-rod is raised by the introduction of an excessive flow of electricity and lowered when the reverse is

the case, the adjusting-screw I³ being used to 40 adjust the normal position of the grip-rod to the proper plane.

The aperture in the grip-rod I' for the carbon-holder D is adjusted so as to let the said carbon-holder slide easily down under a nor- 45 mal and proper current of electricity, but to be gripped by the rod and held fast thereon when circumstances require it. The movement of the grip-rod and its attachments down is by gravity. 50

Having described my invention, I claim—

1. The rectangular vibrating frame H, the side bars of which are made to form armatures for a pair of local magnets, G, placed trans- 55 versely between them and supported independently of the said frame, which is pivoted to a stationary central support, and in combination with said vibrating frame, and articulated to it by a suitable connecting-rod, a trans- 60 verse lever, connected with and operating by means of a suitable connecting-rod, a grip-rod for clamping and moving the sliding carbon-holder rod and, in connection with said actu- 65 ating-lever and suitably attached to it by a connecting-rod, the piston of a dash-pot for governing and equalizing the movement of the working parts, substantially as described.

2. The vibrating frame H, electro-magnets G G, lever I, connecting-rods i, i', and i'', and grip-rod I', combined and arranged as de- 70 scribed.

In testimony whereof I have signed my name to this specification in the presence of subscribing witnesses.

WARREN P. FREEMAN.

Witnesses:

M. RANDOLPH,

W. J. DOUGHTY.