Jan. 13, 1925.

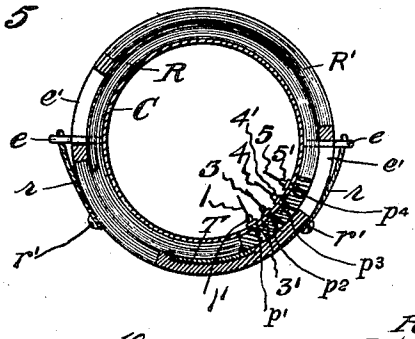
1,523,362

J. C. SHEDD

INCANDESCENT ELECTRIC LAMP

Original Filed Nov. 13, 1918

Fig. 5



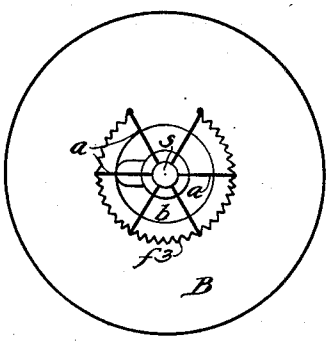


Fig. 4

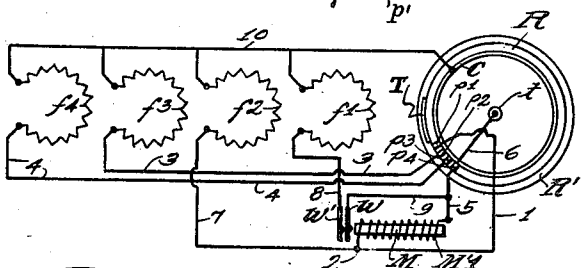


Fig. 6

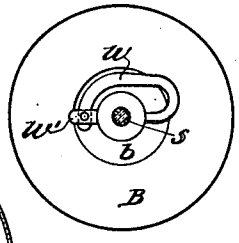


Fig. 3

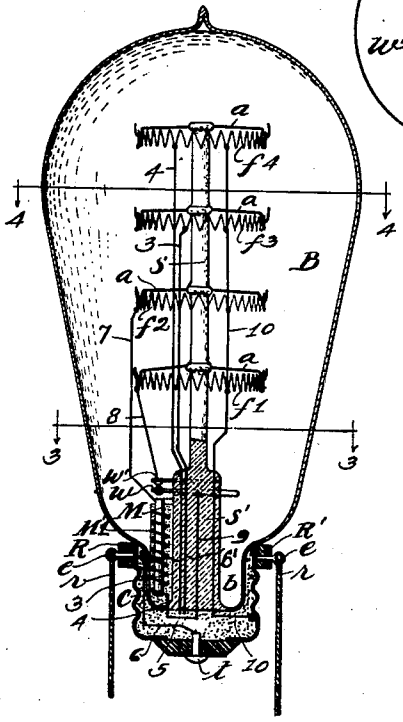


Fig. 1

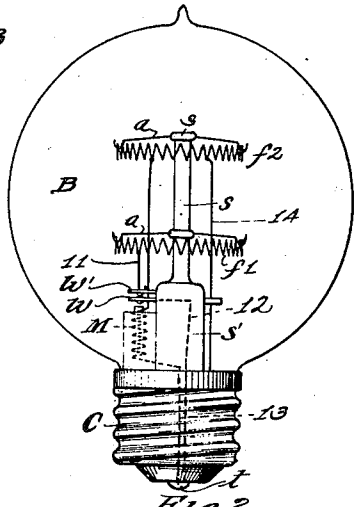


Fig. 2

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Patented Jan. 13, 1925. 1,523,362

UNITED STATES PATENT OFFICE.

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INCANDESCENT ELECTRIC LAMP.

Application filed November 13, 1918, Serial No. 262,397. Renewed August 27, 1924.

To all whom it may concern:

Be it known that I, JOHN CUTLER SHEDD, a citizen of the United States, residing at Eagle Rock City, in the county of Los Angeles and State of California, have invented new and useful Improvements in Incandescent Electric Lamps, of which the following is a specification.

My invention relates to incandescent electric lamps and one of the objects thereof is to provide in such a device an electro-magnetic switch capable of automatic operation for substituting an unused filament for a burnt out filament, thereby greatly increasing the life of the lamp.

Another object is the provision in an electric lamp having a plurality of filaments of means for selectively energizing one or more of the filaments at a time, so as to provide a varying quantity of illumination, according to necessity or expediency.

A further object is to provide in a lamp of the character referred to an electro-magnet connected with the lamp circuit in such a manner that when a regulating device is actuated for controlling the illumination, said magnet may be connected in the circuit of one or more of the filaments, so that in the event of one of the filaments burning out another may be automatically substituted therefor.

A still further object is to provide in connection with the above mechanism a regulating member adapted to be manually operated for energizing the lamp filaments as may be desired. Other objects may appear as the description progresses.

Referring to the drawings, in which one practical embodiment of my invention is clearly illustrated, similar characters of reference being employed in the sepecification and throughout the several views of the drawing for indicating the same or like parts, Fig. 1 is an elevation, partly in section, of my improved multiple filament lamp, four filaments being shown, for purpose of illustration.

Fig. 2 is an elevation of a double filament lamp without the regulating features shown in Fig. 1 and so arranged that one of the filaments may be automatically substituted for the other in the event of the burning out of a filament.

Fig. 3 is a sectional plan of Fig. 1 on the line 3—3.

Fig. 4 is a sectional plan of the same on the line 4—4.

Fig. 5 is an enlarged plan, partly in section, of the regulating means for the form of lamp shown in Fig. 1.

Fig. 6 is a circuit diagram of the form of lamp shown in Fig. 1.

I will first describe the form of lamp shown in Fig. 1, in which an ordinary type of bulb B having a base or stem b is employed. Stem b is fitted with an externally threaded cap C of usual character which is adapted to be screwed into the usual form of lamp socket, not shown, the wall of said cap making contact with the wall of said socket and the usual terminal t on the cap making contact with the central terminal of said socket, when in position for use. The space between the stem b of the bulb and the cap C is filled with cement of a suitable character and an internal stem S is formed internally of the bulb B and extends upwardly to a point near the top thereof and has an enlargement s' at the bottom.

The filaments f^1, f^2, f^3 and f^4 are preferably circular in form and are supported on wire arms a which are fused into the glass stem S at their inner ends and the ends of the filaments are spaced apart and therefore are not continuous as in the usual forms of filaments, the spaces between the ends thereof conforming to the spaces between two of said arms.

On the exterior of the cap C and near the top thereof I provide a stationary ring R which has a plurality of contact pins p^1, p^2, p^3 and p^4 imbedded and radially disposed therein but spaced at their inner ends from the wall of the cap C so as not to make contact therewith, the ring R being of suitable insulating material such as hard rubber or wood fibre and said pins being preferably spaced at equal distances apart. An outer ring R′ of similar material is pivotally held on said inner stationary ring R by means of eye screws e, e at opposite points

on the diameter of the ring, said eye screws being secured to the inner ring R and extended through oppositely formed slots e', e' formed in the outer ring R'. Cords r, r are attached to the periphery of the outer ring R' by means of screws r', r' and are extended through and depend from the eye screws e, e so that they may be manually pulled for rotating the outer ring in opposite directions, i. e. the pulling of one cord will move the ring R' in one direction while the pulling of the other cord will move said ring in an opposite direction. Ring R' has a bus bar, or bridge contact element T suitably held in the inner peripheral face thereof so as to contact with the pins p^1, p^2, p^3, and p^4, in succession, as the ring R' is moved around the ring R, and the slots e', e' are of such length that the ring R' may be moved so as to make contact with all of said pins when moved in one direction and may be moved clear of all of said pins when moved in the opposite direction.

An electro-magnet M is provided for connection with the filaments and may be supported internally of the lamp, as shown, or externally, if desirable. In the manner shown, however, the magnet is embedded in cement between the stem b and the stem enlargement s' and the wire of the magnet is preferably of enameled surface so as to provide thorough insulation when heated. A spring contact switch W is fused at one end into the stem portion s' and is curved therearound, as shown, for affording resiliency.

Spring W forms an arnature for the magnet M and is adapted to be normally in contact with a spring terminal W' which is also fused into and supported by the stem portion s'.

Referring particularly to the circuit diagram in Fig. 6 it will be observed that terminal pin p^1 is connected by means of wire 1 with the upper end of magnet wire M^1 at point 2. Pin p^2 is connected by means of wire 3 with filament f^3 and pin p^3 is connected by means of wire 4 with one of the terminals, or ends, of filament f^4. Pin p^4 is connected by means of wire 5 with the magnet wire M^1 at the lower end of said wire and is also connected by means of wire 6 with the terminal t of the cap C. These wires 1, 3, 4 and 5, are insulated at 1', 3', 4' and 5', through the cap C to the terminals p^1, p^2, p^3 and p^4 in the ring R, from the glass stem s, as indicated in Fig. 5.

One terminal of the filament f^2 is connected by means of wire 7 at point 2 with magnet wire M^1 and one terminal of filament f^1 is connected by means of wire 8 with the spring terminal W'. Spring W is connected by wire 9 with wire 5 leading from pin contact p^4. A common return wire 10 is provided for connection with the other terminals of all of the filaments and connects with the wall of lamp cap C.

Thus, when the wall switch of a lamp or series of lamps is closed the current will flow from central terminal t, through magnet M and to filament f^2 and thence by common return wire 10 to the wall of cap C; also through spring contacts W and W' of filament 1 until the magnet is energized by the passage of the current through wire M^1 thereof, whereupon the armature W is attracted to the magnet core and the circuit of filament 1 is opened thereby. Filament 1 then dies out while lamp filament f^2 remains luminous. In the event of filament 2 burning out, there being no current through the magnet M^1 in such case, the contacts W and W' will automatically close and filament 1 will be energized, this action taking place without the operation of the ring R'.

With the ring R' in normal position and out of contact with all of the pins p^1, p^2, p^3 and p^4, a subsequent counter clockwise movement of said ring so as to make contact only with pin p^1 and pin p^2 will place filament f^3 in parallel with filament f^2 and energize the same. Current for filament f^3 flows through and energizes the magnet M, thus separating contacts W and W' even should filament f^2 burn out. Filament f^3 is therefore made to take the place of filament f^2. A still further movement of the ring R' operates in like manner for energizing filament f^4 while further movement into contact with pin p^4 will short circuit the magnet M through pins p^1 and p^4 and the bus bar T, thereby causing the contact W and W' of filament 1 to close and the energization of said filament.

Thus while my device provides for the substitution, automatically, of one filament for another, one or any number of the filaments may be simultaneously energized by the movement of the ring R' for increasing or decreasing the volume of light.

The resistance of filaments f^2, f^3 and f^4 should in pactice be regulated so as to compensate for the resistance of the magnet in their circuit so that the energizing of said magnet will not detract from the volume of light.

In the form of lamp shown in Fig. 2 the filaments f^1 and f^2 are supported on the stem of the bulb as in Fig. 1. Filament f^1 is connected by wire 11 with contact W' and spring W is connected by wire 12 with terminal t of the lamp. Filament f^2 is connected with magnet wire M and wire 13 connects the opposite end of said magnet wire with terminal t. Common wire 14 connects the opposite terminals of the filaments f^1 and f^2 with the wall of cap C. In this form of lamp, filament f^1 will replace filament f^2 if the latter burns out, as in

the case described with the other form of lamp.

In the consideration of this invention it should be understood that the device disclosed is merely a single adaptation of my improvements in a usual from of lamp, the arrangements of the filaments being such that the connections may be conveniently established and the showing made does not represent in any manner a sole arrangement. The bulbs used with my system may be of the gas filled type, or otherwise, and the filaments may be of tungsten or carbon, the form of the filaments being changed to suit conditions and requirements. I, therefore do not limit myself to the specific form of device herein disclosed but conceive it to be possible to substantially modify the details without departing from the spirit or enlarging the scope of my invention beyond the scope of the appended claims.

What I claim is:

1. In an incandescent lamp, a plurality of filaments, an electromagnetic switch which opens when energized, connecting means for connecting one of said filaments in series with the magnet of said switch and the other in series with the contacts of said switch, and manually operated means forming a part of said first named connecting means for substituting a third filament in the magnet circuit when the first named filament becomes inoperative.

2. In an incandescent lamp, a plurality of filaments having a common connecting wire connected with the lamp socket, and each filament having a second wire and each wire connected with a terminal point, a movable switch member for connecting one or more of said terminal points, an electromagnetic switch which opens when energized, means connecting one of said filaments in series with the magnet of said switch and the other in series with the contacts of said switch, whereby another of said filaments can be connected in the magnetic circuit when one becomes inoperative.

3. In an incandescent lamp, a plurality of filaments connected with a source of electric current, manually operable means for successively energizing said filaments at will, and automatic switch means for deenergizing one of said filaments, whereby said deenergized filament may be held in reserve for future use.

4. In an incandescent lamp, a plurality of filaments supported in spaced relation for use, manually operable means for successively energizing said filaments, an automatic switch for opening the circuit of one of said filaments when the circuit of another filament is closed and adapted to close the circuit of the deenergized filament when said other filament burns out, as set forth.

5. In a multiple filament electric lamp, a plurality of stationary contact elements connected with said filaments, a movable contact element common to all of said stationary contacts for successively closing the circuits of said filaments, and an automatically operable switch connected with said contacts for regulating the operation of one of said filaments.

6. In a multiple filament lamp, stationary terminal elements for the opposite poles of said filaments, a movable bridging element for closing the filament circuits, and an automatic switch interposed in one of said filament circuits within the lamp for opening the circuit of one of said filaments for reserve use, as set forth.

7. In a multiple filament lamp, relatively stationary and movable filament circuit terminal elements, a source of electric current connected with said terminals, and an automatic electro-magnetic switch within the lamp adapted to be energized when said filaments are energized, the operation of said magnet serving to open one of the filament circuits, and the burning out of one of the other filaments serving to deenergize said magnet, thereby energizing said first filament circuit for purpose of substitution.

8. In a multiple filament lamp, a plurality of filaments connected with a source of electric current, a switch interposed in the circuit of one of said filaments within the lamp, an electro-magnet within the lamp for operating said switch when two of said filaments are energized, whereby to open automatically the circuit of and deenergizing one of said filaments for reserve use.

9. In a multiple filament lamp, a plurality of filaments mounted therein, each filament being connected with a common terminal, a plurality of terminals each of which is connected with a filament, a movable switch member adapted for connecting two or more of said terminals with the other lamp terminal, an electromagnetic switch adapted to open when energized, means connecting one of said filaments in series with the magnet of said switch and the other in series with the contacts of said switch, substantially as described.

Signed at Los Angeles, in the county of Los Angeles, and State of California.

JOHN CUTLER SHEDD.

Witnesses:
D. O. FAWCETT,
LUTHER L. MACK.