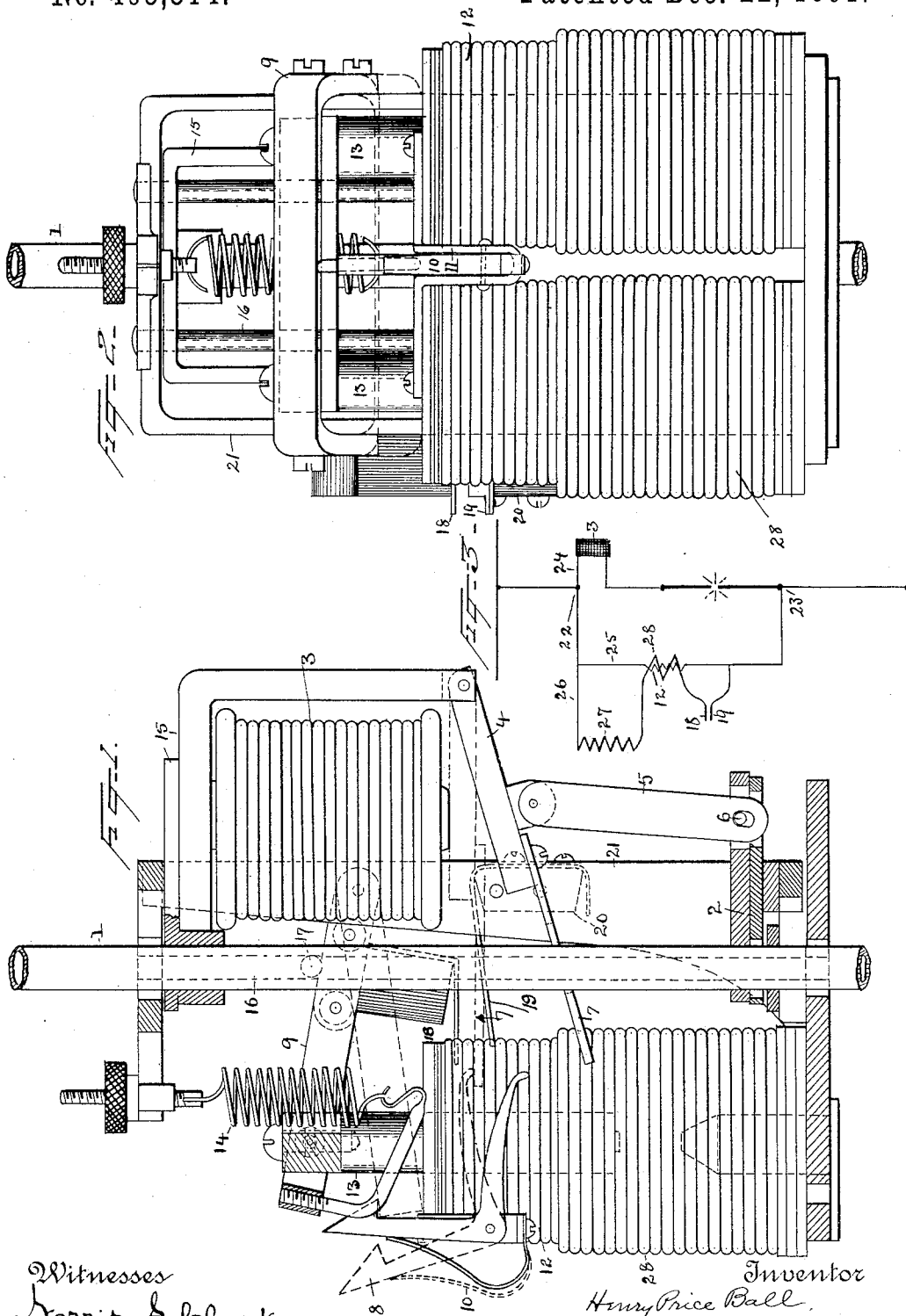


(No Model.)

H. P. BALL.
ELECTRIC ARC LAMP.

No. 465,514.

Patented Dec. 22, 1891.



Witnesses
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UNITED STATES PATENT OFFICE.

HENRY PRICE BALL, OF BROOKLYN, ASSIGNOR TO THE EDISON GENERAL ELECTRIC COMPANY, OF NEW YORK, N. Y.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 465,514, dated December 22, 1891.

Application filed June 13, 1891. Serial No. 396,076. (No model.)

To all whom it may concern:

Be it known that I, HENRY PRICE BALL, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Arc-Lamp Cut-Outs, of which the following is a specification.

The present invention relates to apparatus for cutting out or short-circuiting arc lamps under certain conditions; and the invention consists, especially, in providing the cut-out with a mechanical lock or catch of improved construction for holding the cut-out circuit closed and a trip therefor.

The invention consists, also, in the several features and combinations hereinafter fully set forth and claimed.

In the accompanying drawings, Figures 1 and 2 are views at right angles to each other, illustrating the cut-out on an arc lamp. Fig. 3 is a diagram showing the circuits of the lamp.

1 is the carbon-carrying rod. 2 is the clutch for raising the same to establish the arc.

3 is the main or series magnet, the armature 4 of which is connected to the clutch by a link 5. This link and the clutch are connected by means of a pin 6, which extends into a long slot in the link. This slot allows the magnet and armature to move down with the frame 15, notwithstanding their connection with the clutch. The armature 4 is provided with an extension or arm 7, which normally rests under the end of the angle-lever 8, which forms a mechanical catch or lock adapted to fit over the tilting frame 9 when the latter is in the position shown in dotted lines. The catch is provided with a spring 10, tending to throw it forward. As shown in Fig. 2, this catch and spring are supported by a bracket 11, secured to the upper end of the shunt-magnet 12. Said magnet is provided with armatures 13, pivotally connected to the tilting frame 9, which is normally drawn up by spring 14. While pole-pieces are shown for the shunt-magnet, these are not essential. The main magnet is supported on the frame 15, which is adapted to slide on the guide-rods 16.

17 is a pin or cross-rod connected to the frame 15, and in the position shown resting

on the upper side of the frame 9. This holds the magnet in its highest position. At one side of the tilting frame 9 is carried a contact spring or plate 18, which is adapted to make contact, when lowered, with the contact spring or plate 19, supported on the insulating-block 20 on standard 21.

The circuits are as shown in Fig. 3, where 22 is the positive terminal of an arc lamp, and 23 the negative terminal. The wire 24 extends to the series coil 3, and thence through the arc. The wire 25 extends through the shunt-coil 12, and thence to the negative terminal of the lamp. The wire 26 extends through a resistance 27 to a coarse coil 28, wound on the outside of the shunt-coil and to the contact 18. The contact 19 is connected to the negative terminal of the lamp.

The operation of the devices thus described is as follows: When the circuit is first closed to the lamp, the armature 4 will be raised to the position shown in dotted lines, establishing the arc and throwing the catch 8 toward the left—that is, to its dotted-line position. As the carbons burn away the current in the shunt-coil increases and gradually lowers its armatures, and hence the carbon, the lamp feeding in the ordinary manner; but should the carbons stick in the clutch, so as not to feed regularly, the current in the shunt-magnet would become so strong as to pull the armatures down far enough to connect the springs or plates 18 19, thus closing the circuit through branch 26, resistance 27, and coarse coil 28. This latter coil will prevent the armatures being returned by the retracting-spring until the current has resumed its normal strength in the main coil owing to a re-establishment of the arc. When the closure of the circuit just described short-circuits the lamp, allowing the armature of the series coil to drop to the position shown in full lines, the catch 8 is allowed to move forward. If now for any reason the number of amperes flowing through the coarse coil 28 should diminish, the frame 9 could not rise and thereby separate the contacts 18 19; but if the carbon-rod should slip through its bearings and the clutch and re-establish the arc the armature of the main magnet would be attracted and brought up to its dotted-line

position, since the resistance 27 is made somewhat greater than the resistance of the main magnet and the carbons when they are in direct contact for the purpose of diverting current to re-establish the arc, as just described.

5 It will be evident that as the armature 4 moves from its full-line position to its dotted-line position it will strike the tripping end of the catch and allow the spring 14 to raise the
10 frame 9 and open the cut-out circuit, leaving the lamp in the position which it occupied when the circuit was first closed. The purpose of the lock or catch is to hold the cut-out contacts together, so as to prevent sparking in case the dynamo is stopped while the
15 lamp is cut out or in case the amperes decrease from any cause while the cut-out is closed, thus weakening the attractive power of the coil 28 on the armature 13.

20 What I claim is—

1. The combination, with a cut-out circuit for an arc lamp having main and shunt coils, of a circuit-controller for the cut-out circuit, moved by the shunt coil or magnet, a resistance in the cut-out circuit sufficient to divert
25 current to the main magnet to re-establish the arc when the carbons come together, a catch or lock in position to engage and hold the controller when moved by said coil or magnet, and means controlled by said main
30 magnet for disengaging the catch or lock, substantially as described.

2. The combination, with a cut-out circuit for arc lamps having main and shunt coils, of
35 a circuit-controller therefor, a shunt coil or magnet for moving the controller, a catch or lock in position to engage and hold the controller when moved by the coil or magnet, and a trip for the catch or lock, operated by an armature of the main coil, substantially as described.
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3. The combination, with the feeding mechanism of an arc lamp, of a cut-out circuit for the lamp, a circuit-controller therefor operated by said feeding mechanism, a pivoted
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catch in position to hold the controller closed, an automatic trip, and a coil or magnet in the arc-circuit in position to operate said trip, substantially as described.

4. The combination, with the feeding mechanism of an arc lamp, of a cut-out circuit for the lamp, a circuit-controller therefor operated by said feeding mechanism, a pivoted catch in position to hold the controller closed, and a trip for the catch, also operated by
55 the feeding mechanism, substantially as described.

5. The combination of the main and shunt coils of an arc lamp, the cut-out circuit, the circuit-controller adapted to be moved to close
60 the cut-out circuit by one of the coils, a spring-pressed pivoted catch, an automatic trip, and a coil or magnet in the arc-circuit in position to operate said trip, substantially as described.
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6. The combination of the main and shunt coils of an arc lamp, the circuit-controller adapted to be moved to close the cut-out circuit by the shunt-coil, and a spring-pressed pivoted catch having an end extending into
70 the path of the main-magnet armature, whereby the catch is tripped, substantially as described.

7. The combination of an arc-lamp carbon-carrier, a clutch therefor, a magnet or solenoid, an armature tending to feed the carbon forward, a cut-out circuit containing a circuit-controller rendered operative by said armature on its full stroke, a mechanical catch or lock to hold the circuit-controller in its operative position, an automatic trip, and a coil or magnet in the arc-circuit in position to operate said trip, substantially as described.
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This specification signed and witnessed this 11th day of June, 1891.

HENRY PRICE BALL.

Witnesses:

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