

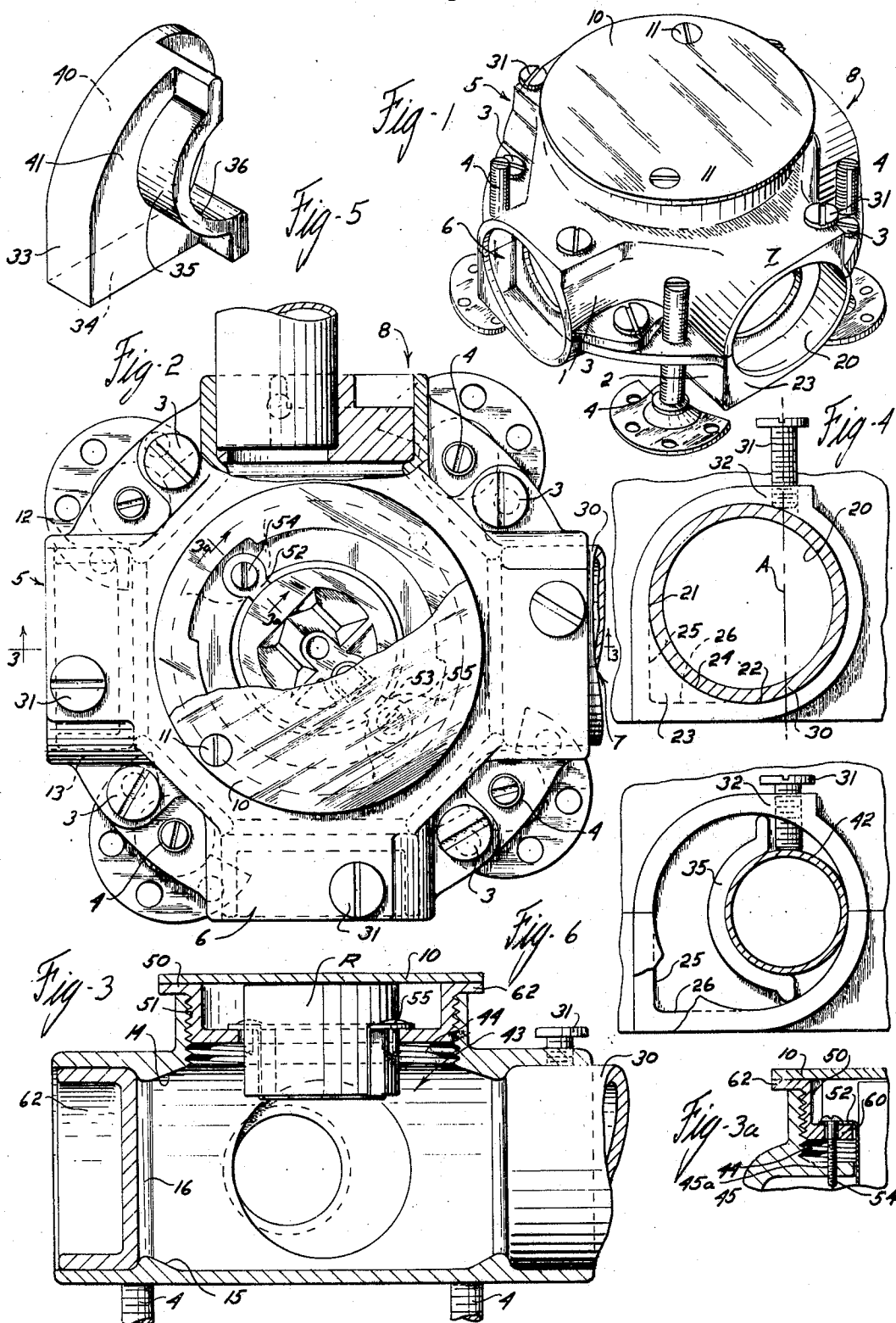
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FLOOR BOX

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3,485,933
FLOOR BOX

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3 Claims

ABSTRACT OF THE DISCLOSURE

Floor box having conduit connector sections to receive maximum size conduit or with adaptor to receive smaller size conduit and also having receptacle support adjustable without twisting wires.

This invention relates to under floor distribution systems and in particular relates to an improved floor box for use in such systems.

One of the principal objects of the invention is to provide a single floor box which is constructed and provided with means which adapt the single box for use with all of the various different size conduits commonly employed in under floor systems and thereby eliminate the need for a vast inventory of floor boxes as now is the case.

Another principal object of the invention is to provide a floor box having means supporting a receptacle for vertical adjustment to accommodate varying floor levels without twisting the wires connected to the receptacle.

The invention will be explained below in connection with the following drawings wherein:

FIGURE 1 is a perspective view of a floor box constructed in accordance with the invention;

FIGURE 2 is an enlarged plan view of the floor box of FIGURE 1 with certain parts broken away;

FIGURE 3 is an elevational view taken along the lines of 3—3 of FIGURE 2.

FIGURE 3a is a fragmentary view taken along the lines 3a—3a of FIGURE 2;

FIGURE 4 is an end view showing the manner in which an under floor conduit of maximum size is connected to the floor box;

FIGURE 5 is a perspective view of an adaptor used with the floor box to adapt the same for smaller sized conduits;

FIGURE 6 is an end view showing the manner in which an adaptor is used to support smaller size conduits for connection to the floor box.

The floor box shown in FIGURE 1 is of two-piece construction there being an upper section generally designated by numeral 1 and a lower section generally designated by numeral 2. The sections abut one another along a horizontal plane and are fastened securely by the screws 3. The levelling devices 4 provide for levelling and adjusting the box vertically at installation. The box has connector sections 5, 6, 7 and 8 for joining tubular under floor conduits. For installation and non-use purposes the box has a cover 10 secured to the top of the box by the screws 11. The cover is replaced by a floor fitting when a receptacle is installed in the box.

The interior of the box is hollow and the design provides for an inside contour which is relatively clean or without burrs and is funnel-like in order to assist the pulling of wires through the same without difficulty. For example, with reference to FIGURES 2 and 3 it will be noted that the structure of the box (adjacent connector section 5) contemplates two vertically extending walls 12 and 13 which are angled with respect to the connector section and top and bottom walls 14 and 15 which are also angled with respect to the connector section. These angled walls are terminated generally by an abutment 16 which is round and smooth. It will be apparent there-

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fore that wires can be pulled through the connector 5 toward the top of the box or toward the left and right hand sides and that the smooth abutment and the shape of the walls will promote movement of the wires. The other connector sections have similar structure.

Heretofore it has been generally the practice to provide single purpose floor boxes, i.e., with connector sections specifically designed for one particular size conduit and in some instances with connector sections specifically designed for conduits of two different sizes. This system of single purpose boxes has the undesirable characteristic of being inflexible and necessitates a vast inventory of floor boxes which not only adds to manufacturing costs but takes up space and creates a problem of identification.

The present invention eliminates the foregoing disadvantages by providing a single box having connector sections of identical construction and each being arranged to receive the maximum size conduit and also arranged to receive adaptors which permit the connector section to accommodate conduits of smaller size. Thus a single box with a few adaptors supplants a wide variety of single purpose boxes.

With reference to FIGURES 1 and 4 it will be seen that the connector section 7 has a partially circular surface 20. The surface subtends an angle of 270° terminating at the ends 21 and 22. A wall 23 has an outer periphery 24 which is partially circular (90°) and is joined to the surface 20 at the ends 21 and 22. Inwardly of the wall 23 are planar surfaces 25 and 26 which intersect one another and respectively join the ends 21 and 22 of the surface 20. The surfaces 20 and 24 and the walls 25 and 26 form a passage which is open to the interior of the box, the terminal point of the passage being the abutment 16.

The surface 20 and the surface 24 form a circular surface dimensioned to make a snug fit with the outer surface of the maximum size tubular conduit which is to be connected to the box. As shown the conduit is designated by the number 30. Preferably the conduit 30 engages the abutment 16.

The conduit 30 is held in the connector and is electrically grounded with respect to the box by means of a screw which is arranged not only to contact the maximum size conduit but also to contact smaller sized conduits (as is explained later).

As shown the grounding screw 31 is threaded into an aperture 32 in the box, the projection of the axis A of which forms a chord with the surface 20 as is indicated in FIGURE 4.

Each connector section is arranged to receive adaptor which will provide for a smaller sized conduit to be connected to the box. The manner in which this is done is noted below.

With reference to FIGURES 1 and 4 it will be observed that the wall 23 and planar surfaces 24 and 25 form a small pocket. In the embodiment shown the abutment 16 also forms part of the pocket. The purpose of this pocket is to maintain an adaptor within the passage particularly during the time when the tubular conduit is being connected.

A preferred form of adaptor is shown in FIGURE 5 and comprises a pair of planar surfaces 33 and 34 together with an extension 35 having partially circular surface 36. The adaptor is put into the connector section in the manner that is shown in FIGURE 6; i.e. with the planar surfaces 33 and 34 respectively engaging the planar surfaces 25 and 26 and the walls 40 and 41 of the adaptor being respectively held between the abutment 16 and the wall 23.

The surface 36 on the adaptor faces the surface 20 and is dimensioned to accept and make a snug fit of the surface 20.

As seen in FIGURE 6 the extension 35 of the adaptor is configured so that the grounding screw 31 can be tightened down to engage the conduit 42. As will be apparent to those skilled in the art the extension 35 in the adaptor can be dimensioned so as to accept and support conduits of the various standard sizes for example $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1" and $1\frac{3}{4}$ " diameter.

With the above described construction a single box equipped with an appropriate size adaptor adapts the box for use with all the various size conduits and the box can be set up for use with conduits of all one size or use with conduits of different sizes.

Another feature of the invention is in the means supporting the receptacle for vertical adjustment without twisting the wires connected to the receptacle.

As seen in FIGURE 3 the top section 1 has an aperture 43 threaded as at 44. Just below the threaded section 44 are a pair of diametrically opposed tabs (FIGURES 2 and 3a) 45 and 46 which have threaded holes (see 45a). A bushing 50 disposed in the aperture has threads 51 mating with threads 44 providing for the bushing to be adjustable vertically in the aperture. The bushing carries a receptacle R, the mounting arms 52 and 53 of which carry the screws 54 and 55 which pass through holes in the bushing, one of such holes being shown at 60 in FIGURE 3a.

The installation of the receptacle and the vertical adjustment feature are explained following.

Assuming that the floor box is installed with the cover 10 in place and it is desired to put in a floor receptacle and bell-type floor fitting (not shown). First the cover 10 is removed and the bushing 50 is threaded in the aperture 34 until the shoulder 62 is flush with the floor tile. The wires inside the box are then fished up and connected to the receptacle. The bushing then is turned so that the holes in the bushing line up with the threaded holes in the tabs. The screws 54 and 55 are then put into place and the receptacle locked down.

With the above construction it will be noted that the receptacle and bushing mounting holes can be lined up with the threaded holes in the tabs by turning the bushing less than 90°. This 90° or less turn moves the bushing only a very short distance axially because of the pitch on the threads and therefore the level of the bushing with the floor surface is not disturbed.

Before closing it is pointed out that connector sections that are not joined with an under floor conduit can be blocked off as by plugs which are inserted in the passage way and locked down by the grounding screws, for example note the plugs 62 in the connector section 5.

I claim:

1. A hollow floor box having a plurality of connector sections for joining under floor tubular conduits to the box, each connector section being constructed by means forming:

a partially circular surface and a pair of intersecting planar surfaces respectively joining the ends of said partially circular surface, the partially circular and planar surfaces forming a passage open to the interior of the box to receive alternatively a tubular conduit of maximum size or an adapter carrying a tubular conduit of smaller size, the partially circular surface being dimensioned to accept and make a snug fit with the outer surface of the maximum size tubular conduit to be connected to the box and the planar surfaces being for use in supporting an adapter and smaller size conduit in the passage;

a threaded aperture open to said passage, the projection of the axis of the passage forming a chord with said partially circular surface; and

a grounding screw in said aperture adapted to engage a tubular conduit of maximum size in said passage and also a tubular conduit of smaller size supported by an adapter in said passage.

2. A hollow floor box having a plurality of connector sections for joining under floor tubular conduits to the box, each connector section being constructed by means forming:

a partially circular surface;

a wall, the outer periphery of which is partially circular and is joined to the ends of first said partially circular surface, the two partially circular surfaces forming a complete circular surface and a pair of intersecting planar surfaces disposed inwardly of said wall and respectively joining the ends of first said partially circular surfaces, the partially circular and planar surfaces forming a passage open to the interior of the box to receive alternatively a tubular conduit of maximum size or an adapter carrying a tubular conduit of smaller size, the circular surface being dimensioned to accept and make a snug fit with the outer surface of the maximum size of tubular conduit to be connected to the box and said wall and said planar surfaces forming a pocket for supporting adapter and smaller size conduit in the passage;

a threaded aperture open to said passage, the projection of the axis of the passage forming a chord with first said partially circular surface, the chord being spaced from the radius center of said partially circular surfaces;

a grounding screw in said aperture adapted to engage a tubular conduit of maximum size in said passage and also a tubular conduit of smaller size supported by an adapter in said passage; and

abutment means disposed at the inner end of said passage to be engaged by a tubular conduit in said passage and by an adapter in said pocket.

3. A hollow floor box having a plurality of connector sections for joining under floor tubular conduits to the box, each connector section being constructed by means forming:

a partially circular surface;

a wall, the outer periphery of which is partially circular and is joined to the ends of first said partially circular surface, the two partially circular surfaces forming a complete circular surface and a pair of intersecting planar surfaces disposed inwardly of said wall and respectively joining the ends of first said partially circular surface, the partially circular and planar surfaces forming a passage open to the interior of the box to receive alternatively a tubular conduit of maximum size or an adapter carrying a tubular conduit of smaller size, the circular surface being dimensioned to accept and make a snug fit with the outer surface of the maximum size tubular conduit to be connected to the box and said wall and said planar surfaces forming a pocket;

an adapter in said pocket, the adapter being for use in supporting a tubular conduit of lesser diameter than the conduit of maximum diameter and the adapter having means forming a pair of planar surfaces in engagement with first said planar surfaces, the engagement of the planar surfaces preventing the adapter from rotating and also positioning the adapter in the passage and an extension having a partially circular surface facing a portion of first said partially circular surface and being dimensioned to accept and make a snug fit with a tubular conduit of lesser diameter than the said maximum so that the lesser diameter conduit also engages a portion of first said partially circular surface;

a threaded aperture open to said passage, the projection of the axis of the passage forming a chord with first said partially circular surface and the chord being spaced from the radius center of first said partially circular surface; and

a grounding screw in said aperture adapted to engage a tubular conduit of maximum size or alternatively

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the tubular conduit of lesser size when the same is supported by said adapter.

References Cited

UNITED STATES PATENTS

| | | | |
|-----------|--------|---------------|-----------|
| 1,271,478 | 7/1918 | Krantz ----- | 174—53 X |
| 1,880,107 | 9/1932 | Roseman ----- | 285—177 X |
| 2,316,835 | 4/1943 | Blood ----- | 174—52.5 |

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