April 14, 1942. G. F. CRAM 2,279,915

SOCKET DEVICE FOR LAMPS AND THE LIKE

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Fig. 1.

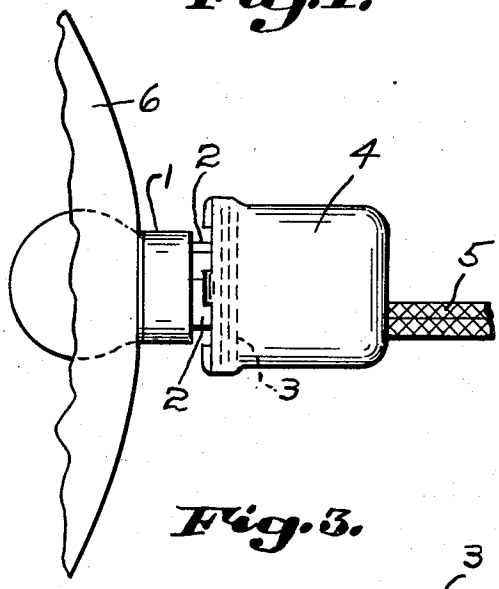


Fig. 2.

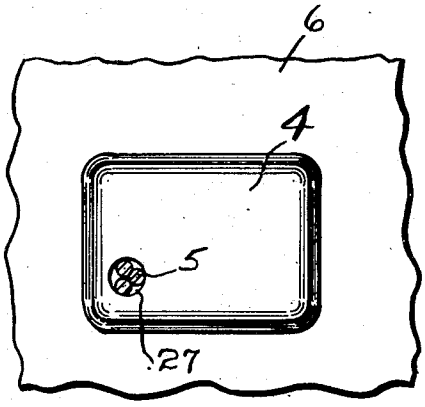


Fig. 3.

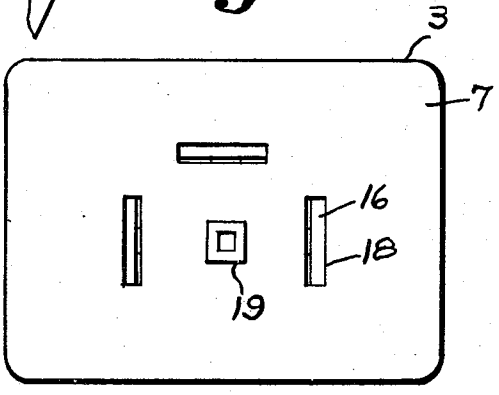


Fig. 4.

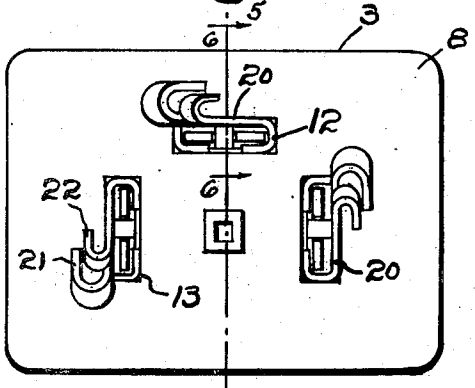


Fig. 5.

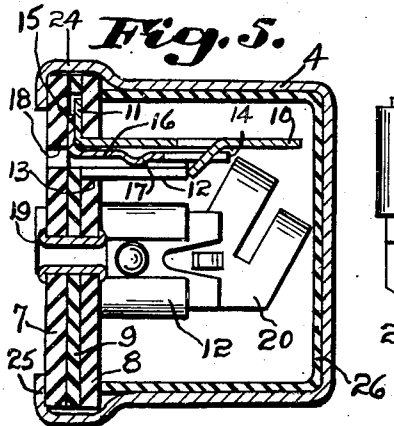


Fig. 7.

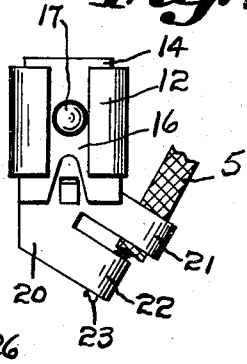


Fig. 8.

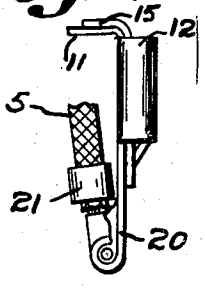


Fig. 9.

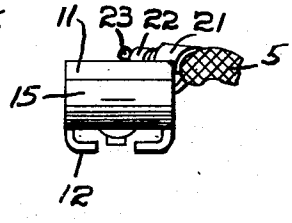
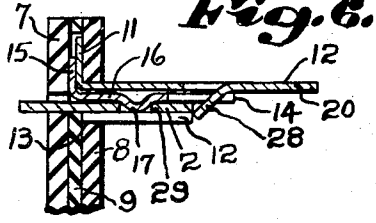


Fig. 6.



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Fig. 10.

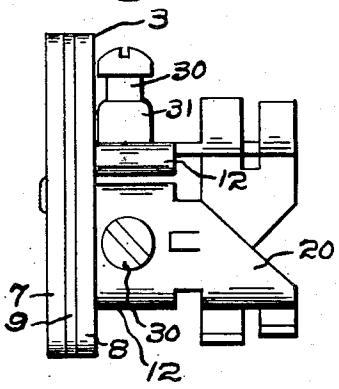


Fig. 11.

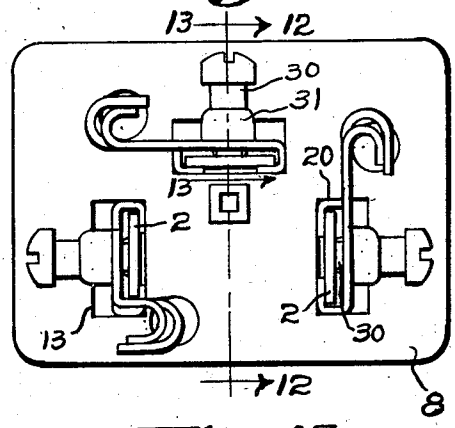


Fig. 12.

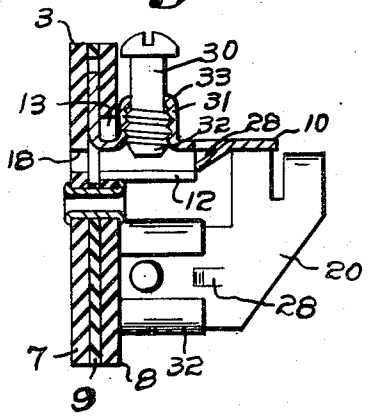


Fig. 13.

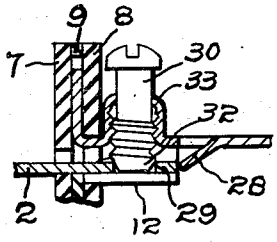


Fig. 15.

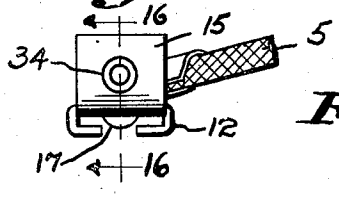


Fig. 16.

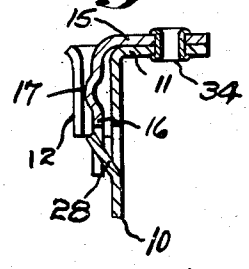
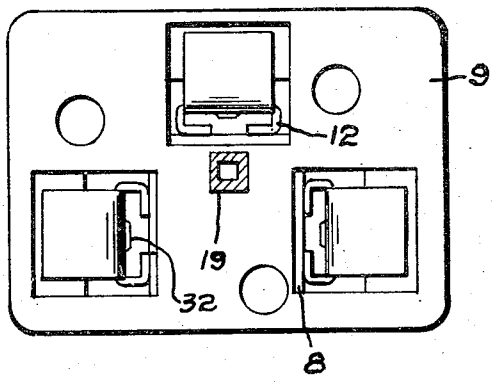


Fig. 14.



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UNITED STATES PATENT OFFICE

2,279,915

SOCKET DEVICE FOR LAMPS AND THE LIKE

George F. Cram, Detroit, Mich., assignor to United-Carr Fastener Corporation, Cambridge, Mass., a corporation of Massachusetts

Application July 19, 1939, Serial No. 285,289

1 Claim. (Cl. 173—328)

My invention aims to provide improvements in lamp sockets for reception of the prongs of a lamp or other suitable device, the socket being adapted to make electrical contact with the prongs of the device and to be interlocked therewith so that the socket contacts cannot jar from a fixed position relation to the prongs.

In the drawings, which illustrate preferred embodiments of my invention:

Fig. 1 is a side elevation of an installation including a socket, a so-called fixed focus lamp bulb, and a portion of a lamp housing reflector or the like associated with the lamp bulb;

Fig. 2 is a rear view of the structure shown in Fig. 1;

Fig. 3 is an enlarged top view of the socket member per se;

Fig. 4 is an enlarged bottom view of the socket member per se;

Fig. 5 is a section taken along the line 5—5 of Fig. 4;

Fig. 6 is a section of the portion of the socket taken on the line 6—6 of Fig. 4 showing a prong interlocked with the contact member of the socket;

Fig. 7 is a side view of one form of my improved contact member;

Fig. 8 is an edge view of the contact member shown in Fig. 7;

Fig. 9 is a plan view of the contact member shown in Fig. 7;

Fig. 10 is a side elevation of a second form of socket for use in the same type of installation shown in Fig. 1;

Fig. 11 is a bottom view of the socket shown in Fig. 10;

Fig. 12 is a section taken on the line 12—12 of Fig. 11;

Fig. 13 is a section taken on the line 13—13 of Fig. 11 showing a prong interlocked with the contact member of the socket;

Fig. 14 is a plan view of the socket with the top insulating plates removed;

Fig. 15 is a plan view of one of the socket contacts which may be used as a unit without the insulated base; and

Fig. 16 is a transverse sectional view of the socket unit shown in Fig. 15.

My invention relates particularly to a so-called fixed focus head lamp structure and especially to socket members for use therewith primarily adapted for reception of the flat prongs of a so-called fixed focus head lamp. The head lamp in my preferred installation is rigidly fixed and the head lamp and socket are so constructed that the parts cooperate to hold the socket in substantially fixed relation to the head lamp so that it cannot accidentally move out of position relative to the head lamp. It is understood that although in my preferred form the lamp is rigid and the socket movable, a reversal of the relation of the parts could be effected by simple modification.

In order to understood my invention, I have shown only that much of the installation as I believe would be necessary for anyone skilled in the art to understand the construction and utility of my improved sockets. Therefore, in Fig. 1 I have shown a fixed focus head lamp 1 having three flat prong members 2 extending therefrom into engagement with the socket 3. The head lamp 1 may be supported in any suitable manner. The socket 3 preferably has a shielding cover 4 assembled therewith to protect the contacts of the socket, and lead wires 5 pass out from the shield through an aperture at the rear end thereof. The head lamp bulb 1 may be formed as an integral part of the reflector 6 (Fig. 1), or the reflector may be a separate member and the lamp assembled therewith in any suitable manner.

Referring first to the particular socket shown in Figs. 1–9 inclusive, there are provided three insulating plates which include a top plate 7, a bottom plate 8, and an intermediate spacing plate 9, as most clearly shown in Fig. 5. The socket is provided with three contact members 10 having plate-engaging portions 11 located between the top and bottom plates 7 and 8 of the socket and box-like prong-receiving portions 12 extending from the portions 10 through apertures 13 in the bottom plate 8, as best shown in Fig. 5. The contact members also include loosely mounted spring finger elements 14, each of which is provided with a flange portion 15 in superposed relation to the plate-engaging portion 11 between the plates 7 and 8. A spring portion 16 extends from the flange portion 15 into the prong-receiving portions 12 and is provided with a boss 17 for a purpose which will be hereinafter more fully described. The top plate 7 has apertures 18 in alignment with the prong-receiving portions 12 so that the prongs 2 of the lamp may pass through and engage with the prong-receiving portion and the spring finger elements 14. The entire socket assembly is assembled together by one or more rivets 19. The intermediate plate 9 is preferably of such thickness that the contact members are held in position by the top plate 7 and the bottom plate 8 and yet there is permitted a slight amount of movement of the contact members relative to the insulating plates, even of the spring fingers 14 relative to the portions 11 and 12 of the contact members.

Referring now more specifically to the construction of the particular contact member illustrated in Figs. 1–9 inclusive, and generally shown by Figs. 7, 8 and 9, there is also provided a terminal portion 20 extending beyond the prong-receiving portion 12. This terminal por-

tion 20 may be of any suitable shape, but I have preferred to have it extend at an angle from the general axis of the contact portion and be divided into two wire-receiving portions with the ends curled so that one portion 21 may be grasped tightly around the covered wire 5 and the other portion 22 may be grasped tightly around the bare wire 23. The bare wire may be soldered, welded, or otherwise securely attached to the portion 22. The reason for offsetting the portions 21 and 22 is to permit dip soldering and yet prevent solder from flowing down into the prong-receiving portion of the contact member and interfering with the operation thereof. The prong-receiving portion 12 of the contact member is preferably of double U shape connected at one side, as shown in Figs. 7 and 9.

The shield 4 is in the form of a metallic case of generally rectangular cup-shaped formation having a flared end 24 for receiving the insulating plates and ears 25 adjacent the flared end bent over against the top plate 7 (Fig. 5) to hold it in place. Within the shield there is provided a lining 26 of insulating material (Fig. 5) to prevent short-circuiting of the contact members. In the bottom of the shield 4 and the lining 26 I have provided an aperture 27 (Fig. 2) through which the lead wires 5 are adapted to pass. Thus I have provided an effective shield which not only protects the contact members, but also serves to prevent a short-circuit with the body of an automobile if the socket is removed from the lamp while the current is on and dropped against a part of the automobile.

When the prongs 2 of the lamp bulb are entered into engagement with the contact members through the apertures 18 in the top plate 7 and the socket is pressed toward the lamp as far as possible, the ends of the prongs come into contact with stop members 28 bent out of the material of the contact member 10, as best shown in Figs. 5 and 6. As the prongs 2 pass into the prong-receiving portions 12, they engage the spring fingers 16 and pass by the bosses 17 in a tight sliding contact and at the same time the ends of the prongs 2 engage the stops 28, the boss portions 17 snap into apertures 29 which are provided in the prongs 2, as shown in Fig. 6. Thus the prong members are interlocked with the contact members and are held tightly against accidental withdrawal. Furthermore, the spring fingers press the prongs tightly against the prong-receiving portions 12 so that there is a good electrical contact made directly with a portion of the contact member which is integral with the part to which the conducting wire is secured. Thus the spring finger 14 is not provided for the purpose of making electrical contact, but it preferably serves the useful purpose of pressing the contact members and the prong members into firm electrical engagement, as well as to hold the socket and the lamp in a predetermined fixed position relative to each other.

Referring now to the socket member shown in Figs. 10–14 inclusive, I have provided a device which is of the same general construction as that of my preferred construction described above. Therefore, the same numerals will be used on like parts.

The main difference lies in the means for making the connections between the prongs of the lamp and the contact members of the socket. In this instance the floating spring elements are omitted and a positive locking means substituted.

The locking means of my second form of socket comprises a screw 30 threaded into a hollow internally threaded boss 31 pressed from each contact member, as most clearly shown in Figs. 12 and 13. When the screws are loosened (Fig. 12) the prongs 2 of the lamp 1 may be inserted until they abut against the stops 28. The apertures 29 of the prongs 2 are then in alignment with the free ends 32 of the screws 30 (Fig. 13). The ends 32 are beveled with the result that when the screws are tightened, the ends enter the apertures 29 and press the prongs into tight electrical engagement with the contact members. The friction effected between the screw and prong serves to lock the lamp and socket tightly in fixed relation. The boss 31 may have an inwardly turned annular flange 33 at its outermost end disposed above the screw threads of the screw 30 and serving to prevent complete separation of the screw from the socket.

In Figs. 15 and 16 there is illustrated the use of one of the socket contacts as a separate unit without the insulating plates. The contacts may be used as units as the primary function of the insulating plates, where a cover is not used, is to hold a series of contact members in position for quick assembly with the lamp prongs. Thus, although the contacts may be engaged more quickly with the lamp prongs when assembled with insulating plates, nevertheless, if desired, they may be separately attached to the lamp prongs. The contact members which I have chosen to illustrate in Figs. 15 and 16 are similar in form to the contact members in connection with my first form of socket member shown in Figs. 1–9 inclusive. The difference lies in the fact that the spring member 16 is held in place through means of a rivet 34 which passes through the flange 15 of the spring member and the portion 11 of the contact member. Although I have preferred to assemble the parts together by means of a rivet, it is understood that the result could also be effected by other means such as spot-welding.

While I have illustrated and described preferred embodiments of my invention, I do not wish to be limited thereby because my invention is best defined by the following claim.

I claim:

A socket contact of the class described including a part formed from sheet metal having a support-engaging portion, a rectangular box-like portion extending from said support-engaging portion in angular relation and being open at the end nearest the support-engaging portion to permit entrance of a flat prong, and a second part having a flange portion in superposed abutting relation to said support-engaging portion and a finger portion integral with said flange portion and extending in angular relation thereto, said support-engaging portion and said flange portion being adapted to be disposed between superposed insulating plates thereby to secure said contact to said plates, said finger portion being located in the box-like portion to cooperate with the box-like portion to make a good electrical contact between the socket contact and the said flat prong.

GEORGE F. CRAM.