Nov. 22, 1955 F. D. KEELER ET AL 2,724,810

ELECTRIC LAMP SOCKET WITH PIN TAP CONNECTING MEANS

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Fig. 1.

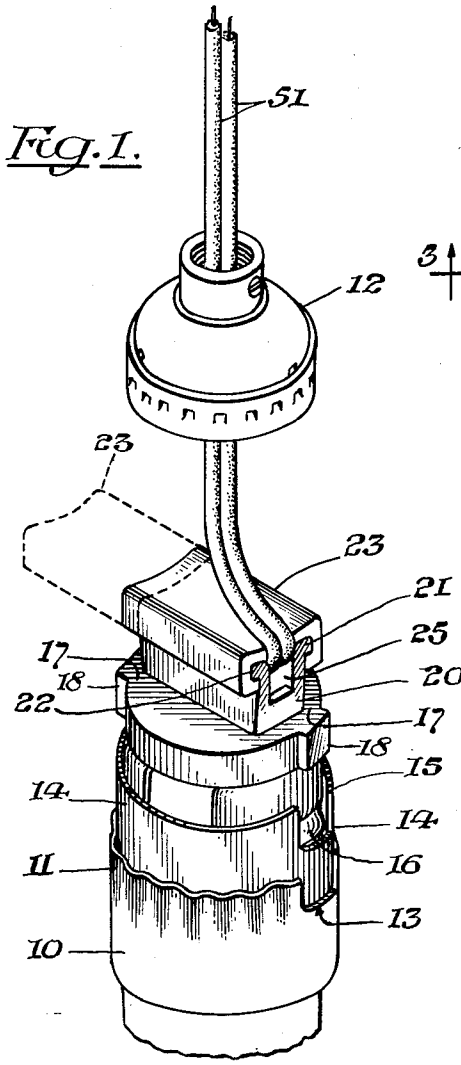


Fig. 2.

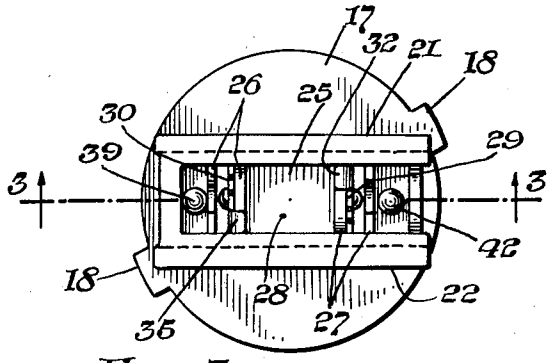


Fig. 3.

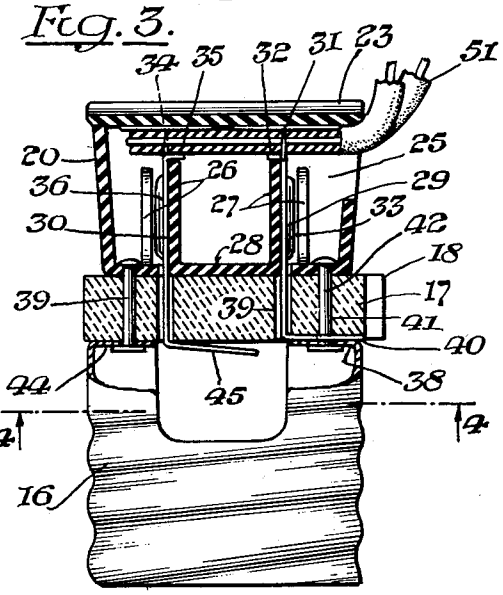


Fig. 4.

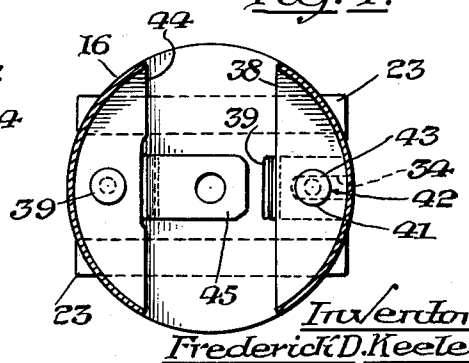


Fig. 5.

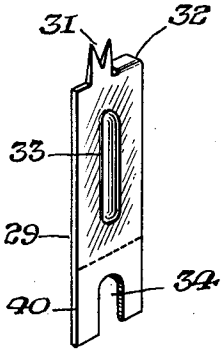
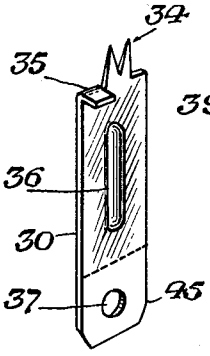


Fig. 6.



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ELECTRIC LAMP SOCKET WITH PIN TAP CONNECTING MEANS

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4 Claims. (Cl. 339—99)

This invention relates to improvements in electric sockets for lamp bulbs or the like, and in particular to modifications of conventional electric sockets permitting greatly simplified constructions, assembly and connection to a two-conductor electric cord.

In the connection of conventional electric sockets to conductor cords, as in the case of lamps or the like, it has heretofore been necessary to cut, strip and twist the wires of the cord, then disassemble the socket, and use a screw driver on its binding posts to connect the wires thereto. According to the present invention, the greater part of this procedure is completely eliminated, particularly the stripping, twisting and connecting of the wires. Instead, the cord need merely be cut to size, laid into a cord-receiving channel over which a cover is slid. These few steps complete the assembly and connection of the wires to the socket. At the same time, the fabrication of the socket and its parts is greatly simplified, by a novel and improved design permitting use of the rapid and inexpensive stamping and molding processes, and minimizing assembly operations.

It is accordingly an important object of the instant invention to provide an improved electric socket capable of rapid assembly with ordinary 2-conductor electric wires.

It is a further object of the invention to provide an improved electric socket which eliminates the usual screw connectors for the connecting wires.

It is another object of the invention to provide an improved electric socket which reduces to a minimum the number of parts and assembly operations required and which permits the use of inexpensive and easily fabricated parts.

Yet another object of the present invention is to provide an electric socket construction in which connection to a conductor cord may be readily made without requiring any particular mechanical skill or tools, or separation or stripping of the cord conductors.

Other objects and advantages of the invention will in part be obvious and in part appear hereinafter.

The invention in its preferred form is embodied in an electric socket of essentially conventional exterior construction, the electrical contacts within the socket being mounted on an insulating base and having integral wire-insulation-piercing prongs reaching into and insulating channel adapted to receive the two-wire conductor and cooperating with a cover adapted to press the conductor in place to make contact with the prongs, without the use of screws or tools.

In the drawing,

Figure 1 is an exploded perspective view of a preferred form of an electric socket assembly made in accordance with the instant invention;

Figure 2 is a plan view of the socket base with the casing and sliding cover removed;

Figure 3 is a longitudinal sectional view of the device of Figure 1, omitting the casing;

Figure 4 is a plan view of the interior of the socket, omitting the casing;

Figure 5 is a perspective view of one of the socket contacts in accordance with the invention; and

Figure 6 is a perspective view of the other contact in accordance with the invention.

Referring to the drawings, the socket of the present invention has an outer casing formed by a casing shell **10** and cap **12**. In well known manner, the cap **12** may have an insulating lining. Casing shell **10** has corrugations **11** generally placed along the lower edge thereof for locking engagement with similar corrugations on the inner surface of cap **12**.

In the side of the socket shell **10** a notch or keyway **13** is provided for locking the interior parts against rotation, as described below. Within the socket shell **10** is placed a conventional insulating lining **14**, having an opening **15** corresponding to notch **13**. Lining **14** surrounds the threaded metallic contact shell **16** which receives the base of the electric light bulb when screwed into the socket.

Fastened to the contact shell **16**, in a manner to be described, is an insulating plate **17** having projections or keys **18** on diametrically opposite sides thereof. These projections **18** are fashioned to fit into notches **13** and **15** for preventing rotation between the casing shell **10** and the remaining structure.

Mounted on the plate **17** in the manner to be described is a cord-connecting member **20**. Member **20**, as shown most clearly in Figure 1, has a longitudinal channel **25** extending therealong. The interior of member **20** is generally hollow, except for two pairs of partitions **26**, **27** which define narrow passages running perpendicularly to channel **25**.

The base **28** of member **20** is apertured or slotted in line with these passages, and respective contact elements **29** and **30** are positioned within these passages and extend through the base apertures.

Contact element **29** is shown in Fig. 5, as it is formed prior to assembly, and is preferably fabricated by stamping from conductive sheet metal. It is formed with a sharp pointed prong or prongs **31** at one end, at which a locating or positioning tab **32** is formed by bending over a flap of the material. A strengthening rib or ribs **33** is formed partially along the length of element **29**. A hole or slot **34** is formed at the opposite end of the contact element **29**.

The other contact element **30** is shown in Fig. 6, before assembly, and has similar pointed prongs **34** locating tab **35**, strengthening rib **36** and apertured end **37**. Element **30** differs from element **29** only in length and if desired, in the use of an aperture **37** rather than a slot **34**.

In assembling the socket, the cord connecting member **20** is placed centrally upon plate **17**, and contact element **29** is inserted through the passage between partitions **27**, through the aperture in base **28** of member **20**, and through an aperture **39** in plate **17**. Then the end **40** of contact **29** is bent outwardly, so that the slot **34** is in registry with an opening **41** in plate **17** which is also aligned with an opening in base **28** of member **20**. The end portion **38** of contact shell **16** has an opening **43** which is aligned with the aperture just referred to. A rivet **42** then secures member **20**, plate **17**, element **29** and contact shell **16** together, and electrically connects contact element **29** to contact shell **16**. The other end portion **44** of shell **16** is secured to plate **16** and member **20** by a similar rivet **39**. Then the contact element **30** is inserted into the passage between partitions **26** and through an aligned opening in plate **17** into the interior of shell **16**, where its end portion **45** is bent toward the axis of shell **16** to form a contact for the center base terminal of the electric light bulb.

In thus assembling the socket parts, it will be noted that the prongs **31** of contact element **29** are adjacent one wall of channel **25** while the prongs **34** of the other element **30** are adjacent the other channel wall. As a consequence, when a conventional twin-conductor rubber covered cord or similar cord is laid into channel **25**, the prongs **31** and **34** are aligned to contact the respective wires of the cord, upon pressing the cord upon these prongs to cause the prongs to pierce the cord insulation. For the purpose of making this connection, the side walls of the member **20** are turned outwardly at their upper edges to form lips **21**, **22**, which engage a mating cover piece **23**.

To connect the cord **51** to the socket, it is merely necessary to lay either the end or an intermediate portion of the cord **51** in the channel **25** and then to slide the cover piece **23** in place, which presses the cord **51** upon the prongs **31** and **34** extending into channel **25**, so that the prongs make electrical contact with the respective wires within the cord. Then the cap **12** is assembled to the casing shell **10** to complete the socket with the cord **51** passing through the central aperture in cap **12**. It will thus be seen that the connector member **20**, the plate **17** and the contact shell **16** form a unitary structure. Upon slipping on the lining **14** and casing shell **10**, the projections **17** engage the notches **15** to prevent relative rotation between the casing and the interior parts.

It will thus be apparent that both the assembly of the socket and the connection of the wire thereto are extremely simplified and made relatively inexpensive.

It will be understood that many equivalent constructions are possible. Thus, the plate **15** may be formed integrally with the connector member **20**, and both may be modified in shape for convenience of molding and minimum size.

Alternatively, plate **15** may be omitted, and the base of member **20** provided with rotation-preventing means equivalent to projections **17**. Any other rotation-preventing means may be used as desired. Instead of rivets **39**, **42**, any functionally equivalent fastening means may be used.

The above description should be considered illustrative only, and not to be interpreted in a limiting sense, the present invention being limited solely as defined in the appended claims.

What is claimed is:

1. A socket for electric light bulbs comprising a conductive casing having relatively separable cap and shell portions, said cap having an axial cord-receiving aperture, an insulating lining within said casing, said shell portion and said lining having aligned cut-out portions in oppositely disposed sections thereof, and a socket structure within said lining, said socket structure comprising an insulating body having a pair of parallel apertures extending therealong axially of said socket and a conductor-cord-receiving channel at one end of said structure extending completely through said structure across the ends of said apertures in a direction connecting said aperture ends, an insulating plate having a pair of projections adapted to engage said shell and lining cut-out portions and fixed to said insulating body at the other end thereof, said plate having apertures in registry with said insulating body apertures, an integral electrical contact member within each of said aligned insulating body and insulating plate apertures and having an insulation-piercing pointed end extending within said conductor-cord-receiving channel, the pointed ends of said two contact members being respectively adjacent opposite sides of said channel and spaced along the length of said channel, one of said contact members having the other end thereof bent integrally to form a tongue extending over the axis of said socket to form a contact for the center base terminal of a thread-type electric light bulb, a metallic thread-bearing contact shell fixed to said insulating body and insulating plate and surrounding said contact tongue, said contact shell being electrically connected to the other end of said other contact member, said channel being formed with a pair of parallel outwardly-extending lips and a cover piece having a T-shaped channel therein slidably engaging said lips for pressing a conductor cord on said pointed ends to pierce the insulation of said conductor cord to contact the wires thereof and to provide electrical connection between the wires of said cord and said contact shell and tongue whereby connection may be made between said wires and a thread-type electric light bulb screwed into said contact shell.

2. A socket for electric light bulbs, comprising a casing having relatively separable cap and shell portions, an insulating lining within said casing, and a socket structure within said lining and having means cooperative with said casing shell portion to prevent relative rotation thereof, said socket structure comprising an insulating body having a pair of parallel apertures extending therealong axially of said socket and a conductor-cord-receiving channel at one end extending through said body across the ends of said apertures in a direction connecting said ends, an electrical contact member within each of said apertures and having an insulation-piercing pointed end extending within said channel, the pointed ends of said two contact members being respectively adjacent opposite sides of said channel and spaced along the length of said channel, one of said contact members having the other end thereof bent to form an integral tongue extending over the axis of said socket to form a contact for the center base terminal of a thread-type electric light bulb, a metallic threaded contact shell fixed to said insulating body and surrounding said tongue, said contact shell being electrically connected to the other end of said other contact member, said channel being formed with a pair of parallel outwardly extending lips, and a cover piece having a T-shaped channel slidably engaging said lips for pressing a conductor cord on said contact member pointed ends to provide electrical connection between the wires of said cord and said contact shell and tongue, whereby connection may be made between said wires and a thread-type electric light bulb screwed into said contact shell.

3. A socket for electric light bulbs, comprising an insulating body having a pair of parallel apertures extending therethrough axially of said socket and a conductor-cord-receiving channel at one end extending through said body and across the ends of said apertures in the direction connecting said aperture end, an electrical contact member within each of said apertures and having an insulation-piercing pointed end extending within said channel, the pointed ends of said two contact members being respectively adjacent opposite sides of and spaced along said channel, one of said contact members having the other end thereof bent to form an integral tongue extending over the axis of said socket to form a contact for the center base terminal of a thread-type electric light bulb, a metallic threaded contact shell fixed to said insulating body and surrounding said tongue, said contact shell being electrically connected to the other end of said other contact member, said channel being formed with a pair of parallel outwardly extending lips, and a cover piece with a substantially T-shaped channel slidably engaging said lips for pressing a conductor cord on said contact member pointed ends to provide electrical connection between the wires of said cord and said contact shell and tongue, whereby connection may be made between said wires and a thread-type electric light bulb screwed into said contact shell.

4. A socket for electric light bulbs, comprising an insulating structure having a pair of parallel apertures extending therethrough and a conductor-cord-receiving channel extending across the ends of said apertures in a direction from one aperture to the other, an electrical contact member within each of said apertures and having an insulation-piercing pointed end extending within said channel, the pointed ends of said two contact mem-

bers being respectively adjacent opposite sides of said channel and being spaced along the length of said channel, one of said contact members having a center socket terminal formed integrally therewith at the other end thereof, a metallic threaded contact shell fixed to said insulating structure and electrically connected to the other end of said other contact member and concentrically surrounding said center contact terminal, said insulating structure having a pair of laterally projecting shoulders extending parallel to said channel, and a cover piece with a T-shaped channel therein slidably engaging said insulating structure shoulders over said first channel and adapted upon such sliding to press a conductor cord on said contact member pointed end to cause said pointed ends to pierce the insulation of said conductor cord and to electrically connect to the wires thereof to provide electrical connection

between said wires and said contact shell and center terminal whereby connection may be made between said wires and a thread-type electric light bulb screwed into said contact shell.

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