Sept. 4, 1934. H. F. TEICHMANN 1,972,541

ELECTRIC LAMP AND SOCKET

Filed Dec. 7, 1932 2 Sheets-Sheet 1

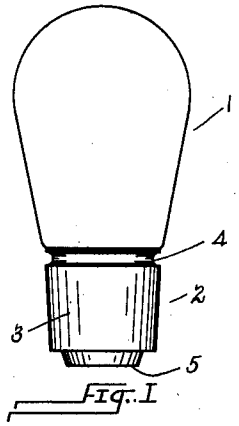



Fig. I

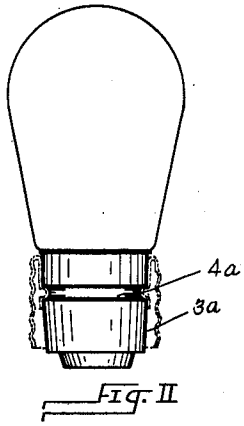



Fig. II

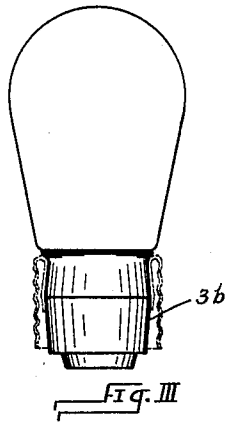



Fig. III

Fig. IV.

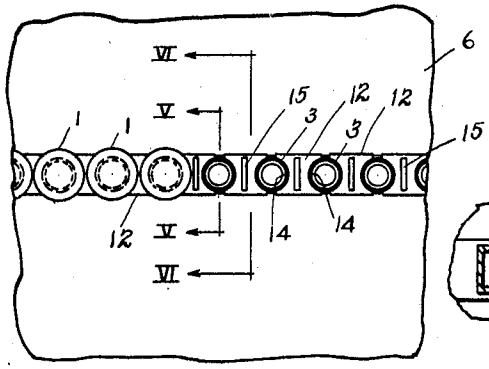
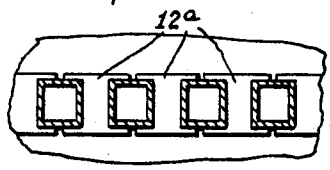



Fig. IV a



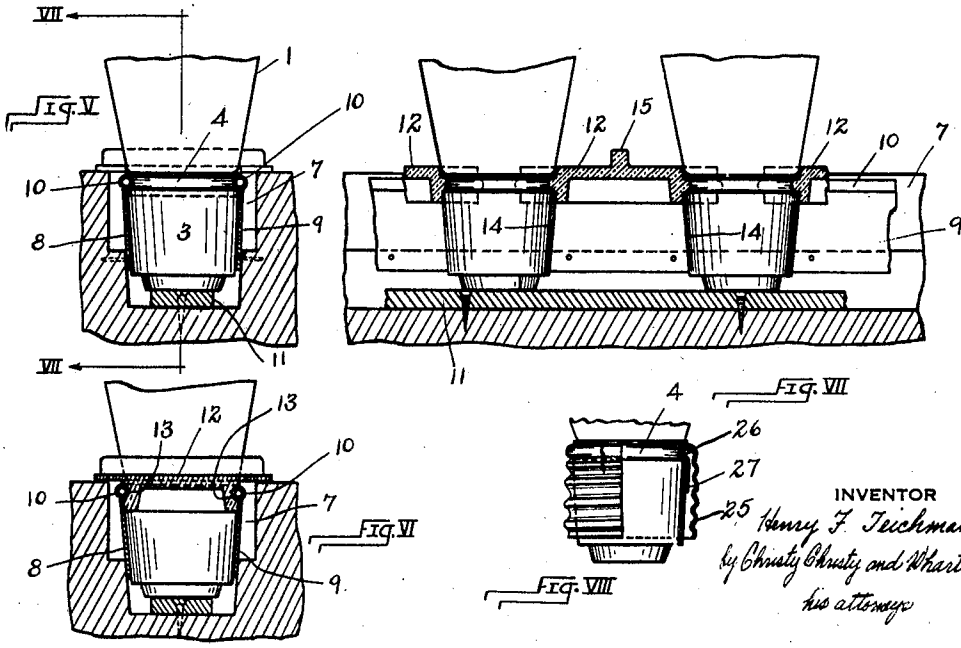







Fig. VI




Fig. VIII

Fig. VII

INVENTOR

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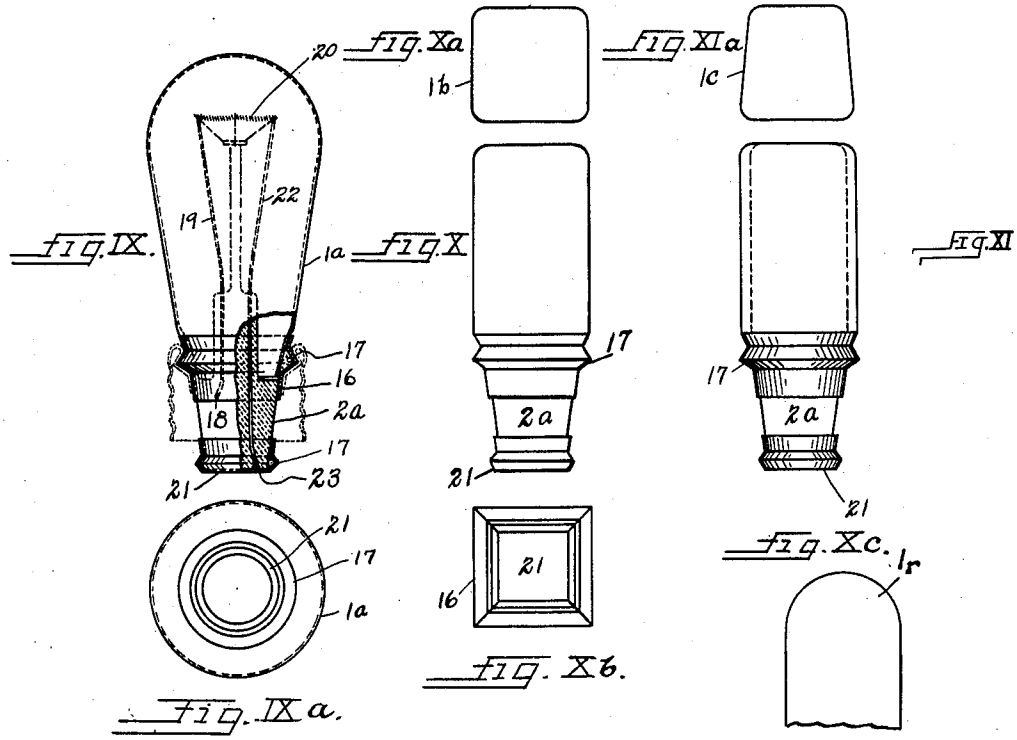
by Christy Christy and Wharton

his attorneys

Sept. 4, 1934. H. F. TEICHMANN 1,972,541

ELECTRIC LAMP AND SOCKET

Filed Dec. 7, 1932 2 Sheets-Sheet 2



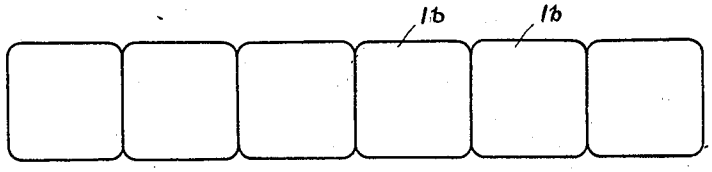




fig. XII

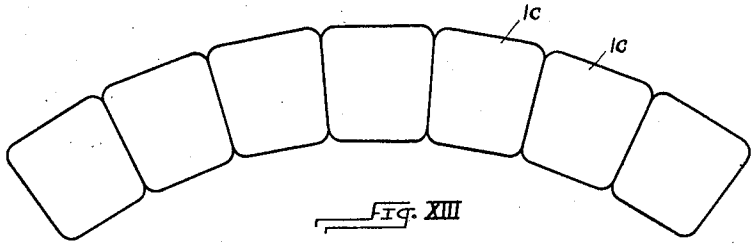



fig. XIII

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# UNITED STATES PATENT OFFICE

1,972,541

## ELECTRIC LAMP AND SOCKET

Henry F. Teichmann, Washington, Pa.

Application December 7, 1932, Serial No. 646,084

8 Claims. (Cl. 173—334)

My invention relates to electric illumination, and, more particularly, is directed to the construction of incandescent bulbs and a socket for electrically mounting a plurality of such bulbs for service. In the practice of my invention the incandescent bulbs ordinarily are "plugged" into the socket, as distinguished from screwing them in. When installed in the socket, each bulb is yieldingly secured against unintentional removal, and, in one form of bulb, is free to be intentionally turned about its axis, so that the filament of the bulb can be oriented in any desired position, this being a feature which is of value in illuminated signs, in photography, and in other special cases of installation where it is desired to adjust precisely the center of light source.

Another feature of my invention is found in the structure of the light socket. The socket is elongate, and includes correspondingly elongate, continuous contact pieces connected to the source of electric energy, so that an aligned group of incandescent lamps may be installed in close juxtaposition in the socket. Such positioning of the lamps is particularly advantageous in electric signs; indeed, it is further characteristic of my invention that the bodies of the lamps may be of specialized form, to the end that the lamps themselves may be so closely arranged in various designs that at a glance the assembled lamps appear as a unitary thing, showing to best advantage and in clearest outline the design portrayed.

The invention is illustrated in the accompanying drawings, in which Figs. I, II and III are views in side elevation of three electric lamp structures adapted to the practice of my invention. Fig. IV is a view in plan, showing a fragment of a signboard in which a series of circular-sectioned lamps is assembled in accordance with the invention. Fig. IV*a* is a fragmentary view, comparable with Fig. IV, showing a series of square-sectioned lamps assembled in accordance with the invention. Figs. V and VI are fragmentary views in cross section, taken respectively on the planes V—V and VI—VI, Fig. IV. Fig. VII is a view in longitudinal section of a fragment of the signboard shown in Fig. IV, the plane of section being indicated at VII—VII, Fig. V. Fig. VIII is a fragmentary view, partly in side elevation and partly in vertical section, showing means for adapting the specialized bulb shown in Fig. I for service in the usual light socket. Fig. IX shows, in side elevation, and Fig. IX*a* in bottom plan, an elaboration of the electric lamp structure; a fragment of the contact stem of the lamp is broken away in Fig. IX, showing in section the internal structure of such stem. Fig. X shows in side elevation, Fig. X*a* in top plan and Fig. X*b* in bottom plan, an electric lamp of specialized construction for use in multiple-lamp assemblies. Fig. X*c* illustrates fragmentarily a modification of the lamp of Fig. X. Fig. XI shows in side elevation, and Fig. XI*a* in top plan, a modification in the lamp structure shown in Fig. X. Fig. XII is a view in plan, showing in outline the particularly effective group organization of lamps which is permitted by the structure of Fig. X. And Fig. XIII is a view comparable with Fig. XII, illustrating in group organization the lamp structure indicated in Fig. XI.

In the practice of the invention, an elongate electric socket is provided for securing a series of electric lamps and bringing the lamps into an energizing circuit. It is characteristic of my structure that the lamps may be pushed into positions of service in the socket, as distinguished from the ordinary type of incandescent lamp whose contact or mounting stem is threaded and must be screwed into the socket. To this end, my electric lamp differs in certain structural particulars from the usual electric light bulb. My lamp, according to usual construction, comprises a hollow glass bulb 1, enclosing light-producing means. The light-producing means may be a filament, adapted to be heated to a condition of luminosity by the passage of electric current. The lamp includes a stem 2 which is integrated with the hollow bulb 1, and carries electric contacts which are united with the terminal wires of the filament, so that the filament may be brought into an energizing circuit when the stem is installed in an electric socket. The stem of the ordinary electric lamp is provided on its side with a metal (brass or copper) surface, in which surface a screw thread is formed. On the bottom face of the stem a metal stud or plate is provided. These two metal surfaces are insulated from each other, and are severally connected to the filament, and constitute the poles for the light circuit. In the lamp of Figs. I, II, and III, one of the metal surfaces upon stem 2 is a smooth and slightly tapering surface. This surface is provided by a copper or brass sheath 3, secured upon the glass body of the stem, by impressing a semicircular groove 4 at the junction of the stem 2 and the bulb 1. The metal contact pole 5 in the flat end of the stem is the same as it is in the ordinary lamp structure alluded to; the pole 5 is isolated by the body material of the stem, and the terminal wires of the filament (not shown) are severally

united with the two contact surfaces (3 and 5) upon the stem.

For furthering an understanding of the invention, I have indicated fragmentarily a signboard 6, Fig. IV and I illustrate how the group installation of lamps may be advantageously effected, by means of my elongate electric socket. In this case, I have shown the socket constructed in the body of the signboard, although the socket may be independently constructed and then installed.

The electric socket comprises an elongate channel 7 whose depth approximates the length of the contact stems (2) of the lamps to be installed. Means are provided in the channel 7 for engaging and yieldingly securing the stems 2 of several lamps, and such means are of a structure which permits a lamp to be pushed into position of service in the socket, or to be pulled from such position. Additionally, once a lamp has been inserted in the socket, it may be turned about its axis, and may be slid longitudinally of the socket, so that the desired position of its incandescent filament can be determined with greatest precision. The means for securing a plurality of lamps in the socket advantageously comprise two parallel resilient strips 8 and 9. The strips 8, 9 in the illustrated case are formed of metal; one strip is secured to each of the opposite side walls of the channel 7, as shown in Fig. V. The strips are provided along their top edges with beads 10 which, as will appear, co-operate with the groove 4 in each lamp mounted in the socket.

Secured to the bottom of the channel 7 is a contact piece 11; the contact piece 11 extends in effect the entire length of the socket; it is formed of copper or other conducting metal, so that it may constitute one pole of an electric supply circuit (not shown). Either or both of the strips 8, 9 is made of conducting metal, so that it also may constitute a contact member, providing the other pole of the supply circuit. Of course, the two pole pieces of the circuit are electrically insulated from each other; in this case the channel 7 is formed in a body of Bakelite, wood or other non-conducting material, and the contact members are secured immediately upon the walls of the socket or channel 7. However, if the channel 7 be provided in metal, the parts 8, 9, 11 will be insulated from the walls of the channel. In assembling a lamp in the socket, the tapering stem 2 of the lamp is thrust inward between the yielding keeper strips 8, 9. Thus, the contact stud 5 of the lamp is brought to engagement with contact piece 11 in the socket, and the contact sheath 3 of the lamp is engaged on opposite sides by the keeper strips 8, 9. The proportions of the parts are such that, when the stud 5 on the lamp stem is brought to position against the contact piece 11, the beads 10 on the keeper strips spring laterally into the groove 4 in the sheath 3, thus yieldingly securing the lamp in the socket with the sheath 3 in electric engagement with the keeper strips 8, 9 and stud 5 in engagement with the contact piece 11. Manifestly, keeper strips 8, 9 (in constituting one pole of an electric supply circuit) and the contact piece 11 (in constituting the other pole of the circuit) serve to connect the electric supply circuit with the filament of the lamp.

In the above-described manner, a plurality of lamps is installed in the elongate socket; when each lamp is installed, it may be turned axially in the socket and shifted longitudinally thereof, until it is oriented in the desired position. A reference to Fig. IV will indicate how a line of several lamps may be installed in close juxtaposition. Between successive lamps I provide plug-like blocks 12 of Bakelite or other insulating material. The blocks 12 include side grooves 13 (Fig. VI) which co-operate with the beads 10 on the keeper strips 8, 9, to secure the blocks in the sockets. The opposite end faces 14 of the blocks 12 (Fig. VII) are shaped in correspondence with the lamp stems 2, thereby permitting snug engagement between the lamps and the blocks. The blocks, as well as the lamps, are adjustable longitudinally of the socket; the blocks serve as spacing and supporting means for the lamps; the dimensions of the blocks may be such as to effect the spacing of successive lamps at any desired distance down to a minimum; the blocks are provided with top ribs 15, by means of which ribs they may be grasped for ready insertion and removal; and, in assembly with the lamps, the blocks cover the socket (7) in the intervals between lamps, and protect the keeper strips 8, 9 and contact piece 11 from the elements and the accumulation of dust. Manifestly, with such an arrangement of push-blocks and lamps, not only is the signboard made more "elastic," in that the adjacent lamps may be set at a smaller distance apart and practically in contact (as is hardly possible, in keeping with economy, with lamps having screw-socket stems), but the assembling of a sign is facilitated, and the replacement of burned-out or broken lamps is facilitated. Additionally, it may be remarked that the blocks 12 serve as positive means for laterally spacing the continuous strips 8, 9, preventing the strips from becoming distorted and short-circuited with the contact strip 11.

Fig. II shows a lamp embodying a slight modification. The metal sheath (3*a*) on the contact stem is provided with the groove (4*a*) in the central portion of the stem, instead of at the top, as is the case in the structure shown in Fig. I. Fig. III illustrates a modification in which the body of the stem and the metal sheath (3*b*) are oppositely tapered from their mid-sections, thus avoiding the need of a groove to secure the sheath upon the stem. Figs. IX to XI show a still further modification in the structure of the contact stem. In this case the glass body 2*a* of the stem is provided with two annular contact bands, one band 16 in the region of junction of the stem 2*a* with the bulb 1*a*, and the other band 21 at the end of the stem. Each band includes an annular ridge or protuberance 17. In assembling the bands upon the lamp, such annular ridges are internally filled with cement, and pressed into position upon the stem 2*a*. The annular ridge or protuberance 17 of the band 16 co-operates with complementary keeper members provided in the electric socket, to secure the lamp in place. The band 16 is united, at 18, with one terminal wire 19 of the lamp filament 20, and constitutes one electric pole of the lamp. The other pole of the lamp comprises the band or cap 21 which is minutely shaped, fitted and cemented upon the end of the stem 2*a*, and the other terminal wire 22 of the filament 20 is united with cap 21, at point 23. It will be noted that, in the lamp structures shown in the latter figures of drawings, the metal sheaths or bands do not completely cover the sides of their stems. As may be perceived in the drawings, there is an appreciable interval between the bands 16 and 21—an interval in which the glass body of the stem 2*a* is exposed. This interval between the bands is in effect a window, through which the points of

union of the terminal wires 19, 22 with the respective bands 16, 21 may be viewed and inspected, and this is an advantage of great practical value to lamp manufacturers and dealers.

In Fig. VIII, I show that a screw-threaded adapter sleeve 25 may be provided for the specialized stem structures of my invention, to the end that the lamps may, if desired, be used in the ordinary type screw socket. The illustrated adapter sleeve 25 is provided with a bead 26, and an inner band portion 27. The inner band or apron 27 extends inward from the bead. Advantageously, the adapter is constructed of thin sheet copper or brass. In service the adapter is screwed into the screw socket in which the lamp 1, 2 is to be installed, then the stem of the lamp is pushed into place within the adapter. The sheet metal of which the adapter is formed yields, to permit passage of the tapering lamp stem, and, when the stem approaches its position of nesting within the adapter, the bead 26 springs into the annular groove 4, and the apron 27 snugly engages the side surface of the stem. Thus, a push-type lamp may be installed in an ordinary screw socket, without requiring the otherwise necessary rotation of the lamp. In Figs. II, III, and IX, I indicate in dotted lines how the adapter sleeve may be altered, to adapt it for service with the other lamp structures, described above. It will be understood that on the market the new adapter sleeve may be furnished with the bulb.

Manifestly, the keeper strips 8, 9 may be readily modified in cross-sectional shape, to co-operate with the lamp structures illustrated in Figs. II, III, and IX.

I propose furthermore to form the stems of the lamps polygonal in cross-section, or substantially so, as illustrated in Figs. X, X*a*, X*b*, XI and XI*a*. The advantage of this structure is that the contact band 16 of the lamp may have relatively large surfaces of contact with the keeper strips 8, 9 of the socket. Hence, the engagement between the lamp and socket members will be more secure, both in an electrical and in a mechanical sense, and the lamp will be secured against turning in the socket. Of course, the latter structure will not be employed in cases where rotary adjustment of the lamps is desired.

Another important modification of my invention is found in the glass bulb of the lamp. That is, the bulb 1*b* of the lamp is polygonal in cross-section, as indicated in Figs. X*a* and XI*a*. A flat-sided bulb of such structure admits of close grouping of the lamps in my socket assembly; indeed, the lamps may be aligned with their bulbs in side-by-side contact, as shown in Fig. XII. If the channel or socket in which the lamps are to be arranged is curved, each bulb may be of wedge-shape, or tapering in cross section, as the bulb 1*c* shown in Figs. XI and XI*a*, and the assembly of such lamps will appear as indicated in Fig. XIII. The tops of the polygonal bulbs may be substantially flat, as shown in Fig. X, or the bulbs may have a round top, as indicated at 1*r* in Fig. X*c*. Various designs may be constructed with the lamps of my invention, and the lamps may be arranged in such close juxtaposition that the several lamps will at a glance appear as an elongate unitary lamp, fashioned in the form of the particular design being portrayed. I also contemplate that each side wall and the top of the bulb may be differently colored, so that from one point of view the grouped lamps will appear differently than from another point of view. In brief, the flat-sided bulb of my invention affords great "flexibility" in the construction of signs, and other installations having electric lamps in group organization. As mentioned, the polygonal-walled bulbs may be variously colored; the walls may be provided with letters, figures, or other subject-matter of design, so that the practice of my invention permits the features of a sign to be rendered in clearest outline, and with greatest artistic effect. The use of my lamp avoids the need of shades and hoods, which are otherwise employed, to obtain the desired appearance of continuity, color effect, and design.

The base of the lamp shown in Fig. X is polygonal in cross section and is substantially co-extensive in cross-sectional area with the body or bulb of the lamp. Accordingly, in grouping bulbs of this structure in side-by-side contact in the elongate socket, there will be no need for the spacer blocks 12. If, however, the bulb of the polygonal lamp is constructed with a much greater cross-sectional area than the base (as manifestly it might well be constructed) spacer blocks 12*a* will be used in the manner indicated in Fig. IV*a*.

I claim as my invention:

1. In a group installation of electric lamps, the combination of an elongate electric socket, a pair of contact pieces insulated from each other and extending along walls of said socket, said contact pieces being adapted to constitute the poles of an electric supply circuit, the contact stems of several electric lamps being located in alignment in said socket and in electric engagement with the respective contact pieces therein, and adjustable blocks located in said socket between the contact stems of successive lamps.

2. An elongate electric socket for the reception of the contact stems of a plurality of electric lamps, yielding means in said socket for laterally engaging and securing the contact stems of said lamps, which yielding means admit of adjustment of the lamps and their contact stems longitudinally of the socket, blocks secured in said socket between the contact stems of successive lamps, said blocks being adjustable longitudinally of the socekt to admit of snug engagement with said contact stems, and two contact pieces extending along the walls of said socket and in engagement with the contact stems of said lamps, which contact pieces are insulated one from the other and are adapted to constitute the poles of an electric supply circuit for energizing the filaments of said lamps.

3. In a group installation of electric lamps, the combination of an elongate electric socket, a plurality of electric lamps mounted in said socket, said lamps having polygonal bases, means in said socket for engaging the flat faces of said polygonal bases and securing the lamps against rotation and unintentional removal from the socket while admitting of lamp adjustment along the socket, and conductors for electrically uniting the poles of the lamps with an electric supply.

4. In a group installation of electric lamps, the combination of an elongate electric socket, a plurality of electric lamps mounted in said socket, means for securing the lamps against unintentional removal from said socket while admitting of adjustment of the lamps along the socket, and means for electrically uniting the poles of the lamps with an electric supply, the bodies of said lamps being polygonal in form, whereby, by adjustment longitudinally of said socket, said bodies may be brought into surface-to-surface contact, to serve in effect as an elongate lamp of predetermined configuration.

5. An electric socket for the installation of a plurality of electric lamps, said socket comprising an elongate channel having secured therein a pair of elongate spaced-apart members between which the bases of said lamps are adapted to lie, at least one of said members being laterally yielding, whereby a plurality of lamp bases may be thrust into installed position, a plurality of removable blocks adjustable longitudinally of said channel for spacing and supporting the lamps installed in said socket, said blocks being additionally of service in protecting the socket from the elements and the accumulation of dust, and means for uniting the poles of the lamps with a supply current.

6. An electric apparatus comprising an elongate socket structure for the reception of the contact stems of a plurality of electric lamps, yielding means in said socket structure for laterally engaging and securing the contact stems of said lamps, which yielding means admit of adjustment of the lamps and their contact stems along the extent of the socket structure, spacers removably secured to said socket structure between the successive adjustably-secured lamps for the purpose described, and two contact pieces extending along the socket structure and in electric engagement with the contact stems of said lamps, which contact pieces are insulated one from the other and are adapted to comprise the poles of an electric supply circuit for energizing the filaments of said lamps.

7. An electric apparatus comprising an elongate socket structure for the reception of the contact stems of a plurality of electric lamps, yielding means in said socket structure for laterally engaging and securing the contact stems of said lamps, which yielding means admit of adjustment of the lamps and their contact stems along the extent of the socket structure, means removably secured to said socket structure between the successive adjustably-secured lamps for provision of a protective covering as described, and two contact pieces extending along the socket structure and in electric engagement with the contact stems of said lamps, which contact pieces are insulated one from the other and are adapted to comprise the poles of an electric supply circuit for energizing the filaments of said lamps.

8. The structure of the next preceding claim, in which one of said contact pieces and said yielding means comprise one and the same structure.

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