No. 817,146. PATENTED APR. 3, 1906.

J. McCULLOUGH.

SWITCHING DEVICE FOR ELECTRIC LAMPS.

APPLICATION FILED JUNE 23, 1903.

Fig. 1.

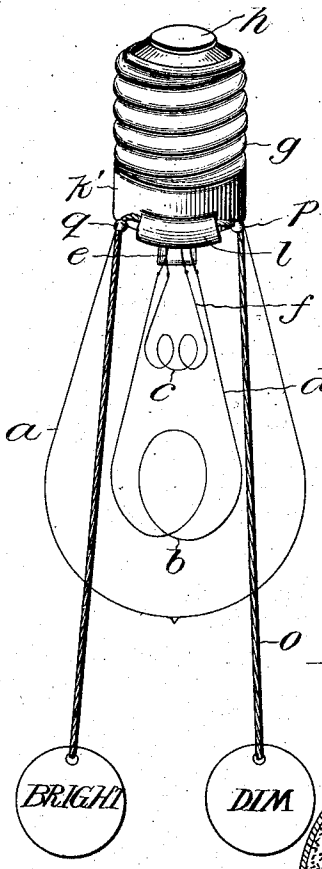


Fig. 5.

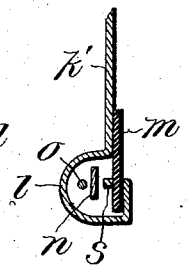


Fig. 2.

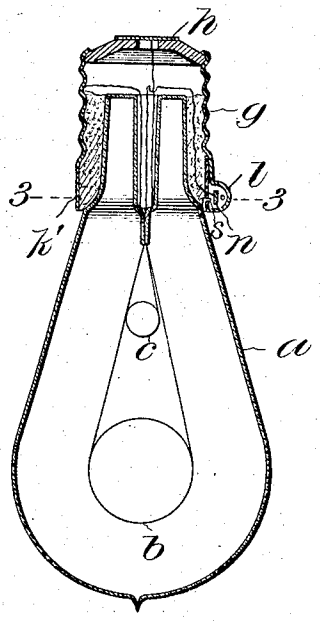


Fig. 3.

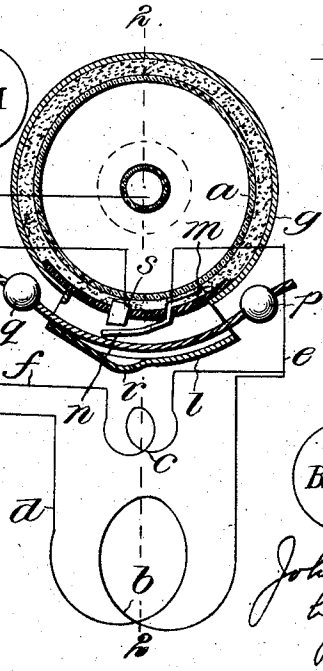


Fig. 4.

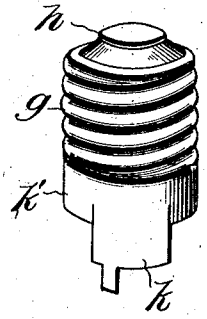
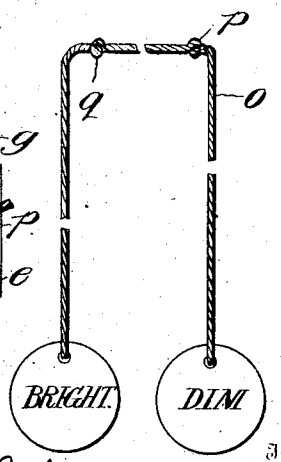


Fig. 6.



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SWITCHING DEVICE FOR ELECTRIC LAMPS.

No. 817,146. Specification of Letters Patent. Patented April 3, 1906.

Application filed June 23, 1903. Serial No. 162,749.

To all whom it may concern:

Be it known that I, JOHN McCULLOUGH, a citizen of the United States of America, and a resident of Newark, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Switching Devices for Electric Lamps, of which the following is a specification.

My invention has for its object to provide means whereby the filaments of a double-filament incandescent electric lamp may be thrown into and cut out of circuit, and thus rendered luminous at will without necessitating the removal of the lamp from the socket and whereby a lamp having these features is adapted to be used with the ordinary form of socket, thereby permitting the replacement of a single-filament lamp by my improved device without necessitating any change in the fixtures.

The mechanism invented by me is especially applicable when the lamp is located at such a height as not to be readily accessible or when a shade is used, as it consists of a contact-breaker located within the lamp-base actuated by means of a cord or other flexible controlling device extending from suitable guides carried by the lamp-collar to any desired point or to below the shade to permit its ready movement.

Referring to the accompanying drawings, in which corresponding parts are designated by corresponding marks of reference, Figure 1 is a perspective view of a lamp having my present invention applied thereto. Fig. 2 is a central vertical section therethrough and through Fig. 3, being taken on the line 2 2 of the latter. Fig. 3 is a transverse horizontal section on line 3 3 of Fig. 2, also showing the circuit connections diagrammatically. Fig. 4 is a view of the lamp-collar before the guide-tube is struck up. Fig. 5 is a detached sectional view showing the means in which the guide-tube is formed by bending up the ear on the collar and showing also the manner in which the end of the ear is anchored. Fig. 6 is a view of the flexible cord with knotted enlargements thereon.

The lamp-bulb *a* contains two filaments *b* and *c*. In the form shown one filament is of greater candle-power than the other. Thus the filament *b* may be of sixteen-candle power and the filament *c* of one-candle power. In the circuits shown in Fig. 3 the terminal of the high-candle-power filament *b* is connected to the leading-in wire *d*, while the opposite terminal of the said filament is connected to one terminal of the low-candle-power filament *c*. A leading-in wire *e* is connected to the joint terminal of the two filaments and a leading-in wire *f* to the other end of the filament *c*, the leading-in wire *f* being connected to the usual metallic lamp-collar *g* upon the base of the bulb. The leading-in wire *d* is connected with the insulated contact stud or button *h* at the base of the lamp, as is well known. The leading-in wire *e* is connected with the spring-contact *n*, hereinafter referred to.

The collar *g* is formed with a projection below its skirt *k'* on one side, and the skirt is slotted on each side of this projection, so that an ear *k* (see Fig. 4) is formed, which before the lamp is assembled is struck up outwardly and then inwardly, forming what may be termed a "tube" *l* and also forming an interruption or notch in the periphery of the lower part of the skirt, which interruption is covered by the turned-out ear. A sheet of fiber *m* is secured inside of the collar opposite the interruption or notch and between it and the butt of the bulb, and to it the lower edge of the bent ear *k* is secured. A strip *n* of suitable material, which should be both elastic and conducting, is passed through the fiber sheet *m* and has its central portion engaged thereby, its one end being located between the bulb-butt and the fiber and its other end being free and contained within the tube *l* and normally standing slightly away from the fiber-plate, but being at the same time out of contact with the ear. The leading-in wire *e* is connected to the end of the spring-contact between the fiber and the lamp-butt, so that the free end of the spring contained within the tube *l* is connected with the united terminals of the two filaments. For convenience the leading-in wire *f* may be, as shown, connected to the collar by being soldered to the end of the ear *k*.

A cord *o* passes through the tube *l* and is movable therein, the ends of the cord being extended a convenient distance to permit its ready manipulation and has therein two enlargements *p* and *q*, one on each side of the tube, which has its one end closed against the passage of the enlargements, the other end of the tube being open to permit the entrance of the enlargement on that side. This construction of the tube I preferably accomplish by flattening the tube at one end, as indicated in Fig. 3. This also forces the enlarge-

ment *p*, which enters the tube toward the free end of spring-strip, as is desirable, as will be hereinafter shown.

The end of the ear may be bent up under the fiber-plate and inserted from the inner to the outer surface thereof, being exposed on the latter and located under the end of the spring-strip in the tube, as at *s*, so that the said end of the spring when forced down by the entry of the enlargement into the tube will contact therewith, in which case the enlargement may be of non-conducting material, by preference formed by a single knot in the cord. (See Fig. 6.) The enlargement may, however, be of conducting material, being, for instance, in the form of a metallic ball adapted to wedge between the outer wall of the tube and the end of the spring-strip contained therein and to thus itself form a double break-switch connecting the collar with the said spring-strip, and thus with corresponding terminals of both the filaments, in which case the bending up of the end of the ear under the fiber-plate and its projection therethrough may be dispensed with, but I prefer to both extend the ear through the fiber sheet and to use a metallic enlargement *p*, as not only are good contacts thus assured in shunting the low-candle-power filament, but the end of the ear is securely anchored and held from displacement against the strain of the cord and of the enlargements thereon.

Whatever of the above constructions may be employed it will be seen that if the parts are in the position shown in full lines in Figs. 1, 2, and 3—that is to say, the enlargement *q* being against the small end of the tube and the free end of the spring in its normal position and such a lamp be placed in a proper socket, so that its butt-plate and its collar are in connection with the opposite leads of a circuit—current will pass through both filaments in series and by the construction thereof, which is well known in the art, will raise the low-candle-power filament only to incandescence, giving a low light. If now the proper end of the string be pulled, (to designate which disks marked with the words "Dim" and "Bright" or their equivalents may be attached to the opposite ends of the cords, as shown,) the enlargement *p* will be drawn into the tube and will itself, if it be conducting material, form a connection between the joint terminals of the two filaments and the collar, or if it be of non-conducting material will force the free end of the spring against the exposed end of the ear, or if the metallic enlargement and the exposed end of the ear be both present contacts through each side will be formed, thus in any of the above cases connecting the high-power filament directly between the end contact-plate and the collar and short-circuiting the low-candle-power filament. Under these conditions the high-candle-power filament will become incandescent, as is well understood. Upon drawing the string from the opposite end the enlargement *p* will be drawn out of the tube and the parts will be resolved to their positions, as shown.

It will be noted that by my present construction as the tube is formed by a part of the lamp-collar that I, in effect, remove the contacts from the exterior surface of the latter to the interior of the butt of the lamp, whereby the points between which sparking is apt to occur are hidden, the tube forming a shield both to protect such parts from accidental bridging and also to prevent danger from sparks, while all the parts are of such a character and constructed as to permit them to be readily made and assembled by machinery and unskilled labor.

If a metallic enlargement *p* is used, the tube at the point where the enlargement would come to rest when drawn therein may be slightly swelled in order to retain it in position against jars and the pressure of the spring. This is shown on an exaggerated scale in Fig. 3. If a non-conducting and elastic enlargement is used, as a knot in the string, this is not necessary, as the resiliency of the enlargement will cause it to bend sufficiently to hold it in place.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof, a tube carried by the collar, a contact part contained within the tube, and means extending through the tube adapted to close the circuit between the collar and contact part, substantially as described.

2. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof, a tube carried by the collar, a contact part contained within the tube, and means movable axially in the tube adapted to close the circuit between the collar and contact part, substantially as described.

3. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof, a tube within the collar, a contact part contained within the tube, and a cord, passing through the tube and having a part thereon adapted to close the circuit between the collar and contact part, substantially as described.

4. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof, a tube within the collar, a contact part contained within the tube, and connected to a lamp-filament, a second contact part adjacent to the first-named contact part and connected to the lamp-collar, and means extending through the tube, adapted to close the circuit between the two contact parts, substantially as described.

5. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof, a tube within the collar, a contact part contained within the tube, and connected to a lamp-filament, a second contact part adjacent to the first-named contact part and connected to the lamp-collar, and means movable axially in the tube itself, adapted to close the circuit between the two contact parts, substantially as described.

6. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof, a tube within the collar, a contact part contained within the tube, and connected to a lamp-filament, a second contact part adjacent to the first-named contact part and connected to the lamp-collar, and a cord passing through the tube and having a part thereon, adapted to close the circuit between the two contact parts, substantially as described.

7. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof having a portion of its skirt struck up to form a tube, a contact part forming a part of the circuit of the lamp contained in the said tube, and insulated from the collar, and means extending through the tube adapted to close the circuit between the collar and contact part, substantially as described.

8. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof having a portion of its skirt struck up to form a tube, a contact part forming a part of the circuit of the lamp contained in the said tube, and insulated from the collar, and means movable axially in the tube adapted to close the circuit between the collar and contact part, substantially as described.

9. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof having a portion of its skirt struck up to form a tube, a contact part forming a part of the circuit of the lamp contained in the said tube, and insulated from the collar, and a cord passing through the tube and having a part thereon, adapted to close the circuit between the collar and contact part, substantially as described.

10. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof, having a portion of its skirt struck up to form a tube, an insulating-plate located between the collar and bulb, a contact-spring forming a part of the circuit of the lamp, carried by the said plate, and located in the tube, and a cord passing through the tube and having a part thereon adapted to close the circuit between the collar and contact part, substantially as described.

11. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof, having a portion of its skirt struck up to form a tube, an insulating-plate located between the collar and bulb, the end of the struck-up portion of the collar engaging the said plate, and forming a contact thereon, a contact-spring forming a part of the lamp carried by the plate and located in the tube above the contact upon the plate, and a cord passing through the tube and having a part thereon adapted to close the circuit between the spring and contact on the plate, substantially as described.

12. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof, having a portion of its skirt struck up to form a tube, an insulating-plate located between the collar and bulb, the end of the struck-up portion of the collar engaging the said plate, and forming a contact thereon, a contact-spring forming a part of the lamp carried by the plate and located in the tube above the contact upon the plate, and a cord passing through the tube and having a metal contact part thereon, adapted itself to connect the spring with the collar and also to force the spring against the contact on the plate, substantially as described.

13. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof, having a portion of its skirt struck up to form a tube, an insulating-plate located between the collar and the bulb, a contact-spring forming a part of the circuit of the lamp carried by the said plate, and located in the tube, and a cord passing through the tube and having a metal contact part thereon, adapted itself to connect the spring with the collar, substantially as described.

14. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof, having a portion of its skirt struck up to form a tube, the said tube having a swelled portion, an insulating-plate located between the collar and the bulb, a contact-spring forming a part of the circuit of the lamp carried by the said plate and located in the tube, and a cord passing through the tube and having a metal contact part thereon, adapted itself to connect the spring with the collar, substantially as described.

15. In an electric lamp, the combination with a lamp-bulb, a collar upon the base thereof, a tube restricted at one end, located within the collar, a contact part contained within the tube, and a cord passing through the tube and having a part thereon adapted to close the circuit between the collar and contact part, substantially as described.

16. In an electric lamp, the combination with a lamp-bulb, of a collar upon the base thereof, having a portion of its skirt struck up to form a tube, with a restricted end, a contact part forming a part of the circuit of the lamp contained in the said tube and insulated from the collar, and means extending axially of the tube, adapted to close the circuit between the collar and contact part, substantially as described.

17. In a switch mechanism for incandescent electric lamps, the combination with a base having a tubular guide upon the exterior thereof, a plurality of contact-points within the guide, a part movable within the guide and adapted to bring the contacts together, and a flexible actuating means for the movable part passing through the said guide.

18. The combination with the metallic thimble of an incandescent lamp, of an insulated contact-piece projecting therefrom, a movable slide and supports therefor, and a metallic surface connected to the thimble, between which and the said contact-piece the slide may be shifted.

19. In an electric incandescent lamp, the combination with a base or cap therefor having socket-engaging means, of a casing having walls of conducting material mounted upon the lower end of said base, an insulated contact in the side wall of said casing, a flexible cord extending through said casing and a conducting metal switch member fixed to said cord within said casing and arranged to make and break connection between the conducting-walls thereof and said contact.

20. In an electric lamp, the combination with a base therefor, of a projecting casing on said base, contacts in the walls of said casing, a coöperation switch member shiftable within said casing and actuating-cords therefor extending through said casing.

21. In an electric lamp, the combination with a base therefor having means for suitably engaging a lamp-holder, of a projecting casing on the lower end of said lamp-base, contacts in the walls of said casing, a flexible cord extending through openings in ends of said casing and a suitable switch member mounted on said cord within said casing.

22. In an electric incandescent lamp, the combination with a base therefor, of a projecting casing on the lower end of said base, an insulated contact on the inner wall of said casing, a guide-shield forming the outer wall of said casing, a switch member in said casing and sliding between the inner and outer walls thereof, and flexible non-conducting cords extending through said casing and connected to said switch member.

23. In an electric incandescent lamp, the combination with a base therefor having means for engaging a suitable lamp-holder, of an insulated contact at the lower normally projecting end of said base, a guide-shield of conducting material on said base and extending over said contact, a switch member shiftable within and in contact with the walls of said shield and arranged to make and break connections with said contact and flexible operating-cords extending through openings in the end of said guide-shield and connected to said switch member.

24. In an electric incandescent lamp, the combination with a base therefor having a socket-engaging means, of a casing having walls of conducting material mounted upon the lower normally projecting end of said base, an insulated contact in the said wall of said casing, a flexible cord extending through said casing and a conducting metal switch member fixed to said cord within said casing and arranged to make and break connection between the conducting-walls thereof and said contact.

25. In an electric lamp, the combination of a base thereof having socket-engaging means, an insulated contact mounted at the lower normally projecting end of said base, a projecting guide-shield on said base and extending over said contact, flexible cords extending through openings in the end of said shield and a shiftable switch member connected to said cords and guided within said shield.

26. In an electric lamp, the combination of a base therefor, comprising a metal shell having socket-engaging means and forming one of the terminals for the reception of current, a rivet extending through and opening in the lower end of said shell, but insulated therefrom, a metal shield formed on and in electrical connection with said shell and extending over said rivet, a flexible cord extending lengthwise through said shield and a metal switch member fixed upon said cord within said shield and arranged to make and break connection between the same and said rivet.

27. A switch for electric lamps comprising a casing having a wall of conducting material, an insulated contact in the side wall of said casing, a shiftable switch member guided within said casing and arranged to make and break connection between the conducting-wall thereof and said contact, and flexible operating-cords extending through said casing and connected to said switch member.

Signed at New York city, New York, this 19th day of June, 1903.

JOHN McCULLOUGH.

Witnesses:
F. E. McIVAE,
MICHAEL LOBENTHAL.