

March 21, 1944.

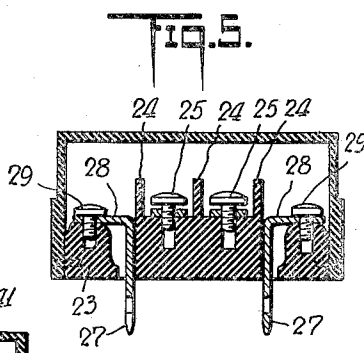
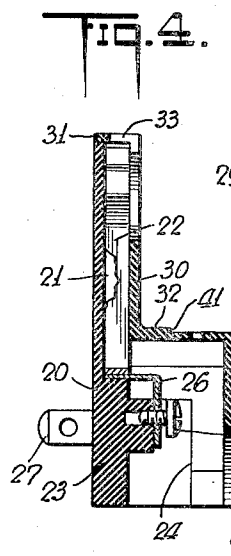
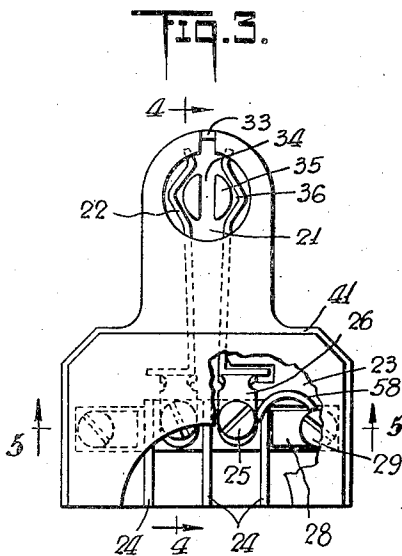
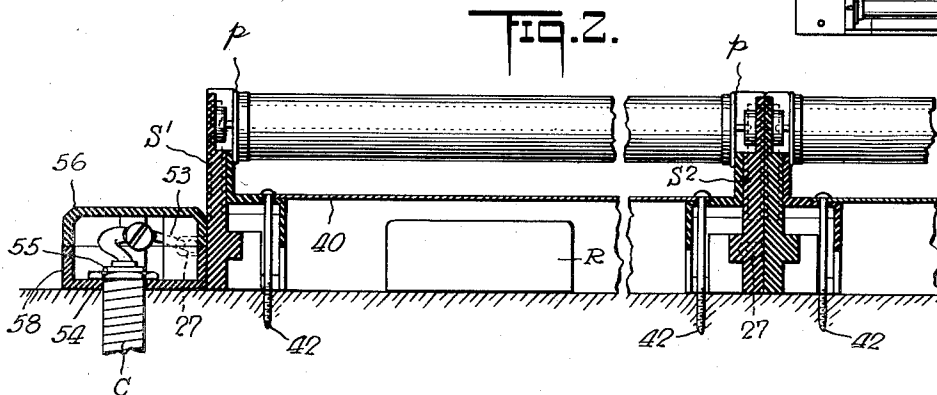
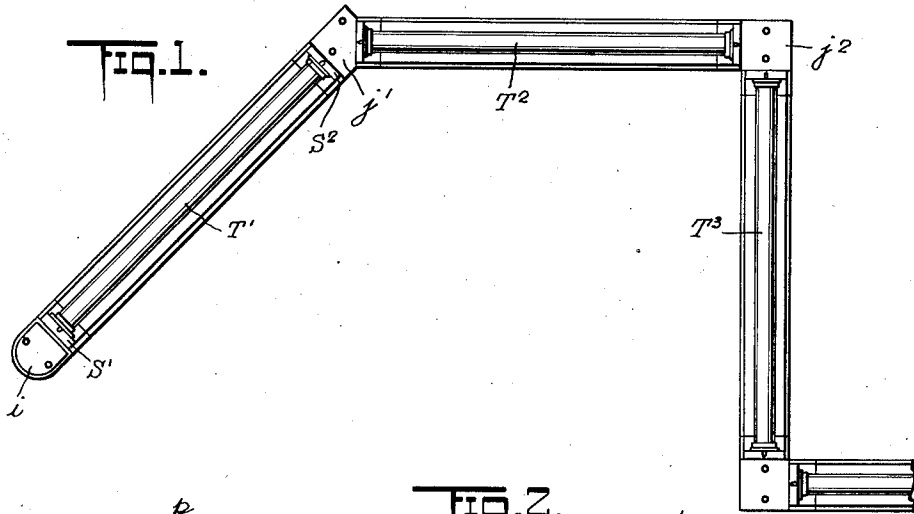
J. D. WHITTAKER

2,344,935

LIGHTING INSTALLATION.

Filed Aug. 9, 1939

2 Sheets-Sheet 1



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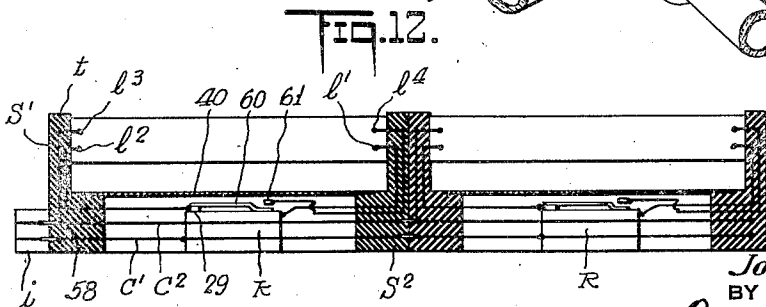
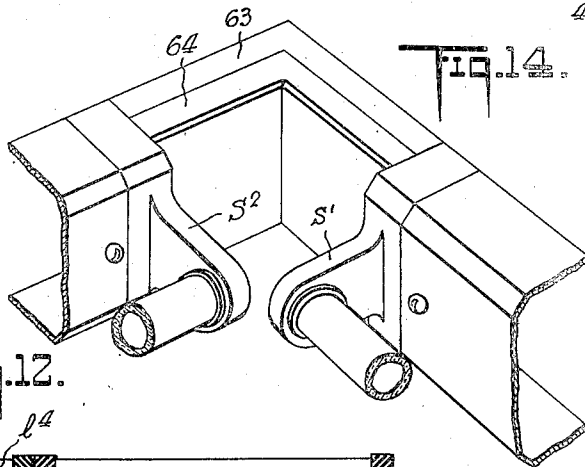
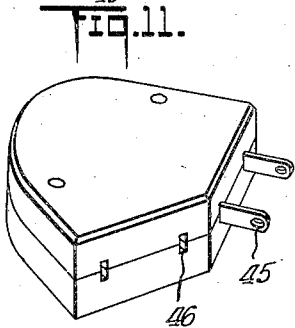
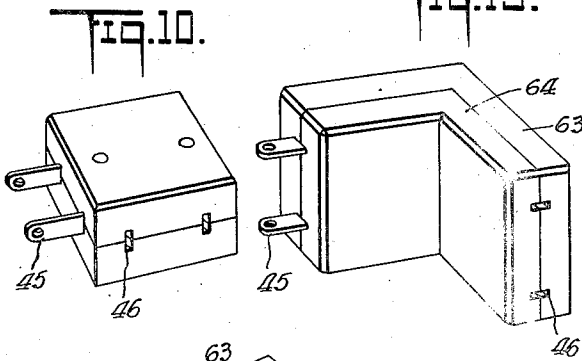
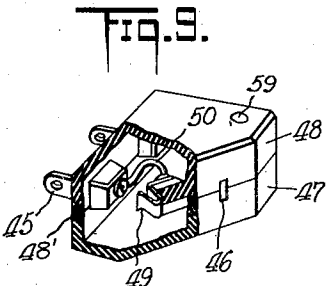
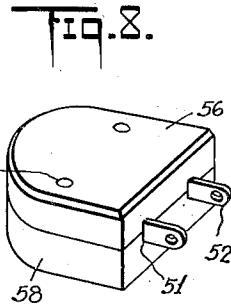
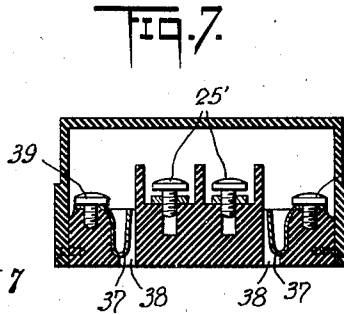
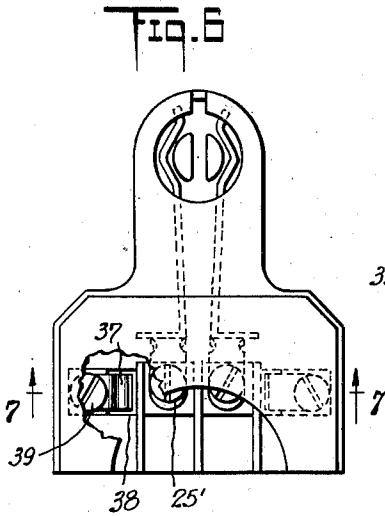
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2 Sheets-Sheet 2



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# UNITED STATES PATENT OFFICE

2,344,935

## LIGHTING INSTALLATION

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Newark, N. J.

Application August 9, 1939, Serial No. 289,107

### 4 Claims. (Cl. 240—9)

The present invention relates to lighting installations and equipment, more especially of the gaseous electric discharge type, and it has special utility for such lamps of the thermionic or hot cathode type.

It is among the objects of the invention to provide a lighting installation utilizing lamps of the above type, which lends itself to any of a wide variety of installations, without complication or high labor cost.

Another object is to provide a self-contained unit for an installation of the above type, which inherently lends itself to correlation and co-ordination with other like units in a single circuit and in any of a variety of different relative angular positions for adaptation even to corners and jogs of an irregularly shaped room to be illuminated.

Another object is to provide an installation of the above type in which the various wiring connections of the respective sectional units, which include the lamp and an associated starting and control unit are in concealed relationship and incorporated as part of a self-contained unit.

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

Fig. 1 is a bottom plan view of a fragment of a lighting installation of the type of the present invention, illustratively bordering the ceiling of an irregularly shaped part of a room,

Fig. 2 is a view in longitudinal cross-section of one sectional unit and contiguous parts,

Fig. 3 is a front elevation of one of the lamp terminal standards with parts broken away,

Fig. 4 is a longitudinal cross-sectional view taken along the line 4—4 of Fig. 3,

Fig. 5 is a transverse cross-sectional view taken along the line 5—5 of Fig. 3,

Fig. 6 is a view similar to Fig. 3 of a corresponding female standard,

Fig. 7 is a view in transverse cross-section, taken on line 7—7 of Fig. 6,

Fig. 8 is a perspective view of an inlet fitting,

Figs. 9, 10 and 11 are perspective views of junction fittings for various angular relationships of tubes,

Fig. 12 is a circuit diagram showing the general relationship of the various terminals and accessories,

Fig. 13 is a perspective view of a junction fitting for installation at a corner below the ceiling, and

Fig. 14 is a perspective view of the fitting of

Fig. 13 with the associated sectional units affixed thereto.

In Fig. 1 is shown the general layout of an installation as applied to the periphery of the ceiling of a room. The installation includes vapor electric lamp tubes  $T^1$ ,  $T^2$ ,  $T^3$ , etc. arranged in sequence about such periphery. Each lamp is mounted in corresponding terminal standards  $S$  to be described more fully hereinafter, junction pieces  $j^1$ ,  $j^2$ , etc., of appropriate shape effecting the connections between those consecutive lamps which are angularly disposed with respect to each other. Through an inlet fitting  $i$ , current is fed to the various lamps in a manner to be described more fully below.

The details of the terminal standard  $S$  are shown in Figs. 3, 4 and 5. Said standard comprises an insulating body, preferably a molded body which includes a flat plate 20 having counter-sunk longitudinal grooves 21 that accommodate the spring blade lamp terminals 22 in more or less conventional manner. The plate 20 has a widened base 23 and is thus generally T-shaped in outline. Three ledges 24 are molded as a unit with the plate 20 longitudinally of the standard and in parallel relation and serve as insulation between consecutive contacts. At the opposite sides of the central ledge 24 are binding posts 25 for the respective outturned and downturned ends 26 of the spring blades 22. Laterally of the outer ribs 24 are the terminals of the standard, which in the embodiment of Figs. 3, 4 and 5 are in the form of prongs 27 protruding from the casing and connected to the insulating base 23 by means of screws 29 through the toes 28 of said prongs 27.

The standard has an insulating cover 30, the rim 31 of which snugly embraces the periphery of the entire T-shaped body 20 other than the lower edge thereof. The cover has a heel piece 32 extending rearward from the body and affording accommodation for the conduit connections thereof. The upper portion of the cover 30 serves to keep the spring contact blades 22 in position and presents the conventional notch 33 through which the two prongs  $p$  at the corresponding end of the lamp may enter, the lower of said prongs passing downward through the gap 34 between the segment-shaped lugs 35 of the standard, so that upon turning of the lamp, through 90 degrees, the two prongs  $p$  will spread the contact blades 22 apart and thereupon be embraced by the V-notches 36 in said blades.

In the embodiment of Figs. 6 and 7, the con-

struction is identical with that of Figs. 3 to 5, except that the male prongs 27 are replaced by female contacts 37 which fit within the openings 38 provided for the purpose in the body and are attached to the body by screws 39.

Thus, identical molds are used for all terminal standard units, which may be made up in the male embodiment shown in Fig. 5 or the female embodiment shown in Fig. 7, depending solely on the character of outer terminal 27 and 37 respectively, applied thereto.

As shown in Fig. 2, two of the standards  $S'$  and  $S^2$ , a male and a female are associated together in a sectional unit by an intervening casing or shell 40, which may be a length of sheet metal channel bar, telescoped at its ends over the corresponding heel pieces 32 of said standards. The heel pieces are preferably reduced in thickness at their outer parts to afford stop shoulders 41. Long screws 42 are preferably used for detachable connection of the channel bar and the two standards in a unit and for attachment of the unit to the wall or other building structure.

An appropriate starting and control unit R, illustratively and preferably of the type shown in the prior Patent No. 2,159,837, issued May 23, 1939, to Babb and Bagno, but which need not be otherwise encased, is lodged within the channel shell 40.

Each sectional element of the installation is thus made up of two terminal standards  $S'$  and  $S^2$  adapted to accommodate a lamp therebetween, a channel housing 40 connecting said standards and enclosing an electric starting and controlling unit R, one of the terminal standards having protruding male contact prongs 27 and the other female terminals 37.

The sectional units set forth may be connected in a straight line sequence with the male terminal standard unit of one plugged into the female terminal standard unit of the next in sequence as shown at the right of Fig. 2.

Where two units are to be angularly disposed relatively to each other at a corner or jog in a room, an appropriate junction fitting is used. Illustrative of these fittings are the units shown in Figs. 9, 10 and 11. Each of the junction fittings has a pair of protruding prongs 45 at one lateral face thereof, and a pair of contact slots 46 at another lateral face thereof, extending at an appropriate angle thereto. Thus, the embodiment of Fig. 9, which corresponds to unit  $j'$  in Fig. 1, determines an obtuse angular setting of 135 degrees. The embodiment of Fig. 10 determines the angular relation of 90 degrees between the sectional units it connects as shown for instance at  $j^2$  in Fig. 1. The fitting of Fig. 11 determines a relation in which consecutive sectional units extend at an acute angle of 45 degrees with respect to each other.

The junction fitting of Fig. 9 may be made up of a pair of generally similar molded trays 47 and 48, each having two pairs of rim slots at the plug-in faces thereof. The abutting rims of the trays are maintained correlated by the rabbet 48' with the respective slots thus in registry, to accommodate the respective contacts. The pair of prongs 45 are lodged in the slots in one face and a pair of female contacts 49 in the slots at the other face. The respective male and female contacts are connected together by insulated wires 50 within the fitting. Each junction fitting has a pair of apertures 59 in its upper and lower faces for fastening screws (not shown) serving to hold the two

parts of the fitting together and to attach the fitting to the ceiling or other building structure.

The junction fittings of Figs. 10 and 11 are identical in detail with that of Fig. 9, just described, except for the difference in shape of casing, for the different angular relation of the sides that have the respective male and female contacts.

It will be understood that each of the fittings of Figs. 9, 10 and 11 may be used for an angle in opposite direction to that shown, by simply reversing it or turning it upside down from the position shown in the drawings.

The inlet fitting of Fig. 8, like those of Figs. 9, 10 and 11 is also made from a pair of similar molds with abutting rims. In this case there is only one pair of slots 51 at the face for accommodating the male contacts 52 (or the corresponding female contacts) in the companion embodiment (not shown). The lower face of the terminal fitting has an aperture 54 through which the armored cable C extends. Lead wires 53 from said cable are connected to the contacts 52. The inlet fitting is applied to the wall or ceiling by the conventional nut and nipple connection 55 on the end of said armored cable. The cover tray 56 of the fitting is applied and attached by screws extending through holes 57 and threaded into the base of the lower tray 58.

Thus, the installation is made up of a sequence of the sectional units extending about the wall or other structure with an inlet fitting  $i$  at one end of the sequence, which is a male or a female unit as the case may be, and with junction fittings  $j$  of proper type to turn corners or jogs in the room.

The circuit connections for an installation of the thermionic type appear diagrammatically in Fig. 12 in which it will be noted that the two leads from the outlet box are connected by way of the inlet fitting  $i$  to the successive sectional units. All electrical connections of each sectional unit are concealed within the structure of the unit as shown. The spring contacts 22 for the lamp terminals, being in the standards and being connected by concealed binding posts 25 to conductors  $c'$  and  $c^2$  extending longitudinally through channel 40 to the terminal standards at the opposite end of said channel. By plugging the successive sectional units together either directly where they are aligned, or through appropriate junction fittings where they are in angular relation, the conductors  $c'$  and  $c^2$  are made to extend as a pair of mains throughout the length of the installation. The coils of the starting units R concealed in the respective channel shells, are all supplied from conductor  $c'$  and connected in parallel to the respective lamp terminals  $l'$ . Lamp terminals  $l^3$  at the other end of each of the respective lamps are connected to the other conductor  $c^2$ . The remaining terminals  $l^2$  and  $l^4$  at the opposite ends of each lamp are connected by way of the circuit interrupter 60—61 of the associated starting and control relay R. Thus the female terminal standards ( $S^2$  and Figs. 6 and 7) have no connection between their plug-in contacts 37 and their binding posts 25', for the latter are connected respectively to the coil of relay R and the contact 61 of said relay. The male terminal standards ( $S'$  and Figs. 3 to 5) have a direct connection 58 between one of the prongs 27 and a binding post 25, while the other binding post 25, is connected to contact arm 60 of the relay R, and the other prong 27 to the coil of said relay.

Thus, from a single outlet box as many sectional units as are within the power capacity of the line are operated, without the need for costly electrical installation work. Pre-fabricated units are simply attached to the wall and plugged together at their ends by quick detachable connections, each unit accommodating one lamp.

The embodiment of Fig. 13 is a junction fitting for use at the corner of a room, where the installation is mounted not at the ceiling but at a lower level. The fitting is of angle-shape as shown, with the prongs 45 one above the other, rather than in side by side relation as in Figs. 9, 10 and 11. The fitting of Fig. 13 is made up like those of Figs. 9, 10 and 11 except that the two molded angle pieces 63 and 64 are of different dimensions. It is seen that the angle-shaped tray 63 has its rim rising from the convex side wall, while the angle piece 64 has its rim rising from the concave side. The edges of the rims are of identical size and shape for abutment one against the other when the angle piece 64 is nested in angle piece 63. In Fig. 14, the relation of two sectional units, or rather their standards S<sup>2</sup> and S' respectively to the left and right side of the fitting of Fig. 13 is shown. The lamps are thus shown to extend at right angles to each other, spaced from the respective walls of the room, but nearly in end to end abutment.

As many changes could be made in the above installation and structures 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 of the United States is:

1. A lamp installation of the gaseous discharge type extending continuously about the wall of a room, comprising pairs of lamp terminal standards arranged in sequence to accommodate tubular lamps therebetween in a continuous line along the walls, jogs and corners of a room, the standards at opposite ends of each of the lamps having respectively prongs and corresponding female terminals, the adjacent terminal standards of lamp tubes in direct alignment with each other having their terminals in mating relation, and junction fittings intervening between adjacent standards at corners or angular conformations of the room, said fittings having faces in corresponding angular relationship, with male and female terminals, respectively mating with the corresponding female and male terminals of the contiguous terminal standards.

2. A lamp installation of the gaseous discharge type extending continuously about the wall of a room, comprising pairs of lamp terminal standards arranged in sequence to accommodate tubular lamps therebetween in a continuous line along the walls, jogs and corners of a room, the stand-

ards at opposite ends of each of the lamps having respectively prongs and corresponding female terminals, and junction fittings intervening between adjacent standards at corners or angular conformations of the room, said fittings having faces in corresponding angular relationship, with male and female terminals respectively at the corresponding faces, mating with the corresponding female and male terminals of the contiguous standards, each of said standards having a base structure, spring contact blades longitudinally of said standards and binding posts therefor within the respective base structures, cover shells extending lengthwise of the respective lamps and between the bases of the corresponding standards thereof, each of said lamps having an associated starting and control unit therefor mounted within and concealed by the corresponding cover shell.

3. A lighting installation of the thermionic gaseous discharge type made up of a plurality of sections connected in sequence, each of said sections comprising a channel piece lengthwise thereof, terminal standards removably attached to the ends of said channel pieces, lamp terminal blades in said standards accommodating the respective lamps at the exterior of said channel pieces, each of said channel pieces having a starting and control unit housed therein for the corresponding lamp, each of said sections having prongs at one end thereof and corresponding female connectors at the opposite end thereof, said installation including an inlet fitting having contacts mating with those at the extremities of one of the sections, and having a mounting connection to an outlet box from which the entire installation is operated.

4. A lamp installation of the thermionic vacuum tube type, comprising a pair of conductors of opposite polarity, made up of quick-detachable rigid sections, each section having a covering shell with male connectors at one end and corresponding female connectors at the other, the successive sections being electrically and mechanically joined by the mating of said connectors, each of said sections having mounting appliances at the opposite ends thereof for the extremities of a tubular lamp, the shell of each of said sections accommodating and concealing an automatic starting and control unit for the corresponding lamp, the various conduits to the lamp terminals being enclosed within the shells and within the respective mounting appliances, junction fittings interposed between sections that extend at an angle to each other, each of said fittings having two faces extending at corresponding angles, one face having male and the other female terminals mating respectively with those of the ends of the sections which they connect, each of said fittings having connections in the interior thereof between the respective male and female terminals at the corresponding faces thereof.

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