

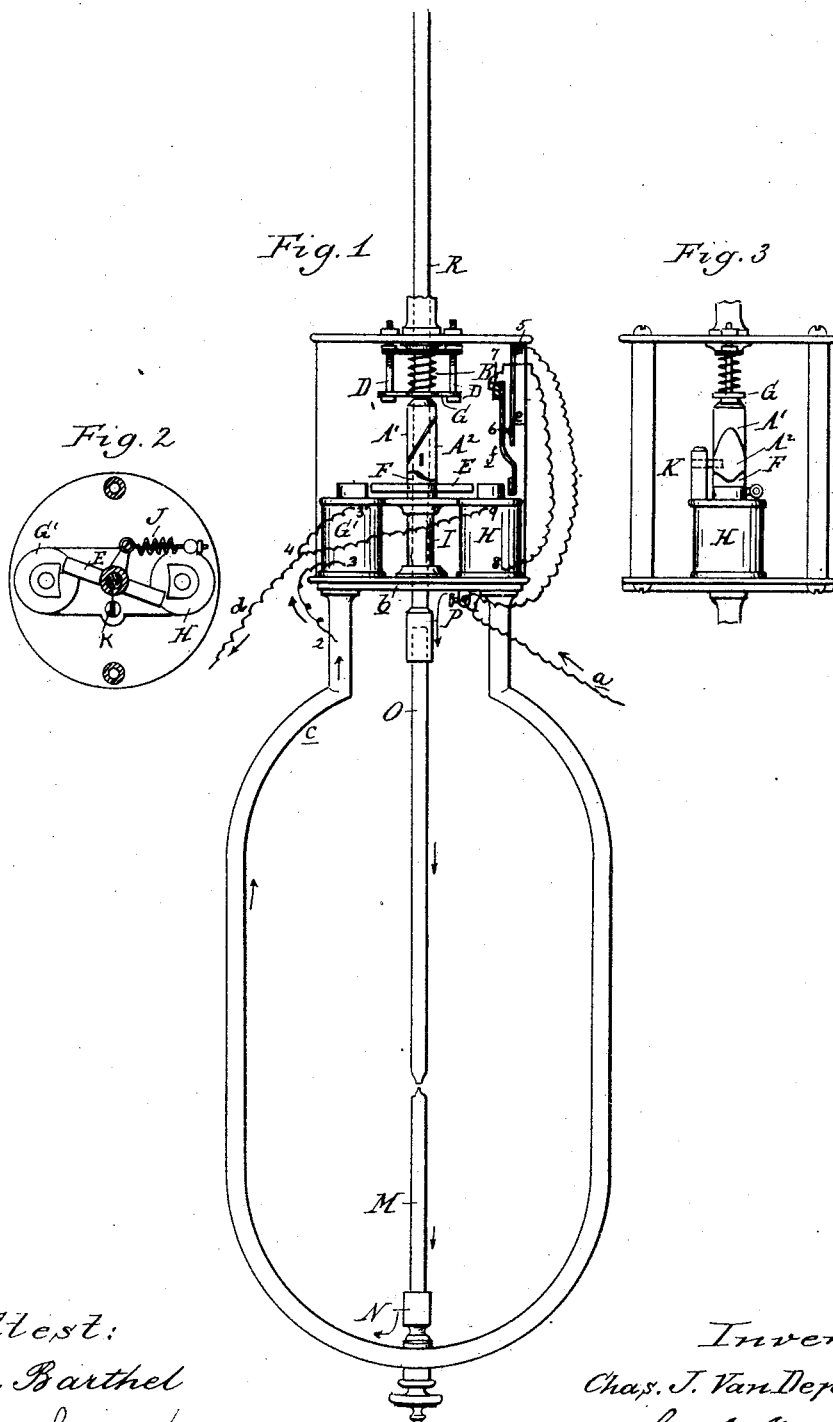
(Model.)

C. J. VAN DEPOELE.

ELECTRIC ARC LAMP.

No. 261,280.

Patented July 18, 1882.



Attest:

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UNITED STATES PATENT OFFICE.

CHARLES J. VAN DEPOELE, OF CHICAGO, ILLINOIS.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 261,280, dated July 18, 1882.

Application filed February 11, 1882. (Model.)

To all whom it may concern:

Be it known that I, CHARLES J. VAN DE-
POELE, of Chicago, in the county of Cook and
State of Illinois, have invented new and use-
ful Improvements in Electric-Arc Lamps; and
I 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.

The nature of my invention relates to certain
new and useful improvements in the construc-
tion of electric lamps of the open or arc-light
type, by means of which the position of the
movable carbon is automatically adjusted, as
such adjustment is required to preserve the
proper relative distance between the adjacent
ends of the upper and lower carbons to form
the proper arc.

The invention consists in the peculiar con-
struction and operation of parts and their var-
ious combinations, as more fully hereinafter
described.

Figure 1 is a front elevation of my improved
electric lamp. Fig. 2 is a cross-section at the
line immediately above the armature and mag-
nets. Fig. 3 is a side elevation of the upper
section of the lamp.

In the accompanying drawings, which form
a part of this specification, A' and A'' repre-
sent a tube or cylinder loosely sleeved on the
rod R, at the lower end of which is secured
the carbon-holder socket P, which carries the
carbon O.

M is the lower carbon, resting in the socket N.
The tube, composed of two parts, A' A'', is
made of brass, ivory, bone, or other suitable
material. As seen, this tube is cut into two
parts, the adjacent ends being cut at an angle
of about forty-five degrees, so that if one of
the parts is turned in either direction the other
part remaining stationary, the tube will be
elongated, or if pressure is applied to the ends
of the two parts, owing to this peculiar cut,
such pressure will cause one part to attempt
to override or pass the other, thereby causing
the parts to bind upon the rod upon which
they are sleeved, and holding the same rigidly
until the pressure is relieved upon the ends of
the tube.

B is a spring coiled around the rod R, and

with its lower end resting upon the plate G,
which is adjustable vertically by means of the
bolts D. This plate G should be so adjusted
against the top of the tube A' A'' that when
the same are in the position shown in Fig. 1, and
which will allow the rod R to slide easily there-
in, no pressure will be exerted upon the plate
G, except just sufficient to hold the two parts of
the tube in place against accidental displace-
ment. E is an armature, centrally sleeved also
upon this rod R, and adapted to have a partially
rotating or vibratory movement. Upon the
central part of this armature is secured the half
of a cam, F, the other half of which is formed
by the lower end of the part A'' of the tube,
and arranged so that when the armature is
vibrated in one direction the lower half of the
tube will be raised, such pressure causing the
two parts of such tube to tighten upon the rod.
The opposite movement of the armature re-
leases this pressure, when the two parts of the
tube resume their normal condition and allow
the rod to slide freely.

G' and H are magnets to actuate the arma-
ture E by means of the main current passing
through the coils of one of the magnets—say
G'—while through the coils of the other mag-
net—say H—a pulsating current is passing,
such current being either a derived or a direct
one.

I is a thimble, sleeved upon the rod R and
supporting the armature, with which it oscil-
lates or vibrates.

J is a spring to regulate the length of the
arc, shorter or longer, as may be desired, by
adjustably limiting the throw of the armature
in its vibrations or oscillations, as shown in
Fig. 2.

K is a post, slotted vertically, and in this
slot is a detent or stop, (shown in Figs. 2 and
3,) which said stop engages with a slot, (shown
in the part A'' of the tube,) to prevent such
tube from turning upon the rod with the vi-
bration of the armature.

In practice, the electric current being estab-
lished in the usual manner, as in the case of
lamps with arcs, the core of the magnet G' be-
comes magnetized and attracts the nearest end
of the armature E toward its center, thereby
compelling the cam F to raise the part A'' of

the tube, which slides along the diagonal cut against the other part, A', of such tube, thereby forcing this part against the plate G, which, under the operation of the spring B, will tend to hold the part A' down and clamp the rod R. Any further motion of the armature in the same direction will overcome the resistance of the spring B and raise the tube and the rod R clamped as described within it. By this means the arc is established between the adjacent ends of the electrodes or carbons. As long as the current is normal and the arc of proper length the magnet G' will hold the armature E pretty near its center; but when the arc grows too long by the combustion or burning away of the ends of the electrodes it becomes necessary to feed the upper carbon gently and yet positively. This is secured by the combined action of the magnets G' and H, the main current passing through the magnet G' and a derived or pulsating current (such as I have described and claimed in an application now pending) passes through the magnet H, the one current alternately drawing the armature in one direction in its oscillation, and the other magnet introducing an opposite movement, whereby the feed of the rod and its movable carbon is positive and steady, as the armature E will be in a constant vibration.

In order that the operation of the two magnets may be better understood, I will now proceed to describe the circuits.

In starting the lamp the current passes through the main wire *a* to the plate *b* at 1, and passes from thence through the carbons O M, up through the frame *c*, from the frame *c* at 2 to the magnet G' at 3, through and out of the magnet G' at 3', and from 3' to the main wire *d*. This circuit, when complete, energizes the magnet G' and raises the upper carbon to form the arc, and is termed the "normal" circuit or current. When, however, the space between the two carbons increases so as to cause a great resistance at that point, a portion of the current passes from the main wire at the point 1 to the spring-contact *e* at 5, from said spring *e* at 6 to the circuit-breaker *f*, from said circuit-breaker at 7 to the magnet H (of higher resistance than the magnet G') at 8, through said magnet, and from the same at 9 to the main wire *d* at 4.

From the above it will be seen that as soon as the second circuit (through the magnet H) is completed it will operate upon the nearest end of the armature E, and turn it and simultaneously attract the circuit-breaker *f* and break the current at 6. This breaking the current at 6 allows the spring circuit-breaker to again complete the circuit at 6, and these movements continue, the circuit-breaker *f* and the armature E vibrating rapidly until the carbon resumes its proper position, when the current again passes entirely through the normal circuit.

I do not desire to confine myself to the ex-

act construction or location of the circuit-breaker as shown, nor to the means shown and described for raising the clutch-sections, as these features may be varied without departing from the spirit of my invention.

What I claim is—

1. The combination, with the upper carbon of an electric lamp, of the two-part clutch A' A'', having angular meeting surfaces, and suitable means for operating said clutch, substantially as described.

2. The combination, with the upper carbon of an electric lamp, of the two-part clutch A' A'', having beveled meeting edges, a spring above the part A', and mechanism, substantially as described, for operating the lower part, A'', against the part A', as set forth.

3. In an electric-arc lamp, the two-part clutch A' A'', having beveled meeting edges, in combination with the armature E and suitable connecting mechanism between the armature and the clutch, whereby the movement of the armature will raise the clutch, substantially as described.

4. In an electric-arc lamp, and in combination with the rod and two-part tube, the spiral spring B and plate G, with its adjustable bolts, substantially as and for the purposes set forth.

5. In an electric-arc lamp, the armature E, pivoted at its center and actuated by a magnet at one end, having a continuous current passing through the same, and a magnet at the opposite end, through which a pulsating or derived or direct current is passing, substantially as and for the purposes set forth.

6. In an electric-arc lamp, the combination, with the two-part clutch A' A'', of the vibrating armature E, and the cam F, secured to the armature and acting against the lower part, A'', of the clutch, substantially as described.

7. In an electric-arc lamp, the combination, with the clutch A' A'' and the vibrating armature E, and connecting mechanism for operating said clutch, of the spring J, substantially as described, and for the purpose specified.

8. In an electric-arc lamp, the combination, with the two-part clutch A' A'' and its operating mechanism, of the post K, carrying a detent engaging with the clutch to prevent it from rotating, substantially as described.

9. In an electric-arc lamp, the combination, with the clutch A' A'' and the vibrating armature E, of the magnets G' H and means, substantially as described, for passing a steady current through one magnet and a pulsating or intermittent current through the other, as set forth.

10. In an electric-arc lamp, the combination, with the two-part clutch A' A'', the spring B, the vibrating armature E, and connecting mechanism between the armature and clutch, of the magnets G' H, currents connecting both magnets with the main line, the spring J, and the circuit-breaker *f* in the circuit of the mag-

net H, and operated by said magnet, substantially as and for the purpose specified.

11. In an electric-arc lamp, the two-part cylinder, constructed as described, in combination with the spring B and plate G, adapted to clamp, raise, and release the rod R, being actuated thereto by the operation of a centrally-pivoted armature between two magnets,

through one of which is passing a steady and through the other a pulsating current, substantially as and for the purposes described. 10

CHARLES J. VAN DEPOELE.

Witnesses:

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FRANK DOUGLAS.