

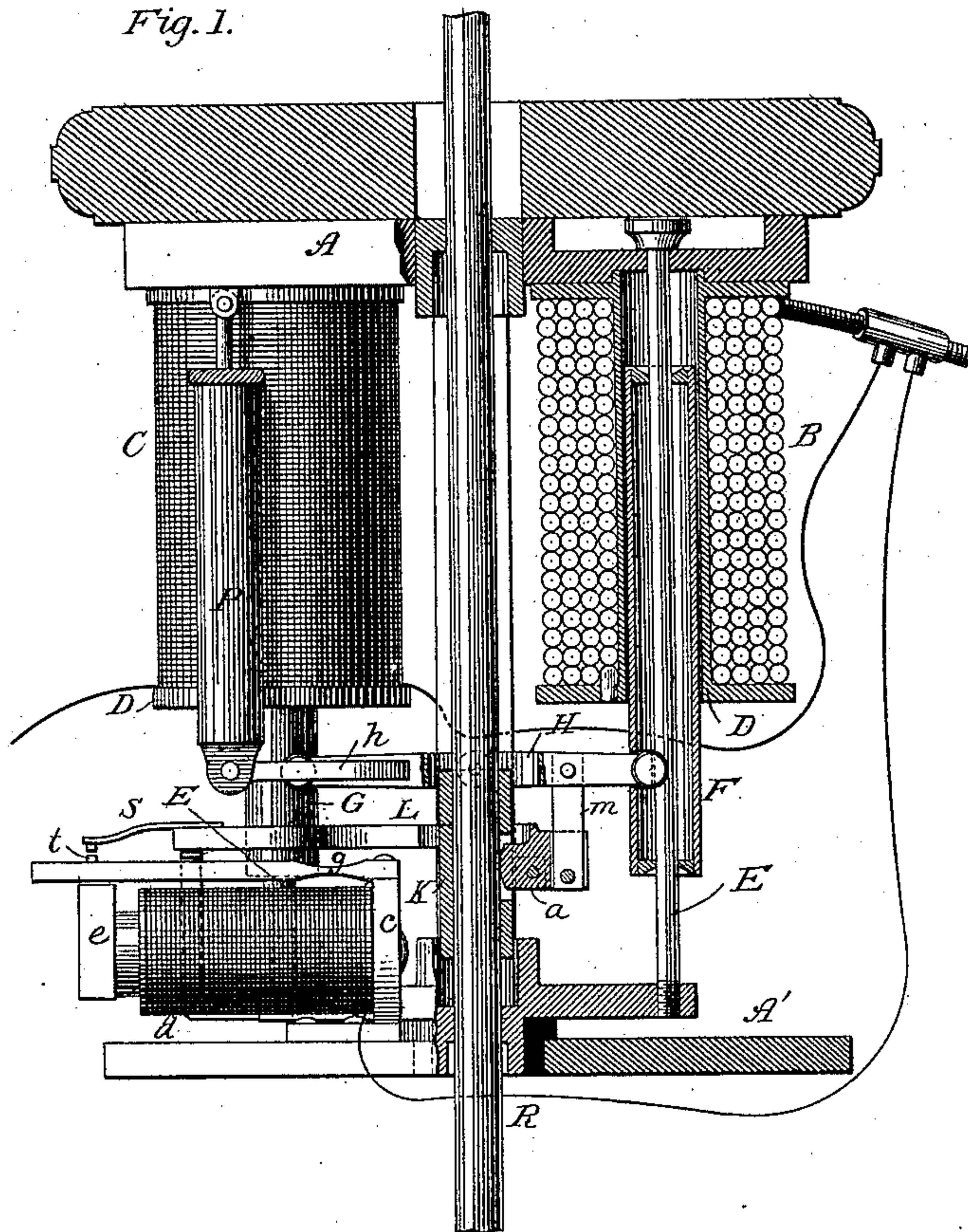
(No Model.)

E. WESTON.  
ELECTRIC ARC LAMP.

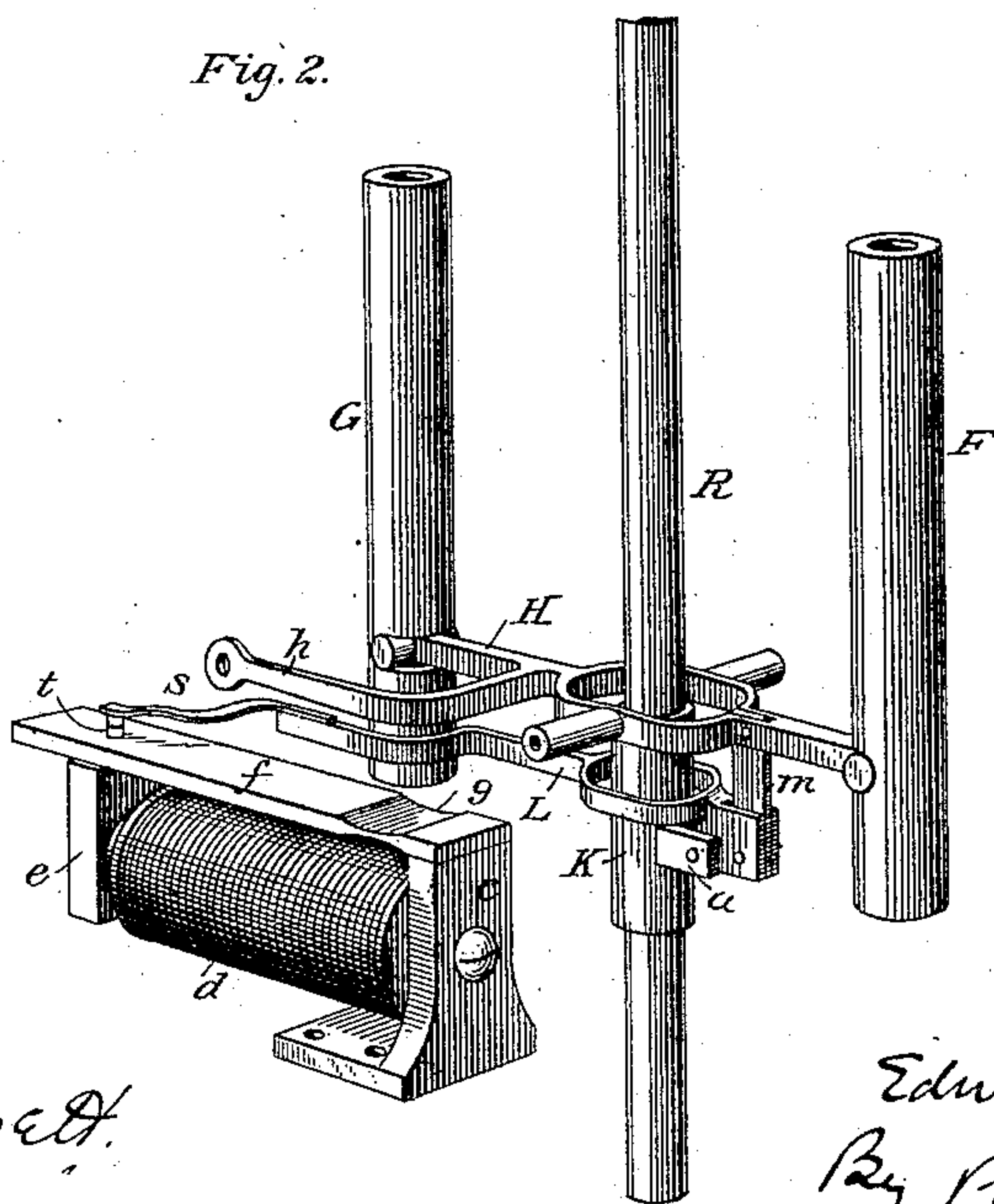
No. 301,076.

Patented June 24, 1884.

*Fig. 1.*



*Fig. 2.*



Attest:  
W. H. Doggett.  
N. Fishy

Inventor:  
Edward Weston  
By Parker W. Page,  
att'y.



# UNITED STATES PATENT OFFICE.

EDWARD WESTON, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE UNITED STATES ELECTRIC LIGHTING COMPANY, OF NEW YORK, N. Y.

## ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 301,076, dated June 24, 1884.

Application filed July 16, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD WESTON, a subject of the Queen of Great Britain, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

My present invention relates to electric-arc lamps in which a clamp or clutch is employed in conjunction with a movable carbon carrier or rod and operated through the instrumentality of one or more electro-magnets for adjusting the position and effecting the feed of the carbon attached to the rod. Heretofore in such lamps the clamp or clutch has been connected to a moving magnet or armature, so as to be brought into a position where it binds the carbon carrier or rod and prevents the same from feeding downward during the existence of a normal arc, and then lowered into contact with a fixed stop, and caused to release the rod when, by the consumption of the carbons, a definite increase in the length of the arc has taken place. A difficulty has been encountered in maintaining in these lamps a sufficiently sensitive action of the feed mechanism to prevent the carbon-rod from being released by the clamp or clutch and falling so far as to bring the carbons into actual contact. For the purpose of avoiding this difficulty a rapid vibratory movement has been imparted to the clutch when it is desirable to feed the carbons together, by this means imparting to the carbon-rod a slow movement through the clutch toward the lower carbon.

My invention consists in a novel means for accomplishing this, in which I combine with the clamp or clutch a detent, which, by the contact therewith of the clamp, is caused to rapidly vibrate and impart its movement to the clamp.

The details of the construction of a lamp made in accordance with my invention are illustrated in the accompanying drawings, where—

Figure 1 is a view, partly in side elevation

and partly in section, of the operative or working parts of a lamp; Fig. 2, a perspective view of the carbon-holder, the clamping mechanism, and the devices for vibrating the same.

The parts shown in Fig. 1 comprise the magnetic system, the feed-controlling mechanism, and a portion of the movable carbon-rod. The remaining portions of the lamp may be of any kind or design commonly used, and for this reason are not shown.

The letter A designates a plate, to which are attached the helices B C—the former of low resistance in the main circuit, the latter of higher resistance in a shunt about the arc. These helices are formed about tubes or spools D, through which extend centrally brass rods E, secured at one or both ends to the framework of the lamp. On the rods E magnetic cores F G, for the helices B C, respectively, are arranged to slide freely in such manner as to have a free movement in and out of the helices without touching the sides of the cylinders D.

H is a bar or plate, open at its center and pivoted to a stationary support fixed to the frame of the lamp. An arm, h, extends from the bar H, and connects with a suitable dash-pot, P, that serves to retard the movement of the pivoted bar. The ends of bar H are caused to engage in any proper manner with the cores or armatures F G.

R is the carbon rod or holder passing through guides in plate A and plate A', the latter of which forms the lower portion of the casing for containing the feed mechanism. Rod R also passes through the bar H and through a short brass cylinder, K. This cylinder has projecting ears or lugs a a, by which it is hung to the lever L, that extends around the cylinder K, and is connected by a link, m, with the bar H. A portion of the lever L extends through a slot in the side of cylinder K, and bears against the rod R, so as to lock it against movement when the bar H occupies a certain position.

On the plate A' is secured a standard, c, to which is screwed a single-core electro-magnet, d, the end of which is provided with a pole-piece, e, fixed thereto in a proper manner.



An armature-bar, *f*, is secured to the standard *e*, and extended over the pole-piece *e*, a certain degree of retractile force being given to this armature, whether by a spring or by filing it  
 5 down at a point, as *g*, and bending it slightly, so that when the circuit through the coil of the magnet is rapidly made and broken the armature will be vibrated. The coil of magnet *d* is in a circuit taken off from the main  
 10 line, and ending at the armature *f* or its support, which is insulated from the lamp-frame. The main circuit is carried around the helix *B*, and then to the carbon-holder. The helix *c* is included in a shunt from the main circuit  
 15 around the carbons. On the armature *f* is a contact-point, *t*, and extending from the clamp-lever *L* is a strip, *S*, which touches the stop *t* when the lever *L* is lowered. When this contact takes place, the magnet *d* is energized;  
 20 but by the movement of the armature *f* in obedience to this attraction it is instantly broken again.

The operation of the lamp is as follows: When the current is directed through the car-  
 25 bons and magnets, the helix *B* draws up its core, tilts bar *H*, and causes the clamping device to bind and raise the rod *R*. This condition of things continues until, by the consumption of the carbons and the increased at-  
 30 tractive power of the helix *c*, the contact-strip on the end of lever *L* is brought down into contact with the contact-stop *t*. The armature *f* is by this means set into rapid vibration, which movement is imparted to the lever  
 35 *L*, whereby it is caused to drop, by imperceptible degrees, the carbon-rod *R* until, by the approximation of the carbon-points and the increasing attraction of the helix *B*, the strip *S* is raised out of the range of movement of the  
 40 armature *f*. The latter, in consequence of this, ceases at once to vibrate. The action described is repeated until the carbons are consumed, the operation of the clutch or clamping devices being such that the rod *R* is at no  
 45 time released from them for a sufficient length of time to permit the upper carbon to fall into contact with the lower.

From the nature of the case it is evident that many special forms of electro-magnet or  
 50 equivalent mechanism may be employed to

impart the requisite vibration to the clamp-controlling lever through the instrumentality of the vibratory detent, and that the invention is not therefore restricted to the specific devices shown.

I am aware that it is not new to impart to a movable clamp or clutch a vibratory movement for the purpose of effecting the feed of the carbon. My improvement, however, consists in the combination and arrangement of  
 60 parts herein described, by means of which a movable clamp or clutch is vibrated.

The features of novelty embodied in the construction of the lamp feeding mechanism—such as the special arrangement of magnets, guide  
 65 for the cores, and the plan of connecting and operating the clutch by the latter—described but not claimed herein, are reserved as subject of other applications for Letters Patent.

What I now claim is—

1. In an electric lamp, the combination, with the movable carbon-holder and a clamp or clutch, of means for raising and lowering the clamp, and thereby adjusting the carbons, a stop or detent, and means for imparting a vi-  
 75 bratory movement to the same when in contact with the clamp, as set forth.

2. In an electric lamp, the combination, with the movable carbon-holder, a clamp or clutch, and electro-magnets for controlling the posi-  
 80 tion of the same, of a magnet in a normally-open shunt or derived circuit from the main circuit, and an armature connected with the circuit of the said magnet, and arranged to be thrown into vibration on the contact there-  
 85 with of the clamp, as and for the purposes specified.

3. In an electric lamp, the combination, with the feed controlling and adjusting magnets, the movable carbon-holder, and a clamp or  
 90 clutch, of an independent electro-magnet and armature for imparting a vibratory movement to the clutch, for the purpose specified.

In testimony whereof I have hereunto set my hand this 14th day of July, 1883.

EDWARD WESTON.

Witnesses:

HENRY A. BECKMEYER,  
 L. V. E. INNES.