C. A. LEWIS.

ELECTRIC SEARCH LIGHT FOR AUTOMOBILES.

APPLICATION FILED AUG. 8, 1910.

1,022,634. Patented Apr. 9, 1912.

Fig. 1.

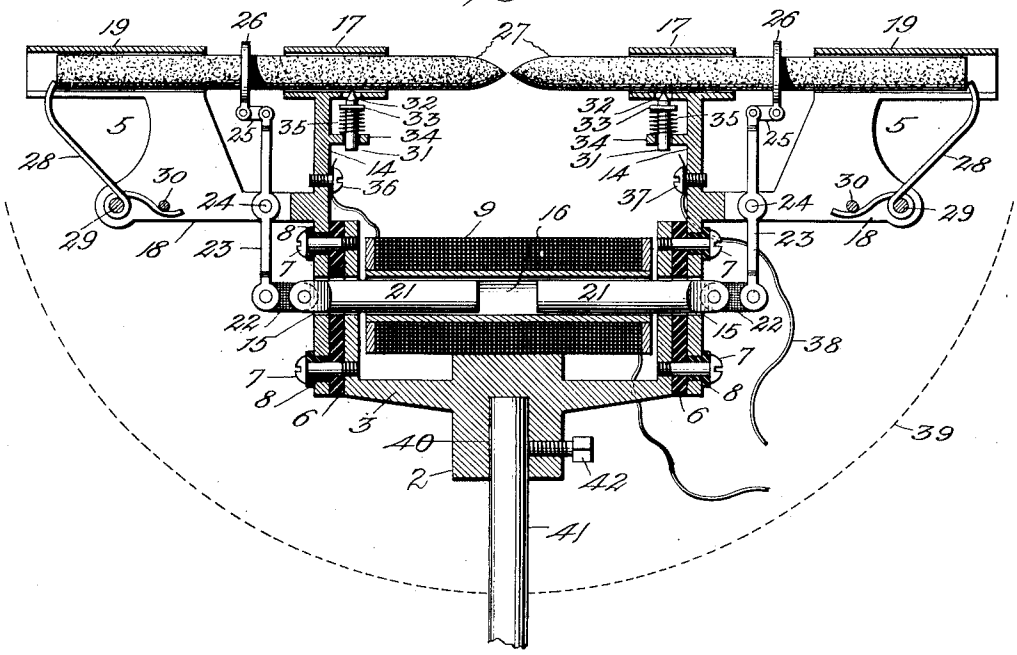


Fig. 2.

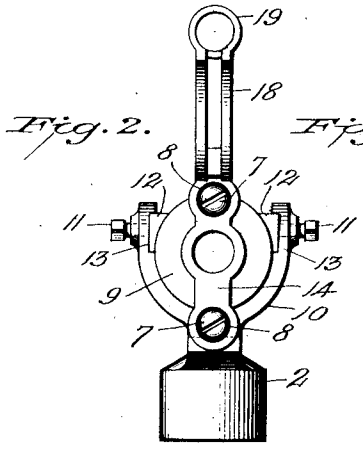


Fig. 5.

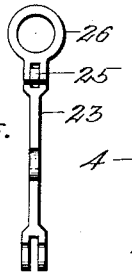


Fig. 3.

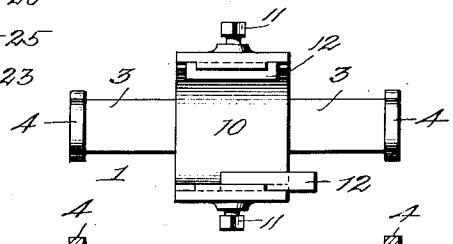
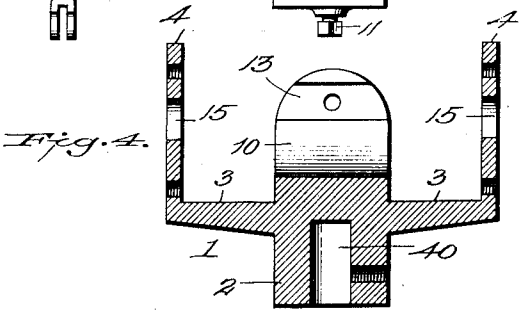


Fig. 4.



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ELECTRIC SEARCH-LIGHT FOR AUTOMOBILES.

1,022,634. Specification of Letters Patent. Patented Apr. 9, 1912.

Application filed August 8, 1910. Serial No. 576,039.

To all whom it may concern:

Be it known that I, CHARLES A. LEWIS, a citizen of the United States of America, residing in the city and county of Denver and State of Colorado, have invented a new and useful Electric Search-Light for Automobiles, of which the following is a specification.

My invention relates to an improved electric arc head-light for automobiles, and the objects of my invention are: First, to provide an automatically operating electric arc head-light for automobiles. Second, to provide a simple, economical, easily applied electric arc head-light for automobiles. And third, to provide an electric arc head-light apparatus particularly adapted for use in connection with automobiles, and which is unaffected by gravity, jolts or vibrations, and which is adapted to be supplied with current from a primary battery, a storage battery, a dynamo, or any other source of electric energy, and which may be used with or without a reflector and lens, or with either of them. I attain these objects by the mechanism illustrated in the accompanying drawings, in which:

Figure 1, is a vertical, longitudinal, sectional view of the improved head-light apparatus, a portion of the hood being shown in dotted lines. Fig. 2, is an end view of the same, the carbon and operating lever therefor on the said end being omitted. Fig. 3, is a plan view of the supporting bracket for the solenoid. Fig. 4, is a vertical, longitudinal sectional view through the same. And Fig. 5, is a front view of the carbon operating lever and the ring through which the carbon passes.

Similar letters of reference refer to similar parts throughout the several views.

Referring to the accompanying drawings: The numeral 1 designates a support or bracket, comprising a central hub 2, from opposite sides of which project horizontal arms 3, which terminate in vertical standards 4 to which are secured the vertical portions of supports 5. These supports are insulated from the standards 4 of the bracket 1, by fiber or other non-conducting strips or plates 6, and are secured to the standards by screws 7, which pass through fiber sleeves 8, which pass through holes in the supports 5, and contact with the strips 6, the sleeves 8 being provided with annular flanges, against which the heads of the screws bear.

The bracket 1 is designed to support a solenoid 9, and while the solenoid may be secured thereto in any suitable manner, it is preferably secured as follows: A semi-circular saddle 10 is formed on the bracket, midway between the vertical standards 4, which saddle is designed to support the solenoid in a position parallel with the horizontal arms 3 of the bracket. The solenoid is held in the bracket by set screws 11, which pass through opposite sides of the saddle, and may contact directly with the periphery of the solenoid, though, as shown in the drawings, these screws bear upon plates or blocks 12, which are removably seated in recesses or grooves 13, in the opposite sides of the saddle, and are clamped against the periphery of the solenoid by the said screws. The vertical members 14, of the supports 5, the non-conducting strips 6, and the standards 4, are provided with registering holes 15, which are in line with the axial hole 16 of the solenoid, and the upper ends of the members 14 terminate in horizontally disposed sleeves 17.

From the arms 14 extend arms 18 comprising parallel spaced plates, which terminate at their upper ends in sleeves 19, in axial line with the sleeves 17, a suitable space being left between the opposing ends of the said sleeves 17 and 19. The sleeves 19 are open or slotted along their lower sides, so as to communicate with the space between the plates constituting the arms 18, as will be understood by reference to Figs. 1 and 2.

Extending loosely through the holes 15 in the supports 5, non-conducting strips 6 and standards 4, and into the opposite ends of the solenoids, are cores or plungers 21, to the outer ends of which are pivotally secured fiber links 22, to which are pivotally connected the lower ends of levers 23, which are mounted midway of their length, between the parallel members of the arms 18, upon pins 24, which extend through the said arms.

To the upper ends of the levers 23, are pivotally secured links 25, the opposite ends of which are pivotally secured to rings 26, which are adapted to encircle electrodes 27, which are supported in the sleeves 17 and 19. These rings normally stand in substantially vertical positions between the sleeves 17 and 19, and when the cores 21 are drawn toward each other, by reason of the current passing through the solenoid, the levers 23 are rocked and the rings 26 are thereby

tilted at an angle to the axes of the electrodes, and thus engage the electrodes frictionally, and move them away from each other, as will be more fully shown hereinafter. The electrodes 27 are normally pressed toward each other, by springs 28, the upper ends of which bear upon the outer ends of the electrodes, while their lower portions encircle pins 29, in the slotted ends of the arms 18, their lower extremities being engaged by stop pins 30, by which the springs are held under tension.

The electrodes are steadied in their movements or prevented from being too suddenly thrown, either by the solenoid or the springs 28, by pins 31, having pointed ends, which extend through holes 32, in the lower sides of the sleeves 17. These pins are provided with shoulders 33, adjacent to their upper ends, and their lower ends pass loosely through holes in arms 34, which extend from the upright arms 14. Coil springs 35 are interposed between the arms 34 and the shoulders 33, and thus hold the pins in contact with the electrodes.

The winding at one end of the solenoid is connected with the adjacent support 5, by a binding screw 36, while from the opposite end of the solenoid, the winding extends to a source of electrical power. The opposite support 5 is provided with a binding screw 37, which clamps one end of a circuit wire 38, the opposite end of which is connected with the said source of power. The current thus passes from the source of power through the solenoid to one of the supports 5, and to the electrode supported thereby; thence it passes to the other electrode, and through the adjacent support 5, and wire 38, to the source of power, thus completing an electrical circuit.

The improved device herein shown and described, may be secured within the light hood 39 (shown in dotted lines) in any desired manner, but when the same is connected to hoods, in present use, the hub 2 of the solenoid supporting bracket, is formed with a socket 40, by which it is adapted to fit upon the end of a supporting rod 41, which extends up into the hood, and the hub is secured upon the said rod by a set screw 42. The mechanism is so positioned that the electrodes are on a horizontal line which passes through the axial center of the hood.

In practice, an electrode 27 is slipped through the sleeves 17 and 19 of each support 5, and through the ring 26 on the upper end of the lever 23, the ends of the electrodes meeting at a point midway between the opposing ends of the sleeves 17. The springs 28 are then caused to engage the outer ends of the electrodes so as to exert a pressure upon them which will tend to move them toward each other. When the current is turned on, the solenoid is energized and the cores 21 are drawn toward each other, whereby the levers 23 are rocked on their pivots, so that their upper ends are moved outward. This movement of the levers tilts the rings 26 so that they bind upon or grip the electrodes and move them apart, whereby an arc is formed between their adjoining ends. The electrodes remain in these relative positions for a limited period, or until their ends are so consumed as to materially lengthen the arc, thereby increasing the resistance and diminishing the magnetic power of the solenoid, which thus permits the cores to move apart. The levers 23 are thereby rocked in the opposite direction, which causes the rings 26 to assume substantially vertical positions, and thus release their frictional grip upon the electrodes, which are then moved toward each other by the springs 28. Thus the arc-forming movement of the electrodes is automatically maintained through the agencies of the solenoid, the cores, the levers, and the gripping rings, while the opposite or feeding movement of the said electrodes is also automatically maintained by the springs 28, the spring-operated pins 31 acting to steady the movement of the electrodes.

The operation of the mechanism constituting the improved electric arc search-light, is not in any way affected by gravity, by jolts, or by vibrations, and a light of uniform power is thereby maintained, and while the device is primarily intended for use in connection with automobiles, it is obvious that the same may be employed in any other connection.

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

1. In an electric arc head-light, a bracket; supports secured to the opposite ends of said bracket and insulated therefrom; horizontally disposed sleeves upon the upper ends of the supports; electrodes slidably mounted in said sleeves; a solenoid on the bracket in circuit with the electrodes; slidable cores in the opposite ends of the solenoid; levers pivotally mounted in the supports and connected at their upper ends with the electrodes and at their lower ends with the cores, said levers being adapted to move the electrodes apart when the solenoid is energized; and springs for exerting a counter pressure upon the electrodes.

2. In an electric arc head-light as specified, a support; electrodes horizontally and slidably mounted in the support; rings loosely mounted on said electrodes; a solenoid in circuit with the electrodes, having movable cores extending into its opposite ends; levers pivotally mounted in the support and having a pivotal connection at their upper ends with said rings and at their lower ends with the outer ends of said cores,

whereby when the levers are rocked by the movement of the cores the said rings are tilted and grip the electrodes frictionally and move them apart; and springs for exerting a continuous counter pressure on the outer ends of the electrodes.

3. In an electric arc head-light as specified, a bracket; a support secured to each end of the bracket and insulated therefrom; horizontally disposed spaced sleeves at the upper end of each support; electrodes slidably mounted in said sleeves; a ring loosely mounted on each electrode between the spaced sleeves; a solenoid secured to the bracket in circuit with the electrodes; cores extending into the opposite ends of the electrodes having non-conducting links pivotally attached to their outer ends; levers pivotally mounted in the supports and pivotally connected at their upper ends to said rings and at their lower ends to the non-conducting links; and springs for exerting an inward pressure upon the outer ends of the electrodes.

4. In an electric arc head-light as specified, a bracket; metal supports secured to the opposite ends of the bracket and insulated therefrom; alined sleeves at the upper end of each support separated by a space, said supports having slots which open into the lower sides of the outer sleeves; a ring on each electrode in the space between the sleeves; levers pivotally mounted in the supports; links connecting the upper end of said levers and said rings; a solenoid removably secured to the bracket, having slidable cores in its opposite ends and in circuit with said electrodes; non-conducting links connecting the lower ends of said levers with the said cores; and springs mounted in the slotted portions of the supports, the upper ends of which extend up through the outer sleeves and bear upon the outer ends of the electrodes.

5. In an electric head light as specified, the combination with a pair of uprights, having carbon supporting sleeves at their upper ends, of spring operated pins carried by said uprights, which are adapted to enter apertures in said sleeves and to frictionally engage carbons placed in said sleeves.

6. In a device as specified, a support comprising a base which terminates at each end in uprights, and a saddle midway between said uprights, brackets secured to said uprights having divided tubular carbon supports at their upper ends, said brackets and uprights being provided with alined apertures, a solenoid secured in the saddle having a core extending into each end projecting through the adjacent aperture in the upright and bracket, a centrally pivoted lever carried by each bracket and connected at its lower end to the projecting end of a solenoid core and insulated therefrom, a link at the opposite end of each lever, and a friction ring pivotally secured to each link and located between the adjacent ends of each divided carbon holder, said rings being adapted to encircle carbons mounted in said holders, and tension springs carried by the brackets, the free ends of which are adapted to bear against the outer ends of the said carbons.

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

CHARLES A. LEWIS.

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