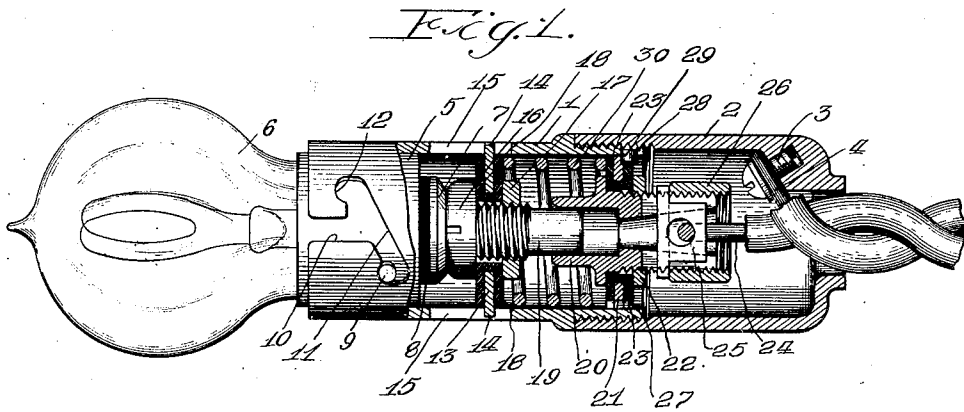
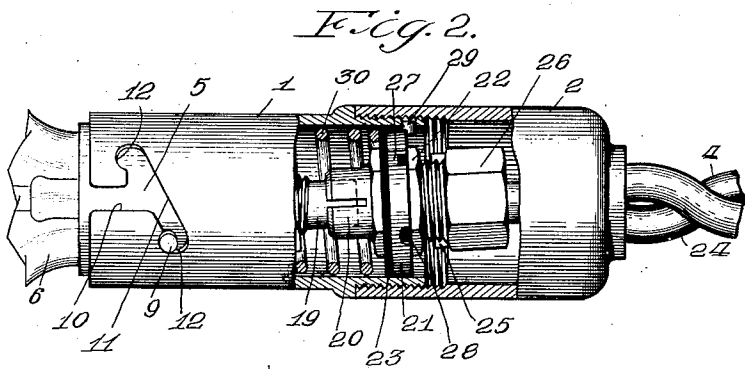
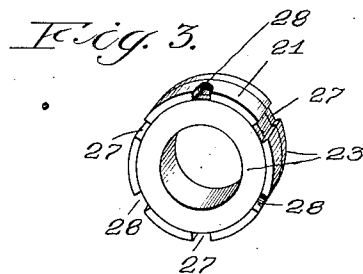


G. C. KNAUFF.
ELECTRIC SOCKET AND CONNECTOR.
APPLICATION FILED FEB. 21, 1913.

1,101,289.

Patented June 23, 1914.

3 SHEETS-SHEET 1.



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3 SHEETS—SHEET 2.

Fig. 4.

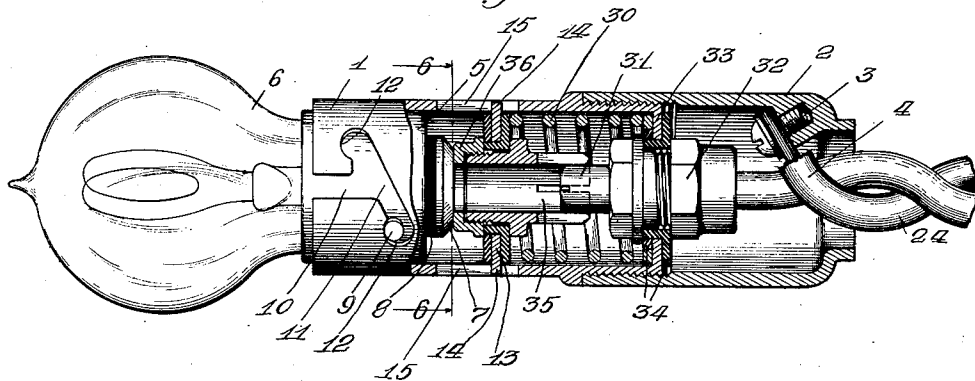


Fig. 5.

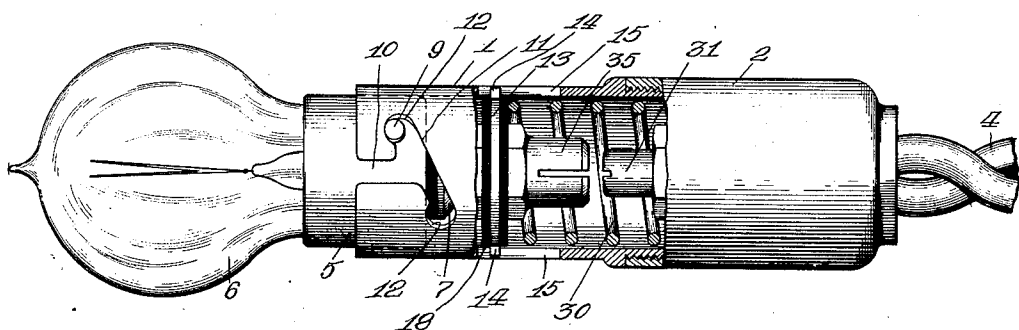
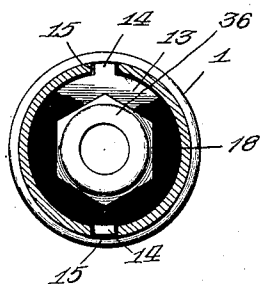


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 7.

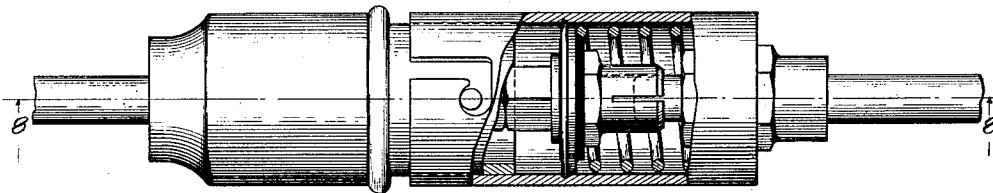


Fig. 8.

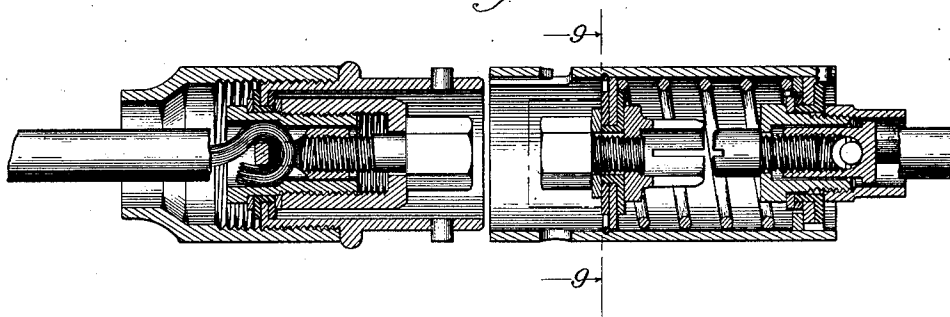


Fig. 9.

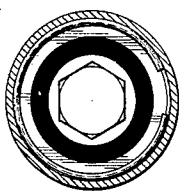
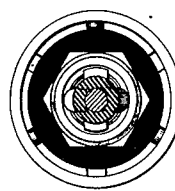


Fig. 10.



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UNITED STATES PATENT OFFICE.

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ELECTRIC SOCKET AND CONNECTOR.

1,101,289.

Specification of Letters Patent.

Patented June 23, 1914.

Application filed February 21, 1913. Serial No. 749,794.

To all whom it may concern:

Be it known that I, GEORGE C. KNAUFF, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric Sockets and Connectors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to sockets as used in connection with electric lamps and with wire terminal plugs, and more particularly to the class of lamp sockets and wire connector sockets used on the lighting circuits of automobiles.

One object of my invention is to provide a simple, metallically housed socket having few and cheaply made insulating parts and adapted to disconnect at least one terminal of the socket from the circuit when the lamp or separable plug is removed therefrom; and also adapted to open or close the circuit upon partially rotating the said lamp or plug without detaching the same from the socket.

Other objects are to provide means for automatically alining the circuit closing parts of the socket into proper contacting relation; to provide ready access to the terminals of the socket to enable an easy and firm fastening of the wire or wires to the same; and to provide for manually detaching the member carrying one of the wire terminals of the socket to facilitate the wiring.

Further objects will appear from the following specification and from the accompanying drawings, in which:

Figure —1— is a view, partly in section, of a socket embodying my invention and of a lamp attached thereto. Fig. —2— is a fragmentary view of the same lamp and socket with the circuit-closing members tilted out of axial alinement with the casing of the socket. Fig. —3— is a perspective view of the manually detachable member carrying the centrally disposed wire terminal. Fig. —4— shows a lamp fitted to a socket having an alternative embodiment of my invention. Fig. —5— shows the same socket with the lamp rotated to the circuit-opening position. Fig. —6— is a transverse section through the socket of Fig. —4— along the line 6—6. Fig. —7— is a view,

partly in section, of a connector socket and plug therefor embodying my invention. Fig. —8— is a longitudinal section through the two manually separable portions of the socket and plug of Fig. —7— when detached from each other. Fig. —9— is a transverse section through Fig. —8— along the line 9—9. Fig. —10— is an end view of the right hand portion of Fig. —8—.

In the embodiment shown in Fig. —1—, the device of my invention consists of a metal casing 1 having a cap 2 threaded upon one end thereof and having a terminal 3 for the wire 4 mounted upon the said cap, the uncapped end of the casing 1 having inter-fitting engagement with the base of a lamp 6. The lamp 6 has one terminal of its filament electrically connected to the outer brass shell 5 of the lamp base, and its other terminal connected to an endwardly disposed contact button 7 central with respect to the axis of the lamp and insulated from the shell by an insulating body 8. Projecting from the shell 5 of the lamp base at diametrically opposite points are anchoring pins or projections 9 adapted to enter longitudinal slots 10 oppositely disposed in the casing 1. Each of these slots 10 leads from the open end of the casing to a transverse slot 11 extending part way around the periphery of the cylindrical casing, the said slot 11 having at each end an enlarged portion or pocket 12, the said enlargements 12 being directed toward the open end of the casing. The transverse slot 11 connecting these pockets is disposed at less than a right angle to the longitudinal slot 10, whereby the pockets 12 at opposite ends of the said slot 10 are located at unequal distances from the end of the casing 1. Consequently, the lamp base will enter the casing at different distances, according as the pins 9 are interlocked with one or the other pair of said pockets 12.

Slidably mounted within the casing 1 is a metal disk 13 having oppositely disposed prongs 14 projecting beyond the bore of the casing into longitudinal slots 15 formed in the diametrically opposite walls of the said casing. The said disk 13 has a contact button 16 mounted upon it, the said contact being secured to the said disk by a nut 17, there being insulating members 18 interposed between the disk 13 and the said contact button and nut. The contact 16 has its in-

wardly directed end reduced in size to form the male member 19 of a pair of slidably interfitting contacts 19 and 20, the latter of which is likewise secured to a metal disk 21 by a locking nut 22, there being insulating members 23 interposed between the said washers and the two members mounted thereon. At the end opposite that forming the female companion to the contact 19, the contact member 20 has a terminal for another wire 24, this terminal consisting preferably of a wire-receiving member 25 adapted to be drawn toward the body of the member 20 by a threaded sleeve 26 mounted upon the rearward end of the member 20. In its preferred form, this wire terminal or fastening is of the type covered by, and more specifically described in, my copending application of even date herewith, Serial Number 749,793, filed February 21, 1913. The disk 21 and the insulating members 23 disposed upon opposite sides and interiorly thereof are all provided peripherally with a series of notches disposed parallel to the axis of the said members, and with a plurality of similarly disposed notches 28 extending only partially across the width of the said washers and insulating members, as shown in Fig. —3—. When the terminal member having these aligned slots and notches is in its normal position, as shown in Figs. —1— and —2—, the notches 28 are in alinement with inwardly directed projections 29 upon the casing 1 of the socket, which projections act as stops to prevent the said terminal-carrying member of the device from being forced longitudinally out of the socket casing by a compression spring 30 interposed between the said member and the member carrying the other one of the interfitting contacts of the socket. By making the notches 28 of a greater depth longitudinally of the socket than one-half the diameter of the retaining pins 29, the terminal-carrying member of the socket may rock upon one or more of the said pins or stops and tilt out of axial alinement with the socket while still permitting the said pins and notches to prevent the said member from rotating with respect to the socket casing. Consequently, the slidably interfitting male and female contacts 19 and 20, which serve to close the circuit of the socket when moved into engagement with each other, are free to tilt out of axial alinement with the socket in case any irregularities in the design or construction of the contacting parts should tend to throw one or the other of the said members out of axial alinement with the socket, it being obvious that the engagement between the prongs or projections 14 upon the slidably mounted switching member of the socket and the slots 15 of the casing will permit this slidably mounted member to tilt relative to the casing with which it is nor-

mally held in substantially axial alinement by the spring 30.

While the wire-fastening terminal shown in Figs. —1— and —2— and more particularly disclosed in my copending application above-mentioned, will readily permit the fastening of the centrally connected wire from the rear of the socket casing 1, I also provide for manually detaching the entire contact and terminal-carrying member so that the wire may readily be secured to the same regardless of the type of terminal mounted thereon. To remove the said tiltable but relatively stationary member from the casing of the socket, it is manually pressed toward the lamp end of the socket, thereby compressing the spring 30 and moving the said endward member until the ends of the notches 28 clear the retaining pins or stop formations 29, whereupon the said member may be manually rotated until the said pins align with the slots 27 of the said member. Then upon releasing the manual pressure, the spring 30 will force the said sliding member out of the end of the socket, thereby permitting ready access to all portions of the same. After the wire has been secured to this member, it may readily be replaced by reversing the operation just described.

While I preferably provide for a detachable and tiltable mounting for one of the interiorly disposed circuit-closing contacts of the socket of my invention, this mounting may be rigid with respect to the socket as shown in Fig. 4, in which the contact member 31 and the wire terminal 32 connected thereto are rigidly clamped to an inward flange 33 upon the rear end of the casing 1, the said members 31 and 32 being insulated from the flange 33 by interposed contact members 34. In this case, I preferably constitute the contact member 31 as the male portion of the circuit controlling means of my socket, the corresponding female portion 35 being mounted upon the slidable member of the socket and clamped thereupon by a perforated contact button 36. By thus providing a perforation in the contact button 36 in alinement with the bore of the female contact member 35, I am enabled to insert a screw driver through the said perforation and bore for access to the slotted end of the male contacting portion 31, thereby enabling the latter to be rotated with respect to other portions of the wire terminal, such as the sleeve 32, when the wire is to be secured to the said centrally disposed wire terminal.

When the lamp is positioned with the pins 9 upon its base engaged with the more inwardly positioned pair of the pockets 12 of the transverse slot, it will be evident from Fig. —4— that the circuit to the lamp will be closed through the contacting interfitting of the members 31 and 35. Upon rotating

the lamp so that the retaining formations 9 upon its base interengage with the more endwardly positioned pair of the coacting formations 12, as in Fig. —5, the spring 30 will move the slidable conducting member of the socket out of contacting or circuit closing relation with the contact terminal member of the socket, thereby opening the circuit. Consequently, the lamp may readily be lighted or extinguished by partially rotating it with respect to the socket without removing the lamp from the latter and without the use of any additional switching mechanism.

When the device of my invention is used upon the socket portion of a connector suited for automobile lighting or stage lighting circuits the diagonally disposed slots in the socket casing may be omitted, as shown in Figs. —7— and —8—, which figures also show an alternative form of fastening for the wire terminals, namely a form corresponding to Letters Patent No. 1018570 granted to me February 27, 1912. It will be obvious from Figs. —7— and —8— that this arrangement also disconnects the central contact button of the socket from the circuit when the plug member of the device is withdrawn from the casing of the socket portion.

While I have shown the interengaging formations on the base of the lamp or plug and the socket casing as comprising outwardly directed projections upon the former, and slots upon the latter. I do not wish to be limited to this particular arrangement, nor to other details of the construction herein disclosed as the same is obviously capable of numerous modifications without departing from the spirit of my invention. Thus, I do not wish to be limited to using the impingement of the prongs 14 against the ends of the slots as the formations for limiting the movement of the slidable contact carrier, nor to the coaction between the inclined slots 11 and the retaining formations on the lamp base as means for moving the said contact carrier into or out of its circuit-closer actuating position.

I claim as my invention:

1. Electric circuit controlling means comprising a casing having a slot adjacent to one end thereof; a contact terminal slidably mounted within the casing; a wire terminal mounted within the casing; a terminal carrier equipped with a lateral projection and with a terminal adapted to abut against the said contact terminal; the said slot and the said projection upon the terminal carrier coacting to interlock the terminal carrier with the casing, and to permit relative rotary movement of the terminal carrier and the casing while preventing separation thereof, the said contact terminal and the said terminal upon the terminal carrier being adapted continuously to contact with each

other during the said relative rotary movement of the terminal carrier with respect to the casing; walls of the said slot providing cam surfaces coacting with the said projection upon the terminal carrier to move the terminal carrier longitudinally with respect to the casing upon relative rotary movement of the terminal carrier and the casing in either direction; circuit-closing means interposed between the said contact terminal and the said wire terminal and adapted to be actuated by the longitudinal movement of the former; and a spring normally holding the said contact terminal out of the position in which it actuates the circuit-closer to close the circuit; the abutting of the said contact against the said contact terminal enabling the terminal carrier to coact with the said projection and cam surfaces to move the said sliding contact terminal into and out of its said circuit-closer actuating position upon reciprocal rotary movement of the terminal carrier with respect to the casing.

2. In a socket for a lamp having a lateral projection upon its base, a casing, one end thereof interfitting the base of the said lamp, the said end of the casing equipped with a slot interfitting the said projection upon the base of the lamp, the said casing having a pair of longitudinally disposed slots intermediate of its ends; a pronged member slidably mounted within the casing, the prongs thereof interfitting the said slot; a contact member carried by the said pronged member and adapted to impinge against a contact upon the lamp base; a wall of the said projection-interfitting slot in the casing providing a cam surface coacting with the said projection to move the said lamp base longitudinally of the casing upon rotary movement of the lamp with respect to the casing; the said lamp base coacting with the contact member impinging against the same to transmit the said longitudinal motion to the said contact member; and a wire terminal member carried by the casing and interfitting one end of the said contact member, the latter adapted to be moved into and out of its said interfitting relation with the said wire terminal member upon the effecting of the said longitudinal motion of the contact member.

3. In a socket for an electric lamp having one end of its filament connected to a shell upon the lamp base, a casing slidably interfitting the said shell of the lamp base, the said casing connected to one terminal of the circuit; a contact terminal axially mounted upon the end of the lamp base and connected to the other end of the filament of the said lamp; a switching member slidably mounted within the casing; a contact member mounted upon the said switching member, one end of the contact member adapted to have abutting contact with the said axially disposed

contact upon the base of the lamp; a wire terminal mounted within the casing and connected to the other terminal of the circuit, the said wire terminal having a portion adapted to contact with the other end of the said contact member; and a spring normally holding the said slidable member with the contact member carried thereby out of its said contact relation with the wire terminal; there being coacting formations upon the casing and the lamp base for interengaging the same, the said formations coacting with the said abutting relation of the axially disposed lamp terminal and the said contact member to move the slidable member with respect to the casing against the pressure of the spring when the lamp is moved into its said interengaged relation with the casing.

4. The combination with an electric lamp socket having a casing adapted to receive the base of a lamp at one end thereof and having inwardly directed projections upon the said casing, of circuit-controlling means comprising a pair of disks housed by the said casing, one thereof normally bearing against the said projections, the other thereof slidably mounted within the casing; a contact axially mounted upon each of the said disks, the said contacts interfittingly closing the circuit when the disks are approached and opening the circuit when the disks are separated; and a compression spring interposed between the said disks and normally separating the latter to cause the contacts carried thereby to open the circuit, the flexibility of the said spring permitting the said disks to be tilted with respect to each other to allow the said interfitting contacts to align with each other when the disks are approached.

5. In a lamp and socket combination, a lamp having a lateral projection upon its base; a socket comprising a casing equipped at one end with a slot having therein a pair of notches separated longitudinally of the casing; a pair of relatively interfitting contacts carried by the casing, the said contacts insulated from each other and from the casing; and a spring separating the said contacts and insulated therefrom; the said slotted end of the casing being adapted to house the base of the said lamp, the said slot receiving the said projection when the lamp base is housed by the casing, the said notches of the slot coacting with the said projection to interlock the said lamp and casing in either of two positions separated longitudinally of the casing; one of the said contacts being slidably mounted with respect to the casing and impinging upon the base of the lamp when the projection upon the latter is interengaged with the casing in either of the said positions; the said casing being equipped with stop formations normally engaging the other of the said con-

tacts, the said spring normally holding the said contacts out of their said interfitting relation and continuously pressing the slidably mounted contact into its said impinging relation with the base of the lamp, the compressibility of the spring coacting with the slidable mounting of the last-named contact to permit the latter to be moved into or out of its said interfitting relation with the other contact when the lamp is moved from one to the other of its said interlocked positions; the flexibility of the spring permitting the last-named contact to rock about one or more of the said stop formations to allow the tilting of the said contact with respect to the casing for aligning the said interfitting contacts with each other.

6. In a lamp and socket combination, a lamp having upon its base a metallic shell connected to one end of the lamp filament and an axially disposed terminal connected to the other end of the lamp filament, and having lateral projections upon its base; a casing having one end interfittingly housing and contacting with the said shell of the lamp base, the said casing connected to one terminal of the circuit and equipped at its said end with slots, each of said slots having a pair of enlargements adapted to interlock with one of the said projections, the said projections and slots coacting to engage the lamp and the socket casing in either of two positions longitudinally separated with respect to the casing; a substantially stationary wire terminal mounted within and insulated from the casing and connected to the other terminal of the said circuit; a movable contact member mounted within and insulated from the casing; and a compression spring housed within the casing and bearing at its ends respectively against insulating portions of the said stationary wire terminal and the said movable contact member, the pressure of the said spring causing one end of the movable contact member continuously to bear against and to contact with the said axially disposed lamp terminal; the other end of the said movable contact member contacting with the said wire terminal, or being out of contact therewith, according as the lamp and the socket casing are in one or the other of their said relatively interlocked positions.

7. A socket for a lamp having the ends of its filament connected respectively to the metal shell of the lamp base and to a contact carried by the lamp base, comprising a casing connected to one terminal of the circuit, the said casing adapted to receive the metal shell of the lamp base and equipped with stop formations; a wire terminal connected to the other terminal of the said circuit; a conducting member adapted to carry current from the said wire terminal to the contact carried by the lamp base; a disk

carrying the said wire terminal and housed within the casing, the said disk having upon one face recesses normally alining with the said stop formations; and a spring housed 5 by the casing and bearing against the said disk, the said spring normally pressing the said disk against the said stop formations, the said recesses normally preventing a rotation of the said disk with respect to the 0 casing; the said disk having peripheral notches normally out of radial alinement with the said stop formations; the said peripheral notches clearing the said stop

formations to permit the detaching from the casing of the said disk and the wire terminal 15 carried thereby, upon a compressing of the said spring and a subsequent partial rotation of the said disk with respect to the casing.

In testimony whereof I have signed my 20 name in presence of two subscribing witnesses.

GEORGE C. KNAUFF.

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