(No Model.)

W. R. RIDINGS, G. F. BULL & L. B. CODD.

ELECTRIC ARC LAMP.

No. 590,238. Patented Sept. 21, 1897.

Fig. 2.

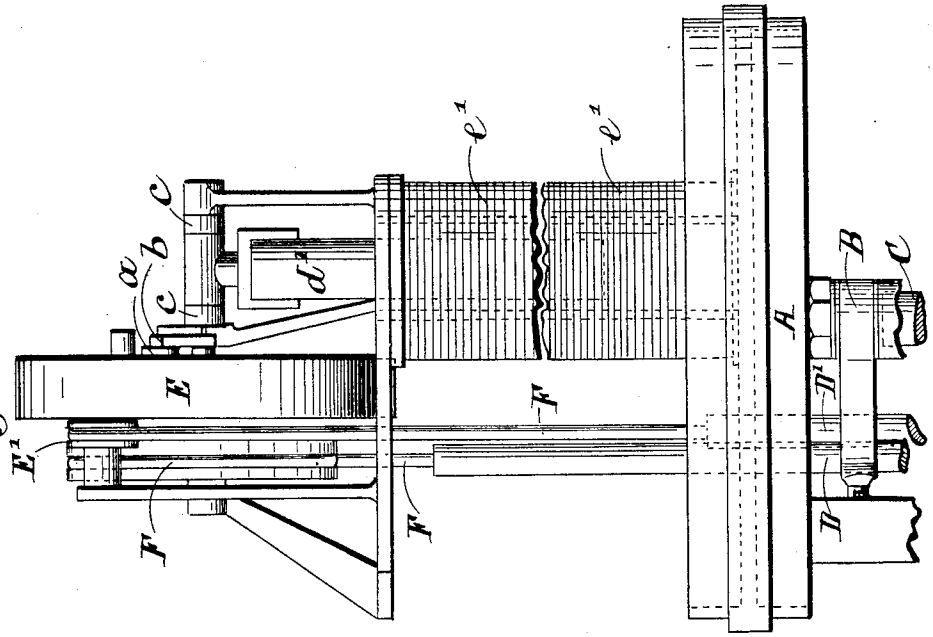
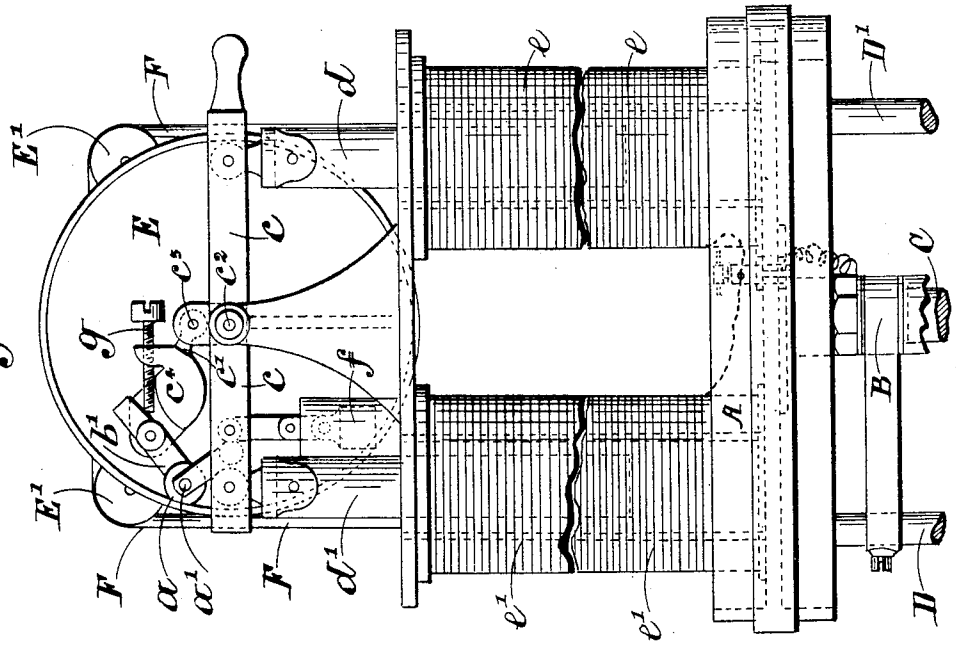


Fig. 1.



Witnesses:
B. W. Miller.
E. A. Babcock.

Inventors:
William R. Ridings,
George F. Bull, and
Llewellyn B. Codd,
By his Attorneys,
Baldwin Dashiell & Wright.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM REGENALD RIDINGS, GEORGE FREDERICK BULL, AND LLEWELLYN BURBANK CODD, OF BIRMINGHAM, ENGLAND.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 590,238, dated September 21, 1897.

Application filed May 28, 1896. Serial No. 593,507. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM REGENALD RIDINGS, GEORGE FREDERICK BULL, and LLEWELLYN BURBANK CODD, subjects of the Queen of Great Britain, residing at Birmingham, in the county of Warwick, England, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

Our invention relates to the brake mechanism of electric-arc lamps and comprises the improvements hereinafter set forth.

Our improved brake consists, essentially, of a suitably-mounted pad or roller or equivalent device which is brought to bear upon a drum or friction-wheel or upon the rods or chains carrying the carbon-holders by a set or series of toggle-levers—that is, a series of levers so fulcrumed that they can be made to operate the engagement or disengagement of the above-mentioned pad or roller under the action of one or more cores or plungers that are excited by one or more suitably-wound coils or solenoids.

Our invention may be applied to or combined with any known or convenient device for carrying the carbons—such, for instance, as a flexible cord, chain, and toothed wheel or wheels, or a rack and pinion.

In the accompanying drawings, Figure 1 is a front elevation, and Fig. 2 is a side elevation, showing our improved brake mechanism.

A is the bed-plate of an electric-arc lamp. B is the upper-carbon holder, and C is a portion of the upper carbon. D is the rod or connection to the said upper-carbon holder, and D′ the rod or connection to the lower-carbon holder, which latter is removed in the drawings.

E is a suitable friction-wheel or drum, upon a reduced or other portion of which are wound the cords or wires F supporting the rods or connections D D′. E′ E′ are grooved rollers over which the said cords or wires F pass, so as to allow more play to the rods or connections D D′.

According to our said invention we provide a pad or roller *a* or equivalent device, mounted upon a pin *a*, carried by and forming the fulcrum of a pair of short or toggle levers *b b′*. The lever *b* is fulcrumed to a forked or double lever *c*, and the lever *b′* is fulcrumed to a lever *c′*, which latter levers are fulcrumed either at a point common to both of them or at separate points c^2 c^3, as shown. The lever *c′* is provided with a counterweight or counterpoise c^4, or it may be controlled by a spring or the like.

d d′ are the cores or plungers of two coils or solenoids *e e′*, the plunger *d* being jointed or pivoted to one extremity of the forked or double lever *c* and the plunger *d* being similarly connected to the other extremity thereof. The core or plunger *d* is passed through or into the coil or solenoid *e*, which is wound in series, and the core or plunger *d′* is passed through or into the coil or solenoid *e′*, which is wound in shunt.

f is a small dash-pot for cushioning or controlling the movements of the forked or double levers *c*, and *g* is an adjustable stop for limiting the movements of the arms or levers *b b′* and regulating the point at which the pad or roller or its equivalent shall leave or come in contact with the friction wheel or drum E, as hereinafter described.

In operation, upon a current flowing through the series or main coil or solenoid *e* the plunger *d* is attracted thereto, thus depressing the end of the forked or double lever *c* to which it is connected, and through the other end of the said lever varying the angle of the short or toggle levers *b b′* so as to bring the pad or roller *a* or its equivalent against the drum E, clutching and carrying it till the arc is struck. As soon, however, as the resistance of the arc becomes too great more current will flow through the shunt coil or solenoid *e′*, attracting its core or plunger *d′*, with the result that the forked or double lever *c* will be so moved as to return through a certain angle in the obverse direction when the said short or toggle levers *b b′* are moved, by reason of the levers *c c′* being fulcrumed at different points, as shown, or by an adjustable stop, or by an adjustable lever fulcrumed in any suitable position, or otherwise, to their normal positions, and consequently the pad or roller *a* or its equivalent leaves the friction wheel or drum E, which is then released. The carbons are then permitted to feed or approach each other by gravity and so lessen or diminish the

resistance of the arc. In this manner these actions take place alternately so long as the lamp is in operation and the feed of the carbons is maintained. By setting the adjustable stop *g* to engage to a greater or less extent with the extension or prolongation shown on the short or toggle lever *b'* the pad or roller *a* can be caused to come in contact with or clutch and leave the friction wheel or drum E after the levers have been moved through a greater or less angle in either direction, as the case may be.

In some instances we provide suitable circumferential or other grooves in the surface of the drum against which the pad or roller *a* or its equivalent presses or with which it engages, and we thus insure a more certain clutching action taking place and obviate slip. It is obvious that the said pad or roller or its equivalent could, if desired, be so arranged as to press against or engage with the outer surface of the friction wheel or drum E instead of the interior surface thereof, as shown, or with a rod, cord, or chain, or other device connected with the aforesaid coils or solenoids and carbon-holders. In the latter case a right-angled extension or projection is either formed on or secured at or near the end of the lever *c*, between which extension and the pad or roller *a* the said rod or chain is nipped or gripped when the toggle-levers are operated, as hereinbefore described.

It will be obvious that the toggle-lever *b* may be fulcrumed to a separate lever, the connection with the lever or levers carrying the coils or solenoids being made in any convenient manner. We may, moreover, use any other suitable number of toggle-levers arranged in a somewhat different manner, and one coil or solenoid wound in series and shunt, or any convenient number of coils or solenoids may be provided. The dash-pot *f* may in some instances be conveniently located on the bed-plate of the lamp and coupled or connected to the extension shown on the right-hand side of the forked or double lever *c* in Fig. 1.

What we claim, and desire to secure by Letters Patent of the United States, is—

1. A brake mechanism for an electric-arc lamp comprising a friction-wheel, a set of toggle-levers, a pad carried at the joint of the toggle-levers, electromagnetic devices for operating the levers to cause the pad to clutch or engage with and leave the wheel, and connections between the wheel and the carbons.

2. The combination with the carbons of an electric-arc lamp of a friction-wheel connected with the carbons, a pad engaging said wheel, the toggle-levers *b b'*, a pad *a* arranged at the joint of the toggle-levers and bearing against the friction-wheel, a lever to which one of the toggle-levers is connected, a pivotal support for the other toggle-lever, and electromagnetic devices for operating the levers to cause the pad to engage with and disengage from the friction-wheel.

3. The combination with the carbons of an electric-arc lamp, of a friction-wheel, connections between the friction-wheel and the carbons, the toggle-levers *b b'*, a pad arranged at the joint of the toggle-levers and bearing on the inside of the annular flange or periphery of the wheel, a pivotal support for one of the toggle-levers, an electromagnetically-operated lever to which the other toggle-lever is connected, and a dash-pot connected with said lever.

In testimony whereof we have hereunto subscribed our names.

WILLIAM REGENALD RIDINGS.
GEORGE FREDERICK BULL.
LLEWELLYN BURBANK CODD.

Witnesses:
HENRY GUYSILK,
BERNARD ARNOLD KRINKS.