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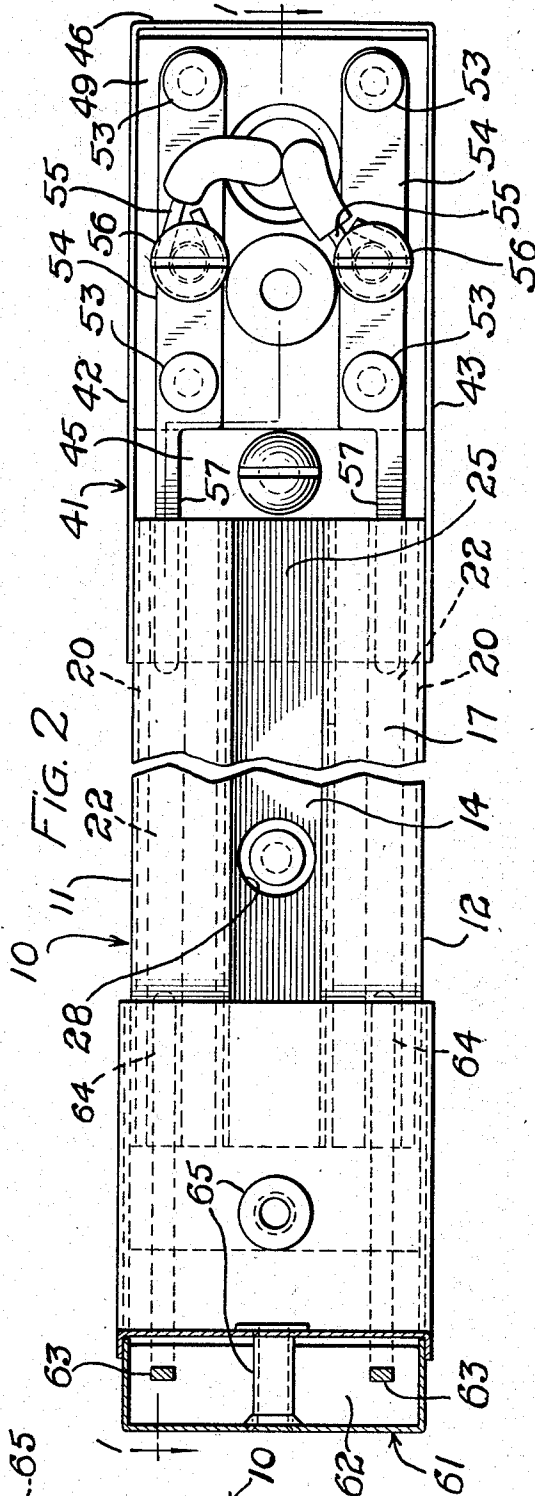
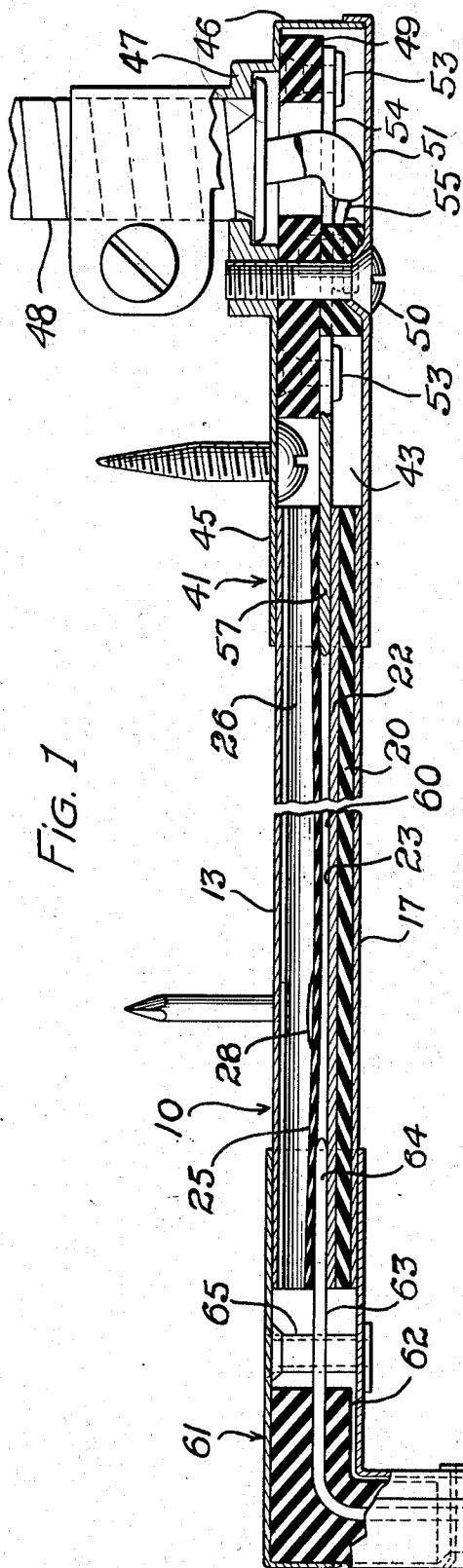
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ELECTRICAL CONTACT PLUG RECEPTACLE

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ELECTRICAL CONTACT PLUG RECEPTACLE

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7 Claims. (Cl. 173—334.1)

This invention relates to electrical contact plug receptacles and more particularly to a continuous strip type electrical receptacle adapted to have particular electrical contact plugs connected thereto throughout its length.

An object of this invention is to provide a continuous strip type electrical contact plug receptacle, which is of simple, inexpensive and durable construction and practical and efficient for purposes for which it is intended.

In accordance with the general features of the invention there is provided an electrical contact plug receptacle which in one application thereof is adapted for attachment to or incorporation in a base board extending around a room, whereby electrical appliances may be connected to an electrical circuit at a plurality of points along each side of the room. One embodiment of the invention comprises an elongated metal housing

having a continuous horizontal slot in its front wall. Snugly fitted within the housing, one at each side of the slot and extending throughout its length is an L-shaped insert of insulating material having embedded in its vertical arm,

forward of its rear surface, a continuous conductor bar which is bare for electrical conduction along its rear face. Loosely fitted within the housing between horizontal arms of the inserts is a continuous insulator strip serving to close the

slot in the front housing wall except adjacent points where plugs are connected thereto. The insulator strip is constantly urged toward the front of the housing to its closing position against continuous stop surfaces provided on the inserts

by a bowed continuous strip spring, the rear edges of which engage the rear housing wall. The conductor bars may be connected to an electrical appliance by a contact plug having oppositely extending contact prongs which are hook shaped

at their outer ends, the prongs of the plug being entered in the housing slot and pressed against the insulator strip to move it rearward against the action of the bowed strip spring and then rotated 90 degrees to engage the prongs with the

conductor bars, the bowed spring applying pressure against the prongs to maintain them in firm contact with the conductor bars. Corner connecting means is provided for joining the ends of receptacles at corners to continue the

electrical circuit through the conductor bars around the room walls from a single current supply source which may be connected to the conductor bars at any convenient point by a suitable connector means.

Other objects and features of the invention

may be had from the following detailed description taken in conjunction with the accompanying drawings, in which

Fig. 1 is a plan sectional view of an electrical contact plug receptacle embodying the features of this invention taken on the line 1—1 of Fig. 2 and showing a corner connector, a combined current supply source connector and an end cover;

Fig. 2 is a front elevation thereof, with a front cover of the current supply source connector removed;

Fig. 3 is a front elevation, partly in section, of a cover for an end of the receptacle which is spaced from the current supply source connector;

Fig. 4 is a vertical section taken on the line 4—4 of Fig. 3;

Fig. 5 is a vertical section through the receptacle with a particular contact plug spaced therefrom with its prongs positioned ready for insertion in the receptacle and engagement with the conductor bars thereof;

Fig. 6 is a similar view of the receptacle with the plug shown in connected position after insertion and a rotation thereof of 90 degrees to engage the prongs thereof with the conductor bars, and

Fig. 7 is a front elevation of Fig. 6.

Referring now to the drawings and particularly to Figs. 1 and 5, wherein a simple inexpensive embodiment of the contact plug receptacle of this invention is shown adapted to be attached to a base board (not shown) extending around the walls of a room, the numeral 10 indicates an elongated housing of rectangular cross section formed from sheet metal, the housing having

top, bottom and rear walls, 11, 12 and 13, respectively. The housing 10 is formed with a continuous horizontal slot 14 in its front wall 17 intermediate the top and bottom walls 11 and 12, respectively. Formed integral with and extending inwardly at right angles from the front wall 17 at each side of the slot 14 are arms 18 forming upper and lower walls of the slot, the extension terminating in oppositely directed right angle lips 19. Although the housing in the present embodiment is described as of sheet metal it may be found desirable to use other material and instead of forming it from sheet material other methods may be used, such as by molding or extruding suitable material to form the

housing.

Formed to fit snugly within the housing 10, one at each side of the slot 14, and extending throughout its length is an L-shaped insert 20 of insulating material having embedded in its

one at each side of the slot 14, and extending throughout its length is an L-shaped insert 20 of insulating material having embedded in its

vertical arm a continuous conductor bar 22 which is bare for electrical conduction along its rear face 23. The inserts 20 may be formed by a suitable continuous extrusion die process and dimensioned to snugly fit between the rear and front walls 13 and 17, respectively and the front wall arms 18 of the housing 10, when slid into position through either of the open ends thereof. The inserts 20 are each formed with a continuous rear extension 24 which projects slightly beyond the lip 19 and the rear face 23 of the conductor 22, the insert extensions 24 serving as spaced stops for opposite portions of a continuous insulator strip 25 which is slidably fitted in the housing between the horizontal arms of the L-shaped inserts 20. Between the opposed inner surfaces of the rear housing wall 13 and the insulator strip 25 is a bowed continuous strip spring 26 having its rear edges engaging under pressure the rear housing wall 13 and the forward crowned surface of the spring pressing against the rear surface of the insulator strip. Thus, the spring 26 is constantly urging the insulator strip 25 against the continuous stop extensions 24 provided on the inserts 20, in which position the insulator strip serves as a closure member for the entire length of the continuous slot 14 in the front housing wall 17, thereby effectively sealing the inside of the housing, which contains the conductor bars 22, from the entrance of dust, water or other liquids and also of foreign metal articles which might make contact with the conductor bars. The rear wall 13 of the housing 10, as well as the strip spring 26 and insulator 25, are formed with aligned apertures 28 arranged at suitable distances apart for the entrance of nails or other fastening means to secure the housing 10 to the base board, the aligned apertures being accessible through the continuous slot 14 in the front wall 17 of the housing.

To establish a connection from the conductor bars 22 at any point in their length to an electrical appliance (not shown) there is provided a particular contact plug 30 (Figs. 5, 6, and 7) comprising an elongated supporting cap or handle 31 of insulating material. Suitably attached to the handle 31 is a pair of terminals 32 which are connected at their inner ends, within the handle, to conductor wires 33 of a cable 34. The terminals 32 project through a central outwardly extending portion 36 of the handle 31 which is of circular cross-section and a diameter which will freely pass into and be capable of rotary motion in the slot 14 of the receptacle housing 10. The periphery of the portion 36 is equipped with an insulated metal sheath to prevent short circuiting between the conductor bars 22 and terminals 32 when inserting or removing the plug 30. The projecting ends of the terminals 32 are bent at right angles in opposite directions and then rearward to form parallel hook-shaped contact prongs 37, the end surfaces of which are so shaped and arranged, as indicated at 38 (Fig. 5), that they may be moved into contact with the rear conducting faces 23 of the conductor bars 22, as shown in Fig. 6 with a cam-like action, thereby facilitating the insertion and withdrawal of the plug.

To attach the contact plug 30 to the receptacle at the desired point and establish an electrical connection from the continuous conductor bars 22, to the terminals 32 of the plug, the handle 31 of the plug is first positioned so that the longest dimension thereof extends at right angles to the

housing slot 14, as shown in full lines in Fig. 5, in which position the plug terminals 32 will lie parallel to the housing slot, whereupon the plug is moved to enter the central portion 36 thereof into the slot and simultaneously pressing the terminals against the outer exposed surface of the continuous insulator strip 25, as shown fragmentarily in dotted outline in Fig. 5, such pressure being resisted by the bowed continuous strip spring 26. The pressure of the terminals 32 against the insulator strip 25 is preferably continued until a rear surface 39 of the plug 30 comes to a stop against the front wall 17 of the receptacle housing 10. In this position of the plug 30 the end surfaces of the hooked-shaped contact prongs 37 of the terminals 32 will lie slightly back of the continuous rear extension 24 of the inserts 20 carrying the conductor bars 22. Thereafter the plug handle 31 is rotated 90 degrees to cause the end surfaces of the contact prongs 37 to lie parallel to the conductor bars 22 and upon releasing the plug 30 the compressed bowed strip spring 26 acting against the insulator strip 25, which is engaging the contact prongs, will move the plug 30 slightly outward and carry the contacting end surfaces of the prongs into firm conducting engagement with the conductor bars 22, as shown in Fig. 6 and the electrical connection between the receptacle and the contact plug 30 is completed. It will be observed that the position of the plug 30 in the receptacle may be readily changed, without detaching it, by merely sliding it along the receptacle. To detach the contact plug 30 from the receptacle inward pressure is again applied to the plug to preferably move the surface 39 thereof into engagement with the front wall 17 of the housing 10, the plug thereafter being rotated 90 degrees and withdrawn.

In the present embodiment of the invention the receptacle, as shown in Figs. 1 and 2, is equipped at its right end with a combined end cover and connector for joining a current supply source to the conductor bars 22 of the receptacle. This connector comprises a metal housing 41 having upper and lower walls 42 and 43, respectively, a rear wall 45 and an end wall 46, the housing being open at its front. The housing 41 is so shaped and dimensioned that it may be slid for a suitable distance with a tight fit into position over the end of the receptacle housing 10. Integrally formed with the rear wall 45 is a split sleeve 47 for receiving and clamping thereto a standard BX cable 48, which may be connected to a current supply source. Fitted within the housing 41 is a molded insert 49 of insulating material which is secured to the rear wall 45 by a screw 50, which also serves to hold a flanged cover plate 51 for the open front of the housing 41. Secured to the front surface of the insert 49 by members 53 are a pair of terminals 54. Conductor wires 55 of the cable 48 are connected to the terminals 54 by screws 56 suitably attached to the terminals. The terminals 54 are formed with contact prongs 57 which extend from the insert 49 and are arranged to enter into the spaces 60 (Fig. 4) formed between the rear faces 23 of the conductor bars 22 and the opposite face of the insulator strip 25, when the connector is slid into position on the receptacle housing 10, as shown in Figs. 1 and 2. Although the combined end cover and connector is disclosed herein as constructed for association with one end of the receptacle it will be obvious that it may be constructed at each side of the split

sleeve 47 with portions for fitting receptacle housings 10 disposed at opposite ends thereof and fitted with pairs of terminal contact prongs 57 at each end, whereby the receptacle may be connected to the current supply source at any point along a wall where found convenient. Also, although the connector disclosed in Figs. 1 and 2 is shown as associated with the right end of a receptacle it may be associated with the opposite end thereof by simply turning it around.

For joining the ends of receptacles at corners, whereby the electrical circuit through the conductor bars 22 may be continued around the room walls from a single current supply source connector of the type above described, an L-shaped metal housing 61 is provided, as shown in Figs. 1 and 2. The housing 61 is so shaped and dimensioned that it may be fitted over the ends of receptacle housings 10 in the manner of the connector housing 41 above described. Carried within the housing 61 is an insert 62 of insulating material having embedded therein conductor bars 63 terminating at opposite ends in contact prongs 64 which extend from the ends of the insert. The contact prongs are so arranged that upon joining the ends of the housing 61 to ends of receptacle housings 10 the contact prongs enter into the spaces 60 (Fig. 4) referred to hereinbefore and the electrical circuit is thus completed around the corners of a room. Each arm of the L-shaped housing 61 is provided with an eyelet 65 having its ends riveted to opposite walls of the housing for the entrance of a screw to fasten the housing to the baseboard of the room.

In Figs. 3 and 4 is illustrated a cover for either end of the receptacle housing 10 which is spaced from the current supply source connector. The end cover comprises a metal housing 67 having front, top, bottom and end walls 68, 69, 70 and 71, respectively, dimensioned and shaped to be slid into position over the end of the receptacle housing 10. Interposed between the housings 67 and 10 is a U-shaped insulating lining member 74 having one arm 75 arranged between the inner and outer surfaces of the front walls 68 and 17 of the housings and an opposite parallel arm 76 between the inner surface of the rear wall 13 of the housing 10 and the bowed strip spring 36, the latter arm being of such width that it fits between the L-shaped inserts 20. A portion 77 of the insulating lining 74 interconnecting the arms 75 and 76 thereof abuts and serves to close the open end of the receptacle housing 10. The outer end portion of the housing extends outward from the end of the receptacle housing 10 and the portion 77 of the insulating lining 74 and is provided in its front wall 68 with an opening for the passage of a screw to fasten it to the baseboard of the room. For the purpose of locating the housing 67 on the housing 10 and strengthening the housing 67 at the end of the housing 10, the housing 67 is formed with a right angle inwardly directed lip 78 struck out of its front wall 68, the lip extending to the plane of the rear surface of the rear wall 13 of the receptacle housing 10.

From the foregoing description it will be observed that a simple, inexpensive and durable continuous strip type electrical contact plug receptacle is provided and the construction is such that it is fully insulated and thereby is safe to use. A receptacle of this type is very useful in that it permits one or more contact plugs to be connected thereto at a plurality of positions in its length, thereby facilitating the connection

of electrical appliances at desired positions in a room. Although in the particular application of the above described receptacle it is disclosed as applied to the baseboard extending horizontally around the walls of a room it may be used vertically wherever found desirable.

It will be understood that the specific embodiment of the invention as herein described and illustrated is to be interpreted as merely illustrative and that it is capable of other applications and that modifications can be made without departing from the spirit and scope of the appended claims.

What is claimed is:

1. In an electrical contact plug receptacle, a housing having an opening extending longitudinally thereof, spaced conductors within, insulated from and extending longitudinally of the housing, said conductors each having an exposed surface for electrical conduction, and means movable independently of and within the housing including a bowed strip spring effective to normally close said opening and adapted to yield when a contact plug is pressed thereagainst through said opening in contacting prongs of the plug with the exposed conductor surfaces, said means effective thereafter to maintain the prongs of the plug in firm contact with the exposed conductor surfaces.

2. In an electrical contact plug receptacle, a housing having an opening extending longitudinally thereof, insulated conductors within and extending longitudinally of the housing at each side of the opening, said conductors each exposed upon a continuous rear surface for electrical conduction, and yieldable means within the housing at the rear of and spaced from said exposed conductor surfaces effective to normally close said opening and adapted to move when a contact plug is pressed thereagainst through said opening in contacting prongs of the plug with the exposed conductor surfaces.

3. In an electrical contact plug receptacle, a housing having an opening extending longitudinally along its front portion, insulating inserts within and extending longitudinally of the housing at opposite sides of said opening, said inserts having portions arranged across opposite housing portions and other portions arranged across the front housing portion, a conductor supported in the latter portion of each insert and having an exposed surface for electrical conduction, and yieldable means within the housing arranged to be engaged and moved by a contact plug upon entering the same through said opening in engaging prongs of the plug with the exposed surfaces of said conductors, said yieldable means effective thereafter to maintain the prongs in firm contact with the exposed conductor surfaces.

4. In an electrical contact plug receptacle, a housing having an opening extending longitudinally along its front portion, insulating inserts within and extending longitudinally of the housing at opposite sides of said opening, a conductor supported by each insert and exposed for electrical conduction upon a surface extending parallel to said opening, said exposed conductor surfaces being depressed to lie back of parallel surfaces of the inserts, and yieldable means arranged between said parallel surfaces of the inserts and an inner surface of the housing, said means effective to normally close said opening and arranged to be engaged and moved by a contact plug entered through said opening in en-

gaging prongs of the plug with the exposed conductor surfaces.

5 5. In an electrical contact plug receptacle, a strip type housing having an opening extending longitudinally thereof, spaced conductors within said housing, insulated from and extending along said opening, said conductors each having an exposed surface for electrical conduction, a movable insulator strip fitted within the housing extending along said opening and exposed conductor surfaces, and yieldable means extending along said strip arranged between and bearing against an inner surface of the housing and said strip effective to normally press said strip to close said opening, said insulator strip adapted to move when a contact plug is pressed thereagainst through said opening in contacting prongs of the plug with the exposed conductor surfaces and effective thereafter to maintain the prongs in firm contact with the exposed conductor surfaces.

6. In an electrical contact plug receptacle, a strip type housing comprising front, rear, top and bottom walls, said front wall having an opening extending longitudinally from end to end thereof, opposite sides of said opening being formed by walls extending inwardly from and attached to said front wall, said inwardly extending walls terminating in oppositely directed angular continuous arms, insulating inserts fitted between inner surfaces of the front, rear, top and bottom walls and said arms at each side of and extending along said opening, a conductor set within each insert and continuously exposed upon one sur-

face for electrical conduction, a movable insulator strip fitted within the housing extending along and adapted to normally close said opening, and a bowed strip spring extending along said strip arranged between and bearing against said strip and rear wall effective to yield upon pressing a contact plug through said opening and against said strip in contacting prongs of the plug with the exposed conductor surfaces.

7. In an electrical contact plug receptacle, a housing having an opening extending longitudinally thereof, spaced conductors within, insulated from and extending longitudinally of the housing, said conductors each having an exposed surface for electrical conduction, yieldable means within the housing effective to normally close said opening and adapted to move when a contact plug is pressed thereagainst through said opening in contacting prongs of the plug with the exposed conductor surfaces, means for connecting a current supply source to said conductors comprising a casing adapted to be connected to an end of said housing, spaced conductor terminals within and insulated from said casing and at free ends thereof being arranged for contact with the exposed surfaces of said conductors upon joining said casing to housing, means attached to said casing for receiving and clamping thereto a current supply source cable, means for connecting wires of said cable to said conductor terminals, a cover adapted to be connected to an end of said housing, and means for insulating the conductors within the housing from the cover.

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