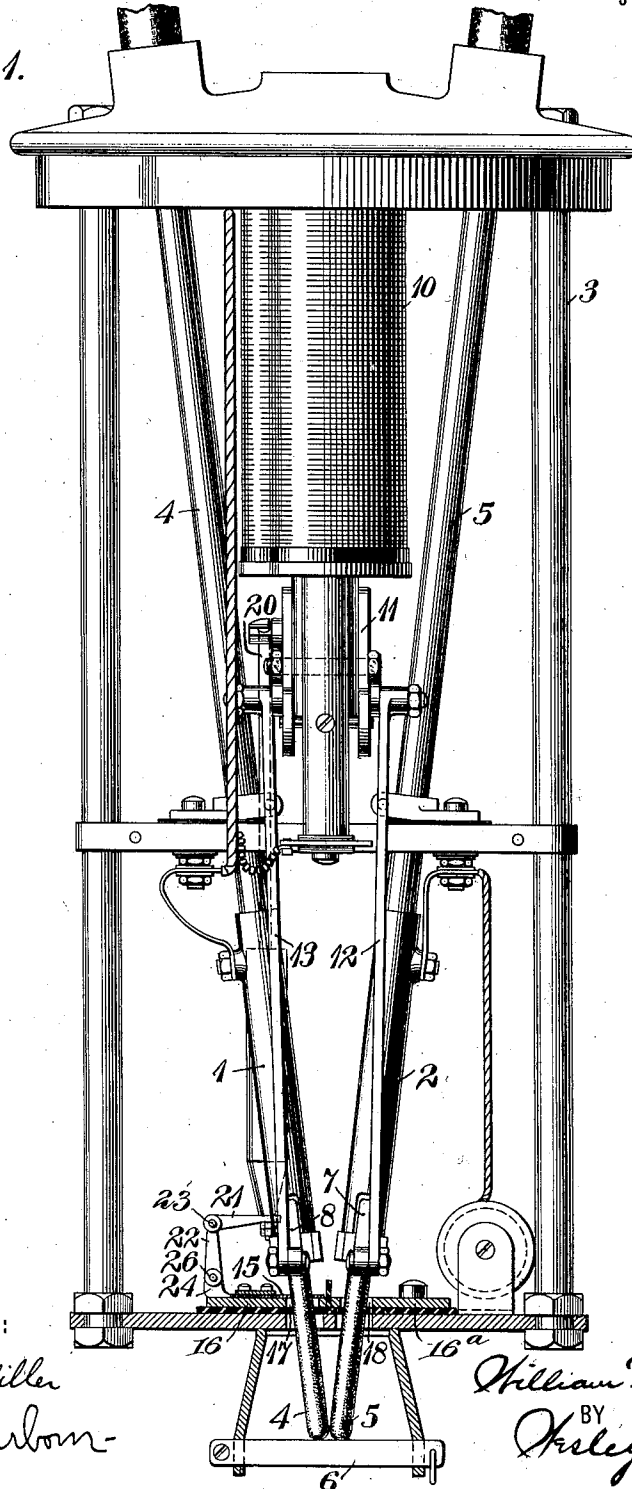


989,292.

3 SHEETS—SHEET 1.

Fig. 1.



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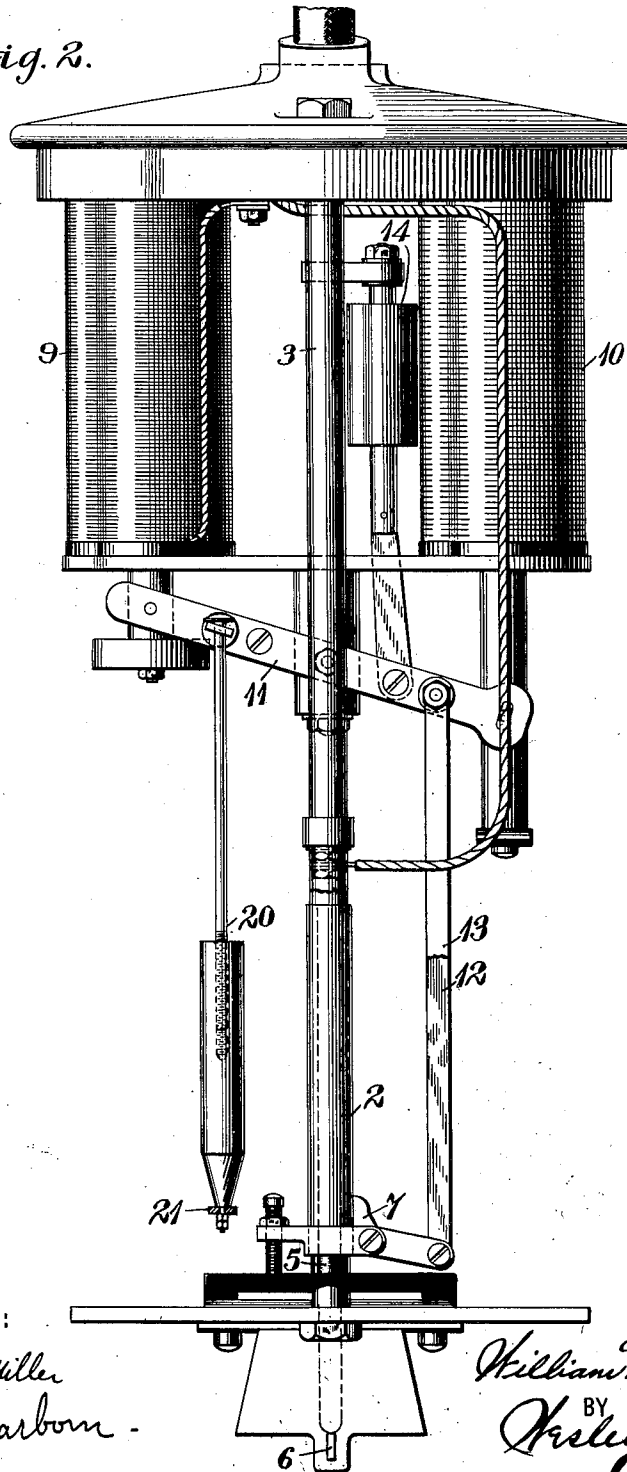
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ELECTRIC ARC LAMP.
APPLICATION FILED DEC. 28, 1905.

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Patented Apr. 11, 1911.

3 SHEETS-SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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ELECTRIC-ARC LAMP.

989,292.

Specification of Letters Patent.

Patented Apr. 11, 1911.

Application filed December 28, 1905. Serial No. 293,632.

To all whom it may concern:

Be it known that I, WILLIAM R. RIDINGS, a subject of the King of Great Britain, and a resident of Stretford, in the county of Lancaster, England, have invented a new and useful Improvement in Electric-Arc Lamps, of which the following is a specification.

My invention relates to electric arc lamps and has special reference to such lamps as employ electrodes that are slightly inclined from the vertical and maintain an arc at their lower extremities.

The object of my invention is to provide lamps of the aforesaid character with simple and effective means for automatically bringing the arcing points of the electrodes together when energy is supplied to the lamp so that a circuit may be completed there-through and an arc established.

In the prior art, arc lamps having inclined carbons which maintained an arc at their lower extremities have usually been provided with igniters which limited the downward motion of the carbons and served to establish an arc between the two. Such devices have usually been complicated and expensive and have given unsatisfactory and uncertain results.

According to my present invention, the inclined carbon electrodes may be fed through loose tubes and regulated by relatively inexpensive clutch mechanisms of any well known variety, which are dependent for their action upon a shunt magnet coil acting in opposition to a series magnet coil, and the electrodes may rest upon a limiting strip when no energy is supplied to the lamp. In case the carbons rest upon a strip of this kind without coming into engagement with each other, the lamp will fail to light when energy is applied thereto. I have therefore provided means for moving the arcing point of one electrode horizontally into engagement with the other, which is dependent upon the energizing of the shunt magnet coil. As soon as the two carbon electrodes have been brought into engagement with each other in this manner, a circuit is completed through them and the series coil, which acts in opposition to the shunt magnet coil, limits the distance to which the clutch mechanism may separate the electrodes.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation, partially in section, of an arc lamp constructed in accordance therewith; Fig. 2 is a similar side elevation, and Fig. 3 is a perspective view of the lower portion of the lamp and showing the device which automatically brings the electrodes into engagement when energy is applied to the lamp.

Referring to the drawings, an electric arc lamp comprises two carbon-feeder tubes 1 and 2, which are attached to a supporting frame 3 and are slightly inclined from the vertical so that two carbon electrodes 4 and 5 therein meet at a common point near the lower extremity of the lamp.

When no energy is supplied to the lamp, the carbon electrodes may rest upon a supporting rod or bar 6, but they are lifted away from this bar, when the lamp is connected to the supply circuit, by a plurality of clutches 7 and 8 which are governed by a shunt magnet coil 9 and a series magnet coil 10, the armatures of said coils being connected, in the usual manner, to opposite extremities of a walking beam 11 which is joined to the clutches 7 and 8 by connecting rods 12 and 13 and is retarded in its motion by a dash-pot 14. Before the clutches 7 and 8 raise the carbon electrodes, thereby separating their extremities, it is essential to complete a circuit therethrough in order that an arc may be formed as they are separated. This result is automatically accomplished by the action of the shunt coil, when energy is first applied to the lamp, through a regulating device comprising a movable strip 15 and two guide plates 16 and 16^a that are located at a relatively short distance above the lower extremity of the lamp and are provided, respectively, with slots 17 and 18 through which the electrodes are free to move. The strip 15 is provided with a slot 18^a for the electrode 4 and is mounted upon the plate 16 and held in position by a guide piece 19 which is fastened to the plate and projects over the strip. Motion is transmitted to the strip 15 to bring the extremities of the electrodes into engagement with each other, from the walking-beam 11, through an extensible connecting rod 20 and a pair of lever arms 21 and 22 which are rigidly mounted on a shaft 23 and project therefrom

at right angles to each other. The free end of the arm 21 is connected to the lower extremity of the connecting rod 20 and the free end of the arm 22 is attached to a projection 24 at one extremity of the strip 15 by a pivot 26. The shaft 23 is rotatably mounted in a sleeve 25 which is supported by a vertical extension of the plate 16. Thus, as energy is applied to the lamp when the electrodes are separated, the shunt coil 9 is first energized and exerts an upward pull upon the connecting rod 20, which brings the ends of the electrodes together as hereinbefore explained. This completes the circuit through the carbon electrodes and also through the series coil 10 which opposes the action of the shunt coil 9, the design of the two coils being such as to maintain the proper arcing distance between the ends of the electrodes.

Although I have shown and described a specific structure, I desire that variations in size, form and arrangement of details which do not change the result shall be included within the scope of my invention.

I claim as my invention:

1. In an arc lamp, the combination with a supporting frame, two carbon-holding tubes, carbon electrodes located therein, opposing shunt and series regulating coils clutch devices actuated by said series and shunt coils to regulate the positions of said carbon electrodes and a horizontal limiting rod or strip of insulation on which the electrodes rest when the lamp is not in operation, of a slotted plate through which the lower ends of the carbon electrodes project, a laterally movable strip having a hole through which one of the electrodes projects, a bell crank lever attached to said movable strip and a rod of adjustable length interposed between the bell crank lever and the clutch-operating mechanism.

2. In an arc lamp, the combination with two stationary carbon-holding tubes that are slightly inclined from the vertical, carbon electrodes located therein opposing series and shunt regulating coils and an insulating limiting rod or strip on which the electrodes rest when the lamp is not in operation, of means for moving the extremities of the electrodes on said limiting rod or strip into engagement with each other, said means comprising a stationary guide plate provided with a plurality of slots through which said electrodes may pass, a slotted strip movably mounted on said plate and a rotatably-mounted connecting link which is dependent for its motion upon the energization of said shunt regulating coil to actuate said strip.

3. In an electric arc lamp, the combination with opposing series and shunt regulating coils, two electrodes which extend upwardly from two points relatively near together, forming a small angle with each other and a horizontal limiting rod or strip of insulating material on which the adjacent ends of the electrodes rest when the lamp is not in operation, of means for automatically moving one of said electrodes into engagement with the other when electrical energy is applied to said shunt regulating coil, said means comprising a stationary guide plate provided with a plurality of slots through which said electrodes may pass, a slotted strip movably mounted on said plate and a rotatably-mounted connecting link which is dependent for its motion upon the energization of said shunt regulating coil to actuate said strip.

4. In an arc lamp, the combination with a supporting frame, a shunt regulating coil, two carbon-holding tubes, carbon electrodes located therein, clutch devices, dependent upon the action of the shunt regulating coil, for regulating the position of said carbon rods and a horizontal limiting rod or strip on which the electrodes rest when the lamp is not in operation, of means for automatically moving said carbon electrodes horizontally on said limiting rod or strip into engagement with each other when energy is applied to the lamp, said means comprising stationary guide plates provided with slots through which said electrodes may pass, a slotted strip movably mounted on one of said plates and a rotatably-mounted connecting link which is dependent for its motion upon the energization of said shunt regulating coil to actuate said strip.

5. In an arc lamp, the combination with two electrodes that are slightly inclined from the vertical and clutch mechanisms for longitudinally adjusting the electrodes in operation without preventing the removal of the electrodes from the lamp, and a horizontal insulating bar or rod on which the electrodes rest when the lamp is not in operation, of means for automatically moving one of the electrodes horizontally on said bar or rod for bringing them into engagement with each other when energy is first applied to the lamp.

In testimony whereof, I have hereunto subscribed my name this first day of December, 1905.

WILLIAM R. RIDINGS.

Witnesses:

JAS. STEWART BROADFOOT,
NORMAN H. SHEARD.