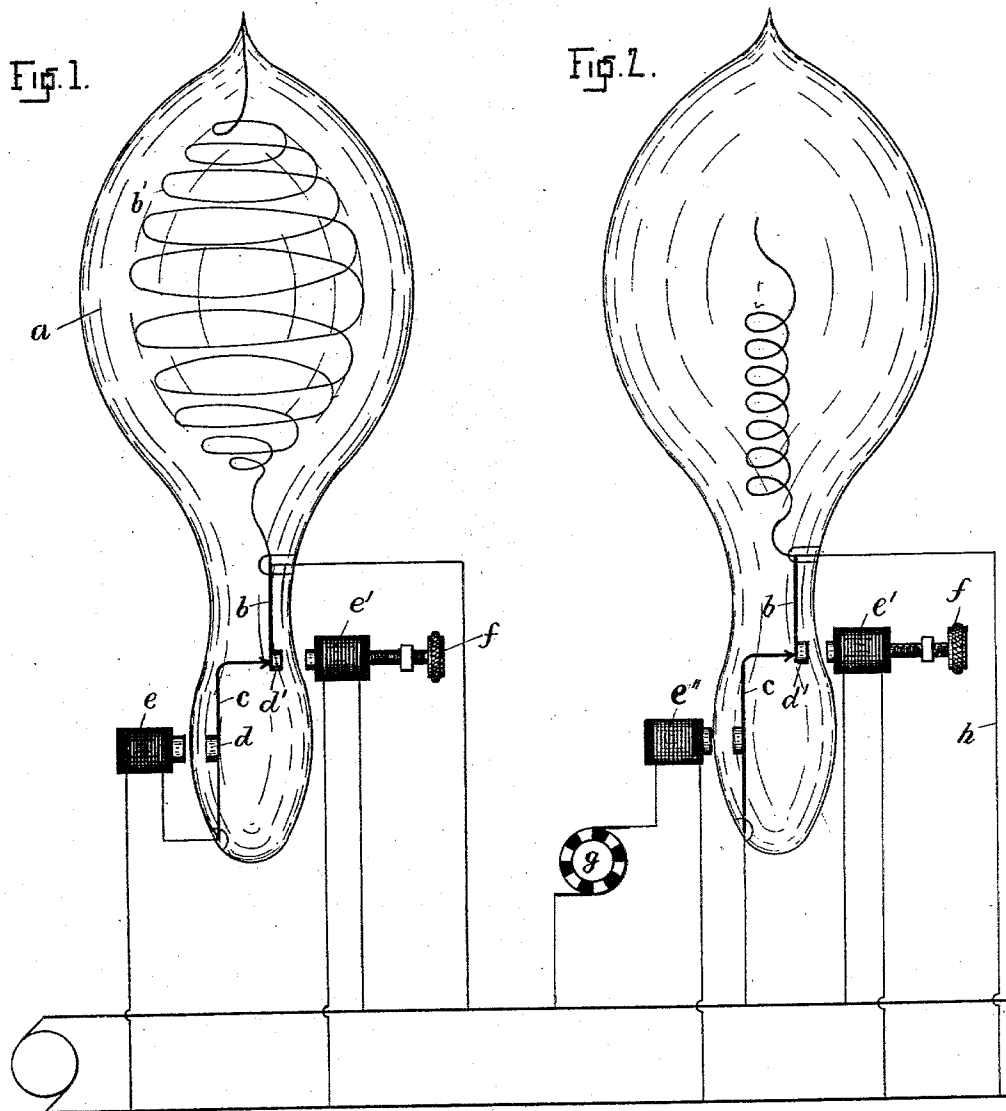


(No Model.)

D. McF. MOORE.
PHOSPHORESCENT ELECTRIC LAMP.

No. 548,574.

Patented Oct. 22, 1895.



WITNESSES:

A. C. Poff.
E. C. Dezhnev

INVENTOR

D. McF. Moore

BY

Edward P. Thompson
ATTORNEY.

UNITED STATES PATENT OFFICE.

DANIEL MCFARLAN MOORE, OF NEW YORK, N. Y., ASSIGNOR TO THE MOORE ELECTRICAL COMPANY, OF SAME PLACE.

PHOSPHORESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 548,574, dated October 22, 1895.

Application filed January 3, 1895. Serial No. 533,700. (No model.)

To all whom it may concern:

Be it known that I, DANIEL MCFARLAN MOORE, a citizen of the United States, and a resident of New York, county and State of New York, have invented certain new and useful Improvements in Phosphorescent Electric Lamps, (Case No. 11,) of which the following is a specification.

The object of this invention is, in general, to produce within an evacuated space a glow or luminosity of sufficient power for artificial illumination by interrupting an electric circuit of comparatively low electromotive force within an evacuated inclosure.

Instead of absolutely breaking the circuit, it may be reduced to that quantity which approaches zero, but does not reach it, and then increasing the current by bringing the terminals together until they almost touch. The terminals in the vacuum are caused in the first place to touch and then to be set into vibration, so as to form a path for the current through the rarefied atmosphere, producing a spark equal in length, which will be produced by the given electromotive force. Instead of having the terminals touch each other during vibration, means are provided to hold one of the terminals so far away that they will not actually touch, but so that they will vibrate to and from each other without touching, and yet at the same time maintain an electric spark of variable length.

Figure 1 shows the manner of carrying my invention into effect. Fig. 2 is a modification.

a represents an evacuated inclosure having electric terminals *b* and *c*, the latter being provided with an armature *d*, having its magnet *e*, which may be outside of the inclosure. This forms the construction, essentially, of a pending application. The operation consists in vibrating the terminals to and from each other, so as to produce rapid interruptions of the electric current and thereby, as already set forth by me in other applications, producing a luminosity throughout the inclosure. The cause of the illumination arises from the fact that the current is rapidly interrupted at a point within the vacuum. One terminal *b* may be extended into the globe *a* in convolutions *b'*, and this wire will be surrounded by an envelope or tube of light.

This invention consists in drawing away the terminal *b*, after the interruptions begin to occur, to such a distance that when the terminal *c* goes toward the terminal *b* no actual contact will take place between the two terminals; and the invention further consists in placing an independent magnet *e'* opposite the terminal *b*, which is provided with an independent armature *d'* within inductive action of the magnet *e'*. A thumb-screw *f* serves to move the magnet *e'* back and forth, so that the armature *d'* may be held at a predetermined distance away from the terminal *c*. The operation consists in turning on the current through the magnet *e*, and having the armature *d'* so adjusted by means of the magnet *e'*, which may also be in circuit, that the circuit is closed at the terminals *c* and *b*. The armature *d'* being attracted breaks the circuit, which causes a second closing of the circuit at *b* and *c*, and this operation is repeated. The luminosity occurs; but it is evident that while the contacts *b* and *c* are touching a great deal of current can pass, and this current does not materially assist in producing phosphorescent light. For example, if the contacts touch for a minute no phosphorescent light would be produced. The time of touchings should be as instantaneous as possible; but it is impracticable to have them touch at all, and yet have the time practically nothing. The magnet *e'* is now moved closer to the armature *d'*, so that the latter is attracted more to the right, so that when the terminal *c* moves toward the terminal *b* contact does not actually take place, and at the same time the arc is maintained.

Inasmuch as the non-touching of the terminals *b* and *c* will cause a rather weak magnet *e*, the same may be replaced by a magnet *e''* in circuit with an interrupter *g*.

For the purpose of vibrating the terminals *b* and *c*, which are included in an independent circuit, lettered on the outside of the bulb *h*, in this modification the magnet *e''* being intermittently magnetized will cause the rapid vibration of any desired magnitude of the terminal *c*, which will cause an interruption of the circuit *h*. The magnet *e'* may then be moved near the armature *d'*, so that the subsequent vibration will consist in not abso-

lutely interrupting the circuit, but in producing the equivalent of the interruptions without losing current by actual contact of the terminals *b* and *c*, and without any gradual destruction or disintegration of the terminals *b* and *c* at either points of contact.

I claim as my invention—

1. A phosphorescent illuminator, consisting of the combination with an evacuated inclosure, of vibratory electric terminals within the inclosure, means for vibrating the terminals relatively to each other, and a device for adjusting the distance between the electric terminals.

2. The combination with an evacuated inclosure having within the same vibratory electric contacts, means for vibrating them relatively, and a movable magnet for adjusting the position of one of the terminals.

3. A phosphorescent illuminator, consisting of the combination of an evacuated inclosure,

electric vibratory terminals located within the same in a given electric circuit, armatures on the respective terminals, magnets within inductive action of the respective armatures and located, the one in a circuit carrying a continuous current, and movable and the other in a circuit carrying an intermittent current.

4. The combination of an evacuated inclosure having relatively yielding electric contacts therein, and means for vibrating them relatively to such an extent that at each approach they just escape each other.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 21st day of December, 1894.

D. MCFARLAN MOORE. [L. S.]

Witnesses:

WM. R. WARREN,

EDWARD P. THOMPSON.