(No Model.)

W. A. TURBAYNE.

ELECTRIC ARC LAMP.

No. 495,643. Patented Apr. 18, 1893.

Fig. 1.

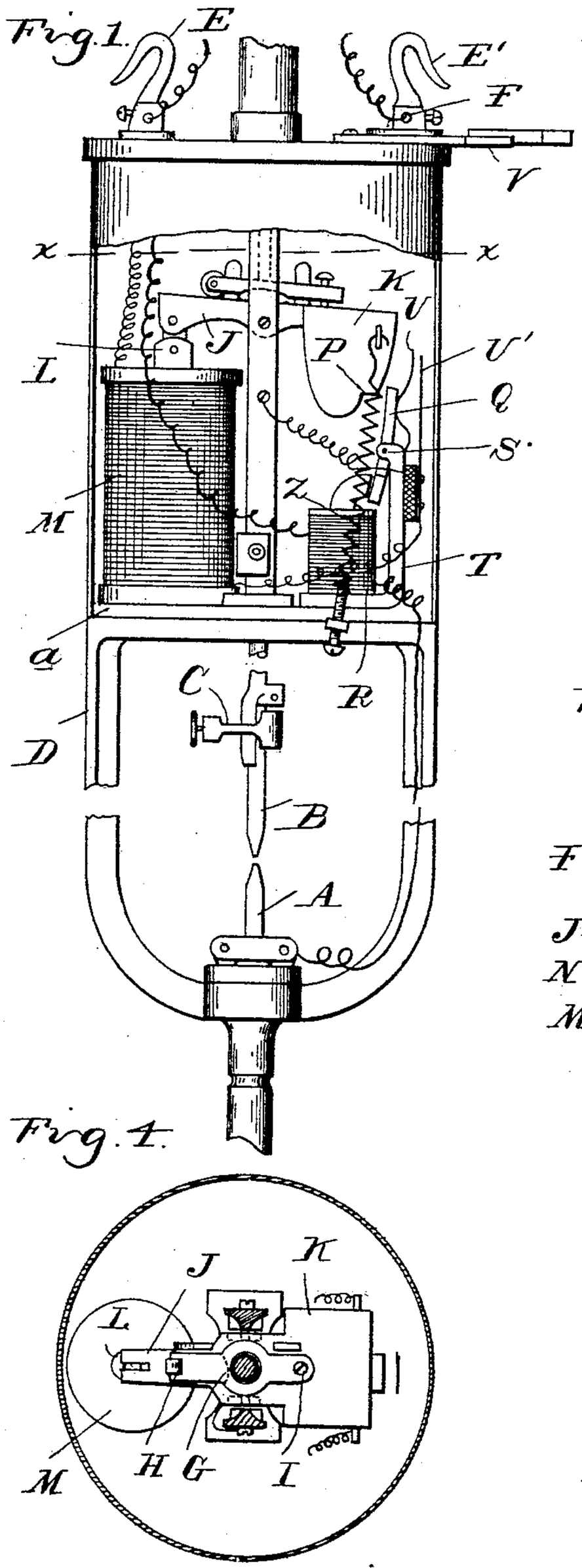

Fig. 2.

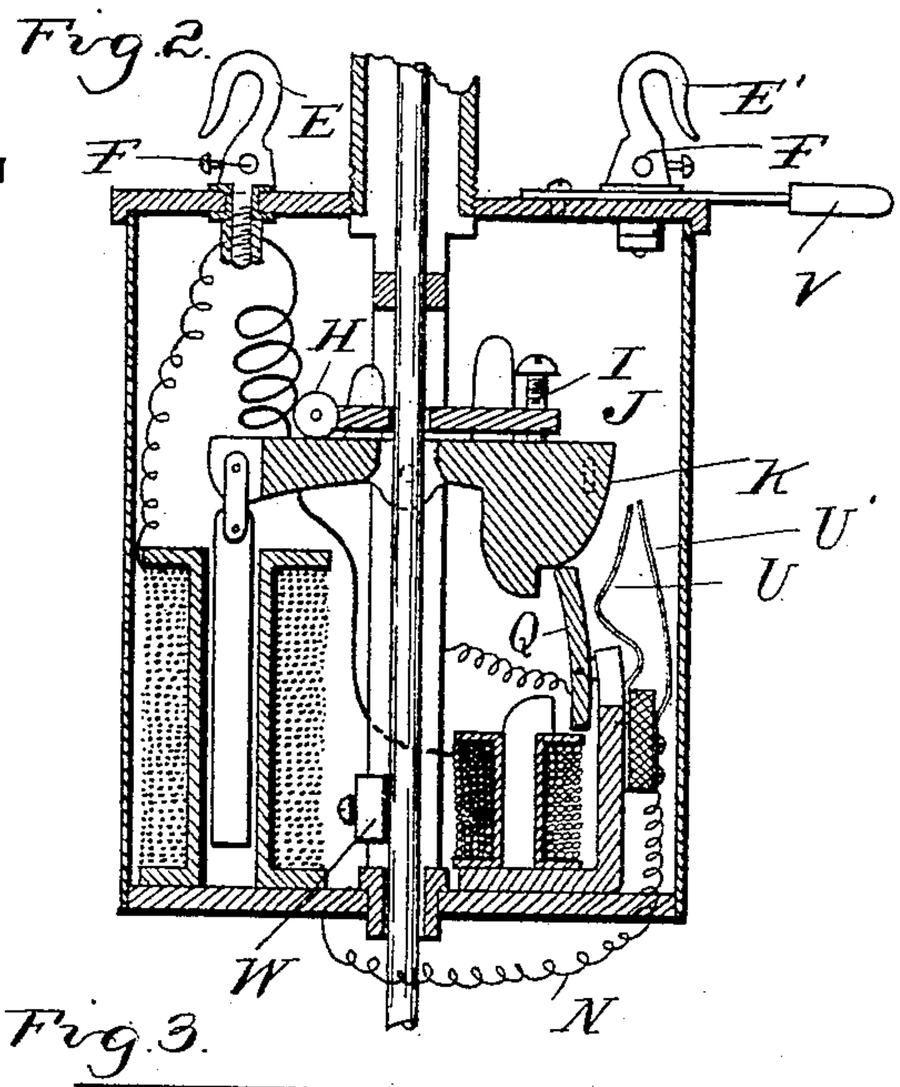

Fig. 3.

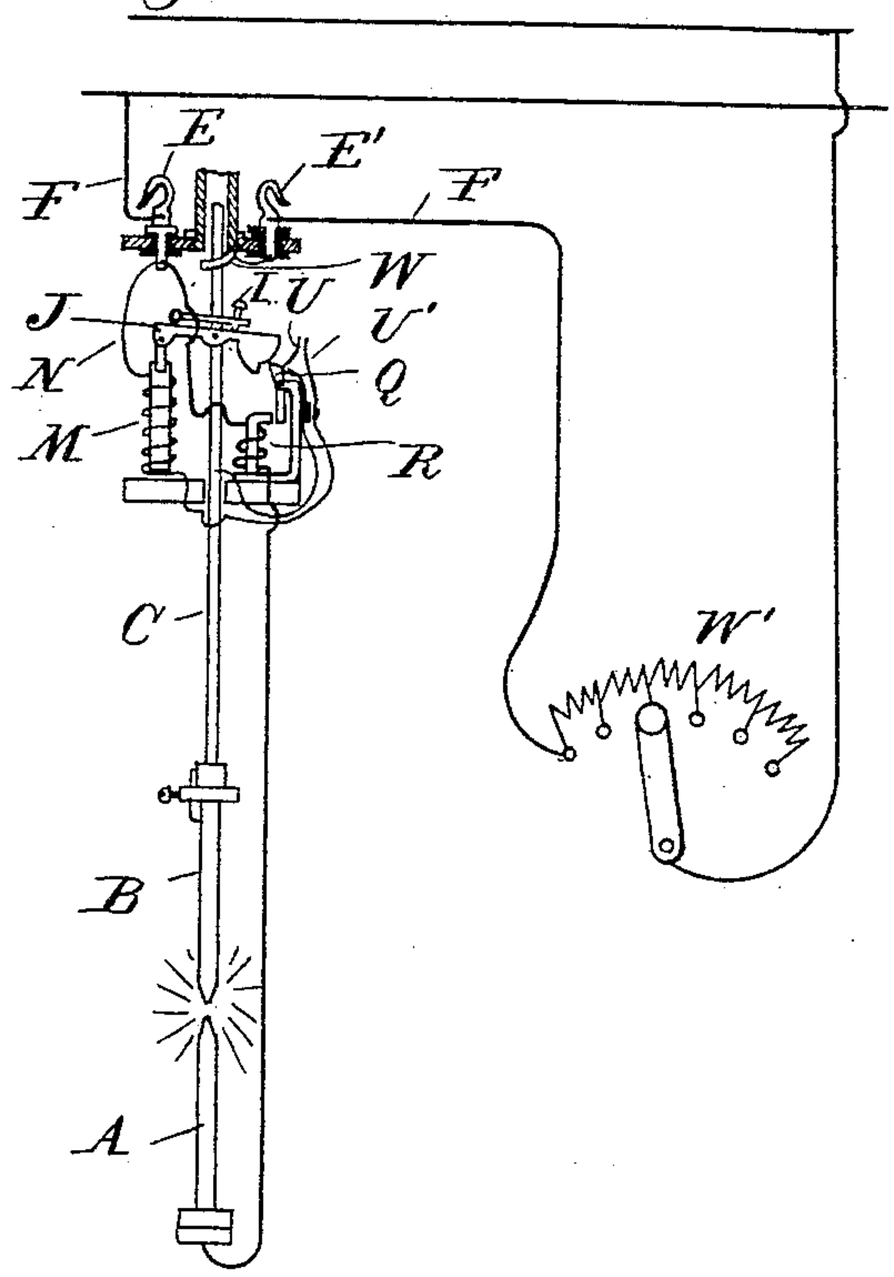

Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM A. TURBAYNE, OF DETROIT, MICHIGAN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE TURBAYNE-TAMBLYN COMPANY, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 495,643, dated April 18, 1893.

Application filed July 1, 1892. Serial No. 438,695. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. TURBAYNE, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates more specifically to new and useful improvements in means for regulating electric arc lamps, and my invention consists in the improved means for feeding the carbon, whereby the mechanism of the lamp is greatly simplified and also adapted for special use in connection with incandescent light systems, all as more fully hereinafter described.

In the accompanying drawings, Fignre 1 is an elevation of my improved electric arc lamp with a part of a casing inclosing the mechanism broken away. Fig. 2 is a vertical central section through the casing and mechanism of the lamp. Fig. 3 is an elevation in diagram thereof. Fig. 4 is a horizontal section on line *x*—*x* Fig. 1.

A represents the fixed carbon, B the feeding carbon. C the holder of the feeding carbon. D the metallic frame. D′ the insulating base of the frame. E E′ the hooks by which the lamp is suspended, and F the terminals of the lamp circuit for which the hooks E E′ serve as binding posts, all constructed and arranged to operate in the usual manner. The carbon holder C of the feeding carbon passes through a ring clutch G provided with oppositely extending arms, one of which carries an antifriction roller H and the other an adjusting screw I. This ring clutch is loosely supported upon a lever J pivotally secured to the frame and provided with oppositely extending arms upon which the antifriction roller and adjusting screw of the ring clutch respectively bear. The lever J carries on one arm a weight K secured to or formed thereon and on the opposite arm the movable core L of the solenoid M, which is in a derived circuit N around the arc. The arm of the lever J carrying the weight (or having the weight formed thereon) is provided with a shoulder P on which the armature Q of the cut-out magnet R is adapted to engage. The cut-out magnet R is connected in the main circuit of the lamp, its armature Q, which is pivotally secured in an upright position at S to a suitable standard T projects with its lower end in proximity to a pole-head suitably formed on the core of the magnet R and its upper end when engaging on the shoulder P is adapted to uphold the weighted end of the lever J. The magnet R operates a cut-out of the solenoid M, which cut-out is formed by the two contact springs U U′. The contact spring U bears against the armature Q and thereby tends to retract it from its magnet and engage it on the shoulder P, but when the armature is attracted by the magnet R it forces the spring U in contact with the spring U′ thereby closing the circuit through the solenoid M and releasing the lever J.

In operation the main current through the lamp is established by closing the usual switch V with which the lamp is provided. This connects the positive terminal of the lamp circuit electrically with the metallic portion of the frame of the lamp. A copper strip W secured to this frame and contacting with the carbon holder C conducts the current to the upper carbon, from thence it passes through the lower carbon and cut-out magnet R to the hook E, to which the other terminal of the lamp circuit is connected. The derived or shunt circuit N includes the solenoid M and the contact springs U U′ of the cut-out and passes around the arc of the lamp. When there is no current through the lamp the parts are in the position shown in Fig. 2 in which the ring clutch is in a horizontal plane or nearly so which allows the carbon holder to fall freely by gravity and thus establish contact between the carbon points, at the same time the contact springs are separated and cut out the solenoid M while the armature Q suspends the weight K from acting on the lever J. When the lamp circuit is now closed the cut-out magnet R becoming energized attracts the armature Q and disengages it from the shoulder P and the weight K being now free to act, tilts the lever. This throws up that end of the

clutch which holds the roller H, clamps the carbon holder and lifting it up separates the carbon points and thereby establishes the arc. The solenoid M which is of a high resistance is now in a closed shunt circuit and therefore when the carbon points become too far separated by the burning away of the carbons the increased resistance in the lamp circuit will increase the flow of current through the shunt circuit until its action upon the movable core will overcome the opposing action of the weight K and thereby move the clutch again into position to release the carbon holder which is thus free to feed by gravity. The arc is then again established by the weight in overbalancing the attraction of the solenoid as soon as the current through the shunt drops back to normal again. Should the resistance in the main circuit of the lamp become abnormally large from a failure of the carbon holder to feed properly or from any other cause the cut-out magnet R would fail to hold the armature Q and the contact springs U U′ would separate and thus cut out the solenoid M and save it from being destroyed. With my improved construction the feeding of the carbon is thus effected by the opposing actions of a shunt magnet of high resistance and of a fixed weight. The advantage which I gain by this arrangement is that I can combine with my lamp a regulator for regulating the light by the amount of current which is allowed to flow through the lamp circuit. Thus as shown in Fig. 3, I may place in the lamp circuit a variable resistance W′ which I place in convenient position to be readily adjusted by hand. As the shunt solenoid M can be made of very high resistance it will within certain limits remain unaffected by variations of current through the main circuit and therefore a certain amount of resistance W′ may be introduced into the lamp circuit without affecting the proper function of the solenoid M. This arrangement makes my construction of lamp especially available for use in connection with incandescent light circuits as in lighting stores or large halls, where it is often very desirable to have some arc lamps used in connection with incandescent lamps. If the weight K is made integral with the lever J, I preferably use a spring Z in connection with it, this spring I provide with a suitable means of adjusting its tension accessible preferably from the outside, as shown, I have thus a means of adjustment equivalent to the use of an adjustable weight.

In a patent granted to me September 1, 1891, No. 458,987, I make use of a ring clutch of a like construction and operation as herein described and therefore I make herein no claim thereto.

What I claim as my invention is—

1. In an arc lamp, the combination with the gravity feeding carbon holder, gravity ring clutch and lever adapted to move said clutch to clamp and lift said feeding carbon holder, of an electro-magnet or solenoid in a shunt circuit adapted to actuate said lever in one direction to release said clutch a weight on said lever adapted to actuate said lever in the opposite direction to clamp and lift said clutch, a magnet in the lamp circuit and a movable member actuated by the lamp circuit magnet, to cut out the electro magnet or solenoid, substantially as described.

2. In an arc lamp, the combination with the gravity feeding carbon holder, gravity clutch and the lever adapted to move said clutch to clamp and lift said feeding carbon holder, of an electromagnet or solenoid in a shunt circuit adapted to actuate said lever to release said clutch, a weight on the opposite end of said lever adapted to actuate said lever to clamp and lift said clutch a pivoted armature an electro magnet and a cut-out in the shunt circuit operated by the armature and electro-magnet or solenoid in the lamp circuit, substantially as described.

3. In an arc lamp, the combination with the gravity-feeding carbon holder, gravity ring clutch, and lever adapted to move said clutch to clamp and lift the feeding carbon, of an electro-magnet or solenoid in a shunt circuit adapted to actuate said lever to release said clutch, a weight on the opposite end of said lever adapted to actuate said lever to clamp and lift said clutch, a cut-out in the shunt circuit, a cut-out magnet or solenoid in the lamp circuit, and a pivoted armature for the cut-out magnet to actuate said cut-out when no effective current passes the lamp circuit and to suspend the action of the weight on the lever, substantially as described.

4. In an arc lamp, the combination with the gravity feeding carbon holder, gravity ring clutch and lever adapted to move said clutch to clamp and lift the feeding carbon, of an electro magnet or solenoid in a shunt circuit adapted to actuate said lever in one direction to release said clutch to feed the carbon, a weight on the opposite end of said lever adapted to actuate said lever and lift said clutch to form the arc, a cut out in the shunt circuit, a cut out magnet in the lamp circuit, and a movable armature controlled by said cut-out magnet to operate said cut out and engage with the lever to suspend the action of the weight when no effective current passes the lamp circuit and to release said lever and close the cut-out when an effective current passes through the lamp circuit, substantially as described.

5. In an arc lamp, the combination with the gravity feeding carbon holder, gravity ring clutch, and lever adapted to move said clutch to clamp and lift said feeding carbon holder, of an electro-magnet or solenoid in a shunt circuit adapted to actuate said lever in one direction to release the clutch, an opposing weight adapted to actuate said lever in an opposite direction to clamp and lift said clutch, and a spring connected with the weighted end of the lever for supplementing the action of said weight and having tensioning de-

vices accessible from the outside of the inclosing casing of the lamp, substantially as described.

6. In an arc lamp, the combination with a gravity feeding carbon holder, gravity ring clutch and lever adapted to move said clutch to clamp and lift said feeding carbon holder, of a shunt electro-magnet or solenoid of high resistance adapted to actuate said lever in one direction to release the clutch, an opposing weight adapted to actuate said lever in an opposite direction to clamp and lift said clutch, a cut-out in the shunt circuit, a cut out magnet in the lamp circuit provided with a movable armature adapted to operate said cut out, a shoulder on the lever or weight on which said armature is adapted to engage to suspend the action of the weight when no current traverses the lamp circuit and an adjustable resistance in the lamp circuit, substantially as described.

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

WILLIAM A. TURBAYNE.

Witnesses:
N. L. LINDOP,
M. B. O'DOGHERTY.