Jan. 26, 1937. R. POPP 2,068,930

LAMP SOCKET

Filed July 30, 1932

Fig 1

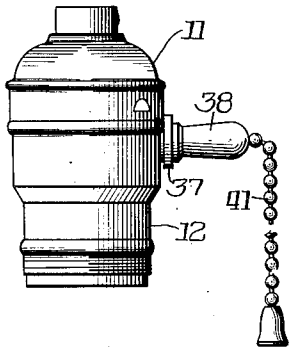


Fig 2

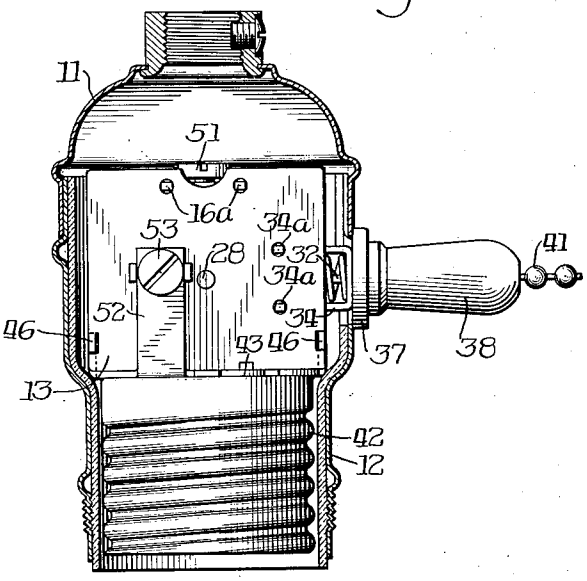


Fig 4

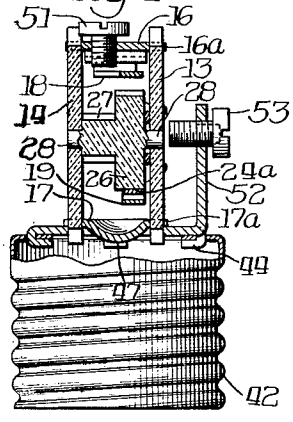


Fig 3

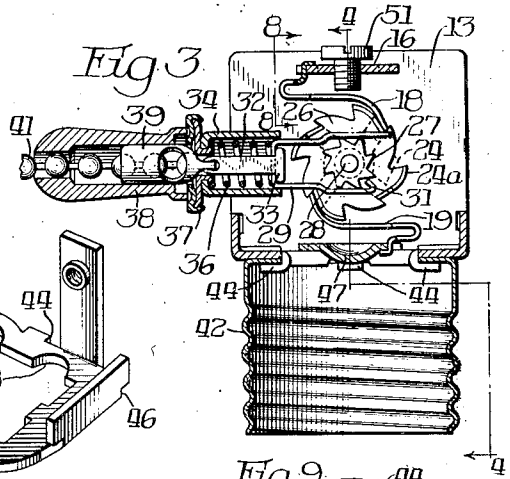


Fig 5

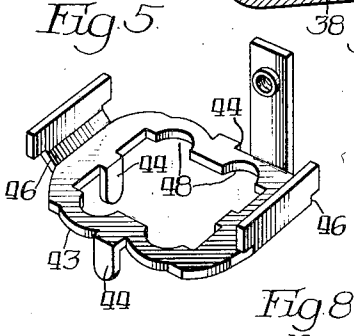


Fig 6

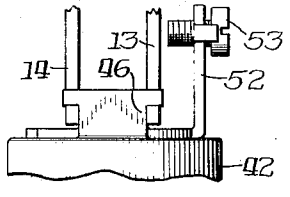


Fig 7

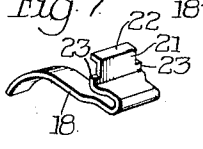


Fig 8

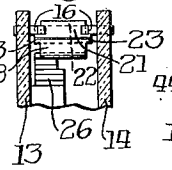
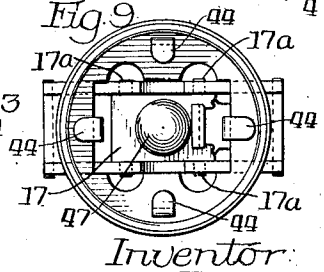


Fig 9



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Patented Jan. 26, 1937

2,068,930

UNITED STATES PATENT OFFICE

2,068,930

LAMP SOCKET

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Application July 30, 1932, Serial No. 627,038

17 Claims. (Cl. 173—354)

My invention relates in general to electric lamp sockets and more in particular to an electric lamp socket having included therein an improved switch mechanism.

The principal object of my invention is the provision of an improved lamp socket.

Another object is the provision of an improved lamp socket and switch combination.

Another object is to simplify the manufacture and assembly of such combination sockets.

A further object is greatly to decrease the number of parts employed in a lamp socket of the character identified, while at the same time decreasing the cost, increasing the life, and simplifying the operation.

A still further object is to avoid the use of porcelain and other conventional insulating means in a lamp socket switch combination and still produce a rugged, long lived article of greatly improved operating characteristics.

Other objects and features of the invention will be apparent from a consideration of the following detailed description taken with the accompanying drawing, wherein

Fig. 1 is an elevational view showing the socket completely assembled;

Fig. 2 is a vertical sectional view of the socket, but showing the switch assembly in elevation;

Fig. 3 is a vertical central sectional view showing the switch mechanism;

Fig. 4 is an irregular section thereof taken along the line 4—4 of Fig. 3;

Fig. 5 is a perspective view of a terminal and assembly member;

Fig. 6 is a fragmentary elevational view showing the manner in which the screw shell and switch frame members are interconnected;

Fig. 7 is a perspective view of one of the stationary switch contacts;

Fig. 8 is a fragmentary sectional view taken on the line 8—8 of Fig. 3 showing the manner in which the stationary contact is supported; and

Fig. 9 is a bottom plan view looking upwardly at Fig. 3 (the lever mechanism being broken away to conserve space).

The lamp socket and switch of my invention is shown best in Figs. 2 to 9, inclusive, Fig. 1 merely showing the outer shell or housing, including the upper portion 11 and lower portion 12. This is a conventional form of shell, it being understood that the combination of my invention may be mounted in other ways. The figure illustrates, however, that it may be employed with conventional fixtures now in common use.

The device per se includes frame members 13 and 14. These two frame members are identical and comprise flat sheets of insulating material such as synthetic resin, fibre, or any of the usual materials employed in electrical industries.

The two members 13 and 14 are separated by a pair of spacers 16 and 17, the spacers having projections 16*a* and 17*a*, respectively, which projections extend through apertures formed in the frame members. These projections may be upended or flattened over to hold the frame members in assembled relation.

A switch mechanism, including stationary contacts 18 and 19 and a movable contact, is mounted between the frame members. First considering the stationary contacts 18 and 19, these contacts, shaped as shown in Fig. 7, are secured to the spacers 16 and 17, respectively. Fig. 8 shows the stationary contact 18 secured to the spacer 16. The contact has a narrowed portion 21, which extends between shoulders formed by recessing the edge of the spacer member. By forming a slight V-slot at the shoulder of the spacer member, some of the material constituting the shoulder is forced over the portion 21 of the stationary contact, which assembles the two members together. A lip 22 lies along one side of the spacer when the two members are secured together in this fashion, and a pair of shoulders 23 on the contact member engage the opposite side of the spacer, thereby reinforcing the connection and preventing the possibility of movement occurring between the stationary contact and the spacer.

A movable contact member is provided between the two stationary contacts. This moving contact is substantially a star shaped bridging contact 24 carried on a toothed wheel 26 having an integral ratchet wheel 27 and projecting axis members 28 journaled in the frame members 13 and 14. The composite member comprising the toothed wheel and ratchet wheel is formed of insulating material, preferably a molding compound. The wheel is provided with teeth, the space between the teeth being alternately shallow and deep, and the arms of the star shaped bridging contact have portions 24*a* formed at an angle to the main portion of the bridging contact member and overlying alternate teeth. As the drawing shows, the stationary contacts, formed of spring material, have arcuate ends shaped to engage between the teeth. When

these stationary contacts engage in the shallow spaces between the teeth, which shallow spaces support the portions 24a, the two stationary contacts are bridged. When the contacts engage in the deep spaces between the teeth, however, they engage nothing but insulating material and are not placed in electrical connection with each other, as occurs when they engage the bridging contact member.

The movable or bridging contact member is operated through the integral ratchet wheel 27 by means of a substantially U-shaped operating member 29. This member has two arms, one of which is bent over at 31 to form an operating pawl and the other of which is disposed flat against the teeth of the ratchet wheel to balance the portion of the wheel which the pawl engages. This operating member 29 is also formed of spring material and by the arrangement of the two arms, the pawl is always resiliently held in a position either in engagement with one of the ratchet teeth or so that it can engage a ratchet tooth if properly moved. The operating member 29 is apertured to pass a headed bar 32, which, due to its head 33, cannot pass through the aperture in the operating member. This bar passes through a U-shaped spring housing 34, which has projections 34a extending through the flat frame members. These projections, the same as projections 16a and 17a, are adapted to be flattened. In the case of the U-shaped spring housing 34, this housing not only functions as a spacer but by its attachment to the frame members is held substantially stationary so that the bar 32 may be moved with respect thereto for operating the bridging contact.

A spring 36 disposed in the U-shaped housing member has one end bearing against the bearing member 29 and the opposite end bearing against the end of its housing. In connection with this U-shaped housing, attention is called to the fact that the two frame members, engaging both sides of the U-shaped housing member, serve to close the housing and substantially entirely enclose the spring 36. A collar 37 is provided, secured to the U-shaped spring housing in the embodiment shown, and functioning as a fulcrum against which a lever 38 is adapted to rock. The bar 32 is connected to a member 39 by universal joint connection and a suitable chain 41 is connected to the member 39. This member 39 is carried and supported within the lever 38 in any suitable manner. It may be stated that insofar as the present invention is concerned, it is merely necessary to provide a universal connection between the lever 38 and the bar 32.

The switch mechanism is attached to the usual screw shell 42 by means of a terminal and assembly member 43. This member has projections 44, two of which extend through slots in the base and are clinched over (Figs. 4 and 9) to attach the terminal and assembly member rigidly to the screw shell. The other two projections 44 extend through an open portion of the base and are clamped over (Fig. 9).

The terminal and assembly member 43 has extensions or ears 46 of general T shape, which extensions by being bent upwardly and inwardly, position the ears to engage in edge slots in the frame members and rigidly interconnect the switch assembly and screw shell.

The frame spacer and assembly member 17 is drawn to form a boss or convexed projecting portion which becomes the center lamp contact 47. To this end the base of the screw shell is formed partially open, the open portion having in general the outline of the open portion shown in the assembly member 43 (Fig. 5). The center contact is, therefore, spaced away from the shell so as to avoid any possibility of a short circuit between the shell and center contact. It should be recalled that the projections 17a extend through the frame members 13 and 14 and, with the terminal and assembly member 43 secured to the screw shell and frame members in the manner described, the assembly member would normally be brought somewhat close to the projections 17a. To avoid any possibility of a short circuit at this point, cutaway portions 48 are provided in the terminal and assembly member 43, and the base of the screw shell is cut away to correspond with these recesses. The terminal and assembly member 43 and the base of the screw shell were previously referred to as being cut away so that one of the spacer members having a special shape could be employed as a center lamp terminal. In addition to this function, however, the contiguous edges of the frame members are shaped to extend down into the open portion of the base of the screw shell and also through the terminal and assembly member 43, thus greatly reinforcing the connection between the screw shell and switch assembly and also facilitating the centering of the switch, particularly for assembly purposes.

The spacer member 16 which supports the stationary contact 18 serves as one terminal of the switch and is provided with a conductor attaching screw 51. The terminal and assembly member 43 has an integral terminal post 52, through which a screw 53 is threaded for attaching a conductor thereto.

The socket and switch assembly of my invention is very simple and inexpensive to manufacture and assemble. All of the parts are either stampings or very simply made in other ways. The switch mechanism is first assembled as a separate unit, this switch mechanism including all of the mechanism supported between the two frame members 13 and 14. The screw shell and terminal and assembly member 43 are then secured together to form a separate assembly unit. The last step in the assembly is to bend up the T-shaped projections 46 so as to engage in the edge slots of the frame members. In this operation, the two previously assembled units are brought together to substantially the position shown in the drawing and the T-shaped projections 46, by a suitable operation, bent upwardly at right angles until they occupy the position shown in Fig. 3. As a preliminary step to the assembly, these T-shaped projections are formed to approximately the shape shown in Fig. 5.

Fig. 2 shows the manner in which my invention fits in the ordinary outer socket shell. The conductor wires are brought in and attached to the socket through the screws 51 and 53 in substantially the ordinary way.

Due to the simplicity of construction, it should be noted that the usual insulating disc within the screw shell is avoided. The member 43 is in full and direct contact with the shell and the usual conductor attached to the mounting post 52 is brought into direct contact with the screw shell. With one of the supports for a stationary contact serving directly as the center lamp contact, and with the other support for a stationary switch contact serving as a terminal for the conductor, it is clear that a very simple and inexpensive device results. The simplicity of my in-

vention is apparent from the number of parts saved. I have compared the socket of my invention to the simplest high grade socket of the prior art having substantially the same mode of operation, and I have found that approximately ten parts are saved. This saving in parts has not been effected merely by combining parts as appears clear from the description, but by a process of simplification, redesigning and rearranging whereby some parts are rendered entirely unnecessary and other parts are made to do double duty. Not only is there an advantage from the standpoint of cost in this arrangement, but, due to the smaller number of parts and the simplicity of the construction, there is less to get out of order and the socket of my invention, by its very nature, will have a much longer life.

I have described my invention in detail so that those skilled in the art will understand the manner in which the same is practiced. My invention is limited, however, only by the appended claims.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. In a lamp socket of the character described, a pair of frame members formed of insulating material and disposed substantially parallel to each other, switch mechanism supported between the frame members, a screw shell having an open base, an assembly member secured to the screw shell and having a pair of T-shaped extensions, and means for attaching said extensions to oppositely disposed side edges of the frame members so as to maintain intermediate end edges of the frame members rigidly on the base of said screw shell.

2. In a lamp socket of the character described, a pair of frame members formed of insulating material and disposed substantially parallel to each other, switch mechanism supported between the frame members, a screw shell having an open base, an assembly member secured to the screw shell and having a pair of T-shaped extensions, and means for attaching said extensions to oppositely disposed side edges of the frame members so as to maintain intermediate end edges of the frame members rigidly on the base of said screw shell, a spacer disposed between the frame members near said intermediate end edges thereof, said spacer having a boss projecting from between the frame members through openings in the screw shell base and said assembly member, said boss extending directly axially of the screw shell whereby to form a center lamp contact.

3. In a lamp socket, a pair of flat frame members formed of insulating material, a spacer member at the top and at the bottom of the frame members, each horizontally positioned and carrying a stationary contact thereon extending inwardly therefrom, a bridging contact rotatably carried in the frame between the stationary contacts, a screw shell having a base with slots therein, an assembly member positioned on the outside of the shell base having lugs projecting through said slots to secure the screw shell thereto, with a T-shaped lug having outstanding ears on the head thereof extending from each end of the assembly bent upwardly whereby the outstanding ears rest in edge recesses in the side edges of the frame plates to retain the frame members in rigid relation to the screw shell.

4. In a lamp socket, a pair of flat frame members formed of insulating material, a pair of oppositely disposed spacers set between the frame members, a pair of stationary electrical contacts mounted on the spacer members, a rotatable bridging contact between the frame members, a screw shell having a base with slots therein, an assembly member having lugs projecting through said slots to secure the screw shell to the assembly member, and a pair of T-shaped extensions from said assembly member, each T-shaped extension having a pair of lugs engaging in edge slots at opposite sides of the frame members whereby to support the frame members on the shell, said assembly member also having an integral terminal post projection extending substantially parallel to the frame members and along one side of one of said frame members.

5. In a lamp socket of the character described, a pair of flat insulating frame members, a pair of spacers holding the frame members substantially parallel to each other, a pair of stationary switch contacts each attached to one of said spacers, rotatable bridging contact means carried by the frame members, a screw shell having a base with an open space therein, and an assembly member attached to the frame members and having ears extending through slots in said screw shell base and clinched over to attach the screw shell to the frame members.

6. In a lamp socket of the character described, a pair of flat insulating frame members, a pair of spacers holding the frame members substantially parallel to each other, a pair of stationary switch contacts each attached to one of said spacers, rotatable bridging contact means carried by the frame members, a screw shell having a base with an open space therein, and an assembly member attached to the frame members and having ears extending through slots in said screw shell base and clinched over to attach the screw shell to the frame members, one of said spacers having a convexed portion projecting through the open space in the base and comprising the center lamp contact.

7. In a lamp socket of the character described, a pair of flat insulating frame members, a pair of spacers holding the frame members substantially parallel to each other, a pair of stationary switch contacts each attached to one of said spacers, rotatable bridging contact means carried by the frame members, a screw shell having a base with an open space therein, an assembly member having lugs extending through slots in the screw shell base to secure the screw shell thereto, and having a pair of substantially T-shaped projections, each T having a web portion lying between the edges of the frame members at opposite sides thereof, and the extensions of the cross pieces of the T's comprising lugs extending into edge slots in the frame members.

8. A lamp socket comprising a pair of insulating flat plates as frame members, means for supporting the frame members in parallel relation, a switch mechanism carried between the frame members, a screw shell at the end edges of the frame members, an assembly member having a flat base with upwardly extending lugs engaging the frame members and downwardly extending lugs for engaging the screw shell to secure the frame members and screw shell together, and a switch operating member projecting from the frame members at right angles to the axis of the shell.

9. A lamp socket including a pair of flat parallel frame plates, spacer members at the top and at the bottom of said frame plate having stationary contacts thereon, rotatable bridging contact mechanism between said stationary contacts,

and a lever for operating said mechanism extending out of one side of the frame opposite said contact mechanism and at right angles to the frame side edge, a screw shell, and an assembly member for uniting the frame plates and screw shell.

10. A lamp socket including a pair of flat parallel frame plates, a combination spacer member and terminal post at the top of said frame plates having a stationary contact thereon, a combination spacer member and center lamp contact at the bottom of the frame plates having a stationary contact thereon, rotatable bridging contact mechanism between said stationary contacts, and a lever for operating said mechanism extending out of one side of the frame opposite one side of the contact mechanism and at right angles to the frame side edge, a screw shell, an assembly member for uniting the frame plates and screw shell, and terminal means for the screw shell.

11. A lamp socket including a pair of flat parallel frame plates, a stationary contact supported at the top of the frame plates, and a terminal post connected thereto, a combination spacer member and center lamp contact at the bottom of the frame plates having a stationary contact thereon, said lamp contact having an embossed portion centrally of said member, rotatable bridging contact mechanism between said stationary contacts, a lever for operating said mechanism extending out of one side of said frame, a screw shell, an assembly member for uniting the frame plates and screw shell, and terminal means for the screw shell.

12. A lamp socket including a pair of flat parallel frame plates a terminal post for one of two conductors to the lamp socket and a stationary contact at the top of the frame plates, a center lamp contact at the bottom of the frame plates having a stationary contact extending therefrom, a screw shell for said lamp socket insulated from said center lamp contact means for securing together said frame plates and said screw shell, said means comprising a one-piece substantially ring-shaped assembly member having a terminal post for the second of the two conductors to the lamp socket on one side thereof extending upwardly on the outside of one of said frame plates, a pair of integral clamping extensions extending upwardly at opposite sides of the ring for engaging in corresponding edge recesses on the side edges of the frame plates, and a plurality of lugs extending downwardly into the screw shell to secure the assembly member thereon.

13. A lamp socket including a switching mechanism assembly comprising a pair of flat parallel frame plates, spacer members at the top and at the bottom of the frame plates, stationary contacts supported within the frame plates and a bridging contact wheel between said stationary contacts, means for operating said contact wheel including a universal lever extending out of one side of said frame and a screw shell and mounting assembly comprising a screw shell having an open base with a mounting member on top of said base, said mounting member including a substantially ring-shaped body portion having a plurality of lugs extending downwardly through corresponding slots in the screw shell base, and a pair of T-shaped extensions extending outwardly therefrom adapted to be bent upwardly and inwardly to fit in corresponding edge recesses in the side edges of the frame plates whereby to rigidly secure together said switch mechanism assembly and said screw shell and mounting assembly.

14. An electric switch having a pair of pre-assembled units, with one of said pre-assembled units comprising an insulating frame having oppositely disposed recessed side edges, switching mechanism rotatably supported within said frame, and the other of said pre-assembled units comprising a screw shell, an assembly member rigidly secured to said screw shell including a pair of oppositely disposed clamping extensions extending upwardly from the screw shell having engaging portions formed to correspond with said side edge recesses of said frame, and said extensions adapted to be bent inwardly to position said engaging portions in said recesses to rigidly fasten said pre-assembled units together.

15. An electric switch having a pair of pre-assembled units, with one of said units including a pair of frame plates, frame plate retaining members at each end thereof, stationary contacts supported within said frame, rotatable contact bridging means carried to rotate between said stationary contacts, and actuating means for said contact bridging means, and the other of said pre-assembled units including a screw shell and an assembly ring rigidly secured thereto, with said assembly ring having a pair of oppositely disposed upwardly extending clamping extensions, and each extension having a pair of engaging ears, with said clamping extensions adapted to be bent inwardly with the engaging ears fitting in corresponding side edge recesses in said frame plates to secure the two units together.

16. An electric switch having a pair of independently pre-assembled units, with one of said pre-assembled units comprising a rigid frame, switching mechanism rotatably supported within said frame, and the other of said pre-assembled units comprising a screw shell, an assembly member rigidly secured to said screw shell having clamping means for engaging the frame of said first pre-assembled unit upon bringing said units together, to rigidly secure said first unit on said second unit.

17. An electric switch having a pair of terminals for electrical conductors and circuit interrupting mechanism to interrupt a circuit including said two conductors, said switch comprising a two pre-assembled unit assembly with one of said pre-assembled units including a frame, one of said terminals on said frame and said circuit interrupting mechanism rotatably carried therein, with the other of said pre-assembled units comprising a screw shell, the other terminal thereon and assembly means rigidly secured thereto, with engaging means on said assembly means to secure said second pre-assembled unit rigidly to said first pre-assembled unit upon bringing said units together.

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