Oct. 21, 1941. J. WERITZ 2,259,915

MOUNTING FOR TUBULAR ELECTRIC LAMPS

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Fig. 1.

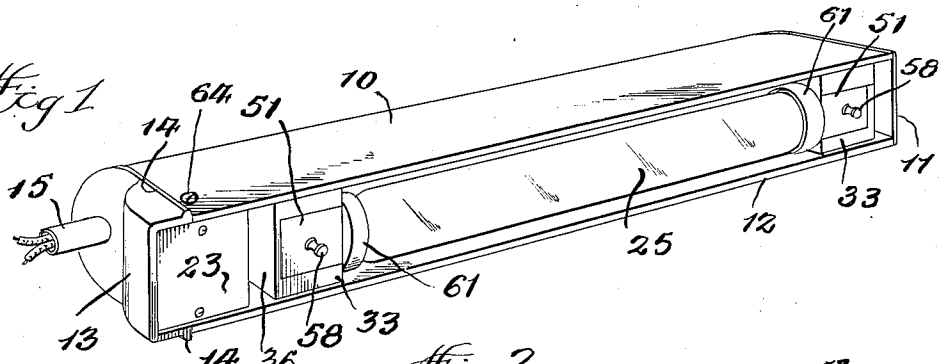
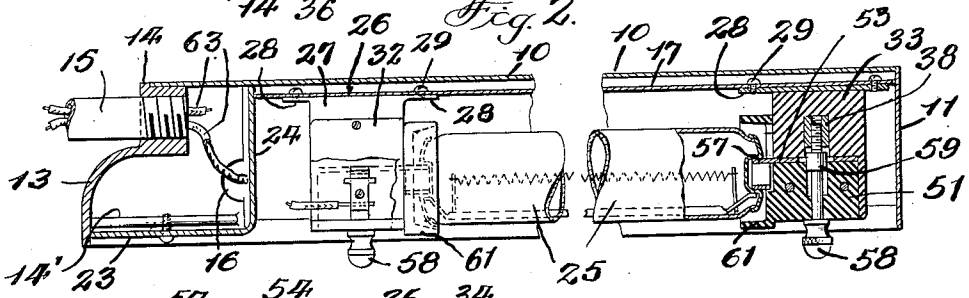


Fig. 2.



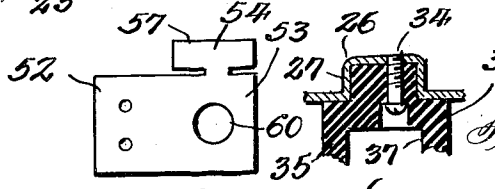


Fig. 3.

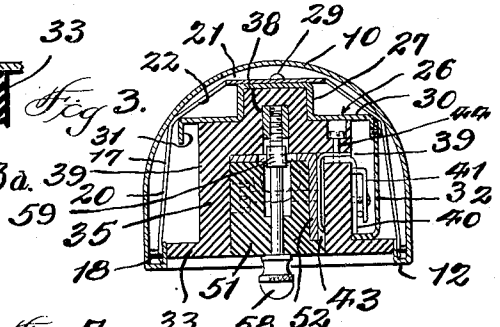


Fig. 6.

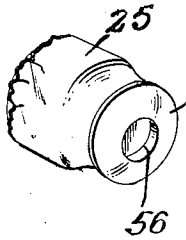


Fig. 3a.

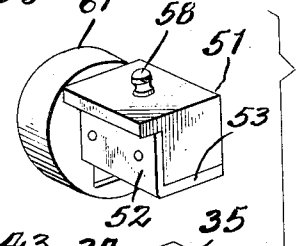
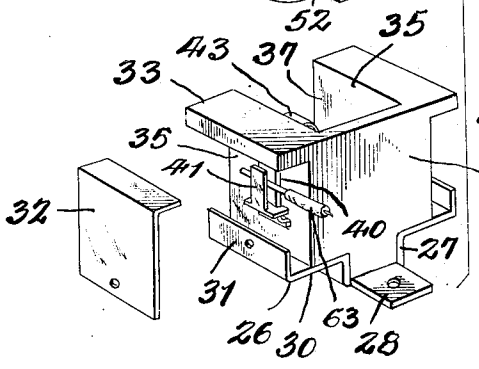


Fig. 7.



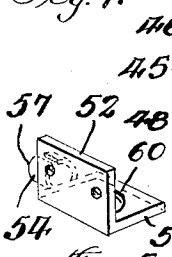


Fig. 5.

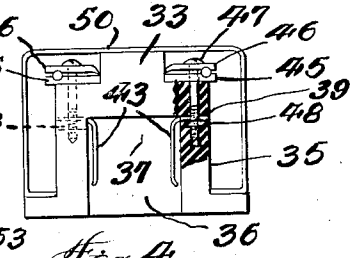


Fig. 4.

Inventor

John Weritz

By Christian K. Nielsen

Attorney

Oct. 21, 1941. J. WERITZ 2,259,915

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Fig. 8a.

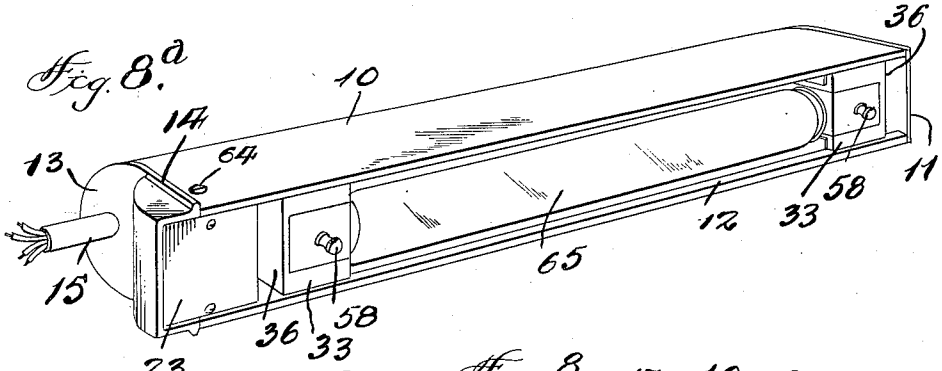


Fig. 8.

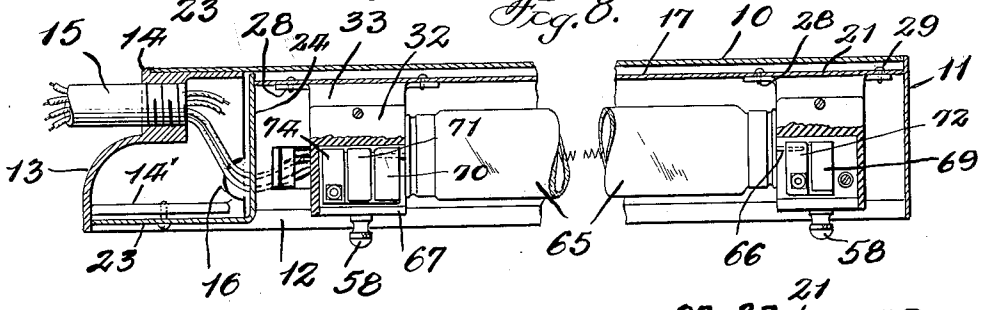


Fig. 9.

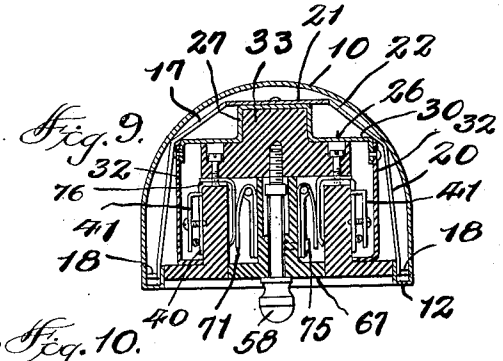


Fig. 10.

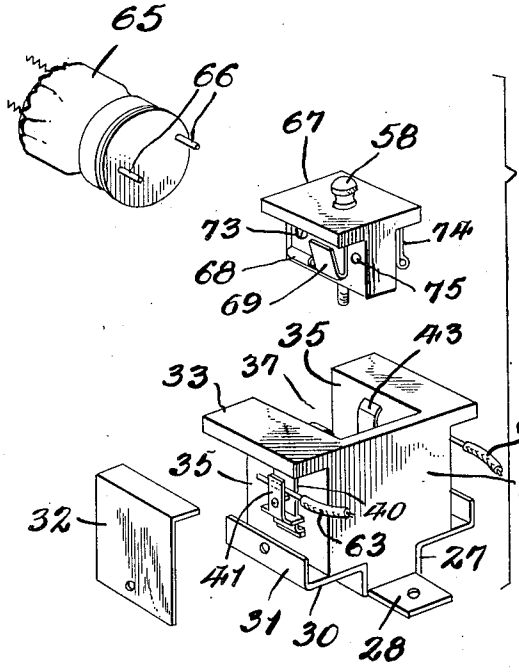
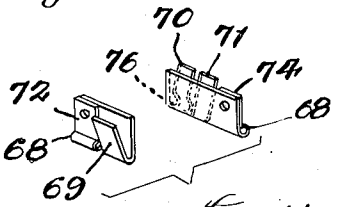


Fig. 11.



Inventor

John Weritz.

By Christian R. Nielsen

Attorney

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UNITED STATES PATENT OFFICE

2,259,915

MOUNTING FOR TUBULAR ELECTRIC LAMPS

John Weritz, Cicero, Ill.

Application February 2, 1939, Serial No. 254,279

5 Claims. (Cl. 173—328)

The invention relates to the mounting and terminal connections for greatly elongated electric lamps, and especially those which have electrodes at both ends, although it may also be adapted to lamps having terminals at one end only.

The invention has for an object to improve the manner of effecting the junction between the tubes and the mounting, and the manner of effecting the necessary contacts at each end of the tube in a separable mounting. It is also an important aim to present means for securing the lamp in the mounting so that it can not work out accidentally by vibration, jarring or engagement with objects or obstructions, and so that good electrical junctions will be assured under all conditions. Another important object is to present a construction for the ends in view which will be applicable to use with standard lamps and circuits and which may be produced at low cost by standard manufacturing practices, principally from sheet metal, excepting certain insulation bodies.

Additional objects, advantages and features of invention reside in the construction, arrangement and combination of parts involved in the embodiment of the invention as will appear from the following description and accompanying drawings, wherein

Figure 1 is a perspective view of a complete lamp and reflector unit such as may be installed in market show cases and store windows and elsewhere, this unit embodying my invention.

Figure 2 is a longitudinal section thereof.

Figure 3 is a cross section thereof on the line 3—3 of Figure 2, showing the single terminal mounting.

Figure 3*a* is a fragmentary section of the receptacle mounting.

Figure 4 is an inner elevation of a double terminal mounting and modification of wire clamp.

Figure 5 is a perspective of a contact plate.

Figure 6 is a plan of the blank for the last named plate.

Figure 7 is an exploded perspective view of a mounting, the plug piece, and the terminal end of a lamp tube of Figures 1 to 3;

Figure 8 is a view similar to Figure 2 of an adaptation of the invention to a lamp having two prongs at the terminals;

Figure 8*a* is a perspective view of the complete lamp and reflector unit.

Figure 9 is a cross section thereof.

Figure 10 is an exploded perspective view of the terminal of the last mentioned lamp, the plug piece and mounting.

Figure 11 is a perspective view of the wipers of the plug piece.

There is illustrated a reflector case 10 adapted to be mounted in any usual manner in a show case or elsewhere, and consisting of an elongated sheet metal wall member substantially U-shaped in cross section and closed at one end by an end plate 11, soldered or welded to the wall 10. The longitudinal edges of the wall portion are turned inward to provide stiffening and reflector-retaining lips 12. The remaining end of the case is closed by an end fitting 13, which is molded of suitable material fitted snugly slidable within the wall and extending into the case a distance, being also U-shaped in cross section and its upper or outer edges being set snugly under the lips 12. An external rib 14 is formed on the end fitting serving as a stop to receive the end of the case thereagainst. The case may be held to the end fitting by any removable fastening.

The end fitting 13 is thickened at its bight portion and a passage formed therethrough to receive a fixture pipe 15, through which wires may be led into the case. The end face of the fitting 13 may be shaped as desired to conform to contemplated uses. The inner edge of the U-shaped part of the fitting is recessed or notched at 16 on each side to permit the passage of wires freely to the case as will be understood from the context. A reflector 17 of suitable form is engaged slidably in the case, this being usually of sheet metal, chromium plated on its inner surfaces and shaped to set snugly within the case with its side walls spaced slightly from the side walls of the case. The reflector is formed with lateral flanges 18 at its longitudinal edges, of a width transversely equal to the major dimension of the lip 12, and the extreme edges of these flanges rest against the walls of the case below or inwardly of the lip 12, so as to hold the sides of the reflector flush with the inner edges of the lips and to provide a space between the reflector and case in which wires may be safely extended longitudinally from the fitting 13 to the far end of the case, as will appear. The reflector 17 is of a length to be set between the inner end edges of the fitting 13 and the end wall 11 of the case, consequently the notches 16 form openings from the interior of the fitting 12 and adjacent part of the reflector to the respective spaces between the reflector and case at each side.

In the present instance, the reflector is formed with angular bends transversely, between which the material is substantially planiform. Thus, the side walls 20 are substantially parallel, al-

though this is not essential, and a back wall 21 is also provided in a plane at right angles to the mean longitudinal plane between the side walls. This back wall is joined to the side walls by diagonal walls 22 of smaller extent. The side walls are also of greater transverse extent than the back wall, so that their junction with the walls 22 rest against the curved inner part of the case 10. The reflector is thus held between the lips 12 and curved inner part of the case so that loose movement of the parts is prevented.

The end fitting 13 is formed with top flanges 14' closely parallel to the top edge thereof and set therebelow sufficiently to receive and support a cover plate 23, thereon, by which the space over the fitting 13 is closed. This cover plate is rectangular in form and may have an inwardly extended end wall 24 at right angles thereto adapted to rest between and against the end edges of the reflector 17 and fitting 13. It may be in registry with the notches 16 so that wires may be led past the wall 20 into the spaces between the sides of the reflector and case. The cover may be held removably in place by usual screws or other means.

Identical mountings are provided at each end of the device, by which a tubular lamp 25 of glass or other transparent material and of any desired length may be mounted in the reflector. Each mounting consists of a bed piece 26 of sheet iron or brass, pressed to form a central channel part 27 with a flat bottom extended at each end to form mounting ears 28 apertured to receive screws 29 through the wall portion 21, and having lateral flanges 30 on each side which are extended near the reflector and formed with flanges 31 by which an insulating plate 32 is secured at each side as required. In the present instance, one of these flanges 31 is not used.

Set on the bed piece 26 there is a socket or base receptacle body 33 which may be molded of insulating material and includes a central inner part set in the channel 27 and secured by screws 34 engaged through the body 33 and screwed into the bottom of the channel part. This body is broadened over the flanges 30 and formed with thick side walls 35 extended outward and flanged to set snugly between the lips 12 of the case. This portion of the body is thus substantially U-shaped in cross section. An integral wall 36 connects the walls 35 at one end of the space or recess 37 within the body, which recess is formed with a flat bottom face, through which the screws 34 are engaged and countersunk. A nut element 38 is set in the material of this receptacle body centrally of the bottom face of the recess 37 to receive the fastening screw 58 of a plug to be described.

A slot 39 is formed through each wall 35 at its base adapted to receive the inturned end of a terminal plate 40 set against the outer side of the wall and having a wire clamp or connector 41 of conventional form thereon secured by the usual screw 42 engaged in the plate 40. A spring contact 43 slightly bowed is also set against the inner face of the wall, with an outturned end set under the inturned end of the plate 40, both of these lapped parts being apertured and the aperture in plate 40 threaded and receiving a screw 44 engaged through the body 33 from next the flange 30. This terminal plate, connector and spring are shown as mounted on only one side of the receptacle, but may be duplicated at the opposite side in case of need for a double contact, as hereinafter shown.

In Figure 4 the construction is modified to the extent that the connector and plate 40 are replaced by a plate 45 secured against the under side of the broadened part of the body 33 together with a connector 46 by means of a longer screw 47 engaged with a nut at 48 in the slot 39, the inner end of the spring 43 being held under this nut in the same position as before described. In this case, in order to afford more room under the body 33 for the connector and screw, the bed piece 50, corresponding to the one 26 before described is not formed with a channel, but is extended as a flat plate across the face of the central inner part of the receptacle. It may be of insulating material and suitably extended beside the receptacle to cover the connectors, as shown, in which event the plates 32 would be omitted.

A plug body 51 is provided, of insulating material, the main portion of which is adapted to be set in the recess 37 so as to lie flush with the body 33 at the two exposed sides. Its inner part is of reduced width between the walls 35, however, so as to accommodate the spring 43 and a thick contact plate 52 suitably secured to the plug and having an extension or inner body plate 53 which lies in the bottom of the recess 37 when the plug is in place. This plate 53 is formed with an extension 54 projected from the plug body and from the receptacle and shaped as a spring plug or clasp to fit an element of a lamp terminal 55 which is permanently secured on the glass tube of the lamp 25 shown in Figures 2 and 7. In the present instance the lamp terminal is a disc or washer with a socket or opening 56 formed therein of circular form. The extension 54 in this instance is formed with lateral ears or tongues which, with the central portion of the extension are bent in one direction to form a C-spring 57 which will fit frictionally within the opening 56 requiring the spring 57 to be slightly deformed in order to enter the opening, whereby a sustained contact will be assured. This extension and spring 57 also serve as the support for the end of the lamp, as will appear.

The plug body is formed with an opening therethrough alined with the nut 38 set in the receptacle body, and a hand screw 58 having a flanged head is engaged loosely through the opening and in the nut 38. The screw is provided with a collar 59 fixed thereon and the body plate 53 is recessed at the inner side around this screw sufficiently to permit some reciprocation of the screw and collar to draw the screw end outward and within the body 51. The plate 53 is apertured so as to clear the collar 59 safely, as at 60.

The plug body may also be formed with a cup-like extension 61, formed integrally with the body portion 52, and adapted to surround the piece 55 and the corresponding part of the opposite end of the lamp 25, and to also partly surround the end of the glass body of the lamp. This is shown, and necessarily extends a distance beyond the plug body, especially at the inner part of the plug, and to facilitate assembly is formed with a slot 62 in this last mentioned part, adapted to receive the spring 57 therethrough while the plate 53 is spaced away from the plug body.

In the use of the invention as described, a mounting being secured on the reflector at each end of the latter, suitable openings being cut in the reflector adjacent the connectors 41 to admit the lead wires, and the parts being cut to proper sizes for assembly, the lead-in wires 63 are engaged with the connectors, and the insulator cover plates 32 secured thereover, after which

the wires are extended through the passage in the fitting 13 into the fixture pipe. The wiring may be started from the opposite direction, if desired. The reflector is then inserted in the case and pushed slidingly into place, after which the fitting 13 is inserted in the end of the case and the cover plate 23 secured thereon so that the wall 24 will hold the wires separated, passing through the notches 16 and between the reflector walls 20 and the sides of the case. The fitting 13 being pressed tightly into the end of the case 10, it is secured by screws 64 engaged through the case and in suitable threaded openings in the fitting 13.

The construction in Figures 8 to 11 may be the same as in Figures 1 to 3 and 7 as to the structure of the case, the reflector, and the mounting of the receptacle, as well as the form of the receptacle body and the wire connections. The use of two contacts in the receptacle is also illustrated, constructed the same as those parts in Figures 3 and 7. The plug element has been modified however, to adapt the device to the mounting of a lamp 65, in which two electrode prongs or pins 66 are projected from the end of the lamp, which is customary in certain lamps. The fluorescent lamp of the General Electric Company has two such electrodes at each end of the lamp. The plug 67 has an outer or top part adapted to close one side of the recess 37, and is relieved on opposite sides next the walls 35 of the receptacle to accommodate a combined socket contact 68 and spring brush 69 formed in one piece at one side, and a spring clip 70 and brush contact 71 at the opposite side. The construction of these parts is such as to attain a new and peculiarly advantageous function in connecting a lamp of the character described.

The socket contact 68 is formed of sheet metal, and includes a substantially square blank having a slit centrally of one side and at right angles thereto, extending half the width of the blank. The material at one side of this slit forms the spring contact brush 69, while the material at the outer side is bent to form an eye socket 68, and a mounting tongue part or ear 72 extending therebeyond and laid flat against the body of the piece. This tongue and body are apertured and receive therethrough a mounting screw 73 secured in the plug body 67 in any approved way. The eye 68 is of a size to snugly receive one of the pins 66 of the lamp, and is located close to the face of the plug which is nearest the lamp when the plug is in place in the receptacle 33. It will be noted that by this construction the eye 68 is formed as a nearly rigid member, although due to the spacing of the screw 73 from the eye a short distance there is still a measure of resilience and the thickness of the metal of the blank is such that the eye may be slightly expanded by the pin 66 when inserted therein. These pins have rounded, tapered or semi-spherical ends in practice, so that their entry to the socket for a snug fit is facilitated. It should also be noted that the socket 68 is held in a substantially rigid relation to the plug body by reason of the proximity of the mounting screw 73.

The contact means at the opposite side of the plug functions quite differently. The blank for the clip and brush 70—71 includes an additional portion at one side, and is formed with two slits, instead of one, whereby the clip tongue 70 is formed at the front side of the piece, the spring contact brush 71 is formed centrally thereof, and a mounting ear 74 is formed at the extreme side of the blank. The latter is bent up close against the body of the blank, the two being apertured to receive a mounting screw 75, engaged in the body 67. The opposite side of the piece is thus capable of slight spring action for movement away from the underlying face of the plug at times. The clip 70 is formed as a spring tongue divergent from the planiform body portion of the contact piece, its junction with the body including a circular bend adapted to receive one of the pins 66 therein and extending for slightly more than 180 degrees, as a C spring 76 forming the bight of the clip, so that when a pin is engaged therein it will be yieldingly held against lateral displacement therefrom. There is thus left a substantial space between the base of the tongues of the clip and the body portion of the contact piece, which will permit a pin 66 to be forced into the clip by lateral presentation under the tongue of the clip and movement of the pin laterally until it is pressed into the bight 76.

The bight 76 and eye 68 may be so spaced on the plug as to approximate the spacing of the pins 66 as nearly as possible, but it is contemplated to have the bight and eye spaced slightly less than the standard spacing of the pins 66, for additional certainty in the forming of a positive contact between the pins and the members of the plug. The contact members on both sides of the plug are secured in place with the unslitted edges of their blanks at the top, and with the tongues formed between the slits projected upwardly. The spring brushes are extended divergently upward from their bases, so that when the plug is formed into the receptacle from the outer side, the brushes are compressed by the contacts 43 to a proper degree, as shown in Figure 9.

In the use of the last described form of the device, the pins 66 may be simultaneously inserted in the eye 68 and bight 76, or, if there is a difference in spacing of the pin points, one may be inserted in the eye 68, while the other is simply allowed to project beside the upper part of the space between the tongue of the clip 70 and the body of the contact plate at that side, and after the first pin is thrust home, the lamp is rotated on that first pin so as to swing the second one in an arc which will cause it to wipe against either the tongue 70 or the base of the clip, whereby it will be caused to enter the bight 76 by lateral movement of the pin. In this movement, the bight portion 66 may be sprung away from the plug body, or may be held in normal relation to the plug or pressed thereagainst. In case the pins 66 are too close together at their ends, this method makes it easier to spring the tips of the pins apart sufficiently, by the assembly operation, or if desired, the pins may be sprung slightly apart as a preliminary so that after one is inserted in the eye 68, the other will wipe against the spring arm 70. It will be appreciated that by this manner of functioning of the parts, a firm contact with the pins will be assured, even if the eye is too large, or the bight 76 too large to clasp the pin snugly when singly engaged. The arm 70 engaging one pin 66 serves to force the lamp end bodily toward the opposite side of the plug 67, so that a loose pin at that side will be moved laterally until stopped against one side of the eye 68. Much ineffectiveness in lighting, and loss of time fitting lamps to mountings will thus be obviated, and variations from standard spacing of the pins 66 will not require correction, nor cause ineffective contacts.

The plugs 67 are engaged with respective ends

of the lamp 65 while the latter is removed from the reflector device, and the plugs then inserted in the receptacles from the open side of the reflector device, after which the hand screws 58 are tightened as before described to retain the lamps firmly in place.

It should be understood that the clip form of contact 70 may be duplicated at both sides of the plug if desired, so that one takes the place of the eye portion 68, in which event one could serve as and be termed the eye member, for use as a pivot the same as the eye 68, or the two pins of the lamp could be presented in the open side of the clips and moved together toward the bights thereof, or one moved first into the bight and one clip and the other engaged by rotation on the first.

While I have described the invention in its best embodiment known to me, I do not regard it as limited thereto, and various modifications and changes may be made within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. A mounting for electric lamps consisting of two receptacles having contacts therein and permanent electric connections thereto, respective plugs insertable and removable from the receptacles having lamp supporting contacts therein and electrically continuous contacts constructed to coengage the first named contacts by insertion of the plugs in the receptacles, said lamp supporting contacts including a pin-receiving eye substantially rigid on the plug, and a second pin-receiving member open laterally and including a resilient side portion yieldable to a pin rotated around the said eye for wiping contact therewith, and manual means to releasably secure the plugs in the receptacles.

2. A receptacle for two-pin electrical terminals including a body having a fixed socket at one side constructed to receive one pin, and a resiliently supported clip device at the opposite side including resilient relatively yielding members divergent in a direction tangent to a circle having the said socket as its center, said body consisting of a removable plug member having the said socket and clip presented adjacent a lateral side of the plug member, said receptacle and plug member having separable circuit forming means connected to the socket and clip and being open at an outer side to receive the plug member, and at a lateral side to expose said lateral side of the plug when inserted.

3. The structure of claim 2 in which said socket consists of a resilient sheet metal strip bent upon itself to form an eye and having its outer portions apertured and secured to the body in closed relation, and said clip consists of a resilient sheet metal strip bent to form divergent portions and a bight constituting a C-spring.

4. The structure of claim 2 in which said socket consists of a resilient sheet metal strip bent upon itself to form an eye and having its outer portions apertured and secured to the body in closed relation, and said clip consists of a resilient sheet metal strip bent to form divergent portions and a bight constituting a C-spring, and having an extension to a distance from said divergent portions and bight and secured to said body, as the mounting of the clip.

5. In a mounting of the character described a receptacle having a plug-receiving recess consisting of two opposed spaced apart walls and a connecting lateral wall and being open on at least two sides between said opposed walls, contact members on said opposed walls and means to connect the same to an electrical source, a plug insertable between the opposed walls, contact members thereon to engage respective first named contact members, a socket on one contact of the plug and a clip on the other having divergent spring arms presented in a direction tangent to a circle having the socket as its center, arranged and constructed so that one pin of a lamp may be inserted longitudinally in the socket with the other pin of the lamp adjacent the clip, and the latter pin moved into the clip by rotation of the lamp on the first pin, said socket being formed of a blank of resilient sheet metal slit at one end to form two tongue parts, one being bent circularly at its base to form an eye socket and its outer part extended in close relation to the body of the blank and secured to the plug, the other tongue part being bent in the same direction and arranged divergent to the body of the blank whereby to form one of said contacts; said clip also consisting of a blank of resilient sheet metal slit at one side to form three tongues, an outer one being bent to form a C-spring and divergent spring arms, the middle one extended divergently from the body of the blank to form the other of said contacts on the plug, and the third being bent close against the body of the blank and secured therewith to the plug.

JOHN WERITZ.