Feb. 7, 1928. 1,658,237

C. E. GODLEY

AUXILIARY SOCKET CONNECTION

Filed Feb. 28, 1925

Fig. 1

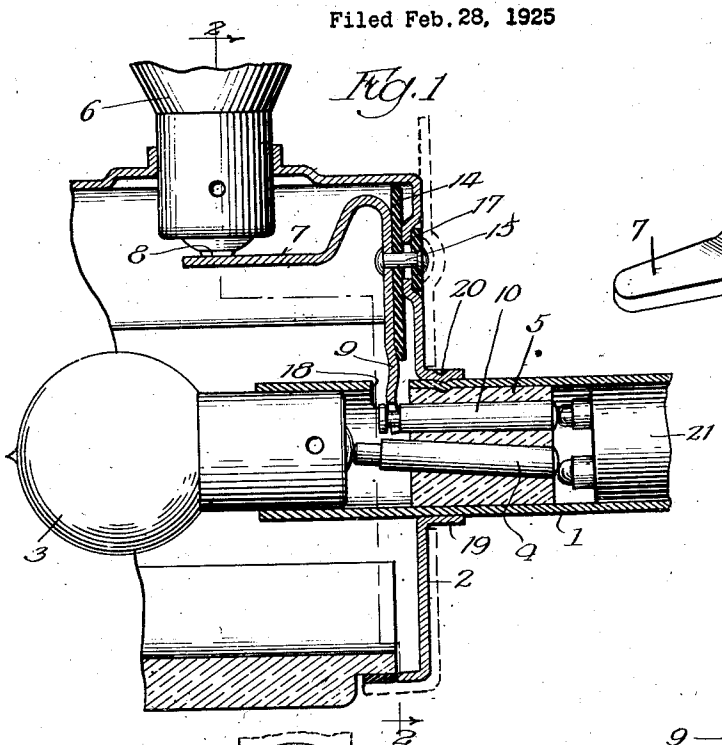


Fig. 3

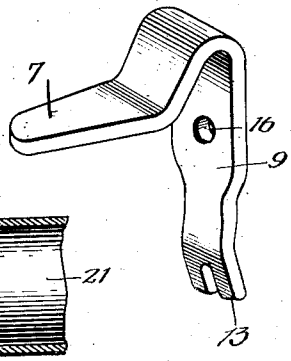


Fig. 2

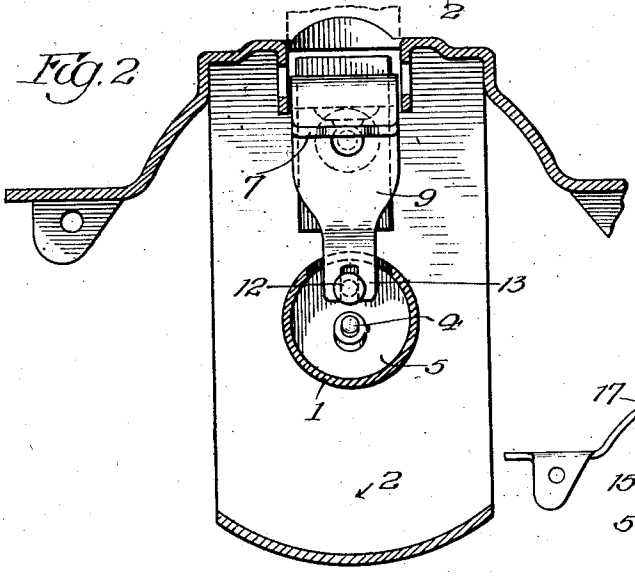


Fig. 4

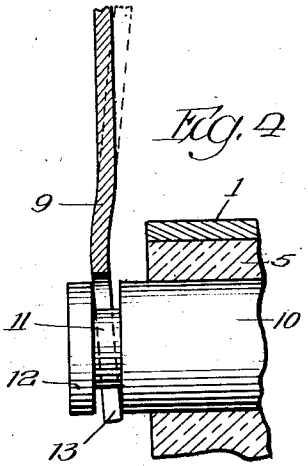
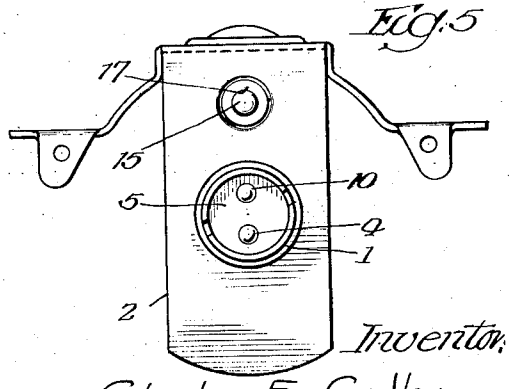


Fig. 5



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UNITED STATES PATENT OFFICE.

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AUXILIARY SOCKET CONNECTION.

Application filed February 28, 1925. Serial No. 12,383.

My invention relates to means for affording a circuit connection from a wire terminal of a lamp socket or the like, and in one of its general aspects aims to provide a simple arrangement of parts whereby a permanently effective connection of ample carrying capacity can readily be made without depending upon screws, nuts, solder or the like for connecting these parts to each other; also for affording such connections to parts of such a relatively small size as would not readily permit the effective use of threaded fastening elements.

In providing circuit conductors for combination lamps of the automobile type, considerable difficulty has been encountered in the securing of the desired carrying capacity and firmness of connections made to parts of sockets or connectors without either employing solder or else requiring an unusually high degree of skill and accuracy on the part of those who do the assembling. Moreover, since the sockets or connector used in automobile lamps are commonly made in factories other than those making the lamps in connection with which they are to be used, it is desirable to have such sockets or connectors reach the lamp factories in completely assembled form. It is also desirable that the needed auxiliary circuit connections should be so constructed that they can be made to such sockets or connectors by comparatively inexperienced helpers in the lamp factories.

My present invention provides a socket and connection arrangement meeting these requirements, although I do not wish to be limited to its employment in connection with automobile lamps, as it might obviously be utilized for numerous other purposes.

In some of its more particular aspects, my invention provides a circuit connection for a wire terminal, in which the connection is made by so tilting the connecting member with respect to the wire terminal as to cramp a portion of this connection between suitably formed parts of the wire terminal, and in which the connecting member has resiliency permitting it to be tilted in this manner by the mere fastening of the connecting member to a suitable support. It also provides a desirable arrangement for this purpose in which a forked end of a connecting member straddles a suitably formed part of the wire terminal, and in which this straddling prevents movement of the connecting member in various directions, thereby permitting a single fastening element to be employed both for securing the connecting member in proper position and for preventing this member from moving into contact with other metallic parts. Furthermore, my invention provides a connection of this kind which can be advantageously employed in a simple and inexpensive single-piece form for making a direct circuit connection from a wire terminal member of a socket to a lamp bulb spaced from the socket. Still further and also more detailed objects will appear from the following specification and from the accompanying drawings, in which

Fig. 1 is a section through a portion of a combination lamp for automobile use, showing the employment of my invention for making a direct connection from an auxiliary wire terminal of a lamp socket to a lamp supported by means other than the said socket.

Fig. 2 is a fragmentary front elevation of the support for both lamps and for the auxiliary circuit connection, taken from the left-hand side of Fig. 1.

Fig. 3 is an enlarged perspective view of the connecting member employed in the arrangement of Figs. 1 and 2.

Fig. 4 is an enlarged side elevation of the forked end of the connecting member of Fig. 3, with dotted lines showing the initial position of the main part of this member when initially disposed in operative relation to a portion of a circuit terminal, and with full lines showing the position to which this part is flexed when it is secured to a suitably disposed support.

Fig. 5 is a rear elevation of the lamp part illustrated in Fig. 2, drawn on a smaller scale.

In the drawings, I am showing my invention as applied to an automobile lamp of the general type disclosed in my copending application No. 719,916, filed June 13, 1924, on a combination tail lamp. In lamps of this class, it is customary to ground one side of the lighting circuit to the frame of the lamp so as to make a grounded connection to the metal shells of the lamp bases, thereby requiring the separate circuit connections to be made only to the base terminals of the

lamp bulbs. In a two-bulb lamp, it is desirable also to make both of the controlled circuit connections from a single socket which extends through the back of the lamp casing and which has one of the lamp bulbs supported by its forward end. This can be done advantageously by initially assembling both of the lamp sockets, together with an interposed circuit connecting member, on a supporting member which is mounted in the lamp casing and which also forms a partition within the lamp casing between the two lamp bulbs.

For this purpose, Fig. 1 shows a lamp socket having a shell 1 projecting through the back 2 of the supporting bracket and holding the lower lamp bulb 3, the controlled circuit connection being made to the base terminal of this lower lamp bulb by the plunger of a circuit terminal 4 which extends through an insulating core 5 and which terminal has its rear end disposed for engaging one terminal of a two-wire attaching plug 21 interlocked with the rear end of the socket shell 1 after the usual manner.

To provide a circuit connection to the base terminal of the upper lamp bulb 6, I employ a connecting member formed of resilient metal and having one arm 7 engaging the base terminal 8 of the upper lamp bulb while its other arm 9 is disposed in good conducting relation to a second circuit terminal 10 which also extends through the insulating core 5 and which has its rear end disposed for engagement with the other terminal of the two-wire attaching plug. This can readily be accomplished in connection with lamp bulbs having an axial base terminal by disposing the plunger-carrying circuit terminal 4 at an angle to the axis of the core 5 and the socket shell, so that its rear end will be at one side of the said axis, or below this axis as shown in Fig. 1.

Owing to the small dimensions in which the bases of the lamp bulbs employed for this class of lighting are commonly constructed and the corresponding small dimensions of the socket shells with which such lamp bulbs and the corresponding attaching plugs are interlocked, the spacing available for the companion or auxiliary circuit terminal 10 is quite limited. Consequently, the diameter in which such a terminal 10 can be constructed while insuring its adequate insulation both from the tilted circuit terminal 4 and the metal socket shell is quite small. Owing to this fact, the use of clamping screws or the like for securing the connecting member to such an auxiliary circuit terminal is not feasible. So also, since the assembled sockets are desirably furnished in a completely assembled form to the lamp manufacturers, in which the socket shell interferes with ready access to interior parts, a soldering of the connecting member to the auxiliary circuit terminal cannot conveniently be accomplished.

To avoid these objections to the use of binding screws, or to a dependence on soldering for making an adequate connection between the auxiliary circuit terminal and the connecting member, I form these members so as to provide interengaging parts which are held in operative position by the mere attaching of the socket and the connecting member to a common support, and so as to have the interengaging parts held in firm engagement by a flexing and cramping of one arm of the connecting member. For this purpose, I provide the forward end of the auxiliary circuit terminal 10 with a pair of shoulder formations. These shoulders are shown as formed by turning a groove near the forward end of the member 10 so as to provide a reduced shank portion 11 extending between the larger diametered head 12 of this member and the correspondingly larger diametered main part of the same member 10. Then I form the free end of the arm 9 of a thickness somewhat smaller than the width of the said groove, so that this end can readily be slid into the groove. I also preferably notch the said free end so that it will constitute a fork adapted to straddle the contracted shank 11, thereby disposing the tines 13 of the fork respectively at opposite sides of the axis of the shank 11.

I also secure the entire connecting member and the socket shell 1 to their support in such relative positions that the fastening of these lamp parts to their supports will flex the arm 9 so as to tilt its forked end oblique to the axis of the auxiliary circuit terminal 10, thereby causing longitudinally spaced portions of each tine of the fork to bear respectively against the opposite walls of the said groove.

As a simple method of accomplishing this while also suitably insulating the conducting member from the lamp body, I dispose an insulating plate 14 between the upper portion of the arm 9 and the back 2 of the supporting member and fasten this arm to the said back by a rivet 15 which extends slidably through a perforation 16 in the arm 9 and which also extends through a relatively larger bore in the back 2 of the said support. By having this rivet extend slidably through an insulating washer 17 seated in a correspondingly shaped circular depression in the back of the support, I cause this washer to center the rivet with respect to the said aperture in the back of the support, thereby maintaining the rivet in a predetermined position with respect to the back, but out of contact with the latter.

Before placing this rivet in position, I slip the forked end of the arm 9 into the

interior of the socket shell and into straddling engagement with the shank 11 of the auxiliary circuit terminal, for which purpose the socket shell is provided with an aperture 18 of considerably larger dimensions than the lower end portion of the arm 9. This is done while the socket shell 1 extends loosely through a collar 19 formed on the back of the support, which collar slidably fits the socket shell. While the parts are thus being assembled and while the rivet 15 is being attached, this socket shell is unattached to the said support, so that it can be disposed in a position in which the natural shape of the connecting member will loosely fit the groove in the auxiliary circuit terminal 10.

After the riveting has been accomplished, I slide the socket longitudinally, so as to flex the arm 9 into a position in which this forked end is tilted out of its former position with respect to the main part of the arm 9, thereby cramping the said forked end in the said groove and causing each tine of the fork to engage one of the two walls of the groove (or the shoulder members on this auxiliary circuit terminal) at points respectively above and below the axis of that member. Thus, in Fig. 4, the relative movement is shown as moving the arm 9 from the position shown in dotted lines, or a position in which the forked end was loosely slipped into the socket shell and over the shank 11, to a position in which this arm 9 is flexed so as to effect the said engagement of the tines with the shoulder formations on the conducting member, the latter position being shown in full lines in Fig. 4. After the entire socket has been slid to a position in which it effects this flexing, it is rigidly secured to the support in any suitable manner, as for example by punching an indentation 20 in the collar 19 to such a depth as to indent the socket shell also.

With the various parts thus secured in position, it will be evident from the drawings that the single rivet 15 holds a connecting member in operative position, that the said cramping effect insures a firm engagement between the conducting member and the terminal 10 at a number of points. As the result, I secure good carrying capacity without requiring any soldering; and by utilizing the resiliency of one member for maintaining this firm interengaging, I avoid such troubles as frequently occur where dependence is placed on wire-binding screws. At the same time, the straddling of the shank 11 by the fork of the connecting member prevents the latter from rotating about the rivet 15, so that this single fastening element suffices to hold the connecting member in operative position with respect to both the socket and the upper lamp bulb.

Since both the attaching of the rivet and the securing of the socket shell to the support can easily be effected by the ordinary factory helpers employed by lamp manufacturers, the sockets can be furnished in completely assembled form from factories better equipped for making them.

However, while I have illustrated and described my invention in connection with a lamp in which two lamp bulbs are supported by a bracket formed separately from the body of the lamp, I do not wish to be limited to this particular use of my invention. Neither do I wish to be limited to the various details of construction and arrangement above disclosed, since many modifications might obviously be made without departing either from the spirit of my invention or from the appended claims.

I claim as my invention:—

1. A circuit connection for electric sockets having a circuit terminal member provided with a peripheral groove comprising a resilient metal member having a forked end disposed with its arms in the said groove at respectively opposite sides of the axis of the grooved portion of the wire terminal member, said forked end being disposed at an angle to a line drawn at right angles through the axis of the terminal member, and means engaging a part of the resilient member spaced from the said forked end for flexing the resilient member to cause each of the said arms to engage opposite walls of the said groove.

2. A circuit connection for electric sockets having a circuit terminal member provided with a peripheral groove comprising a resilient metal member having a forked end disposed with its arms in the said groove at respectively opposite sides of the axis of the grooved portion of the wire terminal member, said forked end being disposed at an angle to a line drawn at right angles through the axis of the terminal member, means engaging a part of the resilient member spaced from the said forked end for flexing the resilient member to cause each of the said arms to engage opposite walls of the said groove, and means associated with the resilient member for preventing a withdrawal of the forked end thereof from its said disposition.

3. A circuit connection for an electric socket having an insulator mounted in a shell provided beyond one end of the insulator with a lateral perforation, and having a conducting member extending through the insulator and presenting two relatively spaced shoulder formations opposite the said perforation, comprising an auxiliary conductor extending through the said perforation into the shell and presenting a portion between the said shoulder formations of the conducting member, said portion being disposed at an angle to the main portion of the auxiliary conductor, and means outside the shell for

tilting the said auxiliary conductor so as to force the said portion thereof into cramping engagement with the said shoulder formations.

4. A circuit connection for a lamp-socket of the single-pole type having a circuit terminal member engaging the base of a lamp bulb mounted in the socket, and a second circuit terminal member mounted in the socket and having a part thereof provided with a peripheral groove, comprising a resilient metal member extending into the socket transversely of the axis of the second wire terminal member and having a forked portion disposed with the arms of the fork extending through the said groove respectively at opposite sides of the axis of the said part, said forked portion being disposed at an angle to said resilient member, and means associated with the resilient member for forcibly tilting the same with respect to the said second circuit terminal member so as to cause each arm of the fork to engage both walls of the said groove.

5. A device set forth in claim 1, in which the means for securing the resilient member to the support comprise a single fastening element extending through the resilient member intermediate of its ends, and in which the engagement of the said forked end with the contracted shank portion of the circuit terminal serves to prevent rotation of the resilient member about the said fastening element.

6. A circuit connection for electric sockets having a circuit terminal member provided with a peripheral groove, comprising a substantially right-angled member having one end thereof forked to provide a pair of arms adapted to engage within the groove of said terminal member upon opposite sides of its longitudinal axis, and means associated with said connection whereby to flex the same and cause each of the arms of the forked end to contact with the opposite walls of said groove.

7. A circuit connection for electric sockets having a circuit terminal member provided with a peripheral groove, comprising a member having one end thereof forked to provide a pair of arms adapted to engage within said groove upon opposite sides of its longitudinal axis, said member being crimped adjacent the forked end whereby said end is disposed at an angle to the body of said member and means associated with said member whereby to flex the same and cause each of the arms of the forked end to contact with the opposite walls of said groove.

8. A circuit connection for lighting systems comprising a circuit terminal for a lamp bulb having socketing means for holding the same, a second circuit terminal spaced from the first named terminal and having a shank portion disposed between two shoulders, a support holding the said circuit terminals in rigidly spaced disposition, and a connecting member formed of resilient metal and secured to the support intermediate its ends and having one end disposed to engage the contact of a lamp bulb, the connecting member having at its other end a fork straddling the shank portion of the second named terminal, said fork being disposed at an angle to the main portion of the connecting member and being of less thickness than the distance between the said shoulders, the shape of the connecting member and the position of the said shank portion with respect to the said securing of the connecting member to the support being such as to flex the part of the said member between the said securing portion and the forked end, thereby forcing two longitudinally spaced portions of each tine of the forked end respectively against the said two shoulders.

9. A circuit connection for electric sockets, said connection comprising a circuit terminal member provided with spaced confronting shoulders, a conducting member bent at substantially right angles having one end thereof formed to engage the contact of a lamp bulb and its opposite end forked to provide a pair of arms, said forked end being crimped and disposed at an angle to the axis of the terminal member and engaged on its opposite faces by the confronting faces of the shoulders of said terminal member, and means intermediate the ends of said conducting member whereby to secure the same in position upon a support.

Signed at Detroit, Michigan, February 20th, 1925.

CHARLES E. GODLEY.