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ELECTRICAL SOCKET FOR INCANDESCENT
LAMPS AND MOUNTINGS THEREFOR
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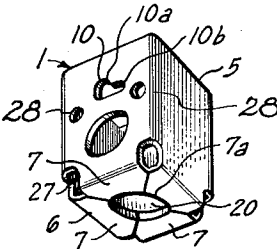
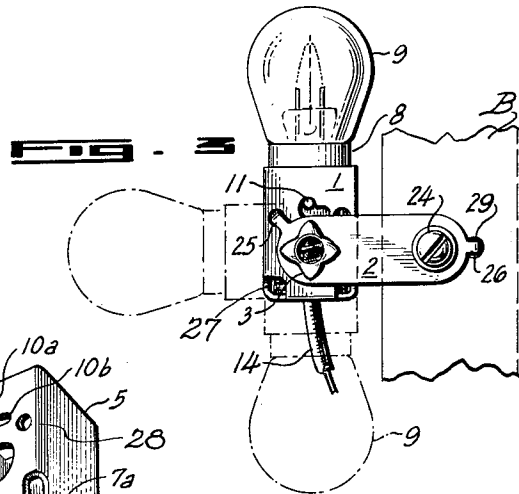
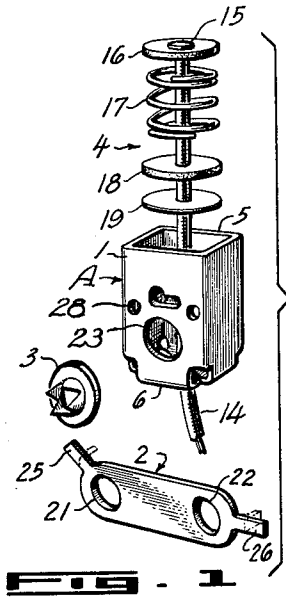


FIG. 2

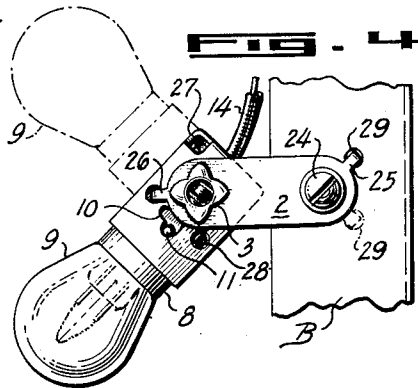


FIG. 4

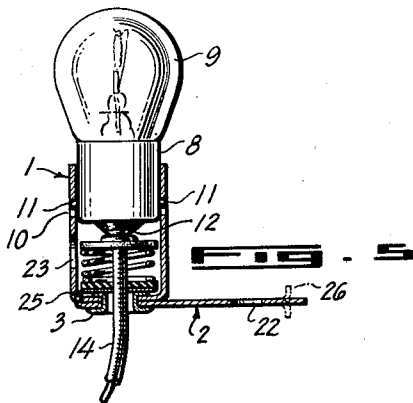


FIG. 5

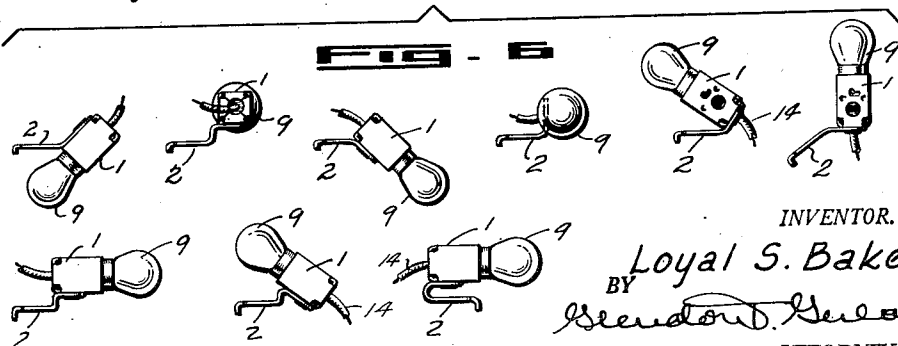


FIG. 6

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ELECTRICAL SOCKET FOR INCANDESCENT LAMPS AND MOUNTINGS THEREFOR

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The present invention relates generally to electrical fixtures and is particularly directed to improvements in sockets for incandescent lamps and their mountings.

In the application of electric incandescent lamps it is desirable to provide a high degree of flexibility of mounting. This is especially true in the use of the smaller sizes of these devices in vehicles such as aircraft and busses for reading lights, instrument illumination, and the lighting of passages and compartments. In most cases of this kind, while the location and position of the light source is often quite critical, as for example in instrument panel lighting, the surrounding structure from which the fixtures must be supported assumes a wide variety of shapes and positions and the space in which the fixture must be mounted is often considerably confined. Because of this, it is difficult to effect any degree of standardization of the mounting means. While standardization of the socket per se has now been effected, there exists but a few standard means of supporting the socket and the designer is forced in many cases to provide a special bracket or mounting for each installation.

The principal object of the present invention is to provide an improved electrical fixture and a simple mounting means that is adapted to form a positive connection to the fixture to support it universally from the surrounding structure in a wide variety of angular positions.

A further object of the invention is to provide an electrical fixture comprising a single-piece, square cross-sectioned receptacle or socket and a flat pliant mounting clip having means for positively connecting one to the other in one of a plurality of pre-selected angular relationships with respect to each other.

Another object of the invention is to provide an electrical receptacle socket embodying improved means for supporting and retaining electrical apparatus therein and having pliant mounting means adapted to support the socket from surrounding structure in any of a wide range of pre-selected angular positions and locations with respect thereto.

Further objects and advantages of the invention will be apparent from the following specification and the drawings which form a part hereof in which like numerals of reference denote like parts throughout the several views.

In the drawings:

Fig. 1 is an expanded view of a fixture and mounting embodying the features comprehended by this invention.

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Fig. 2 is a perspective of a receptacle or socket forming a part of the fixture.

Fig. 3 is a view of the socket and mounting in assembled relation illustrating one series of mounting positions.

Fig. 4 is a view illustrating a series of positions of the fixture permissible by assembling the socket and the mounting clip in a different manner.

Fig. 5 is a section of the fixture showing the relation of the bulb and conductor, with the mounting clip attached to the socket to provide still another series of mounting positions.

Fig. 6 is a group of views illustrating a few of the positions that may be obtained by varying the configuration of the mounting clip and its manner of attachment to the socket.

While the present invention is illustrated and described in connection with the mounting of an electrical socket for incandescent bulbs it will be obvious to those skilled in the art that the principles involved are equally applicable to a variety of other electrical fixtures such as male and female receptacles, couplings, and the like. For this reason, it is desired that the showing of this particular application be considered as purely illustrative and not in any sense to limit the scope or utility of the invention.

Referring to Fig. 1, the invention is shown exemplified in an electrical fixture A comprising essentially a receptacle or a socket 1, a mounting clip 2, a hollow fastener or rivet 3, and a conductor assembly 4.

The socket 1, as best shown in Fig. 2, comprises a hollow metallic shell or receptacle having a square cross-section, which may be formed from seamless or seam-welded tubing with an open end 5, and a closed end 6, the closed end 6 is integrally formed by bending down portions of the material forming the shell, and in the present case is formed by bending inwardly a 90° tongue 7 from each wall of the socket 1 so that they meet in a plane transverse to the axis thereof.

The internal dimensions of the socket 1 are selected to accommodate the base 8 of a standard bayonet type incandescent bulb 9 or other similar electrical device. An L-shaped aperture 10 having an axial leg 10^a and a transverse leg 10^b is provided in the center of one or more of the walls of the socket 1 at a sufficient distance below the edge of the open end 5 to engage the standard bayonet pin 11 of the bulb 9 and to retain the latter within the socket 1. To install the bulb 9, the base 8 is inserted into the socket 1 with the bayonet pin 11 positioned towards one

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corner thereof so that it extends into the space formed between the circular base portion 8 and the square socket 1. Rotation of the bulb 9 then causes the pin 11 to enter the leg 10^b of the aperture 10 when aligned and engaged with the leg 10^a thereof, the bulb 9 is positively held in the socket 1 and an electrical contact is formed therebetween by reason of the contact of the pin 11 against the sides of the aperture 10.

The type of fixture illustrated is adapted to accommodate a single contact bulb, i. e. in which the bulb is provided with a single central electrode 12 in its base connected to the filament and the other side of the filament is connected to ground through the shell of the base 8, and the socket 1, to the structure through the mounting clip 2. In operating this type of bulb a single wire is required to conduct current from the electrical source to the filament. For this purpose, in the assembly shown a conductor assembly 4 is provided consisting of a "pigtail" formed of a short length of a single-conductor insulated wire 14 having one end exposed and soldered to a contact 15, an insulating washer 13 secured between the contact 15 and the covering of the wire, a compression spring 17, a lower insulating washer 18 and a metallic washer 19. The washers 18 and 19 are provided with a central hole permitting them to slide loosely over the covered wire 14. The outer diameter of all of the washers 16, 18, and 19 and that of the spring 17 is less than the internal dimensions of the socket 1, so that when assembled within the latter, they may move freely within it so supporting the wire 14 axially of the socket 1 and position the contact 15 against the electrode 12 of the bulb 9 when assembled, as shown particularly in Fig. 5. The bent-in tongues 7 of the socket 1 are provided with arcuate cut-outs 7^a which cooperate with each other when the tongues 7 are in bent-down relation to form a central aperture or opening 20 on the axial center-line of the socket body 1 through which the wire 14 is positioned in assembly.

While a single wire conductor assembly 4 is herein shown and described, it will be obvious that a similar arrangement for two or more wires may be provided when the nature of the device supported in the fixture so requires without departing from the principles of the invention.

When the conductor assembly 14 is arranged as shown in Fig. 5 and the bulb 9 secured within the socket 1 as described, the spring 17 acting between the closed end 6 of the socket 1 and the washer 16 maintains contact between the electrode 12 and the contact 15, and positively engages the bayonet pin 11 in the leg 10^a of the aperture 10.

As thus far described, the invention exemplifies a simple and reliable electrical fixture consisting of a single-piece square cross-sectioned receptacle or socket having provisions for removably securing an electrical device therein and a means for conducting current to it. The use of a square sectioned socket to secure a device having a circular sectioned mating base provides ease and convenience of assembly and disassembly. In conventional devices wherein a circular socket is employed difficulty is often encountered in removing and replacing the electrical device because of corrosion between the parts. In the device of the present invention, this difficulty is obviated by reason of the reduced contact area between the elements. Reduction in the contact area between the elements does not impair the

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electrical contact since this is adequately provided for in conventional sockets as well as in the form of the present invention by the contact existing between the bayonet pin 11 and the edges of the aperture 10.

An important feature of the present invention resides in the flexibility permitted in connecting the mounting means with respect to socket. To accomplish this, the assembly is provided with a flat, elongated metallic mounting clip 2 having mounting holes 21 and 22 of equal diameter located in either end thereof, adapted to interchangeably mate with either the hole 20 in the closed end of the socket 1 or a hole 23 of equal diameter located in one side thereof, and to be positively connected to the socket 1 by means of the hollow fastener or rivet 3. When so assembled either of the mounting holes 21 or 22 that is not employed for fastening the socket 1 to the mounting clip 2 is adapted to be used for securing the fixture A to any convenient part of the surrounding structure B by means of a screw or bolt 24 cooperating with a suitable hole therein.

In order to positively lock the socket 1 with respect to the structure B a pair of extended tabs 25 and 26 are formed integrally with and in the plane of the mounting clip 2 adjacent to the mounting holes 21 and 22 respectively, which are adapted to be bent-down and to project into suitable locking holes in the socket 1 and the structure B on assembly in a manner to be described.

The tabs 25 and 26 are disposed radially from the mounting holes 21 and 22 respectively, the former extending at a 45° angle from the longitudinal centerline of the mounting clip 2 and the latter lying on the longitudinal centerline thereof. The mounting clip as thus described exemplifies an inexpensive means for supporting the socket 1 to the structure B being formed in blank as a simple stamping. It is contemplated that the mounting clip 2 be formed of sheet metal or other electrically conductive material of sufficient pliability to permit its being bent to any desired shape in assembly. The mounting clip 2 may be made available in any length, but is preferably supplied in a standardized series of lengths designed to encompass a practical range of sizes for supporting the receptacle or socket.

In forming the socket 1, an opening 27 is provided at each of the four locations defined by the intersections of the longitudinal edges thereof and the edges of the closed end 6, so that an aperture having a chordwise dimension slightly greater than the widths of the tabs 25 and 26 is provided in each of the three planes forming the corners of the closed end 6. The mounting hole 23 is located centrally in one side of the socket 1 at a distance from the closed end 6 such that when either of the holes of the mounting clip are mated therewith and the socket 1 is attached to the mounting piece 2 by means of the rivet 3 the bent-down tab 25 or 26 adjoining the end of the mounting clip 2 connected to the socket 1 may selectively project into and engage one or another of the locking holes 27 on the side of the socket body 2 in which the hole 23 is provided, thus forming a positive connection between the mounting piece 2 and the socket 1 and serving to hold one in pre-selected angular relation to the other. On the side of the socket 1 in which the hole 23 is provided, an additional pair of locking holes 28 is formed equidistant from each other and from the openings 27 and being of suitable diameter to accommodate either

of the tabs 25 or 26 of the mounting clip 2, to positively lock the latter with respect to the socket 1 and thus provide means to lock the two elements in an additional series of angular positions. From the foregoing, it may be seen that the socket 1 is adapted to be connected to the mounting clip 2 by means of the hollow rivet 3, and locked in one or another pre-selected relative angular position thereto by bending down and engaging either of the tabs 25 or 26 and engaging it in assembly with one of the openings 27 or one of the locking holes 28.

As best shown in Fig. 3, when it is desired that the socket 1 be mounted axially or transversely of the mounting clip 2, the 45° angle tab 25 of the latter is bent down, and the two elements are fastened together by mating the mounting hole 21 with the mounting hole 23 and connecting the elements by means of the rivet 3, with the tab 25 engaging one of the locking holes 28 or the lock openings 27 depending upon which of the positions shown is desired for the particular installation. When it is more convenient to support the socket 1 at a 45° angle to the mounting clip 2, the tab 26 is bent down and the two elements are fastened together by mating the mounting hole 22 with the hole 23 and riveting them together with the tab 26 projecting into one or another of the locking holes 28 or the openings 27 to provide the desired angular position between them as shown in Fig. 4.

The distance between the holes 28 and the openings 27 and the proportioning of the tabs 25 and 26 with respect to the mounting holes 21 and 22 respectively, is such that the mounting clip 2 can be interchangeably fastened to the socket by fastening them together by means of the hole 23, as previously described, or else by means of the hole 20 in the closed end 6 of the socket body 1 when it is desired that the bulb 9 be supported at right angles to the general plane of the mounting clip 2 as shown in Fig. 5. In this case, the tab 25 or 26 engages one or another of the four lock openings 27 and prevents relative rotation between the two elements. In the latter arrangement, wherein the socket 1 is secured at right angles to the plane of the mounting clip 2, the wire 14 may be led out from the socket through the hollow rivet 3 after the latter has been driven, as shown in Fig. 5.

After assembling the socket 1 and the mounting clip 2 together in the desired relation, a suitable hole is formed in the structure B to accommodate the bolt 24 and hold the bulb 9 in the desired position, and the mounting clip 2 is locked against rotation with respect to the structure B, by providing a small hole 28 in the latter adjacent to the bolt 24 of sufficient diameter and in the proper radial relation thereto to engage the tab 25 or 26 formed on the end of the mounting clip 2 not used for securing the socket 1.

In addition to the wide range of positions that may be obtained between the socket 1 and the mounting clip 2, and the flexibility permitted in supporting the fixture A from the structure B, it is contemplated that the mounting clip may be bent or formed "on the job" into an infinite number of shapes and configurations to permit the light source or other electrical fitting to be located at the precise position desired while utilizing the most convenient portion of the surrounding structure for its support. A few of the possible arrangements are illustrated in Fig. 6.

It is to be noted that while the riveting and positioning of the socket 1 to the mounting clip 2

as well as the forming and shaping of the latter may be pre-planned and accomplished on high-production tools and dies, one of the important features of the invention is that these operations may be easily performed with hand tools on the site of the installation and to suit the particular requirements of each job. In this regard, it is contemplated that the hollow rivet or fastener 3 be of the type which may be driven or formed after the desired positioning of the mounting clip 2 is determined, by means of a pair of long-nosed pliers, or by inserting a buck inside the socket and driving the protruding head of the fastener down with a hammer to form a positive connection between the two elements.

As thus shown and described, the present invention exemplifies a novel form of electrical fixture including a simple and flexible means for mounting the same comprising a generally square cross-sectioned receptacle or socket having an electrical conductor supported therefrom, and a flat pliant, elongated mounting clip having means associated with each end thereof adapted to interchangeably form an operative connection between the socket and the mounting clip to positively lock one with respect to the other in any of a plurality of angular relationships.

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

1. An electrical fixture for incandescent lamps comprising a receptacle member having a mounting hole, a locking hole in said receptacle member associated with said mounting hole, a conductor assembly supported by the receptacle member to provide electric current to a lamp carried therein, means for retaining said lamp in said receptacle, an elongated pliant mounting clip having a plurality of mounting holes adapted to be interchangeably mated with the mounting hole in said receptacle member, a fastener adapted to connect said receptacle to said mounting clip by means of said mounting holes, and tabs adjacent each of the mounting holes in said mounting clip, each of said tabs having a different angular relationship to said mounting clip and each being adapted to be bent down from the plane of said mounting clip to engage the locking hole in said receptacle member to positively lock said receptacle and said mounting clip in predetermined angular relationship when connected together with said fastener.

2. An electrical fixture for incandescent lamps comprising a receptacle member having a mounting hole, a plurality of locking holes in said receptacle member equally spaced from said mounting hole, a conductor assembly supported by the receptacle member to provide electric current to a lamp carried therein, means for retaining said lamp in said receptacle, a pliant mounting clip having a plurality of mounting holes adapted to be interchangeably mated with the mounting hole in said receptacle member, a fastener adapted to fasten said receptacle to said mounting clip by means of said mounting holes, and tabs adjacent each of the mounting holes in said mounting clip, each of said tabs having a different angular relationship to said mounting clip and each being adapted to be bent down from the plane of said mounting clip to engage one of the locking holes in said receptacle member to positively lock said receptacle and said mounting clip in pre-determined angular rela-

tionship when connected together with said fastener.

3. In combination, an electrical fixture for incandescent lamps comprising a hollow square cross-sectioned receptacle having a mounting hole in one side thereof and a plurality of locking holes equally spaced from said mounting hole and having a mounting hole in an end wall and a plurality of locking holes equally spaced from said latter mounting hole, a conductor assembly supported by the receptacle member to provide electric current to a lamp carried therein, means for retaining said lamp in said receptacle, an elongated, pliant mounting clip having a plurality of mounting holes adapted to interchangeably mate with the mounting holes in said receptacle, a fastener for connecting said receptacle to said mounting clip by means of one of the mounting holes in said receptacle and one of the mounting holes in said mounting clip and tabs adjacent each of the mounting holes in said mounting clip disposed at different angles to said mounting clip adapted to be bent down from the plane of the mounting clip to engage the locking holes in said receptacle and positively lock said receptacle and said mounting clip in pre-selected angular relationship when connected together with said fastener.

4. An electrical fixture for incandescent lamps comprising an open-ended receptacle having an end wall and integral side wall surfaces, with said side wall surfaces having a mounting hole, a plurality of locking holes provided at the intersection of said side wall surfaces with said end wall, an elongated, pliant mounting clip having a plurality of mounting holes adapted to mate interchangeably with the mounting hole in said receptacle, a fastener for connecting said receptacle to said mounting clip by means of the mounting hole in said receptacle and one of the mounting holes in said mounting clip, integral tabs provided on said mounting clip adjacent each of the mounting holes therein, each of said tabs having a different angular relationship to said mounting clip and each adapted to be bent from the plane of said mounting clip to engage one of the locking holes in said receptacle positively to lock said receptacle and said

mounting clip in pre-determined angular relationship when connected together with said fastener, means for retaining a lamp in said socket, and a conductor assembly supported by said socket to provide electric current to said lamp.

5. An electrical fixture for incandescent lamps including a receptacle comprising a single piece, square cross-sectioned, socket having an open end adapted to receive and support a lamp, a closed end formed of integral portions of said socket inwardly bent to meet in a plane transverse to the axis of the socket, a mounting hole in a side of said socket and a plurality of locking holes equally spaced therefrom, a locking hole provided at the intersection of each of the longitudinal edges of the socket and the edges of said closed end, a mounting hole in said closed end, an elongated, pliant mounting clip having a plurality of mounting holes adapted to interchangeably mate with the mounting holes in said receptacle, a fastener for connecting said socket to said mounting clip by means of one of the mounting holes in said socket and one of the mounting holes in said mounting clip, integral tabs formed on said mounting clip adjacent each of the mounting holes in said mounting clip disposed at different angles to said mounting clip adapted to be bent from the plane of the mounting clip to engage locking holes in said socket and positively lock said receptacle and said mounting clip in pre-selected angular relationship when connected together with said fastener, means for retaining a lamp in said socket, and a conductor assembly supported by said socket to provide electric current to said lamp.

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