

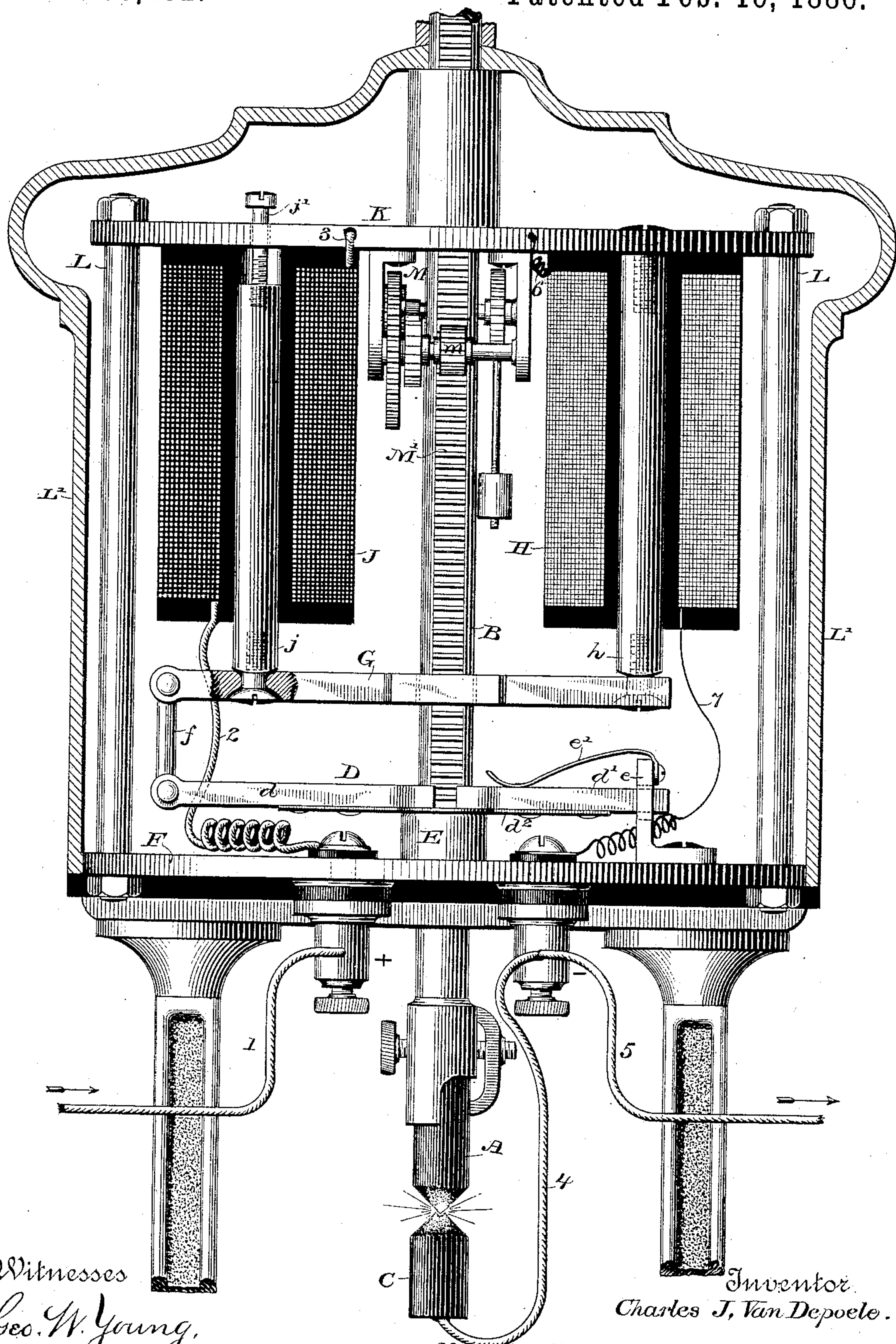
(No Model.)

C. J. VAN DEPOELE.

ELECTRIC ARC LAMP.

No. 336,452.

Patented Feb. 16, 1886.



Witnesses
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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. 336,452, dated February 16, 1886.

Application filed August 1, 1885. Serial No. 173,232. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. VAN DEPOELE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification, reference being had to the accompanying drawing.

My invention relates to improvements in electric-arc lamps; and it consists in certain novel details of construction and arrangement, as will be hereinafter fully described and claimed.

The drawing is an elevation, partly in section, of the regulator or feed-controlling mechanism of my improved lamp, the lower portion of the frame being omitted.

A is the upper carbon, which is fed downward by the force of gravity whenever released from its suspending mechanism.

B is the carbon-rod to which the carbon A is attached.

C is the fixed or negative carbon.

D is the clutch for raising and holding the upper or positive carbon; and it consists, essentially, of two short pieces of metal, d d' , formed at their inner ends so as to readily hold the carbon-rods B when placed between them, and united by a thin piece of spring-metal permanently attached to their under sides, and by which they are united, substantially as shown and described in Letters Patent No. 294,532, granted to me March 4, 1884.

A boss or support, E, extends upward a short distance from the bottom plate, F, of the lamp, and upon which the under side of the clutch rests when about to release the carbon-rod. One end of the clutch d' is loosely secured within a bracket, e , and steadied by a small spring, e' . The other end portion of the clutch d is permanently connected to the armature G by a link of diamagnetic material, f .

H is an electro-magnet of comparatively high resistance, to the core h of which the extremity of the armature G is loosely but permanently attached and magnetically connected.

J is a solenoid of comparatively low resistance, the core or plunger j of which is loosely attached to the armature G at a point not far

from the link f . The solenoid J and the magnet H are both attached to an iron heel-plate, K, to which the core h is permanently attached. The core j does not extend, however, entirely through the solenoid J, there being a space between its free end and the under side of the heel-plate to admit of longitudinal movement of the said core within the solenoid, its range with respect to the heel-plate being limited by a set-screw, j' . Tie-bolts L unite the upper and lower portions of the regulator.

L' is a removable cover, which fits over the entire apparatus to protect it from the elements.

M is a clock-train, the main pinion m of which meshes with rack-teeth M' on the carbon-rod, and it operates to retard the descent thereof when released by the clutch.

1 is the main conductor entering the lamp, and it passes from the binding-post by conductor 2 to the solenoid J, thence by conductor 3 to the heel-plate K, thence to the carbon-rod and upper carbon, the arc, the lower carbon, the conductor 4, to negative binding-post, and thence by conductor 5 to line. The circuit of the high-resistance shunt-magnet is from the heel-plate K, by way of conductor 6, into the magnet H, and from thence by conductor 7, to the negative binding-post and to line.

With the construction above described it will be apparent that the heel-plate K, the cores j and h , and the armature G will be magnetized and form a magnetic circle under the influence of the solenoid J, the constant tendency of which is to draw in its core j , and thereby raise the armature G and clutch D, and separate the carbons. The winding of the magnet H is such that its magnetic effect will be the reverse of that of the solenoid J, and therefore whatever magnetic influence is exerted by the magnet H tends to cause the solenoid J to release its core, and allow the armature G and clutch D to descend, the effect of which movement being to seat the clutch upon the support E, when its portion d d' will immediately separate, releasing the carbon-rod. If provision were not made to prevent it, the result of this movement would be the sudden fall of the carbon until both upper and lower

carbons were in contact, which would cause a very perceptible blink, and I obviate it by the use of the clock-train M, which consists simply of a pinion engaging a rack on the
 5 carbon-rod, a backing-ratchet, a main wheel, a scape-wheel, and anchor, and the moment the carbon-rod is released by the descent of the solenoid-core *j* its entire weight is thrown upon the pinion *m*, the clock-train put in motion, and the rod allowed to descend slowly
 10 until the arc becoming normal the resistance is decreased, and the current effect again preponderates in the solenoid J, which, regaining its strength and magnetizing, raises the armature and clutch and arrests the further descent
 15 of the carbon-rod until, by the lengthening of the arc, the resistance is so much increased that a larger proportion of current will be forced through the magnet H, and by elevating its power decrease that of the solenoid J, and
 20 cause the lamp to feed again, just as described.

What I claim and desire to secure by Letters Patent is—

1. In an electric-arc lamp, the combination
 25 of a solenoid in the main circuit, a heel-plate of magnetic material to which said solenoid is connected, a shunt-magnet of high resistance secured to the opposite end of the heel-plate and having its core in permanent connection therewith, an armature hinged to the
 30 fixed core of the shunt-magnet and extending therefrom to the movable core of the solenoid, completing a magnetic circle, a clutch for supporting the carbon-rod, and mechanical connections between the clutch and the free
 35 end of the armature, and electric connections so disposed that an increase of current through the shunt-magnet will tend to demagnetize the main or clutch magnet and cause the lamp to
 40 feed, substantially as described.

2. In an electric-arc lamp, the combination of a solenoid in the main circuit, a heel-plate of magnetic material to which said solenoid is connected, a shunt-magnet of high resistance secured to the opposite end of the heel-
 45 plate and having its core in permanent connection therewith, an armature hinged to the fixed core of the shunt-magnet and extending therefrom to the movable core of the solenoid, completing a magnetic circle, a clutch for
 50 supporting the carbon-rods, and mechanical connections between the clutch and the free end of the armature, a clock-train operated by the descent of the carbon-rod for retarding the same, and electric connections so disposed
 55 that an increase of current through the shunt-magnet will tend to demagnetize the main or clutch-supporting magnet and cause the lamp to feed, substantially as described.

3. In an electric-arc lamp, the combination
 60 of a solenoid, J, in the main circuit, heel-plate K, electro-magnet H, in a shunt around the arc and having core *h* permanently secured to the heel-plate, an armature, G, pivotally attached to the extremity of the fixed core *h*
 65 and loosely attached to the vertically-moving core *j* of the solenoid, the upper end of which is provided with an adjusting-screw, *j'*, a suitable clutch and connections extending from the armature thereto, and the clock-train
 70 M *m*, connected to and adapted to retard the descent of the carbon-rod, substantially as shown and described.

In testimony whereof I hereto affix my signature in presence of two witnesses.

CHARLES J. VAN DEPOELE.

Witnesses:

JOHN EASON,
 WARREN S. STEARNS.