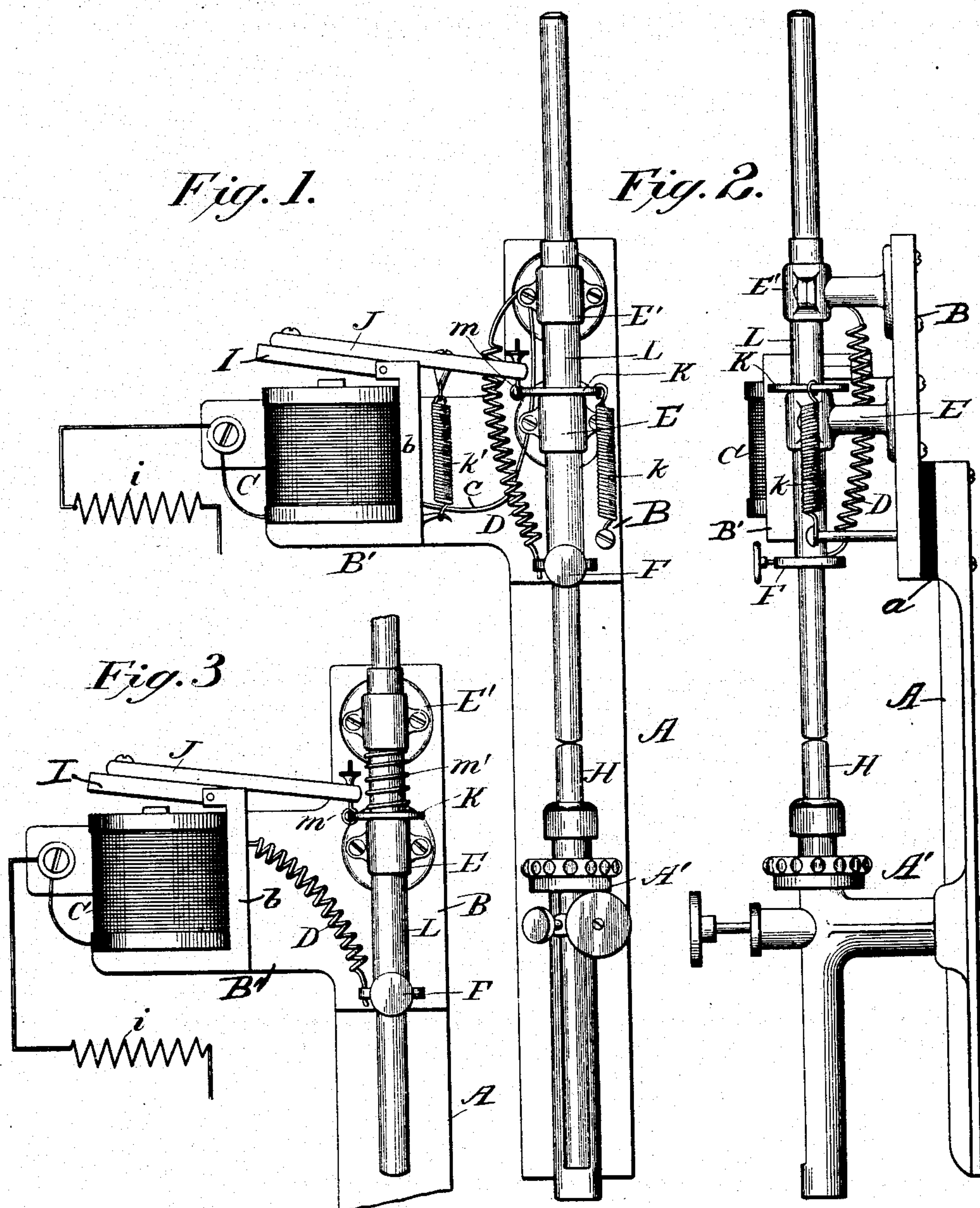


W. E. WALDRON.

FEEDING AND REGULATING MECHANISM FOR ARC LAMPS.

(Application filed Feb. 6, 1901.)

(No Model.)



William E. Waldron, Inventor.

Witnesses

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WILLIAM E. WALDRON, OF COLORADO SPRINGS, COLORADO, ASSIGNOR OF
ONE-HALF TO ANDREW L. LAWTON, OF SAME PLACE.

FEEDING AND REGULATING MECHANISM FOR ARC-LAMPS.

SPECIFICATION forming part of Letters Patent No. 677,005, dated June 25, 1901.

Application filed February 6, 1901. Serial No. 46,244. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. WALDRON, a citizen of the United States, residing at Colorado Springs, in the county of El Paso and State of Colorado, have invented new and useful Improvements in Feeding and Regulating Mechanism for Arc-Lamps, of which the following is a specification.

This invention relates to certain new and useful improvements in arc-lights, the purpose being to provide an arc-lamp or head-light for electric cars or in other such places where the lamp is subjected to jars and to intermissions in the flow of the current such as are incident when a car passes a crossing or over a rough joint, the construction being designed to provide a lamp with a rigid frame and means whereby the arc will be instantaneously struck.

In carrying out my invention I avoid the use of shunt-currents, the current passing at all times through the coil of an electromagnet, from the electromagnet directly to the upper carbon, and from the lower carbon to the frame, thence to the next lamp or return-conductor. The lamps may be arranged in series, using five-hundred-volt direct-current circuit. A resistance may be placed in series with the carbons. In operation when the carbons come together the core of the magnet being magnetized operates an armature connected to a ring-clutch, which lifts the upper carbon and establishes the arc, the downward feed being accomplished by gravity.

My invention consists in the construction and organization of the parts, as will be hereinafter set forth, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a front elevation of an arc-lamp constructed in accord with my invention. Fig. 2 is a side elevation; and Fig. 3 is a front elevation of the upper portion of a lamp, showing a modification.

To the main frame or back-piece A is bolted or otherwise attached the lower-carbon holder A', said holder being provided with means whereby the lower carbon H can be adjusted to the desired height, the lower-carbon holder A' projecting from the back-piece, as shown.

To the upper portion of the main frame is

secured a frame B, it being separated from the back-plate by suitable insulations *a*, and this frame B is shaped to provide a laterally-projecting portion B', upon which is mounted an electromagnet C, the core thereof projecting above its upper end. The laterally-projecting part B' of the frame B has a vertical portion *b*, upon which is fulcrumed an armature, and said part *b* may have an outwardly-projecting stud for connecting thereto the lower end of a spring *k'*, the upper end thereof being attached to the armature.

E E' refer to guides which are attached to the part B, and through these guides pass the upper-carbon carrier L, to which the upper carbon is secured by means of a clamp F. The carbon-carrier is adapted to move freely through the guides E E', and in order to insure electric connection between the wire or coil of the electromagnet and the carbon-carrier a wire *c* is attached to both of the guides and to the clamp F, the wire adjacent to the clamp being bent spirally to form a coil D, which permits the upper-carbon carrier moving vertically. To the vertical portion *b* of the frame B is pivoted the armature, comprising a bar J, which carries a metal plate I, located above the core of the magnet. The bar J may be made of non-conducting material and has at its end nearest the carbon an aperture through which passes the shank of a movable coupling *m*, the rod from which the coupling is made being threaded to receive a nut which contacts with the bar J, the opposite end of the bar being formed into a ring which engages an eye or perforation through the ring-clutch K. The nut and threaded shank of the coupling provides means for adjusting the armature to suit the conditions under which the lamp is used.

The ring-clutch K encircles the carbon-holder L, being placed between the guides therefor, so that it may bear upon the lower guide E. The ring-clutch is maintained normally in a horizontal position, so that the carbon-holder can slide freely therethrough by springs, and, as shown in Fig. 3, a single spring *m'* encircles the carbon-holder and bears against the ring-clutch and the upper-carbon guide, or I may attach a spring *k'* to the bar J and to the stud which projects from

the vertical portion *b* of the frame B, and on the other side there is a spring *k*, one end being attached to the ring-clutch and the other end to the frame. The different arrangement
5 of springs I consider equivalents, as they both serve to move the armature away from the magnet and tend to hold the ring-clutch in a horizontal position.

It will be noted that when the ring-clutch
10 is horizontal the upper carbon will be fed downward by gravity; also, that when said clutch is horizontal the armature is out of contact with the core of the magnet.

In practice the end of the wire from the coil
15 of the electromagnet may be formed into a coil and attached directly to the clamp F, the other end of the core being fastened to a binding-post, a wire leading therefrom to a resistance *i* of any suitable type.

20 The parts constituting the lamp are all securely connected to stand rough usage. The circuit is through the resistance to the coil of the electromagnet and from thence to the upper carbon, passing from said carbon to
25 the lower one and from thence to the main frame A to another lamp, or elsewhere, as may be desired.

In practice when the lamp is working the current passes through the coils of the electro-
30 magnet, energizes the soft-iron core thereof, and draws the armature down, tilting the clutch-ring, which responds to the movement of the armature and strikes the arc, insuring the proper working of the lamp, and as the
35 carbon burns away the circuit is broken, which permits the carbon to move downward sufficiently to reestablish the arc. This action takes place instantaneously. Under all conditions the carbons are held in the same
40 relative position by the electromagnet, so that under all variations in the current the lamp gives a steady even light and is not extinguished until the circuit is entirely broken. Thus the lamp operates under extreme varia-
45 tions of the current and is not affected by jar or vibrations, such as are present on electric cars. Two or more lamps may be placed in series or may be used independently, and all shunt-circuits are avoided.

50 When necessary or deemed advisable, the electromagnet, as described, may be inverted, thus placing the armature under the magnet, reserving the same general construction.

Having thus described my invention, what
55 I claim as new, and desire to secure by Letters Patent, is—

1. In an arc-lamp, the combination of a

main supporting-frame, a lower-carbon holder in electrical connection therewith, a frame at-
60 tached to the upper part of the main supporting-frame and insulated therefrom said upper frame having guides for the upper carbon and a projecting portion, an electric magnet and its armature the armature being carried
65 by the projecting portion of the frame; a ring-clutch mounted between the guides, means as a spring or springs for holding the ring-clutch horizontally upon one of the carbon-guides and the armature away from the core of the
70 electromagnet, substantially as shown.

2. In an arc-lamp, the combination of a main supporting-frame and a lower-carbon holder which is rigidly attached thereto, of a frame having guides for the upper carbon, a
75 laterally-projecting portion constructed to support an electromagnet and its armature, an electromagnet and an armature therefor, a ring-clutch which surrounds the upper carbon and is positioned above one of the guides,
80 means for adjustably connecting the armature to the ring-clutch, a spring or springs acting upon the ring-clutch and the armature to hold the former horizontal and the latter out of engagement with the core of the elec-
85 tromagnet, and means for electrically connecting the upper-carbon holder and its carbon with the coil of the electromagnet, substantially as shown and for the purpose set forth.

3. In an arc-lamp, the combination of a
90 main supporting-frame having attached thereto a lower-carbon holder, of a frame carried by and insulated from the main supporting-frame, a pair of guides for the upper carbon, an electromagnet the coil of which is
95 electrically connected with the upper carbon, an armature pivoted so that one end will move to and from the core of the magnet, a ring-clutch mounted between the guides and adapted to engage with the lower guide,
100 means for adjustably connecting the ring-clutch to the armature, and a spring which encircles the upper carbon positioned between the clutch and the guide immediately above said clutch, substantially as shown and
105 for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM E. WALDRON. [L. S.]

Witnesses:

NETTIE I. FREESE,
CHARLES W. HELSU.