Jan. 18, 1944. M. A. BABB 2,339,244

HOT VAPOR LAMP EQUIPMENT

Filed April 11, 1940 2 Sheets-Sheet 1

Fig. 1.

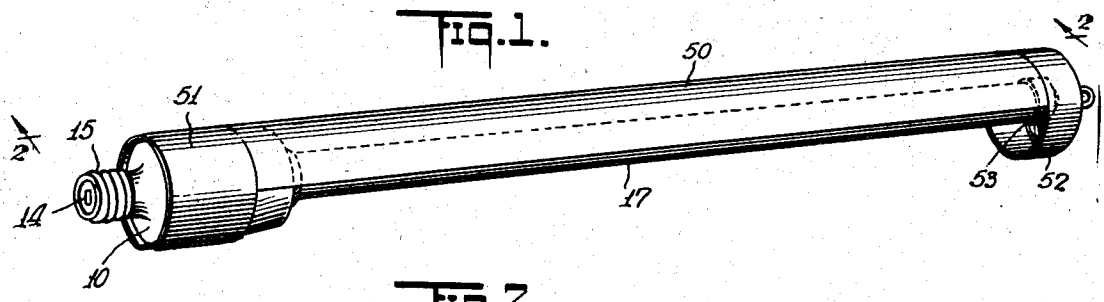


Fig. 2.

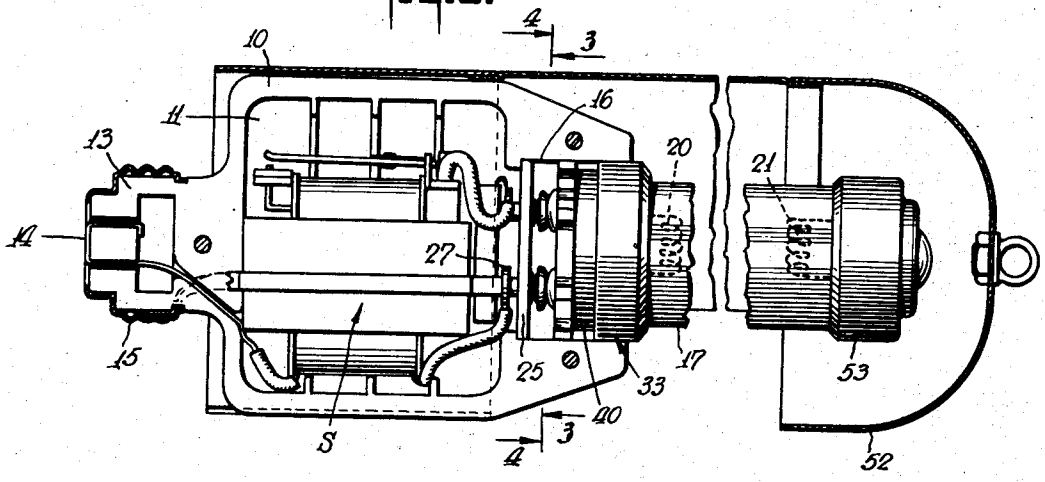


Fig. 3.

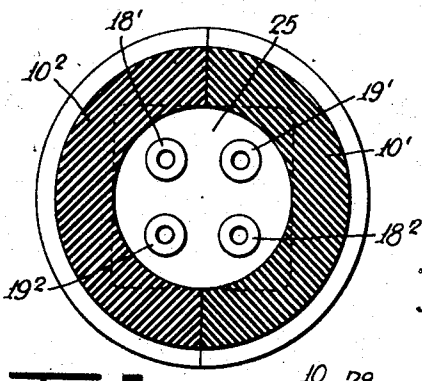


Fig. 4.

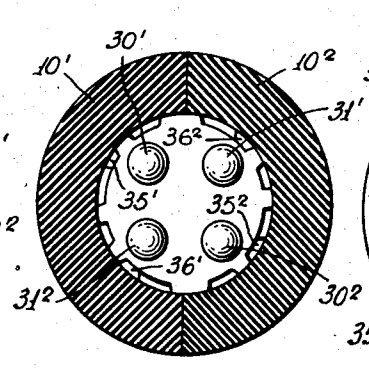


Fig. 5.

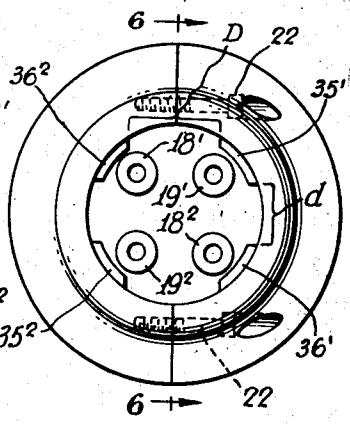
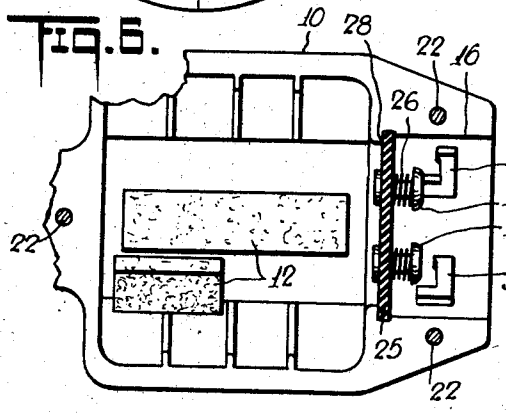


Fig. 6.



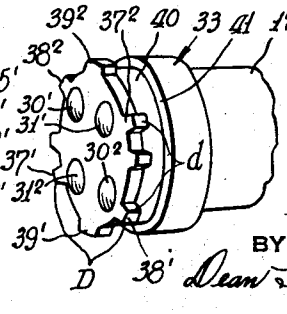


Fig. 7.

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HOT VAPOR LAMP EQUIPMENT

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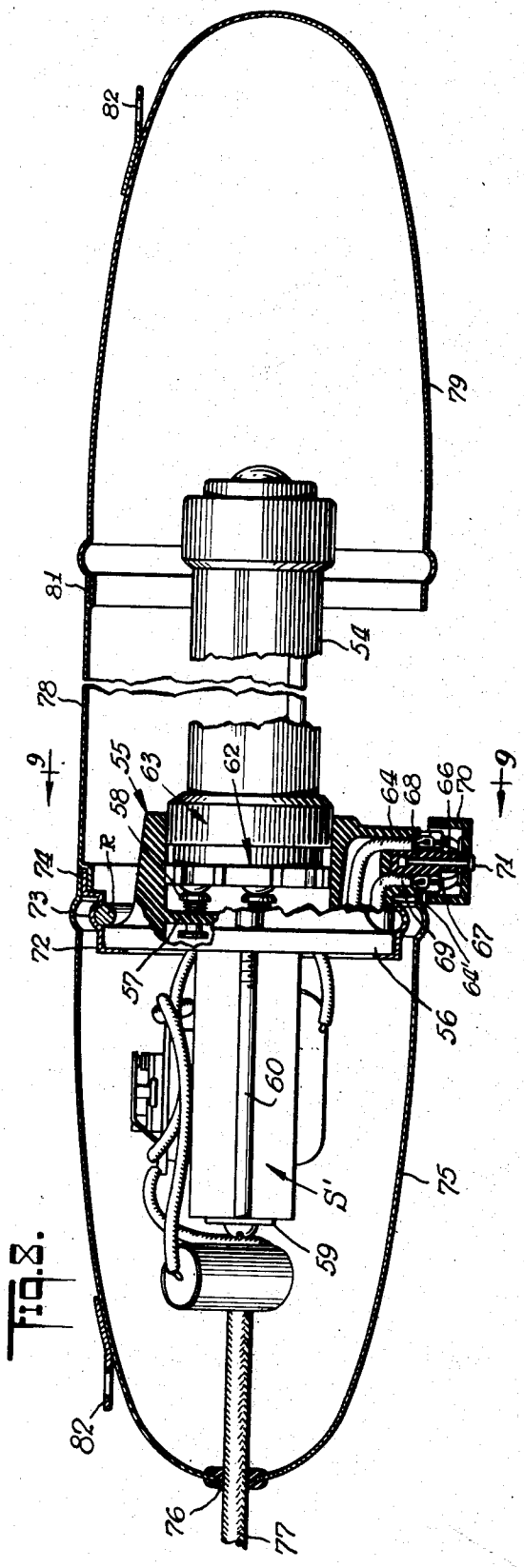


Fig. 8.

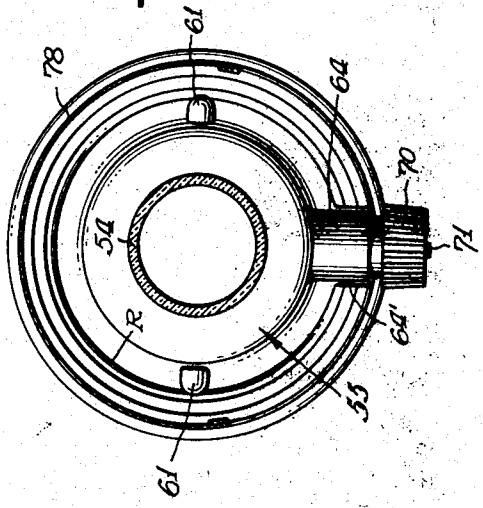


Fig. 9.

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HOT VAPOR LAMP EQUIPMENT

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Application April 11, 1940, Serial No. 329,035

10 Claims. (Cl. 240—1)

The present invention relates to the art of electric vapor lamps and is more especially concerned with lamp equipment of the hot cathode type.

Among the objects of the invention are to provide a practical and compact vapor lamp installation in which the various elements including the lamp tube, its mount, its starting unit and its associated reflector are all inter-related in a single compact inexpensive unit of attractive appearance that may be readily installed and re-lamped for operation on the standard house or office lighting circuit and without the need for auxiliary wiring.

Another object is to provide a hot cathode vapor lamp installation by the use of which the life of the emissive heated cathodes of any suitable tube employed, is greatly lengthened.

In the accompanying drawings in which are shown one or more of various embodiments of the several features of the invention.

Fig. 1 is a perspective view of one embodiment of lamp assemblage of the lamp mounted type,

Fig. 2 is a sectional view on line 2—2 of Fig. 1, taken on a larger scale, with the central part broken away,

Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 2,

Fig. 4 is a transverse sectional view taken on line 3—3 of Fig. 2,

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 2,

Fig. 5 is a plan view of the socket end of the mounting appliance and casing element of the assemblage,

Fig. 6 is a fragmentary sectional view taken on line 6—6 of Fig. 5,

Fig. 7 is a perspective view of the mounting base end of the lamp,

Fig. 8 is a view similar to Fig. 2 of another embodiment of lamp assemblage of type not directly affixed in a lamp socket, and

Fig. 9 is a transverse sectional view taken on line 9—9 of Fig. 8.

Referring now to the drawings, the assemblage shown in general outline in Fig. 1 includes a casing element 10 shown in greater detail in Figs. 2 to 6 inclusive, in which is housed the automatic lamp starting unit, desirably of the electromagnetic type, the details of which need not be described, but illustratively and preferably are those of prior Patent No. 2,159,837, granted on May 23, 1939, upon application filed by me, jointly with Samuel J. A. M. Bagno. The casing is desirably made of two longitudinal halves 10′ and 10^2 of plastic molded product, illustratively "Bakelite," determining a cavity 11 therein for the electromagnetic or other starting unit S which is desirably merely lodged therein and retained against rattling (when screws 22 are applied to hold said halves in assembled relation), by means of sponge rubber spacers 12 adhesively secured in one of said halves.

The casing has a unitary plug 13 mounting the conventional central contact 14 and screw shell contact 15 for insertion into an ordinary lamp socket. At the opposite end the insulating casing has a socket 16 for mounting the lamp tube 17. The socket carries two pairs of contacts 18′, 18^2 and 19′, 19^2 for the respective pairs of terminals of the two cathodes 20 and 21 at opposite ends of the lamp tube.

The contacts 18 and 19 are headed studs extending through a rigid fiber base plate 25 and urged outwardly by coil springs 26 surrounding the shanks of the respective studs, washers 27 on the inner ends of the studs determining their extreme outer position. The rigid contact carrying plate 25 is preferably rectangular and is embraced securely in corresponding deep grooves 28 molded into the casing as best shown in Fig. 6.

The lamp has two pairs of contacts 30′, 30^2 and 31′, 31^2 arranged on diameters at right angles to each other and mounted in an insulating base 33 at one end thereof. One pair of said contacts constitutes the terminals for the cathode 20 and the other pair for the cathode 21 at the outer end of the lamp, the leads (not shown) to said latter cathode extending lengthwise of the lamp tube 17. The insulating base 33 has a bayonet slot connection with respect to the socket 16 of the mounting casing.

In actual use of a hot cathode lamp of the type noted, it is found in practice that the thermo-emissive substance wears off most rapidly at the hotter end of each of the two cathodes. In order to prolong the life of the lamp, it is, therefore, desirable to provide facilities for introducing it into circuit with the terminals in either of the two relatively reversed position.

To this end, the bayonet slot connection is specially constructed and arranged. The socket 16 has two pairs of inwardly protruding angle shaped or bayonet bosses 35′, 35^2 and 36′, 36^2 molded as a unitary part thereof, with the horizontal limbs thereof lying in a common plane. The elements of each pair of bosses are diametrically opposite each other, but the diameters of the respective pairs are not at a right

angle but at an acute angle relative to each other. As a consequence the distance between the successive bayonet bosses, proceeding about the socket, are illustratively alternately greater as at D and lesser as at *d*.

The mounting base 33 of the lamp tube, which is desirably of molded plastic such as "Bakelite" has a toothed conformation complementary to that of the socket. One pair of diametrically opposite peripheral locking teeth or lugs 37', 37^2 will illustratively interlock with the pair of bayonet bosses 25', 35^2 respectively and the other pair of such teeth 38', 38^2 will interlock with the other pair of bayonet bosses 36', 36^2 respectively. For this purpose, as indicated in Fig. 7, the distances between the four locking teeth 37', 38^2, 37^2, 38' proceeding peripherally about the lamp base are alternately greater as at D and lesser as at *d* to correspond with those in the socket.

The lamp base 33 in addition to the locking teeth has a pair of diametrically opposite wider projections, lugs or teeth 39' and 39^2 adjacent the pair of teeth 38' and 38^2 respectively. The overall span of teeth 38' and 39' and that of teeth 38^2 and 39^2 is greater than the gap *d* in the socket and less than gap D so that the lamp tube may be introduced into the socket only in either of two relatively reversed positions rather than in the four positions that would be possible were the spacing of the bayonet conformations uniform.

The base 33 has a peripheral groove 40 above the line of the locking and blocking teeth, the ledge 41 of which groove will rest upon the upper edges of the bayonet bosses 35, 36 in the socket 16 when the lamp is introduced thereinto. When the lamp is then turned and pressed inward, the locking teeth 37, 38 will latch under the bayonet bosses 35, 36 and the turning will be arrested when the teeth engage the vertical elements of the respective bayonet bosses. In that position, the two pairs of contacts 30, 31 of the lamp are in registry with the two pairs of spring-pressed contacts 18, 19 in the socket and the lamp is resiliently held in place and in circuit by springs 26.

In the course of operation, the lamp is from time to time to be removed from its socket and reintroduced after turning the same 180 degrees, in which setting the current through the respective cathode coils would be reversed, thereby prolonging the life of the lamp for the reasons and in the manner set forth.

In the embodiment of the invention shown in Fig. 1, the lamp may be provided with a shield desirably in the form of a reflector 50 which is semi-cylindrical and is spot-welded at the end to a spring steel clamp 51 substantially encircling the cylindrical wall of the casing 10. At the opposite end, the shield has desirably spot welded thereto a husk 52 encircling the outer or upper end 53 of the lamp.

The embodiment of Figs. 8 and 9 shows a self-contained unit which may be used as a fixture or fitting apart from the electric lamp socket. For this purpose, the socket 55 which mounts the tube 54 is a unitary molded block with a flange 56 and an integral bottom 57 through which extend the spring pressed contacts 58 similar to those in the embodiment of Figs. 1 to 7. The starter unit S' which is similar to that used in Fig. 2 is attached by means of a yoke 59 and long screws 60 extending the length of the unit and threaded into sockets (not shown) molded into corresponding bosses 61 in the socket piece. The bayonet slot connection 62 between the lamp base 63 and the socket 55 is preferably identical with that of the embodiment of Figs. 1 to 7. The socket 55 has an integral boss 64 which mounts a snap switch assembly by which circuit is made and broken to the starter unit S' and the lamp 54. The switch desirably comprises a molded switch head 66 carrying a stationary contact piece 67 and provided with a unitary shank 68 snugly fitting into the socket 64. The conducting leads 69 from the switch extend along longitudinal grooves in the shank 68 and are thereby mounted in place. The operating or movable member of the switch is the cap 70 telescoped over the head 66 and is retained in place by an axial metal fastener 71.

Desirably the socket flange 56 rests on the end annulus of a spring metal mounting cap ring 72 and is retained in place by a spring ring R snapped into a bead 73 in ring 72. The ends of spring ring R substantially engage the opposite sides of boss 64, which in turn is lodged in a notch 64' in the cap ring 72 and the associated metal structure described below. Ring 72 has a skirt 74 over which is telescoped a sheet metal husk 75 which houses the electric starter S' and through an axial hole 76 in which extend the flexible cords 77 with the conventional electric plug (not shown) to be introduced into an outlet box. The reflector 78 similar to that shown in Figs. 1 and 2 is telescoped under the skirt 74 of the ring 72 and a husk 79 desirably is telescoped at 81 over the correspondingly reduced extremity of the reflector 78. Desirably hanger eyes 82 are riveted to the two husks, by means of which the lamp unit may be supported horizontally or vertically or in any other desired position.

As many changes could be made in the above apparatus and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

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

1. A hot cathode vapor lamp installation of the type having its four terminals at one end, a terminal carrying base for one end of the vapor lamp, a socket mounting said base, said socket having spring pressed contacts for coaction with those of the lamp, and a bayonet slot connection between said socket and said base, the bayonet connection comprising two pairs of diametrically opposite bayonet conformations respectively in the socket and on the lamp base, said two pairs being on diameters of the socket and base respectively that are disposed at a relative angle other than a right angle, the base having blocking conformations of width greater than the distance between the pairs of bayonet conformations in the socket that have the lesser gap therebetween, and less than that having the greater gap therebetween, whereby the lamp may be introduced into the socket with the terminals for the two hot cathodes in either of the two possible mutually reversed circuit relations.

2. A vapor lamp installation of the hot cathode type, comprising a lamp tube having the four cathode terminals all at one and the same end thereof, said tube having an insulating base carrying said terminals, an insulating socket for said tube having four spring pressed terminals there-

in for coaction with the terminals of said lamp, said socket having inwardly projecting bayonet conformations in two diametrically opposite pairs, the bayonet conformations between each diametrically opposite pair being nearer one of said pair than the other, said base having bayonet lugs thereon for coaction with the bayonet conformations in said socket, said base also having diametrically opposed projections of width greater than the distance between a pair of more nearly adjacent bayonet conformations in the socket, and less than that between a pair of more widely spaced conformations, whereby the lamp may be introduced into the socket with the terminals of each cathode in engagement with only one of the two pairs of contacts in the socket but in either of the two mutually reversed circuit relations.

3. The combination of a hot cathode vapor lamp and a carrying socket therefor, the socket element of which has two pairs of diametrically opposite angle-shaped projections therein, the diameters of said pairs being at an acute angle with respect to each other, the mounting end of said lamp having the four terminals of the cathodes thereof and having four lugs adapted for bayonet connection with respect to the conformations of the socket and having blocking projections of width greater than the distance between the more nearly adjacent pairs of said bayonet projections, and less than the distance between the more widely spaced of said bayonet projections, thereby to permit entry of the plug into mounting and circuit making relation in only two possible relations at 180 degrees with respect to each other.

4. A hot cathode vapor electric lamp installation, comprising a socket and a coacting lamp having an insulating base at one end thereof, said socket having two pairs of spring pressed contacts in the base thereof, said pairs being on diameters at right angles to each other, said lamp having two pairs of cathode terminal contacts at said base thereof similarly disposed, and a bayonet slot connection between said socket and said lamp base, comprising two pairs of diametrically opposite coacting interlocking bayonet structures, the respective pairs being on diameters at an acute angle relative to each other, the lamp base having blocking projections associated with one pair of the bayonet structures thereon to preclude the entry thereof between the narrower of the spaces between the bayonet structures in the socket but to permit entry thereof through the wider of such spaces, whereby the lamp may be connected in circuit with its terminals always in contact with one and the same pair of terminals in the socket but may be introduced in either of two possible settings at 180 degrees with respect to each other.

5. The combination recited in claim 4 in which the lamp base presents an insulating shoulder adapted to ride during the setting of the bayonet connection, upon the upper edges of the bayonet structures in the socket.

6. A hot cathode vapor lamp combination, comprising a socket having a starting unit therein and including two pairs of contacts, a tubular lamp having a base with corresponding two pairs of contacts coacting with those in said socket and a reflector unit encircling and clamped with respect to said socket, extending lengthwise of said lamp and having a husk at the opposite end thereof extending about the free end of said lamp.

7. A hot cathode vapor electric lamp combination, comprising a casing having a starting unit therein, a lamp carrying socket at the forward end of said casing having two pairs of spring pressed contacts in the base thereof, a tubular lamp having a base with two pairs of contacts therein for coaction with those in said socket, a cylindrical reflector clamped with respect to said casing and extending lengthwise of said lamp and a husk on the free end of said reflector enclosing the free end of said lamp.

8. A hot cathode electric vapor lamp unit, comprising an insulating casing having a mounting plug at one end thereof and a lamp carrying socket at the other end thereof and having a lamp starting unit enclosed therein, a lamp removably mounted in said socket, and a reflector extending lengthwise of said lamp, having a clamp at one end thereof encircling said casing and having a husk at the other end thereof encircling the free end of the lamp.

9. A vapor electric lamp unit, comprising a lamp carrying socket, a starter unit affixed to the back of said socket, a lamp in said socket, a husk enclosing said starter, means affixing said husk with respect to said socket, a reflector concentrically affixed at one end with respect to said husk and a second husk affixed on the opposite end of said reflector and housing the free end of said lamp, said socket having a snap switch mounted thereon for connecting the starter and the lamp in circuit.

10. A vapor electric lamp unit, comprising an insulating flanged socket, a lamp starting unit affixed to the rear face of said socket, a lamp mounted at one end in said socket, a cap ring supporting and embracing said socket flange, a split spring lodged in a bead in said cap ring and engaging the outer face of said flange, a husk enclosing said starting unit with its rim snugly engaging said cap ring and a reflector having one end thereof snugly enclosed by said cap ring and having a husk snugly mounted on the opposite end thereof for housing the other end of the lamp.

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