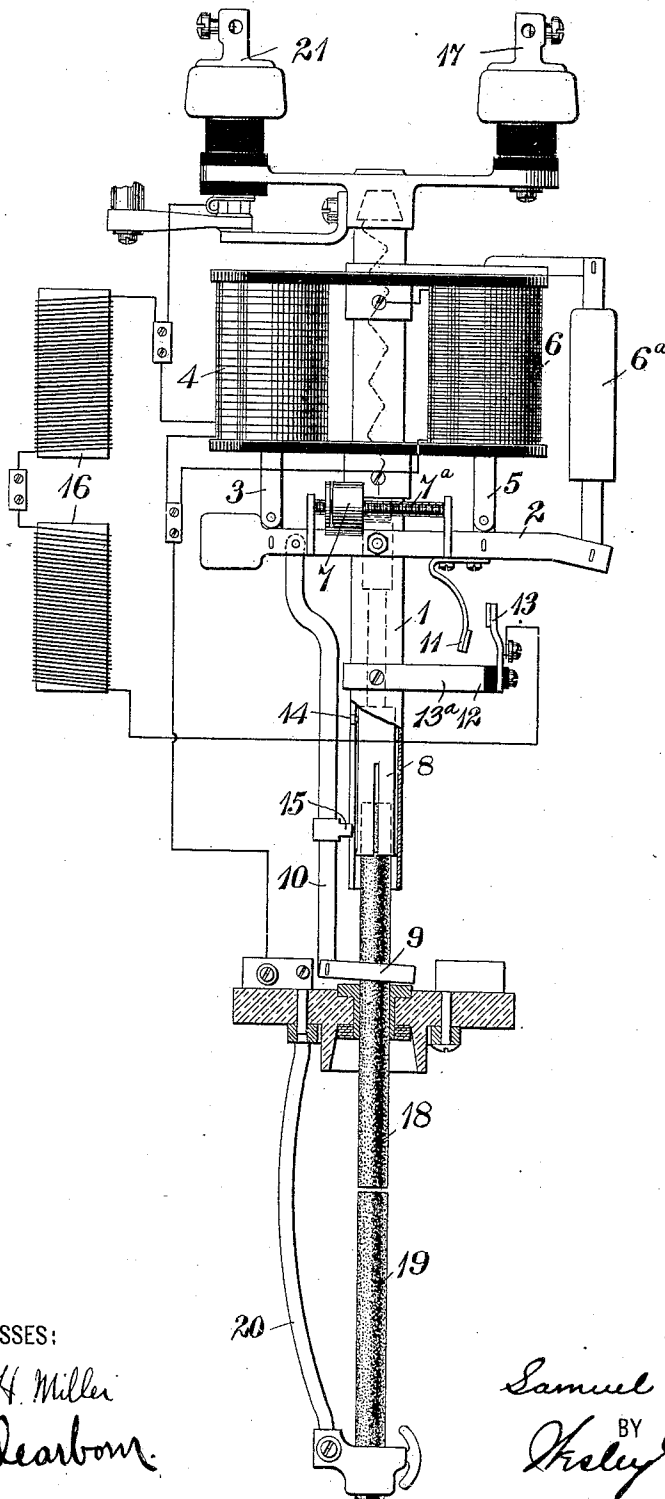


S. P. WILBUR,
ARC LAMP,
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989,518.

Patented Apr. 11, 1911.



WITNESSES:

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ARC-LAMP.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, SAMUEL P. WILBUR, a citizen of the United States, and a resident of Wilkesburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Arc-Lamps, of which the following is a specification.

My invention relates to arc lamps and particularly to that type, commonly known as the series arc lamp, in which a substantially balanced condition is maintained between its series and shunt magnets.

The object of my invention is to provide means for effectually actuating the cut-out of an arc lamp, at the end of the carbon life, without producing any substantial variation in the voltage applied to the lamp.

Series arc lamps of the stationary central tube variety are ordinarily constructed with weak series magnets acting in opposition to strong shunt magnets and are provided with adjustable weights which give substantially balanced conditions in the lamps. When this construction is employed, any change in the weight of the moving parts will proportionately change the voltage applied to the lamp. Consequently when the upper carbon becomes so worn that its sheath rests on the clutch, as is ordinarily the case, the series coil is relieved of the weight of both sheath and carbon, thereby increasing the force which opposes the shunt coil, and the voltage applied to the lamp is increased to a considerable extent before the shunt coil can act to cut out the lamp. To obviate this detrimental condition, I have provided a projection on the movable carbon sheath which is so placed with reference to a corresponding projection on the clutch rod that the two come into engagement near the end of the carbon life, whereby the cut-out contacts are gradually brought together and the lamp finally cut out at the end of the carbon life without substantial change in the voltage applied and without changing the weight of the moving parts.

The single figure of the accompanying drawing is a diagrammatic and partially sectional elevation of an arc lamp embodying my invention.

Referring to the drawing, pivotally supported upon a stationary central tube 1, in the usual manner, is a rocking-beam or balancing bar 2, to one end of which is attached the

core 3 of a series coil 4 and to the other end of which is attached the core 5 of a shunt coil 6, its movement being retarded in the ordinary manner by a dash-pot 6^a. A balancing weight 7, which engages a screw-rod 7^a that is parallel and attached to the beam 2, may be adjusted along the rod to balance the weight of the movable parts of the lamp, which comprise a sheath 8, containing a carbon pencil 18 or other suitable electrode, a clutch 9 and a clutch-rod 10 that is pivotally attached to and supported by the walking-beam 2. The lamp further comprises an automatic cut out switch 12, a shunt resistance 16 in series therewith, a stationary electrode 19 to cooperate with the movable electrode 18, and a support or holder 20 therefor.

The cut-out switch 12 comprises a stationary terminal 13 that is supported and insulated from the central tube 1 by an arm 13^a and a movable terminal 11 that is so attached to the rocking-beam 2 as to make contact with the stationary terminal when the pull of the shunt coil 6 materially overbalances that of the series coil 4.

Electric energy is supplied to the lamp through a terminal 17, which is connected to the carbon sheath 8, one terminal of the shunt coil 6 and contact terminal 11 of the cut-out switch 12. The circuit is completed through movable carbon 18, fixed carbon 19, stationary holder 20 and the series coil 4 to an opposite line terminal 21. The other terminal of the shunt coil is connected between the stationary electrode and the series coil and the resistance 16 is connected between the contact terminal 13 of the cut-out and terminal 21 of the lamp.

The operation of the lamp is as follows: As the upper electrode is gradually worn by the action of the electric arc, the projection 14 on the carbon sheath approaches and finally engages the projection 15 on the clutch-rod 10. Since the sheath and the rod are both supported from the beam 2 at some point, the balanced condition of the mechanism is unaltered, but a further downward movement of the electrode is prevented and, consequently, the arc is soon lengthened and the current traversing the arc and the series coil diminished. The pull of the shunt coil is therefore relatively increased, without a material increase in the voltage applied to it, and the cut-out contacts are

thus brought into engagement. A circuit is then established from the terminal 17, through the tube 1, beam 2, switch terminals 11 and 13 and the resistance 16 to the lamp terminal 21.

Although my invention is illustrated and described only in connection with a specific form of lamp, I desire it to be understood that all similar means for accomplishing the same result in the same or a different type of lamp are included within its scope.

I claim as my invention:

1. In an arc lamp, the combination with a stationary electrode, a movable electrode, a sheath therefor having a projection, and a clutch mechanism for the electrode, of opposing series and shunt magnet coils which govern the action of the clutch mechanism, and means dependent upon the engagement of the sheath projection with a portion of the clutch mechanism for cutting out the lamp.

2. In an arc lamp, the combination with a stationary central tube, a stationary electrode, a movable electrode, a holder, a clutch mechanism therefor, and a movable clutch-rod, of projections on the movable clutch-rod and on the holder, respectively, and means dependent upon the engagement of said projections for cutting out the lamp.

3. In an arc lamp, the combination with a stationary and a movable electrode, a holder for the movable electrode, a stationary central tube, a rocking beam attached thereto and supported thereby, a clutch for regulating the movable electrode, a connecting rod whereby the clutch is suspended from the rocking beam, and opposing series and shunt actuating magnet coils therefor, of a projection on said clutch-rod, a complementary projection on said holder and cooperating stationary and movable cut-out contact members, said movable contact member being attached to the rocking beam.

4. In an arc lamp, the combination with

movable and stationary electrodes, a stationary frame, a rocking beam attached thereto and supported thereby, opposing series and shunt magnets for actuating the rocking beam, a clutch which regulates the relative movement of the electrodes, a connecting rod whereby the clutch is suspended from the rocking beam, and a cut-out device that comprises a fixed contact member and a cooperating movable contact member that is attached to the rocking beam of complementary projections on the clutch-rod and on the movable electrode, and means dependent upon the engagement of said projections for actuating the cut-out device.

5. In an arc lamp, the combination with a stationary frame, a stationary central tube, and a stationary electrode, a movable electrode, a sheath or holder therefor, a projection on said holder, a rocking beam attached to and supported by the central tube, a clutch which supports and regulates the movement of the movable electrode, a connecting rod whereby the clutch is suspended from the rocking beam, a projection on said clutch rod, and opposing series and shunt electro-magnets that are adapted to actuate the rocking beam, the movable parts being substantially balanced, of an interrupted circuit which may shunt the electrodes and comprises a resistance and a pair of cooperating stationary and movable contact members, the movable contact member being attached to the rocking beam, and means dependent upon the engagement of the sheath and clutch-rod projections for automatically establishing the shunt circuit.

In testimony whereof, I have hereunto subscribed my name this 22nd day of May, 1905.

S. P. WILBUR.

Witnesses:

R. J. DEARBORN,
BIRNEY HINES.