

[54] **PULL KNOB ASSEMBLY WITH INTERCHANGEABLE PLUG INSERTS**

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[51] Int. Cl. **A47b 95/02**

[58] Field of Search **16/121, 127, 118, 16/110 R; 292/347**

[56] **References Cited**

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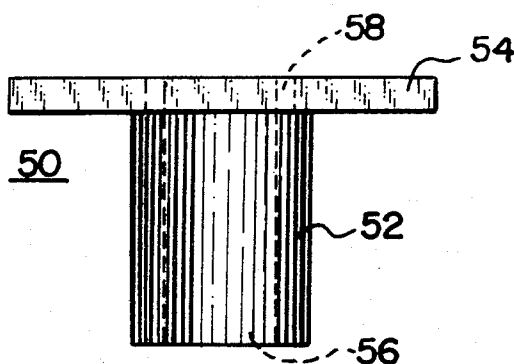
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Primary Examiner—Francis K. Zugel
Assistant Examiner—Kenneth J. Dörner
Attorney—Milton J. Wayne et al.

[57] **ABSTRACT**

A pull knob assembly utilized for attachment to doors drawers and the like. The assembly comprises a body portion having a flange to be grasped for opening and closing of the door. A set of interchangeable plug elements fit within the body portion. One plug element is completely enclosed within the body portion while the other plug element projects slightly therefrom to provide a mounting for a grasping element to be used instead of the flange. A complete knob unit is assembled by inserting a plug element into the body portion, and this includes an internal fastening device that cooperates with an external fastening device for mounting the knob unit on the door. The internal fastening device may be formed either in the plug element or it may be formed in the body portion, in which case the plug element is formed with leg members slidably mounted on either side of the internal fastening device.

24 Claims, 36 Drawing Figures



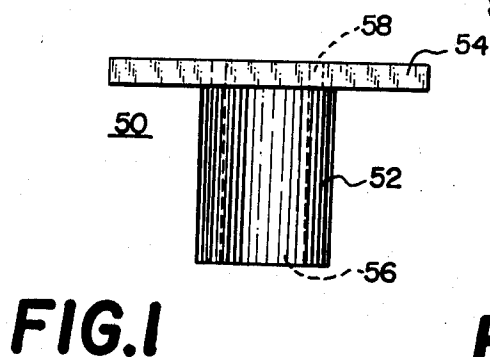
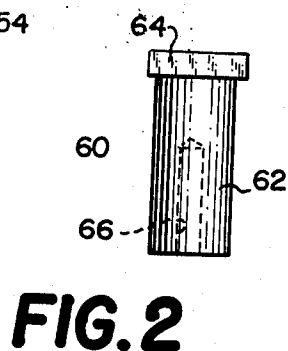
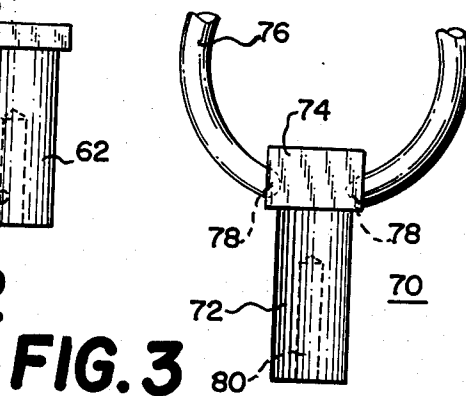
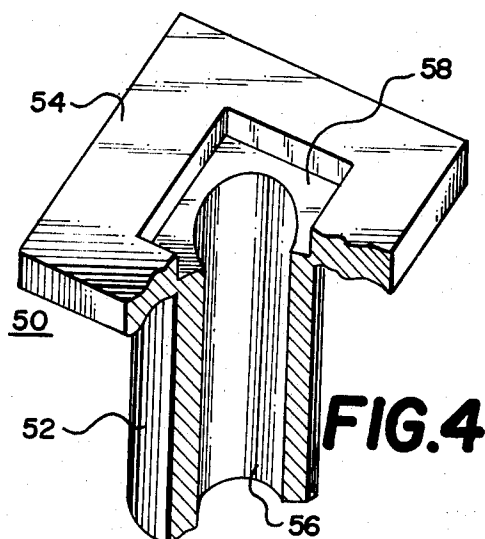
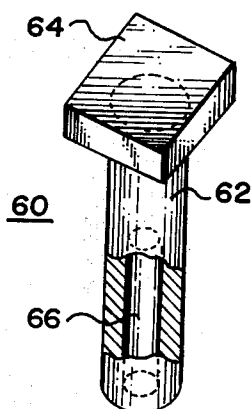
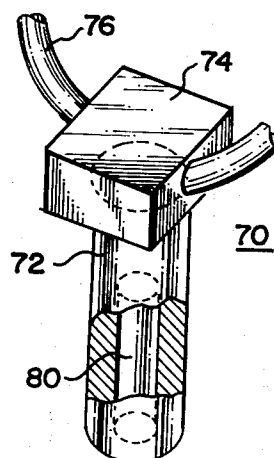
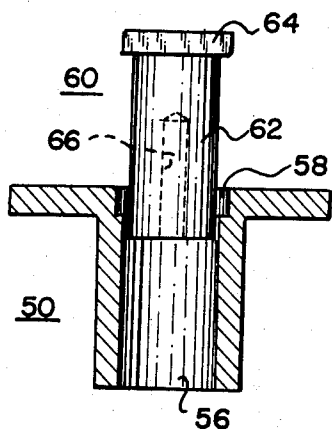
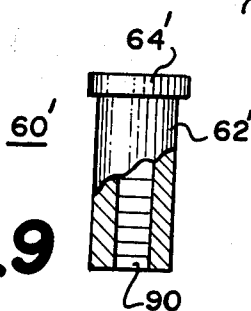
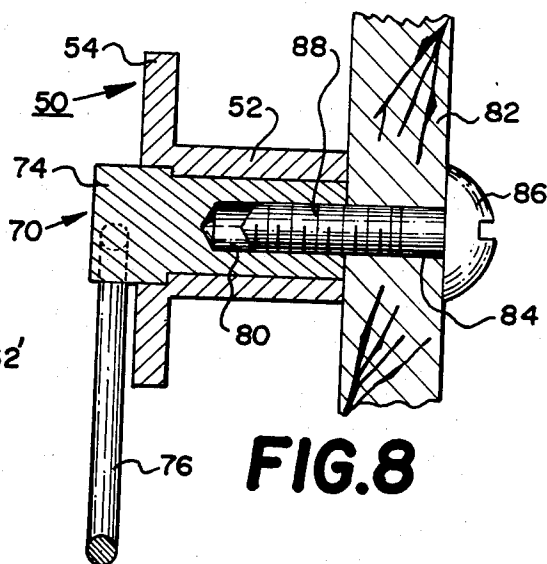


FIG. 7



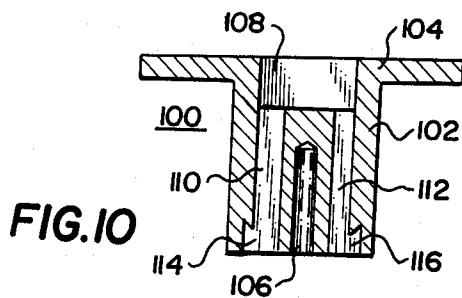


FIG. 10

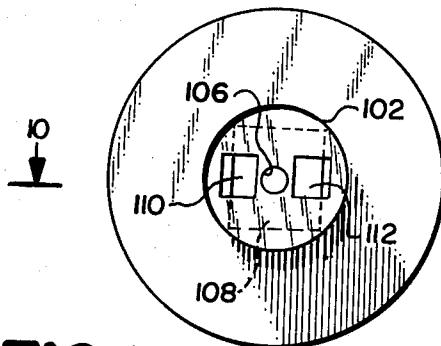


FIG. 11

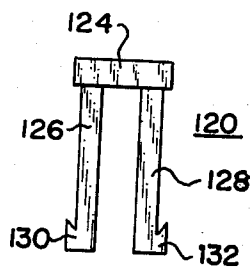


FIG. 12

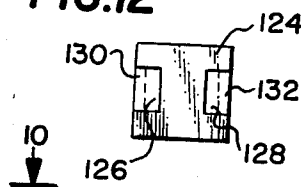


FIG. 14

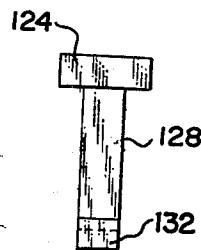


FIG. 13

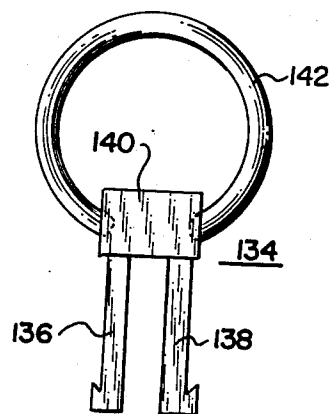


FIG. 15

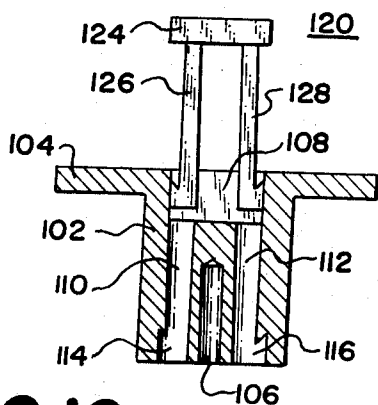


FIG. 16

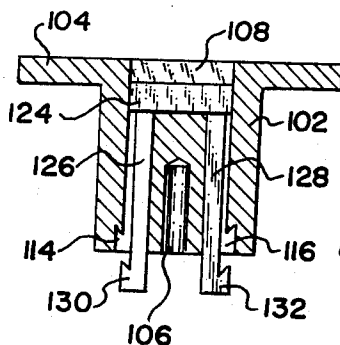


FIG. 17

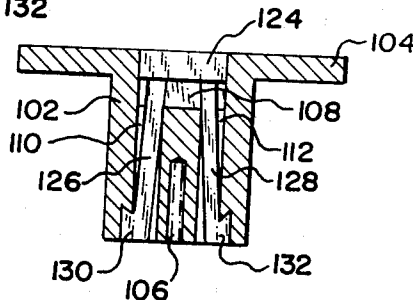


FIG. 18

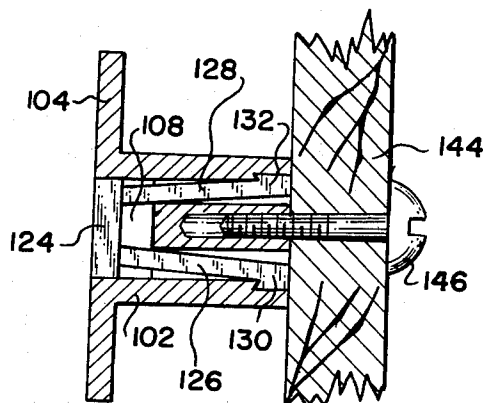


FIG. 19

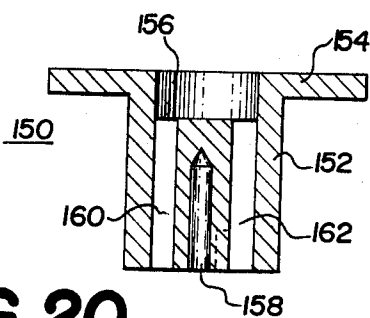


FIG. 20

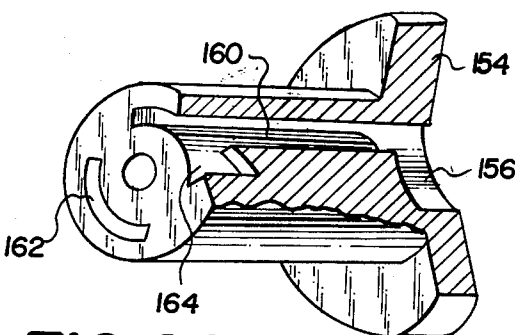


FIG. 22

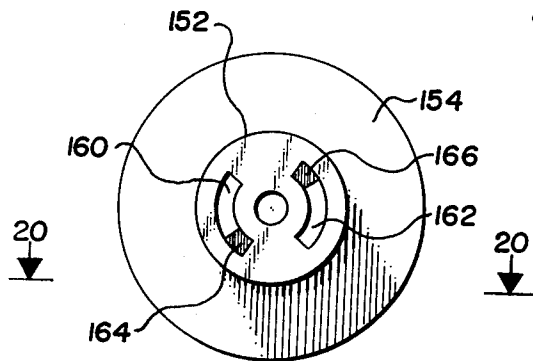


FIG. 21

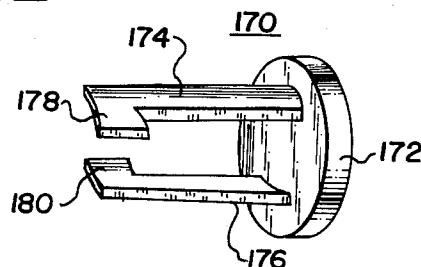


FIG. 23

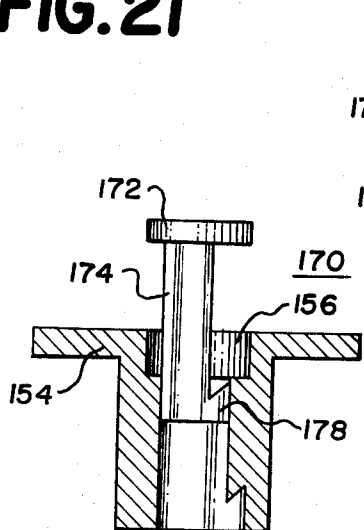


FIG. 24

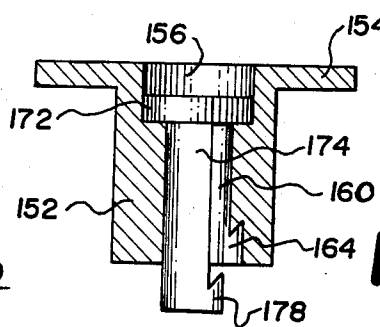


FIG. 25

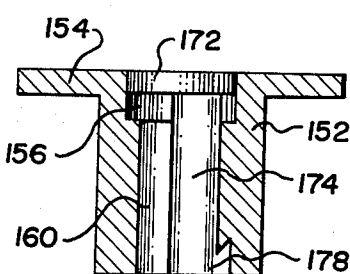


FIG. 26

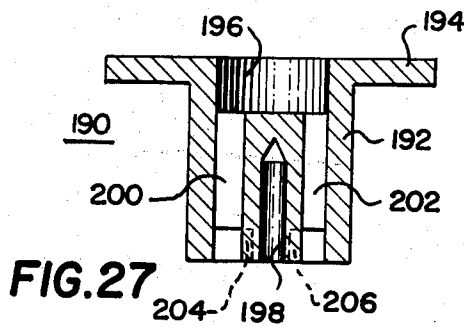


FIG. 27

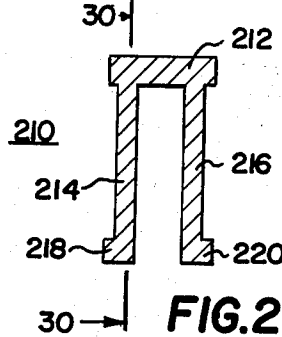


FIG. 29

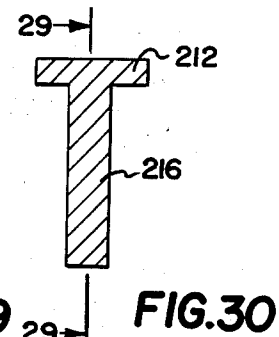


FIG. 30

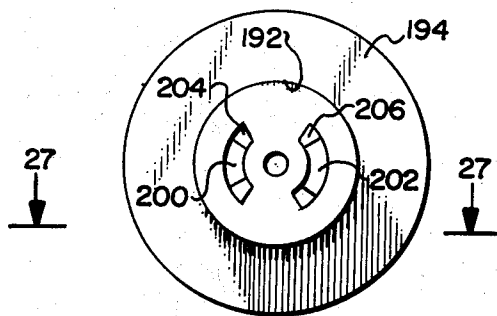


FIG. 28

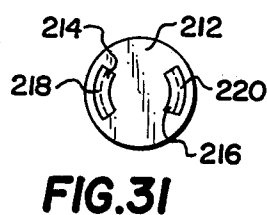


FIG. 31

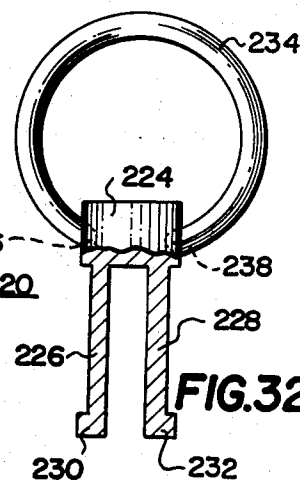


FIG. 32

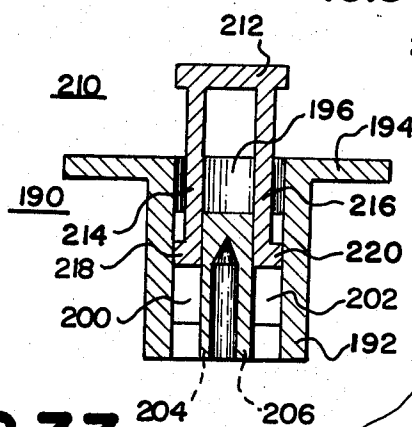


FIG. 33

FIG. 34

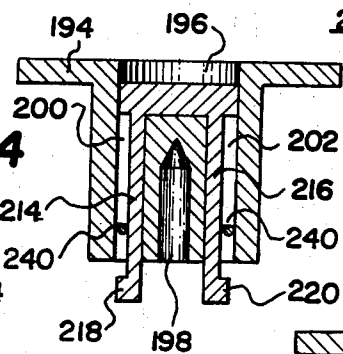
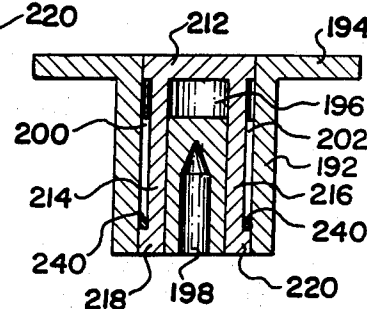


FIG. 35

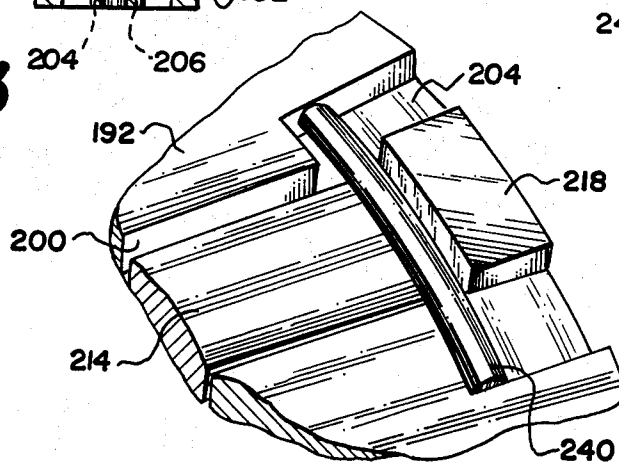


FIG. 36

PULL KNOB ASSEMBLY WITH INTERCHANGEABLE PLUG INSERTS

BROAD STATEMENT OF INVENTION

The present invention relates to a pull knob for doors, drawers and the like and is particularly concerned with interchangeable plug elements with fastening means that can be formed either in the plug element or in a body portion of the pull knob.

DESCRIPTION OF THE PRIOR ART

It is known in the prior art to provide a pull knob for a door or the like which can be grasped by hand for opening and closing the door. The knob generally includes a body portion mounted on the door with a flange on the remote end to be grasped. Another type of knob involves the use of a swingable ring attached to the knob and the ring is grasped for moving the door. However, the ring knob in the prior art is a completely separate knob unit with respect to the flat flange unit, and the purchaser has to select either one or the other for the permanent installation. Accordingly, it would be desired if a single pull knob assembly were available which could be used interchangeably with either the flat flange surface or the pull ring.

DESCRIPTION OF THE INVENTION

The present invention provides a pull knob assembly consisting of a single body portion and interchangeable plug elements that can form a knob unit with either a flat flange surface or a ring pull.

In the present invention a pull knob assembly is provided in which the knob body portion includes an opening into which either one plug element can be inserted to provide a flush outer flange surface or a separate plug element can be inserted having a projecting mounting for a pull ring.

A further provision of the present invention is a pull knob assembly having a knob body portion with a flange through which an opening is formed to receive either a plug element that is completely received within the opening to form a flush outer surface of the flange, or a separate plug element received to have a part projecting beyond the flange on which a ring is mounted with both plug elements having internal fastening means cooperable with an external fastening means for mounting on a door or the like.

There is further provided by the present invention a pull knob assembly having a knob body portion that includes a pair of openings on either side of internal mounting means with the openings adapted to receive a pair of legs in sliding engagement formed separately on a pair of interchangeable plug elements, one of the plug elements providing a flush surface with the flange and the other plug element having a ring mounting projecting beyond the flange surface.

There is also provided in the present invention interchangeable plug elements for a knob body in which one plug element is formed with a flat end and the other plug element is formed with a ring on its end, both plug elements having extending leg portions that terminate in projections for locking engagement when inserted into the knob body.

Another provision of the present invention is a pull knob assembly having interchangeable plug elements of which one includes a ring mounting, both plug elements having leg portions received in corresponding

openings of the body of the knob and rotatable therein whereby projecting portions at the ends of the legs are moved into locking engagement in the knob body.

A further provision of the present invention is interchangeable plug elements for a pull knob body in which one plug element has a ring mounted thereon and both plug elements have leg members slidably received in corresponding openings in the knob body to be held therein by wire inserts placed between a respective plug element and the knob body.

In a first embodiment of the present invention a pull knob assembly is provided by a knob body and a pair of interchangeable plug elements with fastening means for mounting the assembled knob unit on a base surface. The knob body has one end for the abutment with the base surface, and the other end has a flange thereon with a center opening extending through the knob body. A recessed portion is centrally located in the flange surrounding one end of the opening, and one of the plug elements includes an enlarged head that snugly fits within the recess when the plug is inserted in the opening so that the enlarged head of the plug and the flange form a substantially flush surface. The knob unit formed by the body portion and this plug can then be mounted on the base surface by utilizing internal fastening means within the plug, and opening and closing of the base surface, such as a door, is effected by grasping the flange. The other plug element also has an enlarged head, but this head has greater longitudinal dimension than the head of the first plug so that when inserted in the opening, part of the enlarged head projects beyond the flange, and this part is utilized as a mounting for grasping means, such as a ring. The other plug element also has an internal fastening means for mounting on the base surface. The internal fastening means is a bore extending partway within each plug element. This bore may be threaded to receive an external fastening means in the form of a screw or bolt, or the external fastening means may be a self-tapping screw that will form the threads in the bore.

Another embodiment of the present invention includes a pull knob assembly consisting of a knob body, interchangeable plug elements and internal fastening means located in the knob body. The knob body includes a flange on one end, and a pair of openings are formed through the knob body spaced around a centrally located recessed portion in the flange end. A first plug element has an enlarged head portion sized to fit snugly in the transverse direction in the knob body recess but with longitudinal movement provided. This first plug element includes a pair of legs extending from the enlarged head portion and terminating in projecting portions. Corresponding slots or notches are formed at the ends of the opening remote from the flange so that when the leg portions are slid into the openings of the knob body, the enlarged end portions of the legs are movable into locking engagement with the notches at the ends of the openings. This engagement is provided by first sliding the enlarged head of the plug to abut the transverse surface of the recess whereby the legs will project through the knob body and can be bent outwardly to fit into the notches as the plug element is moved in a reverse direction and the enlarged head positioned flush with the flange. The other plug element has an enlarged head portion with a greater longitudinal dimension to project beyond the flange to form a mounting for a ring or other grasping means. The inter-

nal fastening means is a bore extending partway in a central portion of the knob body. This bore may be threaded to receive an external fastening means in the form of a screw or bolt, or the external fastening means may be a self-tapping screw that will form the threads in the bore.

A third embodiment of the present invention includes a pull knob assembly having a knob body, a pair of interchangeable plug elements that are rotatable into locking engagement and internal fastening means formed in the knob body. The knob body includes a pair of openings spaced respectively from a longitudinal centerline and formed with a transverse curved configuration. Each plug element has an enlarged head with a pair of legs extending therefrom having a configuration of corresponding curvature to fit within the body openings. The knob body has a centrally located recessed portion to receive an enlarged head in a transverse snug fit with longitudinal movement provided between the knob body and the recessed portion. At the remote end of each leg member an oppositely extending projection is formed, and an individual corresponding notch is provided in the end of each opening remote from the flange. When the legs are inserted in the openings and the enlarged head slid to the base of the recess, the enlarged ends of the legs extend beyond the opposite end of the knob portion to allow rotation of the plug element followed by reverse sliding movement of the plug element for locking engagement with the notches. The other plug element has an enlarged head of greater longitudinal dimension so that it can project beyond the surface of the flange to provide a mounting for grasping means. On the other hand, the first plug forms a flush surface with the flange when it is in locked engagement. Mounting of the assembled knob unit is effected in the same manner as for the previously described embodiments.

A further embodiment of the present invention involves a pull knob assembly having a body portion, a pair of interchangeable plug elements which are held in place by means of wire inserts, and internal fastening means located in a central part of the knob body. A flange is formed on one end of the knob body within which a central recess is located, and a pair of openings are spaced around the centerline of the body and formed with a transverse curved configuration. At the ends of the openings remote from the flange transverse slots or notches are formed therein so that a wire insert can be placed to extend thereacross. Each plug element includes an enlarged head from which legs extend and terminate in projections facing outwardly from the centerline of the knob body when the legs are slid into the openings. Upon assembly, the legs are slid into the openings so that the enlarged head abuts the base of the recess and the legs extend beyond the opposite end of the knob body. Wire inserts are then placed in the slots and the plug element moved in a reverse direction whereby the legs abut the wire insert and are held in locking engagement therewith. In this position the enlarged head of one plug element is flush with the flange while the other plug element projects beyond the flange to provide a grasping means mounting. The fastening to a base surface is effected as in the earlier described embodiments. In this embodiment the legs are curved to correspond with the curvature of the openings.

The nature of the present invention will become more clearly apparent and better understood from the

following description and accompanying drawings in which:

FIG. 1 is an elevational view of the knob body of the present invention;

FIG. 2 is an elevational view of one plug element;

FIG. 3 is an elevational view of another plug element;

FIG. 4 is a perspective view partly in cross-section of the knob body shown in FIG. 1;

FIG. 5 is a perspective view partly in cross-section of the plug element shown in FIG. 2;

FIG. 6 is a perspective view partly in cross-section of the plug element shown in FIG. 3;

FIG. 7 is an elevational view partly in section showing the start of the insertion of a plug element into the knob body;

FIG. 8 is a sectional view showing an assembled knob unit mounted on a base surface;

FIG. 9 is a modification of the fastening means in a plug element;

FIG. 10 is a second embodiment of the knob body of the present invention showing a sectional view taken along lines 10—10 of FIG. 11;

FIG. 11 is a bottom view of the knob body shown in FIG. 10;

FIG. 12 is a front elevational view of a plug element utilized with the knob body of FIG. 10;

FIG. 13 is a side elevational view of the plug element shown in FIG. 12;

FIG. 14 is a bottom view of the plug element shown in FIG. 12;

FIG. 15 is a front elevational view of another plug element utilized with the knob body of FIG. 10;

FIG. 16 is an elevational view, partly in section, showing the start of the insertion of a plug element into the knob body of FIG. 10;

FIG. 17 is a view similar to FIG. 16 showing the full insertion of the plug element into the knob body;

FIG. 18 is a view similar to FIG. 16 showing the operational position of the plug element inserted within the knob body;

FIG. 19 is a sectional view showing an assembled knob unit mounted on a base surface;

FIG. 20 is a third embodiment of the knob body of the present invention showing a sectional view taken along lines 20—20 of FIG. 21;

FIG. 21 is a bottom plan view of the knob body shown in FIG. 20;

FIG. 22 is a perspective view partly cut-away showing the knob body of FIG. 20;

FIG. 23 is a perspective view of a plug element utilized with the knob body of FIG. 20;

FIG. 24 is an elevational view, partly in section, showing the start of the insertion of a plug element into the knob body of FIG. 20 turned 90°;

FIG. 25 is a view similar to FIG. 24 showing the plug element in its fully inserted position;

FIG. 26 is a view similar to FIG. 24 showing the insertion plug element in its operational position;

FIG. 27 is a fourth embodiment of the knob body of the present invention showing a sectional view taken along lines 27—27 of FIG. 28;

FIG. 28 is a bottom plan view of the knob body of FIG. 27;

FIG. 29 is a sectional view taken along lines 29—29 of FIG. 30 of a plug element used with the knob body of FIG. 27;

FIG. 30 is a sectional view taken along lines 30—30 of FIG. 29;

FIG. 31 is a bottom plan view of the plug element shown in FIG. 29;

FIG. 32 is an elevational view, partly in section, of another plug element utilized with the knob body of FIG. 27;

FIG. 33 is an elevational view, partly in section, showing the start of the insertion of a plug element into the knob body of FIG. 27;

FIG. 34 is a view similar to FIG. 33 showing the full insertion of the plug element and the placement of wire inserts;

FIG. 35 is a view similar to FIG. 33 showing the plug insert in its operational position; and

FIG. 36 is a cut-away portion of the assembly knob unit showing the location of the locking wire insert.

It will be understood that the accompanying drawings are in part diagrammatic illustrations, and reference should be made to the following description for a more detailed explanation of the present invention.

FIGS. 1-8 illustrate a first embodiment of the present invention wherein the pull knob assembly comprises a knob body, a pair of interchangeable plug elements for selective insertion therein and fastening means for mounting an assembled pull knob unit on a base surface such as a drawer, door or the like. A knob body portion 50 includes an elongated circular body 52 and a flange 54 at one end thereof. The shape of flange 54 is shown as square (see FIG. 4), but it is to be understood that the flange could be of other shapes, such as circular, rectangular, oblong or having a complex configuration such as a fleur-de-lis, with ornamentation or decorative patterns formed on the remote flat surface of the flange. Although body 52 is shown as being circular, other shapes could be used, such as previously described with respect to flange 54. However, it is most practical that the surface of body 52 be smooth to the touch in operation.

Opening means such as a hole 56 is centrally located in knob body portion 50. Although hole 56 is shown as being circular, other shapes are possible as long as the plug element to be inserted has a corresponding shape as will be explained hereinafter. At the flange end of body 50 a centrally located recess 58 is formed. Although recess 58 is shown in FIG. 4 as having a square shape, other shapes can be used, such as circular, rectangular or oblong as long as it has transverse dimension greater than the transverse dimension of bore 56, and an enlarged head of the plug element to be described hereinafter has a corresponding shape.

The basic concept of the present invention is that interchangeable plug elements can be utilized to be inserted into hole 56. A plurality of plug elements are contemplated in which different grasping facilities are provided, but the present disclosure illustrates a pull knob assembly with a pair of interchangeable plug elements, a first plug element that provides a flush surface with the flange and a second plug element that projects therefrom to provide a mounting for grasping means such as a ring. However, it is contemplated that within the scope of the present invention that there could be additional plug elements to provide other grasping means, such as a part protruding from the flange to provide a mounting for a grasping tab or other shaped grasping means.

FIG. 2 illustrates a first plug element 60 comprising an elongated body member 62 of a configuration to snugly fit within hole 56 and further having an enlarged head portion 64 of a configuration to snugly fit within recess 58. The longitudinal dimension of plug 60 is substantially the same as the length of hole 56 with the longitudinal dimension of head 64 being substantially the same as the depth of recess 58 whereby plug 60 can be completely fitted within hole 56 so that the top of head 64 forms a flush surface with the top of flange 54. Centrally located within plug 60 and extending partway therein from the end remote from head 64 is a bore 66 forming an internal fastening means for mounting the assembled knob unit on a base surface as will be explained hereinafter with respect to FIGS. 8 and 9. As mentioned before, plug 60 comprises an enlarged head 64 of square shape and a body member 62 of circular shape, but other shapes could be utilized as long as they correspond with the related openings in knob body 50.

FIGS. 3 and 6 illustrate a second plug element 70 forming part of the pull knob assembly, and FIG. 8 illustrates a selected combination of knob body 50 with plug element 70 in mounted position on a base surface. Plug 70 includes an elongated body member 72 of circular shape similar to body member 62 of plug 60. However, plug 70 includes an enlarged head 74 which has a greater longitudinal dimension than enlarged head 64 of plug 60, and it will be appreciated that when plug 70 is inserted within hole 56 of knob body portion 50, as shown in FIG. 8, part of enlarged head 74 extends beyond flange 54 and provides a mounting for a grasping means shown as a ring 76. Head 74 includes pivot means which comprises a pair of pivots 78 so that ring 76 is freely swingable therein. It is contemplated that the knob body portion and plug elements would be formed of metal although other materials, such as plastic, could be utilized. It is further contemplated that plug 70 could be formed by a two-stage casting process wherein mating dies are provided in which a first shot of molten material forms the body member 72 and enlarged head 74 with indentations for pivot means 78 while another shot in the second stage simultaneously forms the ring 76 with its ends swingable within the pivots 78 of a previously formed and solidified plug element 70 that has been moved to the second stage. An example of such two-stage casting process is known from U.S. Pat. No. 2,819,494 issued Jan. 14, 1958 to Louis H. Morin.

Internal fastening means in the form of a centrally located bore 80 is formed in body member 72 extending partway therein. As seen in FIGS. 3 and 6, plug 70 has a square shaped head 74 and a circular shaped body member 72, but as in the case of plug 60, different shapes can be utilized as long as they correspond with the related openings in body portion 50.

In the assembly of a knob unit, body portion 50 is combined with a selected one of the plug elements. FIG. 7 illustrates a combination of body portion 50 with plug 60. As clearly seen therein, plug body member 62 is slid into hole 56, and such sliding would continue until the bottom surfaces thereof are flush and head 64 snugly fits within recess 58. In this assembled position knob body portion 50 and plug 60 are ready for mounting on a base surface such as a drawer, door or the like.

The mounted assembly shown in FIG. 8 illustrates the combination of knob body portion 50 with plug ele-

ment 70. In a manner similar to the above description of FIG. 7, plug 70 would have been assembled with knob body portion 50. As seen in FIG. 8, enlarged head 74 has a portion projecting beyond flange 54 so that ring 76 is swingably mounted thereon and can be easily grasped for operation. For mounting the assembled knob unit on a wooden door 82, a hole 84 would be made in door 82 to receive an external fastening means such as self-tapping screw 86. The size of bore 80 (or corresponding bore 66) is related to the size of screw 86 so that the rotation of screw 86 while holding the assembled knob unit against door 82 will allow threads to be cut into bore 80 by the external fastening means provided by threads 88 of screw 86. This provides an effective locking engagement between the internal fastening means provided by bore 80 and the external fastening means provided by screw 86.

It is contemplated that the knob unit of the present invention could be mounted by means of the internal bore of the plug element being previously threaded, and the external fastening means could be provided in the form of a screw or a bolt. For example, a plug element 60' is shown in FIG. 9 which includes an enlarged head 64' and a body member 62' which includes an internal threaded bore 90. Plug 60' would be combined with a knob body portion as previously described and when placed against a base surface, which could be wood or metal having a hole formed therein, the internal fastening means in the form of threaded bore 90 would then receive a corresponding threaded screw or bolt as deemed appropriate for the fastening.

It will be appreciated from the above described embodiment as well as the embodiments to be subsequently described that the interchangeable features of the plug elements is an important concept of the invention. The pull knob assembly would be sold as a packaged unit consisting of a basic knob body portion and a plurality of plug elements, preferably a pair so that the purchaser could have the option of fitting together an assembled knob unit having either a flush surface on the flange or a mounting for projecting grasping means. The purchaser would then mount the assembled knob unit with one of the plug elements as described hereinabove. However, it is within the option of the purchaser at any time to remove the external fastening means and replace one plug element with the other plug element and then remount the knob unit. This is an advantageous feature of the pull knob assembly not heretofore available in the prior art.

In the above described embodiment shown in FIGS. 1-9 it is to be appreciated that each plug element has to be internally threaded or tapped for locking engagement. This can be done by the self-tapping screw when mounting the assembled unit, or each plug element can be previously threaded. However, it is contemplated within the scope of the invention that this pull knob assembly can be provided wherein the internal fastening means is available with a single threaded bore so that the threading operation is halved. Such a construction will now be described in the following embodiments.

A second embodiment of the present invention is shown in FIGS. 10-19 herein the internal fastening means is formed in the knob body portion, and the plug elements include additional means for engagement with the knob body. In FIGS. 10 and 11 a knob body portion 100 is formed with a cylindrical body 102 having a flange 104 on one end thereof. Centrally posi-

tioned within body 100 about the center axis 0 is a bore 106 that functions as an internal fastening means and extends partway therein from the end of body 102 opposite the flange. At the flange end of knob body portion 100 a centrally located recess 108 is formed in a square configuration. Spaced equally on either side of the center axis and extending from the base of recess 108 to the remote end of body 102 are a pair of openings 110 and 112. At the end of openings 110 and 112 remote from flange 104 enlarged portions or notches 114 and 116, respectively, are formed. Notches 114 and 116 have a dovetail configuration sloping upwardly and outwardly toward the flange. The transverse dimension of each of openings 110 and 112 is substantially less than a corresponding parallel transverse dimension of recess 108. Although recess 108 is shown as being square, it could be round or of other shape as long as it corresponds with the plug element.

Although flange 104 has been shown as being circular in shape, it may be formed in other shapes as described in connection with the embodiment of FIGS. 1-9.

In FIGS. 12-14 a first plug element 120 is illustrated comprising an enlarged head 124 from which a pair of leg members 126 and 128 extend and terminate in enlarged portions 130 and 132, respectively. The configuration of enlarged portions 130 and 132 corresponds to the dovetail configuration of notches 114 and 116 so that they can fit therein in locking engagement as will be described hereinafter. The transverse dimension of enlarged portions 130 and 132 is no more than the corresponding transverse dimension of openings 110 and 112 so that the legs can slide therein, as most clearly shown in FIG. 16. As shown in FIGS. 12-14, head 124 has a square configuration, but it may have other shapes as long as it corresponds with and snugly fits within the corresponding shape of recess 108 as will be explained hereinafter. It is to be noted that recess 108 has a greater depth than the corresponding longitudinal dimension of head 124. It is further to be appreciated that the length of plug 120 from the remote edge of head 124 to the remote edges of enlarged portions 130 and 132 is equal to the depth of recess 108 combined with the length of either opening 110 or opening 112.

Another or a second plug element 134 is shown in FIG. 15 and includes an enlarged head 140 from which extend a pair of legs 136 and 138 that have the same dimensions and enlarged end portions as plug element 120 shown in FIGS. 12-14. However, enlarged head 140 has a greater longitudinal dimension than head 124 so that in the operable position within knob body 100, part of head 140 projects beyond flange 104 to provide a mounting for grasping means such as ring 142 in the same manner as described in connection with ring 76 shown in FIG. 3.

The assembly of the knob unit of the embodiment of FIGS. 10-19 will now be described, and it will be noted that it is different from the assembly of the first embodiment due to the different locking engagement utilized between the plug element and the knob body portion. In assembling and mounting the knob unit, one of the plug elements is first selected, and in the illustration shown in FIGS. 16-19, plug element 129 has been selected for illustrative purposes. However, it is understood that the assembly would be the same if plug element 134 were selected for the assembly. As seen in FIG. 16, legs 126 and 128 are slid downwardly through

corresponding openings 110 and 112 of knob body portion 102, and such sliding continues until enlarged head 124 abuts the base of recess 108 and enlarged portions 130 and 132 extend beyond knob body portion 102 as shown in FIG. 17. In this position legs 126 and 128 can be bent outwardly so that the enlarged portions 130 and 132 move into longitudinal alignment with respective notches 114 and 116. Plug element 120 is then slid in a reverse direction whereby the bent out enlarged portions 130 and 132 move into locking engagement with notches 114 and 116 as shown in FIG. 18. In the locked position of FIG. 18, it will be noted that the top of enlarged head 124 is flush with the top of flange 104. If plug element 134 has been selected for insertion, its enlarged head would project beyond flange 104 to provide the mounting for ring 142.

One of the advantageous features of the present invention is that any selected plug element can be later replaced. In this respect it will be noted that recess 108 provides a space between enlarged head 124 and the base surface of the recess in the operational position. Head 124 can therefore be depressed to abut this surface whereby enlarged portions 130 and 132 can be bent inwardly so that plug element 120 can be slidably removed by withdrawal and replacement by another plug element.

FIG. 19 illustrates the mounting of the assembled knob unit on a base surface such as a door 144. The internal fastening means disclosed as bore 106 may be previously threaded, or it may be threaded during mounting by a self-tapping screw 146 as previously explained in connection with the first embodiment. The assembled knob unit comprising knob body portion 100 and a selected plug element such as plug 120 is placed against the door 144 and the external fastening means in the form of screw 146 is appropriate, provides the mounting of the unit.

A third embodiment of the invention is shown in FIGS. 20-26, and this embodiment is similar to the second embodiment previously described in that the internal fastening means is located in the body portion of the knob so that the threading operation need only be effected on one element of the assembly. The third embodiment differs from the second embodiment in the type of locking engagement between a selected plug element and the knob body portion. In FIG. 20 a knob body portion 150 includes a circular body 152 and a flange 154 having a centrally located recess 156 that extends deeper into the knob body portion than the depth of the flange. A central bore 158 extends part-way into body 152 from the end of body 152 opposite to flange 154. Bore 158 forms the internal fastening means for mounting the assembled knob unit on a base surface in a manner similar to that shown in FIG. 19 of the second embodiment.

A pair of openings 160 and 162 are equally spaced around a centerline of knob body 152 and extend from the base of the recess throughout the body. As most clearly shown in FIGS. 20-22, openings 160 and 162 are curved with a constant transverse dimension throughout terminating in an enlarged transverse slot or notch on one side of each opening. Opening 160 terminates in notch 164, and opening 162 terminates in notch 166. It will be seen most clearly in FIG. 21 that notches 164 and 166 extend from opposite sides of respective openings to be diagonally opposed with respect to each other. The reason for this is to allow rota-

tion of a plug element for locking engagement as will be explained hereinafter, and for this purpose recess 156 is circular in configuration with a corresponding shape of the head of the plug element. However, with respect to the configuration of flange 154, variation is possible as described with respect to the earlier embodiments.

A plurality of plug elements are available for selection as described hereinbefore, but for illustrative purposes only a single plug element has been shown in connection with the embodiment of FIGS. 20-26. Plug element 170 shown in FIG. 23 includes an enlarged head 172 of circular configuration to snugly fit within recess 156. A pair of leg members 174 and 176 extend from head 172 and are spaced about a central point so as to correspond with the spacing of openings 160 and 162. At the remote end of each leg 174 and 176 are enlarged respective portions 178 and 180. It is to be noted that each leg and its enlarged portion is curved transversely to conform with the curvature of its respective openings 160 and 162. Additionally, the shape of enlarged portions 178 and 180 is inclined to form a dovetail shape or fitting with notches 164 and 166.

In the assembly of the knob unit shown in FIGS. 20-26 a selected plug element, such as plug 170, is assembled with knob body portion 150. FIG. 24 represents a view turned 90° with respect to FIG. 20 so that it can be appreciated that each of openings 160 and 162 has a transverse dimension sufficient to accommodate the sliding reception of legs 174 and 176 including the enlarged portions 178 and 180. Plug element 170 has its legs 174 and 176 slid through openings 160 and 162 until enlarged head 172 abuts the base surface of recess 156, and enlarged portions 178 and 180 then extend on the other side of knob body 152 as shown in FIG. 25. In this position the plug element 170 can be rotated by means of the extended portions so that the enlarged portions 178 and 180 align with notches 164 and 166. Plug element 170 is then slid in a reverse direction to allow the locking engagement of portions 178 and 180 with the respective notches as shown in FIG. 26. It will be noticed that in this operative or assembled position as shown in FIG. 26 that the top of head 172 is flush with the surface of flange 154. If another type of plug element were used, such as the ring type shown in FIG. 15, then the enlarged head portion would have a greater longitudinal dimension so that it would extend from flange 154 in the assembled position to form a mounting for the ring or other grasping means.

It is to be understood that the mounting of the assembled unit shown in FIG. 26 would be effected by internal and external fastening means as described in connection with FIG. 19. If it is desired to interchange the plug element, assembled plug 170 could be removed by depressing its enlarged head to the base of recess 156, rotating the plug element in a direction to unlock the engagement and then withdrawing the plug element for insertion of a replacement plug.

A further embodiment of the present invention is shown in FIGS. 27-36 in which another variation of the locking engagement between a selected plug element and a knob body portion is disclosed. In the embodiment shown in FIGS. 27-36 the locking engagement is provided by a wire insert as will now be described. FIGS. 27 and 28 illustrate the body portion 190 of the body which comprises a knob body 192 and a flange

194 with a centrally located recess 196 at the flange end having a depth greater than the depth of flange 194. A centrally located bore 198 extends partway into body 192 from the end remote from flange 194. A pair of openings 200 and 202 are equally spaced from the centerline of body portion 190 and are seen in FIG. 28 to be of curved configuration and extend from the base of recess 196 throughout the knob body terminating in enlarged portions each forming an enlarged slot or notch configuration. The enlargement extends on either side of each opening, and as most clearly shown in FIGS. 28 and 36, opening 200 terminates in enlargement 204, and opening 202 terminates in enlargement 206. The shape of flange 154 and recess 156 is circular, but it is to be understood that other configurations could be utilized as explained in connection with the embodiment in FIGS. 10-19.

A plurality of plug elements are provided as explained in connection with the earlier described embodiments, and a plain or flush end plug element is shown in FIGS. 29-31 with a ring type plug element shown in FIG. 32. As seen in FIGS. 29-31, plug element 210 includes an enlarged head 212 having extending legs 214 and 216. Legs 214 and 216 are spaced inwardly from the periphery of enlarged head 212, and the spacing of legs 214 and 216 about a centerline of the plug corresponds with the spacing of openings 200 and 202 so that they will fit therein. At the end of each leg 214 and 216 is an enlarged portion extending transversely and terminating in longitudinal alignment with the periphery of enlarged head 212. Leg 214 includes enlarged portion 218, and leg 216 includes enlarged portion 224. It is to be noted from FIG. 31 that the legs 214 and 216 have a curved configuration corresponding with the curvature of openings 200 and 202.

The ring type plug element shown in FIG. 32 comprises a plug 220 having an enlarged head portion 224 and extending legs 226 and 228. The legs 226 and 228 terminate in enlarged portions 230 and 232 respectively having the same dimensions and configuration as described earlier with respect to plug 210. It is to be noted that head 224 has a greater longitudinal dimension as compared with head 212 of plug 210, and this extended dimension provides a mounting for a grasping means such as a ring 234 in pivots 236 and 238 in the same manner as described previously with respect to FIGS. 3 and 15.

The assembly of the knob unit of FIGS. 27-36 is shown by the steps of the assembly in FIGS. 33, 34 and 35. For illustrative purposes plug 210 is shown in the assembly, and legs 214 and 216 are slid into openings 200 and 202 as shown in FIG. 33. When enlarged head 212 abuts the base surface of recess 196 as shown in FIG. 34, enlarged portions 218 and 220 project beyond the remote end of body 192. In this position a pair of wire inserts 240 are inserted into respective openings 200 and 202 to be seated in notches 204 and 206 respectively as shown in FIG. 36. Plug 212 is now slid in the opposite direction to the assembled position shown in FIG. 35 where the top of head 212 is flush with flange 194. In this position the enlarged portions 218 and 220 are brought into tight engagement with wire inserts 240 which provide a locking engagement for the plug 212 in body portion 190. In the operative or assembled position, the knob assembly can then be mounted on a base surface in a manner such as described previously with respect to FIG. 19.

In the illustrated embodiments of FIGS. 27-36 flange 194 and recess 196 as well as head 212 have been shown as being circular, but it is to be understood that different configurations can be utilized as explained in connection with the embodiment shown in FIGS. 10-19. It is also to be understood that plug element 210 can be easily removed from knob body portion 190 as previously described in connection with the embodiment shown in FIGS. 10-19 by separating the internal and external fastening means and then removing plug 210 by depressing head 212 to the base of the recess and removing the wire inserts 240 so that the plug can be withdrawn from the knob body for replacement by another selected plug element.

The advantages of the novel pull knob assembly described hereinbefore lie in the selection available to use different plug inserts for the same knob body portion and to be able to interchange the plug elements when desired.

A further feature of the present invention is that the outer surface of the flange of the body portion can be utilized for a decorative design, and a corresponding decorative design can be placed on the outer surface of the enlarged head of the plug element. The different plug elements would have the same decorative design to match with the flange design in the assembled position.

It will be understood that other changes and modifications may be made by those skilled in the art in the particular features of the various embodiments which have been described above for illustrative purposes without departing from the scope of the invention as defined by the following claims.

What we claim is:

1. A knob assembly comprising

a body portion of a predetermined longitudinal dimension having opening means extending there-through;

a first plug element having a longitudinal dimension substantially the same as said predetermined longitudinal dimension and adapted to fit and be substantially enclosed within said opening means;

a second plug element having a longitudinal dimension slightly greater than said predetermined longitudinal dimension and adapted to fit within said opening so that a portion thereof protrudes therefrom;

said body portion and a selected one of said plug elements fitted therein forming a knob unit adapted for mounting on a base surface;

internal fastening means located within said knob unit; and

external fastening means adapted to cooperate with said internal fastening means for effecting the mounting of said knob unit on the base surface.

2. A knob assembly according to claim 1 wherein grasping means is mounted on said protruding portion of said second plug.

3. A knob assembly according to claim 2 wherein said grasping means is provided in the shape of a ring.

4. A knob assembly according to claim 1 wherein said body portion comprises an elongated body having a flange on one end with said opening means centrally extending therethrough.

5. A knob assembly according to claim 4 wherein said first plug comprises an elongated body member having said internal fastening means located therein in

the form of a central bore extending partway therein.

6. A knob assembly according to claim 5 wherein said external fastening means comprises a self-tapping screw adapted to pass through and cut threads in the surface of said bore and be received therein.

7. A knob assembly according to claim 2 wherein said second plug comprises an elongated body member having said internal fastening means located therein in the form of a central bore extending partway therein.

8. A knob assembly according to claim 7 wherein said external fastening means comprises a self-tapping screw adapted to pass through and cut threads in the surface of said bore and be received therein.

9. A knob assembly according to claim 5 wherein said first plug includes an enlarged head at one end thereof, and said elongated body member extends therefrom.

10. A knob assembly according to claim 9 wherein said body portion has a recess centrally located within said flange, and said enlarged head is sized to snugly fit within said recess, a remote end of said enlarged head thereupon forming a flush surface with said flange.

11. A knob assembly according to claim 7 wherein said second plug includes an enlarged head at one end thereof which includes said protruding portion, and said elongated body member extends therefrom.

12. A knob assembly according to claim 11 wherein said body portion has a recess centrally located therein, and said enlarged head is sized to partially fit within said recess in a snug relation, the protruding portion of said enlarged head including the grasping means mounting.

13. A knob assembly according to claim 1 wherein said body portion comprises an elongated body having a flange on one end, and said opening means comprises a pair of openings spaced on each side of a centerline of said body portion.

14. A knob assembly according to claim 13 wherein said body portion has said internal fastening means formed therein as a central bore located between said openings.

15. A knob assembly according to claim 14 wherein said external fastening means comprises a self-tapping screw adapted to pass through and cut threads in the surface of said bore and be received therein.

16. A knob assembly according to claim 13 wherein said first and second plug elements each comprise an elongated head from which an elongated body member extends in the form of a pair of leg members spaced to correspond with said body portion openings and be received therein.

17. A knob assembly according to claim 16 wherein said body portion includes a recess centrally located within said flange, and said enlarged head of such of said first and second plug elements is adapted to snugly fit within said recess.

18. A knob assembly according to claim 17 wherein said enlarged head of said first plug element forms a flush surface with said flange.

19. A knob assembly according to claim 17 wherein said enlarged head of said second plug element forms said protruding portion so that grasping means can be mounted thereon.

20. A knob assembly according to claim 17 wherein said recess has a predetermined depth terminating in a flat transverse surface, and said enlarged head is positionable to abut said flat surface whereby said leg members extend beyond ends of said openings.

21. A knob assembly according to claim 16 wherein said openings have a predetermined transverse dimension and ends of said openings remote from said flange include respective portions having an enlarged transverse dimension, said leg members having a transverse dimension less than said predetermined transverse dimension, and remote ends of said leg members include respective enlarged portions adapted to fit within the portions of said openings with enlarged transverse dimensions.

22. A knob assembly according to claim 21 wherein said openings are curved to be concentric about a centerline of said body portion and said leg members are correspondingly curved to be received therein.

23. A knob assembly according to claim 21 wherein said enlarged portions of said openings and said leg members extend along the line of curvature from individual opposite sides thereof, respectively, thereby allowing said enlarged portions of said leg members to slide into said enlarged portions of said openings upon relative rotation therebetween.

24. A knob assembly according to claim 16 wherein said openings are concentrically curved, respectively, around a centerline of said body portion, said openings have a predetermined transverse dimension along the line of curvature, ends of said openings remote from said flange include enlarged portions extending further along the line of curvature to form a notched section, a wire element is received in each said notched section, and said leg members each have an outwardly projecting section at their remote ends adapted to abut said wire to be held in locking engagement within said openings.

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