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C. C. CATTELL
CONNECTING DEVICE

2,767,009

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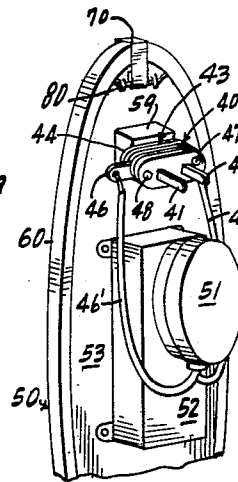
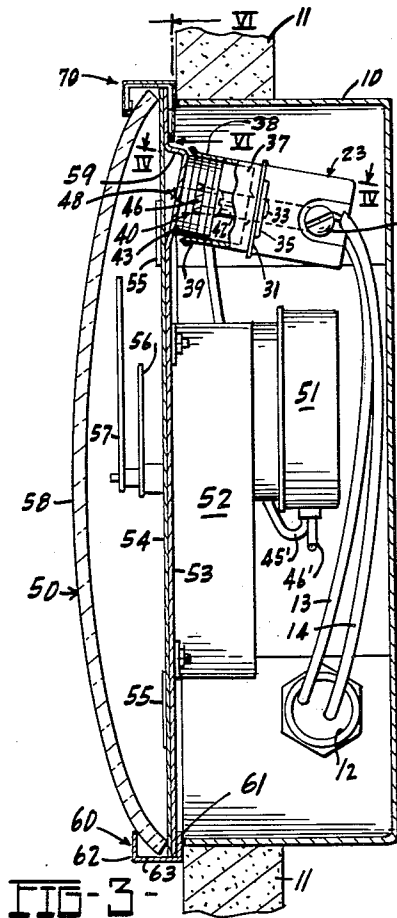


FIG. 2-

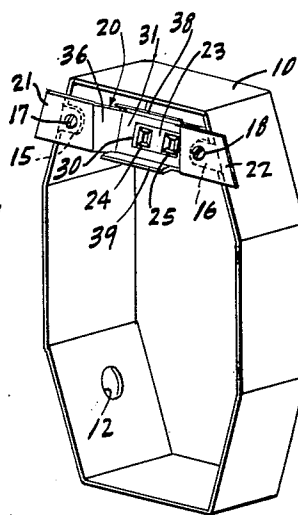


FIG. 1-

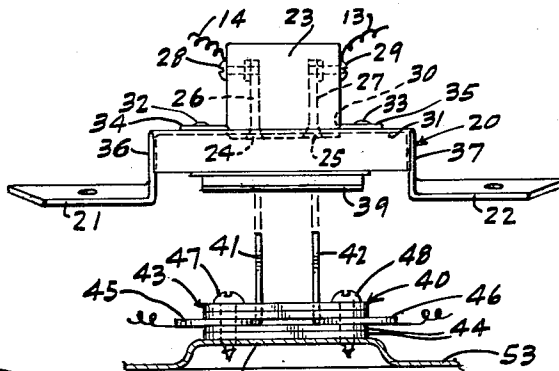


FIG. 4-

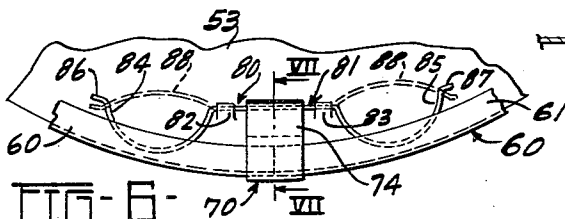


FIG. 6-

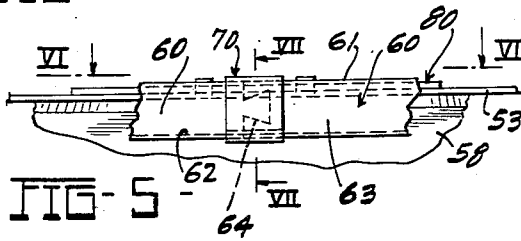


FIG. 5-

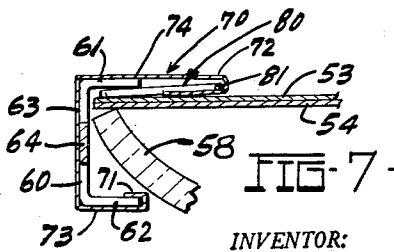


FIG. 7-

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2,767,009

CONNECTING DEVICE

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8 Claims. (Cl. 292—256.6)

This invention relates to connecting and supporting devices. More particularly, it deals with a combined electrical plug and socket bracket for an electrical device to be supported on a wall, such as an electric clock, together with the particular assembly of such a device, including specifically a retaining ring connection, such as for the transparent lens for the clock.

Previously electrical wall instruments or devices, such as electric clocks, were either mounted with electrical conductors of wires extending along the wall to them from an electrical outlet, or if they were attached to a special electrical outlet, they were fastened to the wall in such a manner that they could not easily be removed from the wall for repairs without tools such as at least a screw driver. Then after the device or clock was removed it generally also required tools to take it apart.

It is an object of this invention to produce a simple, efficient, effective and economical connecting bracket for an electrical device which may be readily installed or removed without the aid of tools by just pushing it into its place or removing it.

Another object is to produce a combined electrical plug and socket support for an electrical device for easy mounting and demounting on a wall.

Another object is to produce a combined bracket and electrical connection which is maintained connected and in position by the weight of the device supported by the bracket.

Another object is to produce such a bracket which may support a device flush with a wall or surface without any visible means of connection.

Another object is to provide such a supporting and electrically connecting bracket which may be fitted into a conventional type of electrical outlet box mounted on a wall.

Another object is to provide a safe, slip fitting connection and support for an electrical device mounted on a wall or the like free from visible electric wires.

Another object is to produce a smooth retaining ring for the transparent lens for the dial of an instrument which can be easily removed manually without the use of a tool.

Another object is to produce a connection for a split retaining ring which is smooth and free from sharp and exposed edges and presents a neat and even decorative appearance.

Generally speaking, a connecting device of this invention comprises an electrical socket connector mounted in the base of a U-shaped channel bracket, the sides of which bracket are placed at a slight angle to parallelism with the floor, with their open end slightly upwardly; and a cooperating electrical plug connector mounted on a projecting base having a pair of parallel sides spaced equal to and substantially coextensive with the inner surfaces of the sides of the U-shaped channel bracket, whereby the insertion of the plug into its cooperating socket, also supports the insulated base of the plug between the sides of the U-shaped channel bracket. Since

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these sides of the bracket are slightly inclined downwardly from their open end into which the socket fits, the weight of the device to which the plug and its base are attached maintains the plug in the socket as well as the base in the bracket. The supporting sides of the bracket are of sufficient width so that an electrical connection cannot be made between the plug and socket elements until at least the edge of the base of the plug is in contact with the outer edge of the side of the supporting bracket, thereby avoiding any possibility of obtaining an electrical short circuit during the placing or removal of the device on the bracket. Such a bracket connection may be mounted within a conventional type electrical outlet box mounted on or in a wall and a two pronged conventional plug with its insulated base may be mounted on the back of an electrical device, such as an electric clock, so that said device may be mounted flush against a wall into a conventional two slot socket with the mechanism of the device fitting into the outlet box.

In such a neat and flush assembly, an additional connecting device may be provided for mounting the transparent lens on a disk or face of the clock, whereby as little as possible of the clock projects beyond the plane surface of the wall. Such a means includes a neat manually demountable split retaining ring and clip therefor, in which the ring is a U-shaped channel with dove-tailed interfitting ends covered by a U-shaped clip with inwardly projecting hooks at the ends of the clip for hooking from one edge of the channel ring to a resilient retaining wire adjacent the other edge of the ring, which wire may fit against a lug on the back of the face plate of the device to retain the clip in position. Thus, one may remove the clip by unsnapping the wire from the lug, and then the dove-tailed connection of the ring is exposed for easy release.

The above mentioned and other features and objects of this invention and the manner of attaining them are given more specific disclosure in the following description of embodiments of this invention taken in conjunction with the accompanying drawing, wherein:

Fig. 1 is a perspective view of an electrical outlet box having mounted therein an electrical socket and supporting bracket according to this invention;

Fig. 2 is a perspective view of the back of a wall electric clock with its lower part broken away, but showing an electrical plug with a base mounted thereon according to this invention, which plug and clock mechanism is adapted to fit into the socket and box of Fig. 1;

Fig. 3 is an enlarged vertical section of an assembled electric clock connected to and mounted in an outlet box flush with a vertical wall, by combining the parts of Figs. 1 and 2;

Fig. 4 is a further enlarged plan view of the socket and connecting bracket aligned with its cooperating plug and base taken along line IV—IV of Fig. 3 but with the parts spaced apart for assembly;

Fig. 5 is an enlarged plan view of the dove-tail connection and clip for the split retaining ring for the lens of the clock shown in Figs. 1 and 3, showing a portion of the edge of the clock lens and face;

Fig. 6 is a side view of the clip and its retaining wire taken from lines VI—VI of Figs. 3 and 5 showing a portion of the back of the dial of the clock; and

Fig. 7 is an enlarged section taken along lines VII—VII of Figs. 5 and 6.

Referring to Figs. 1 and 3 there is shown an electrical outlet box 10 of the type which may be readily mounted on or within the surface of a vertical wall 11 of a room, which outlet box may be provided with an opening 12 in one of its sides for electrical supply conductors 13 and 14. The open or front side of the box 10 may be provided with ears 15 and 16 extending inwardly from its

edges, into which screws 17 and 18, respectively, may engage in threaded openings for fastening a face plate or other member to or in the box 10.

A connecting device or bracket 20 according to this invention may be mounted across the top and inside of the open end of the outlet box 10 shown in Figs. 1 and 3, which bracket may be provided with oppositely extending ears 21 and 22 in the same plane, through which the screws 17 and 18 may fasten the bracket 20 to the outlet box 10. An essential portion of the bracket 20 comprises a conventional type of two slotted electrical socket 23, which may be made of some non-conducting plastic material having a pair of parallel slots 24 and 25 inside of which slots may be molded a pair of electrical terminals 26 and 27, respectively, connected to the conductors 13 and 14 by means such as screws 28 and 29.

This socket 23 may be mounted in an aperture 30 in the base portion 31 by means of rivets 32 and 33 or the like through flanges 34 and 35 mounted on the socket 23. The plane of the base portion 31 is at a slight angle to the plane of the ears 21 and 22, say less than about 20° and preferably about 10° of arc. This base portion forms the bottom of a pocket which may have end sides 36 and 37 which connect it with the ears 21 and 22. Perpendicular to the base portion 31 and extending at least part of the distance between the end sides 36 and 37, are a pair of parallel sides 38 and 39 which may be flared outwardly at their outer ends, and taken together with said base portion 31 form a U-shaped channel member. Between these sides 38 and 39 the device to be supported is anchored, with the lower side 39, which may extend out farther from the base portion 31 than the side 38, supporting the weight of such a device. Since the sides 38 and 39 are perpendicular to the base portion 31, which is at an angle to the vertical side of the wall 11, these sides 38 and 39 are similarly at an angle to the horizontal so that the pocket formed between them opens outwardly and slightly upwardly, and thereby retains any device placed into it by the weight of the device itself.

Cooperating with this pocket bracket 20 and its electrical socket 23, there may be provided an electrical two pronged plug 40 having a pair of metal prongs 41 and 42 for making an electrical contact in the slots 24 and 25, respectively, of the socket 23. These prongs 41 and 42 may comprise L-shaped members which may be embedded in a base block member 43, preferably of non-conductive material, such as for example, a stack of comparatively stiff plates 44 of plastic reinforced fibrous material. Between about a center pair of plates 44, the feet 45 and 46 of the L-shaped prongs may be sandwiched (see Fig. 4) to insulate said prongs. Such a stack of plates including feet 45 and 46 may be held together and anchored to a base support, by means of insulated rivets or screws 47 and 48. The sides of said insulated block 43 (or stack of plates 44) is dimensioned so that they snugly fit into the pocket in the bracket 20, particularly snugly between the supporting sides 38 and 39 (see Fig. 3).

The plug 40 with its base block 43 may be mounted on a device which is to be supported by the bracket 20 and electrically connected to the socket 23. Since this plug and socket also connects electrical current over two electrical conductors, the device may also be electrically operated or controlled, and accordingly adapts itself well for the mounting and connection of electric clocks to walls provided with outlet boxes installed specifically for them. Accordingly, an electric clock 50 is shown in Figs. 2 and 3, having an electric motor 51 connected to the terminals 45 and 46 by conductor wires 45' and 46', which motor may be mounted on a gear mechanism housing 52 having a dial plate or disk 53. On the outside of the disk 53 may be mounted a dial face 54 with numbers 55 to which the hour and minute hands 56 and 57, respectively, may point. Over the face 54 and hands 56 and 57 there may be provided a transparent convexo-concave lens 58, usually of glass. Mounted on or pushed up from the sheet metal

disk or dial plate 53, may be provided an angular base support 59 on which the plug base block 43 may be mounted by the screws 47 and 48. The angle of the surface of the supporting base 59 is preferably equal to the angle that the base 31 is to the vertical, and may even be a few degrees more to insure a good hooking engagement in the pocket and close fitting of the lower edge of the clock 50 against the wall 11. Since the whole weight of clock 50 is supported on the block 43 in the bracket 20, and this block and bracket are located at an angle to the horizontal, the weight of the clock itself maintains the electrical connection between the plug and socket, and prevents the clock from being vibrated off of the wall once it is mounted as shown in Fig. 3.

The above assembly for an electric clock and its mounting on a wall, free from any exposed electrical connections or wires, is made even more flush with the wall by the use of the specific split retaining ring 60, preferably of a resilient metal such as aluminum, which holds the lens 58 in place over the dial 54 and its backing plate 53. Details of this ring 60 are shown in Figs. 5, 6 and 7, in which the ring itself comprises a U-shaped channel strip which is bent around in a circle with the side flanges 61 and 62 of the ring extending toward its center and engaging, respectively, along the outer sides of the peripheral edge of the lens 58 and the backing plate 53, holding these edges together. The ends of base portion 63 of the U-shaped channel strip or ring, may be provided with a dove-tail joint 64 to hold the ring to a given radius once it is assembled around the peripheral edges of the clock face and lens.

In order to cover this dove-tail joint and to prevent one end thereof from radially springing out of and away from the other, a covering clip 70 may be provided of thin sheet material, preferably metal bent in the form of a U with inwardly bent U-shaped hook ends 71 and 72 on each end of the U side portions 73 and 74 (see Fig. 7). The former hook end 71 may fit snugly over the abutting ends of the sides 62 of the channel strip 60, and aid in keeping them in alignment and the dove-tail joint together. The other hook end 72 may extend farther from the rim 63 of the channel strip, and engage a wire retaining spring 80 which has a straight portion 81 extending across said hook 72 and passing under a pair of hook flanking lugs 82 and 83, which lugs may be pushed out from metal back plate 53. In order to be able to easily and manually disengage this spring from the lugs 82 and/or 83 to dismantle the ring 60 and get to the face of the clock 50, one or both ends of the spring wire 80 may be provided with bowed portions 84 and 85 which normally may be snapped under and behind the side 61 of the strip 60 as shown in Fig. 6. The spring wire 80 may also have bent tip ends 86 and 87 that may be engaged by one's finger-nail to pull their corresponding bowed portions 84 and 85, respectively, out from behind the side 61 of the channel strip ring 60, so that the wire 80 may be rotated around the axis of the straight portion 81 into the dotted line position 88 of the bowed portions shown in Fig. 6. Now, one's finger may be placed behind the bowed portions 84 and 85 to pull the portion 81 of the wire 80 out from under the adjacent lugs 82 and 83, respectively, to release the clip 70 from its resilient pull by the wire 80 on the hook 72 to maintain the clip 70 tensioned over the dove-tail joint 64. With the clip 70 released and removed, the ends of the ring strip 60 may be disengaged and then the whole lens may be removed. Such is the simple manual method for taking apart the lens retaining ring of the clock. This connecting device comprises the retaining ring 60, its clip 70 and wire 80, which give a neat appearance and do not expose to the outside anything but smooth surfaces and edges.

Although the particular structures of the connecting devices disclosed herein have been illustrated for an electric wall clock which is mounted with its dial face flush with the wall, the features of this structure may also be

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applied to other devices than clocks which require both a bracket support and an electrical connection, such as for meters on a panel, etc. without departing from the scope of this invention. The ready manner in which the clock for such devices can be interchanged without the presence or nuisance of loose conductor wires is a very material advantage of this invention and enables a repair man to snap, hang or put in place a spare device immediately while the faulty one may be removed to a shop for repairs.

Furthermore, the specific structure of the clip connection for the abutting ends of a split retaining ring, may be adapted to other purposes than affixing the lens on the dials of clocks, or like instruments, such as for the neat outward fastening of the tops on closures, etc. without departing from the scope of this invention.

While there is described above the principles of this invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of this invention.

What is claimed is:

1. A clamp ring for the periphery of a pair of rim members comprising: a U-shaped channel strip bridging the peripheral edges of said rim members, a dove-tailed connection between the abutting ends of said strip, a U-shaped clip for covering said dove-tailed connection to hold it together, said clip having a pair of inwardly hooked ends, one of said ends engaging the abutting ends of one side edge of said channel strip, a lug means mounted on one of said rim members, and spring means between and engaging the other of said hooked ends and said lug means for tensioning said clip around said dove-tailed connection.

2. A connection according to claim 1 wherein said spring means includes a bowed portion for resilient engagement with said channel strip for enabling manual disconnection of said spring means from said clip for dismantling said channel strip and said rim members.

3. A clamping ring for the periphery of a pair of rim members, comprising: a channel strip having longitudinal inner side edges and bridging the adjacent peripheral

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edges of said rim members, a flush interlocking connection between the abutting ends of said strip, clip means having hooked ends, one of which ends engages the abutting ends of one side edge of said channel strip, a lug means mounted on one of said rim members, and spring means engaging the other hooked end of said clip and said lug means for maintaining said clip means around said connection.

4. A connection according to claim 3 wherein the opposite sides of the edges of said rim members are formed to wedge between the longitudinal inner side edges of said channel strip.

5. A connection according to claim 4 wherein at least one of said rim members is formed to have a surface diverging away from its periphery.

6. A connection according to claim 3 wherein said lug means comprises a pair of lugs adjacent opposite side edges of said clip means.

7. A connection according to claim 3 wherein said spring means includes an extension from said lug means for engagement within said channel strip between an inner side edge of said strip and said one of said rim members.

8. A connection according to claim 7 wherein said extension comprises a pair of bowed portions wherein the bows of said bowed portions engage said channel strip.

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