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[56]

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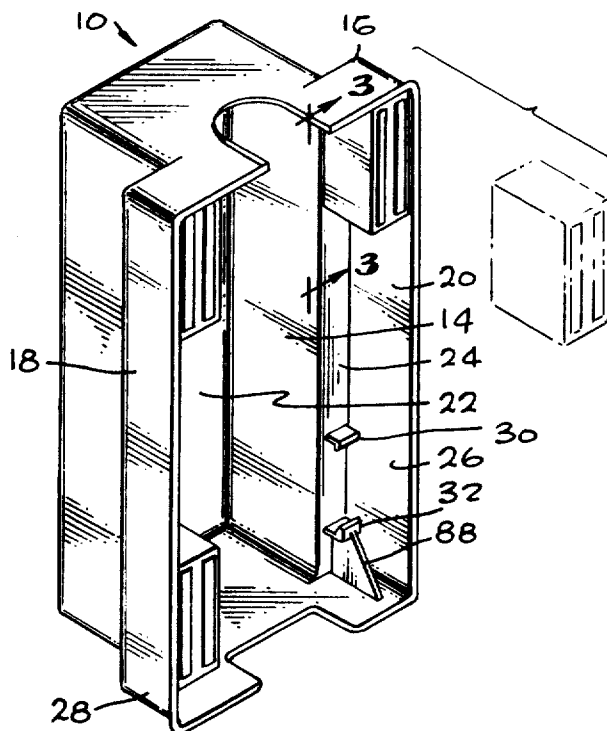
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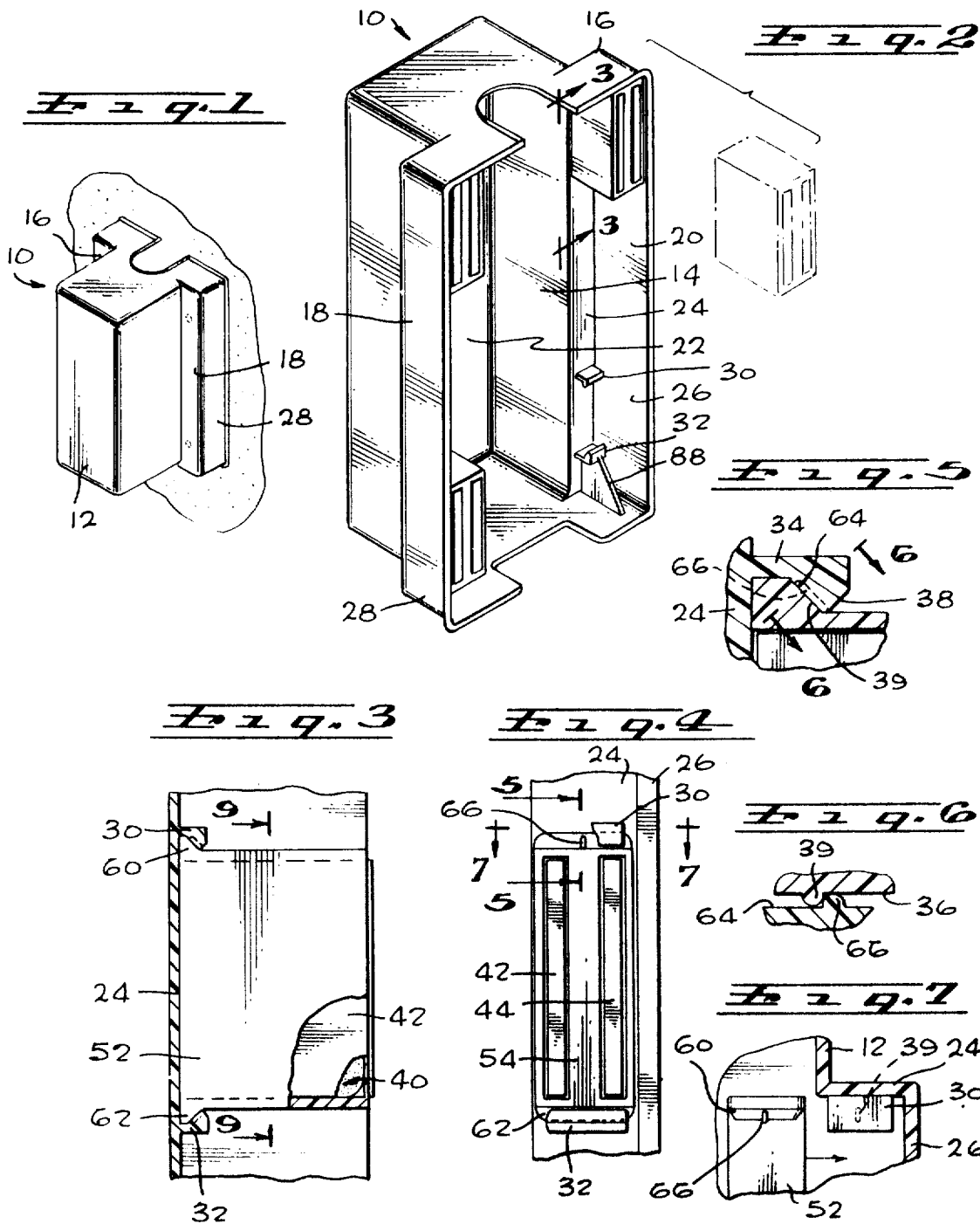
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[54] **COVER HOUSING FOR TELEPHONE CONNECTORS OR THE LIKE WITH MAGNETIC OR MECHANICAL RETAINING MEANS**
20 Claims, 16 Drawing Figs.

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339/36
[51] Int. Cl. **H02g 3/02**,
H05k 5/03
[50] Field of Search 174/48, 66,
67, 138.4; 339/36; 292/251.5; 335/219, 285, 302,
303, 304; 248/206 A; 206/DIG. 33; 220/55 MG

ABSTRACT: The housing comprises a hollow, rectangular structure having one open side, and means to retain the structure in position. The housing is of sufficient size to engage over and enclose a standard, multiple-contact telephone connector. The housing means includes retaining magnets for holding the housing against a steel surface. The retaining means also includes a wallplate having resilient snapfingers thereon, with engagement means in the housing for engaging upon the snapfingers.





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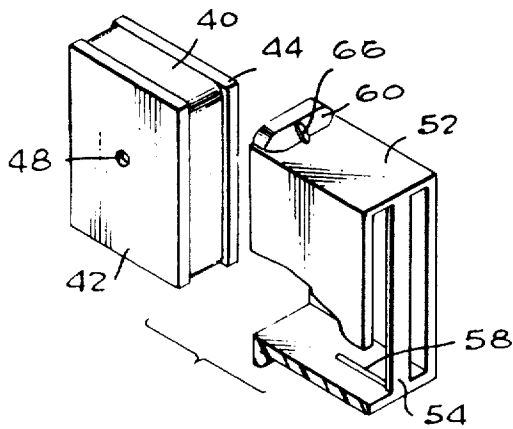
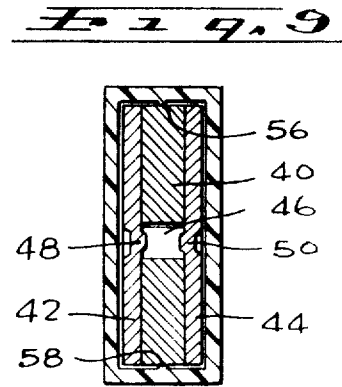
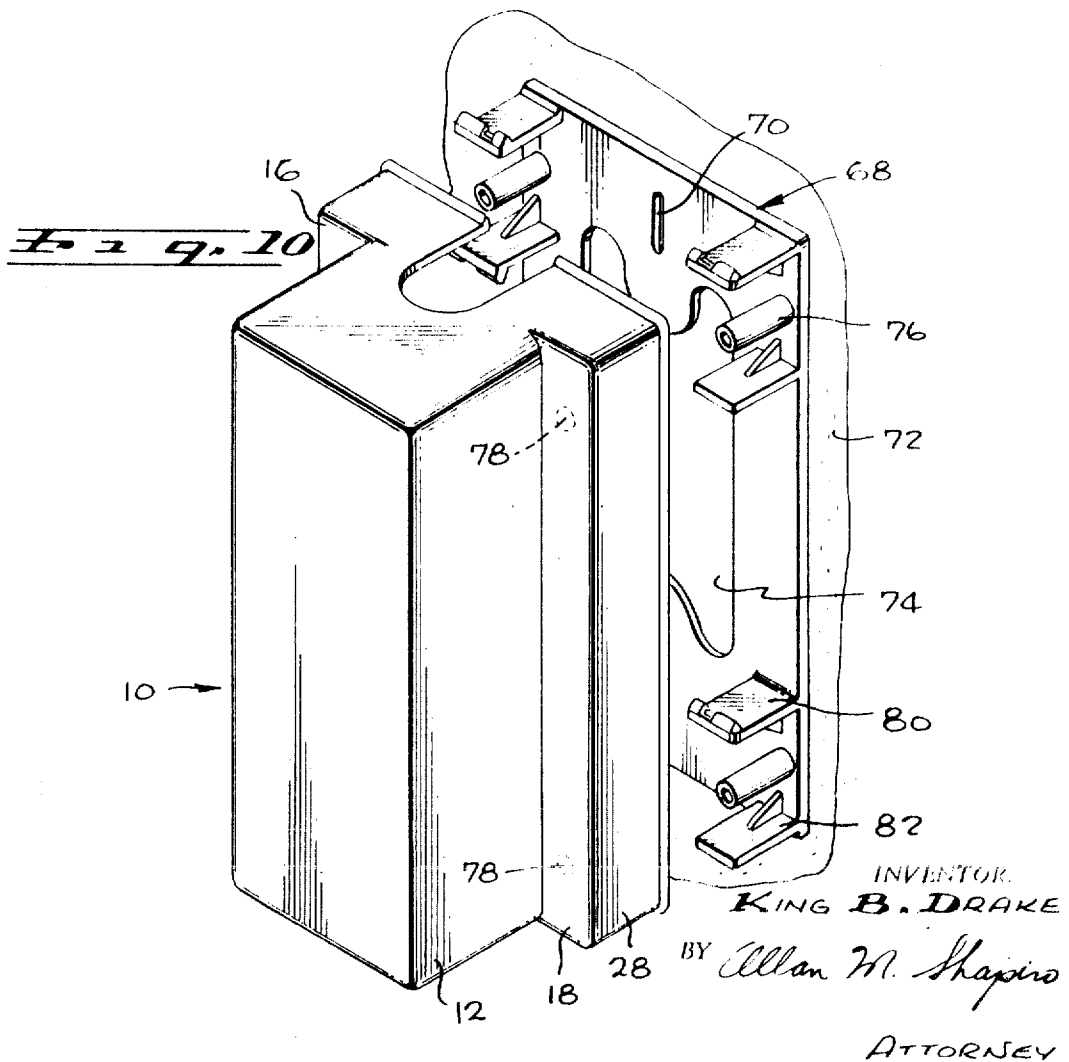


Fig. 11

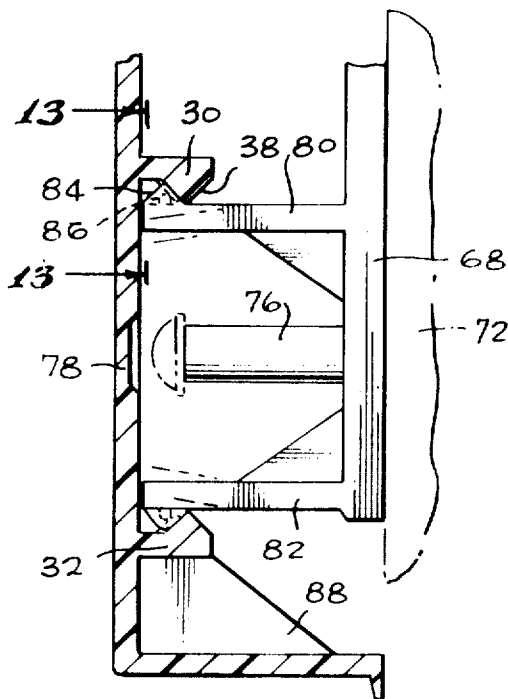


Fig. 12

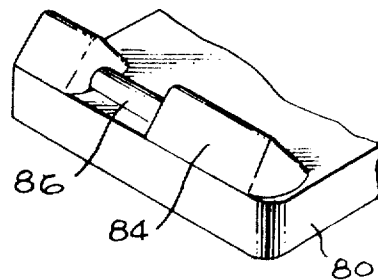


Fig. 13

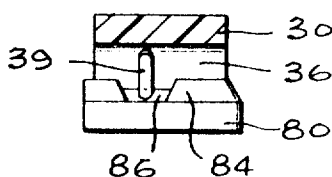


Fig. 14

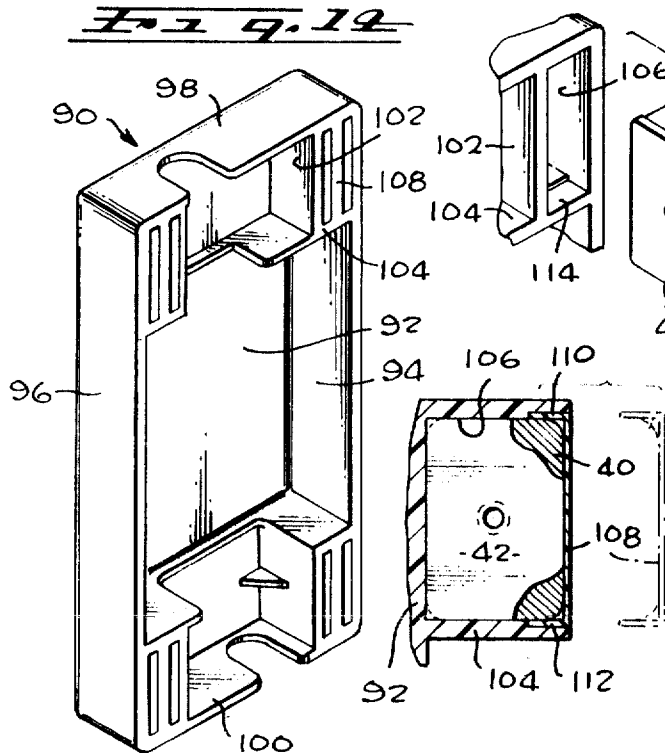


Fig. 15

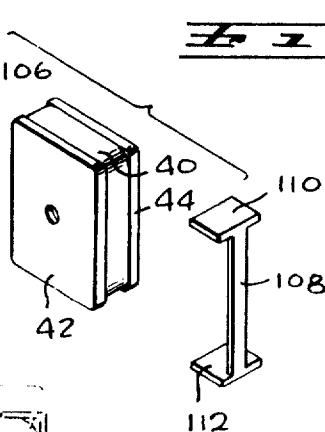


Fig. 16

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COVER HOUSING FOR TELEPHONE CONNECTORS OR THE LIKE WITH MAGNETIC OR MECHANICAL RETAINING MEANS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention is directed to a housing, and especially a housing of sufficient size as to engage over a telephone connector, together with magnetic and mechanical means for retaining the housing in position.

2. Description of the Prior Art

Housings of various sorts and configurations are widespread in the art. Many different structures have employed a cover, and the covers have been secured by various different means. Thus, the general concept of providing a housing, or cover, is old.

The prior art also includes covers which form an essential part of telephone connection equipment to protect or retain together the connections. These are special purpose covers which form an integral part of the structure, as completed. Such covers are not available for providing a housing over an already completed connection.

SUMMARY OF THE INVENTION

In order to aid in the understanding of this invention, it can be stated in essentially summary form that it is directed to a housing. The invention includes several forms of housing, and in each case the housing is a multiple-sided structure, having one open side so that the housing may be placed over a telephone connector, and against a substantially flat surface to cover the connector. Housing retention is accomplished either by magnetic means or mechanical means. In the magnetic case, a plurality of magnets are retained in the housing, and two pole pieces are movably mounted with respect to each magnet, so that the pole pieces can come into engagement with the surface against which the housing rests. In the mechanical engagement embodiment a wallplate carries resilient fingers thereon, which resilient fingers engage on connectors in the housing to resiliently retain the housing against the surface.

Accordingly, it is an object of this invention to provide a housing which is especially arranged for covering electrical connectors, particularly telephone connectors. It is another object to provide a housing which has an open side and which is adapted to lie against a flat surface, and to be retained against the flat surface to provide a fully enclosed housing for a connector. It is another object to provide magnetic means for retaining the housing against a steel surface. It is still another object to provide magnet retention means within said housing so that the magnets are retained within the housing and pole pieces are engaged against the magnets and movably mounted with respect to the magnets so that the pole pieces can engage a flat steel surface for retention of the housing thereagainst. It is a further object to provide a housing wherein magnets may be secured to engagement means within said housing, and the same engagement means can be employed by resilient retention fingers for retaining the housing in place.

Still other objects, features and attendant advantages of the present invention, together with various modifications, will become apparent to those skilled in the art from a reading of the following detailed description of the preferred embodiment constructed in accordance therewith, taken in conjunction with the accompanying drawings wherein like numerals designate like parts in the several figures.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the preferred embodiment of the housing of this invention.

FIG. 2 is an enlarged perspective view showing the open side of the housing, and showing one of the inventive magnet retainers in an exploded condition in broken lines.

FIG. 3 is an enlarged partial section taken generally along the line 3-3 of FIG. 2 and partly broken away.

FIG. 4 is a front elevational view of the magnet retainer structure shown in FIG. 3.

FIG. 5 is an enlarged section taken generally along the line 5-5 of FIG. 4.

FIG. 6 is a partial section taken generally along the line 6-6 of FIG. 5.

FIG. 7 is a view looking in the direction shown at 7-7 in FIG. 4, but with the magnet retainer ready to be moved into position in the housing.

FIG. 8 is an exploded perspective view of the magnet and its retainer, with parts broken away.

FIG. 9 is a section through the center of the magnet and the magnet retainer, taken generally along the line 9-9 of FIG. 3.

FIG. 10 is a perspective view of the same housing, shown in association with an inventive wallplate having resilient retainer fingers thereon.

FIG. 11 is an enlarged section showing the resilient finger engagement of the housing by the wallplate of FIG. 10.

FIG. 12 is an enlarged partial perspective view showing a detail of the ends of the resilient engagement fingers. FIG. 13 is a section taken generally along line 13-13 of FIG. 11.

FIG. 14 is a perspective view from the open side of another embodiment of the housing of this invention.

FIG. 15 is an enlarged, exploded, perspective view showing the inventive magnet retention means which holds the magnet into the housing of FIG. 14.

FIG. 16 is a side elevational view, with parts broken away, showing the inventive magnet retainer of FIGS. 14 and 15 for retaining the magnet within the housing.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, and particularly to FIGS. 1 through 9, the preferred embodiment of the housing of this invention is generally indicated at 10. Housing 10 has a fairly thin-walled, boxlike main housing section 12 which has an open interior 14. The open interior is employed in the containment of other structures. Housing 10 is particularly adapted for the engagement over and housing of connectors in telephone lines between the fixed portion of the telephone line in a building to the handset. In offices, a telephone cable sufficient for one telephone extends from a receptacle or some other source. This cable has a connector thereon, and a further cable connected to the handset is engaged in the connector. Housing 10 is particularly adapted to engage over such connectors. Such connectors in the telephone wire can either be closely adjacent the wall, or may be close to the handset. However, in view of the mounting adaptability of housing 10, the housing can engage over such connector in any location.

Housing 10 incorporates first and second shoulders 16 and 18 which respectively define recesses 20 and 22. The housing 12 is a five-wall structure having an open side, and recesses 20 and 22 are directed toward the open side. The recesses are defined by shoulder walls, one of which is seen at 24, and sides 26 and 28.

As is best seen in FIGS. 3 through 7, engagement means 30 and 32 are formed on shoulder wall 24. Engagement means 30 and 32 are in the form of upstanding claws which face each other. As is seen in FIG. 5, each of the claws has an upstanding flange 34 which carries an angular engagement wall 36. The outer surface is chamfered at 38 to aid in the insertion of retaining means in the engagement means. Engagement wall 36 carries rib 39 which interacts with a similar rib 66 to aid in retention of structures between the engagement means 30 and 32. As is seen in FIGS. 1 and 2, housing 10 is rectangular and, accordingly, engagement means is provided in each of the four corners thereof on the open side.

FIGS. 3, 4, 8 and 9 illustrate, in considerable detail, the magnet and magnet retainer which is engaged by engagement means 30 and 32. Magnet 40 has substantially parallel opposite planar pole faces, upon which pole pieces 42 and 44 are engaged. Magnet 40 has a hole 46 therethrough while pole

pieces 42 and 44, respectively, have stamped dimples 48 and 50 which extend part way into the hole 46. Since the dimples are of smaller diameter than the hole, the pole pieces have a certain amount of lateral freedom of motion on the sides of the magnet and, in normal conditions, the pole pieces are magnetically retained against the magnet with the dimples in the hole.

Magnet retainer 52 is a four-sided, rectangular box of sufficient size as to receive the magnet 40 and its pole pieces 42 and 44. Opposite ends of the magnet retainer are open, and rib 54 extends across one of the open sides. Rib 54 is slightly narrower than the thickness of magnet 40, and the rib is centrally located so that magnet 40 engages against the rib when the magnet is positioned in the magnet retainer. However, the spaces on the sides of the rib are sufficiently large to permit the pole pieces to move therethrough, within the restraint imposed by the dimples in the pole pieces engaging in the hole in the magnet.

As is best seen in FIGS. 8 and 9, magnet retainer 52 has ridges 56 and 58 therein. These ridges are of such dimension as to directly engage the magnet to retain the magnet in the magnet retainer. Magnet retainer 52 is preferably made of somewhat resilient, synthetic polymer composition material so that ridges resiliently deflect and resiliently engage the magnet, but of sufficient rigidity so that such engagement is forceful to prevent accidental dislodgement.

As best seen in FIGS. 3 through 8, magnet retainer 52 has locking feet 60 and 62 thereon. Locking feet 60 and 62 are related to engaging means 30 and 32 so that they respectively engage thereunder, as is shown in FIGS. 3 and 4. The locking feet are formed on the magnet retainer, and have angular faces, such as face 64 illustrated in FIGS. 5 and 6. Face 64 is directed toward engaging wall 36. Furthermore, face 64 carries rib 66, which interengages with rib 39. The manner of assembly is seen in FIG. 7, where magnet retainer 52 is thrust sideways, i.e., laterally under the engaging means 30 and 32. In order for magnet retainer 52 to reach its proper, in-place position, as is shown in FIG. 4, the lateral thrusting of the magnet retainer snaps rib 66 past rib 39. FIGS. 5 and 6 also illustrate this position of the ribs. Since the structures are made of resilient material, the ribs can snap into the orientation shown, without destruction, and thus resist removal of the magnet retainer.

With four such magnet retainers in place, each having its magnet and pole pieces therein, the housing is ready for use. When a telephone connection to a handset has connector adjacent a steel panel, such as a desk, the connector is quickly covered by placing the housing thereover and permitting the magnets to engage the desk panel to hold it in place. Thus, the connector is sufficiently secured in place, and is properly covered.

As seen in FIGS. 10 through 13, the same housing 10 can be employed in connection with a different retention means. Wallplate 68 has holes therein, one of which is seen at 70, for attachment of the wallplate to the standard recessed wall junction box. By attaching screws through the holes 70 into such a junction box, the wallplate can be secured against the wall 72. A central opening 74 in the wallplate permits the cable to extend from the interior of the junction box to exteriorly of the wallplate.

Wallplate 68 has cylindrical bosses 76 thereon. These bosses have holes therethrough, and can be employed for the insertion of screws through the bosses to secure the wallplate against the wall, as is indicated in FIG. 11.

Wallplate 68 is of such dimensions that sides 26 and 28 embrace around the edges of the wallplate. As an alternative employment for bosses 76, screws can be inserted through knockouts 78 into the bosses to hold housing 10 in place. Knockouts 78 comprise thin panel sections of the shoulder walls. In such position, the housing 10 is adequate to contain and cover a connector in a cable to a telephone handset. Housing 10 has sufficient openings at each end, as is seen in FIGS. 1, 2 and 10, to permit connection of a cable from the interior of the housing to the handset.

As a preferred manner of connection of housing 10 to wallplate 68, the wallplate is provided with pairs of resilient fingers. One such pair is indicated at 80 and 82. Each of the pairs is identical, and each corresponds to a pair of engaging means 30 and 32, and thus there are four such pairs of engaging fingers on the wallplate. As is thus seen in FIGS. 12 and 13, the end of each of the engaging fingers is provided with a detent rib 84 which preferably has a lower section or notch 86. Notch 86 corresponds to the position of rib 39 so that rib 39 does not interfere with full engagement of engaging wall 36 against the retaining side of detent rib 84. As is seen in FIG. 11, detent ribs oppose each other and are arranged to engage under engagement means 30 and 32, as previously stated. Furthermore, the fingers 80 and 82 are sufficiently resilient so that they can be snapped into place. Chamfers 38 on the ends of the engaging means 30 and 32 aid in such assembly. Furthermore, since the engaging side of detent rib 84 and engaging wall 36 are angularly related, the parts can be snapped apart through resilient deflection of the fingers 80 and 82. By this means, the housing is detachably secured upon the wallplate.

As is seen in FIGS. 2 and 11, angular flange 88 extends from the top of engaging means 32 and extends angularly at least part way up the endwall of the housing to act as a guide. As is seen in FIG. 11, this guide prevents finger 82 from engaging behind engagement means 32, but instead guides the finger 82 into appropriate position so that it engages on the correct side of engaging means 32.

Another embodiment of the housing is generally indicated at 90 in FIG. 14, and details thereof are shown in FIGS. 15 and 16. Housing 90 is in the form of a rectangular structure having top 92, sides 94 and 96 and ends 98 and 100. These parts define a housing which encloses an interior which is open to one side. The open interior is of sufficient size to receive and hold a conventional telephone handset cable connector.

At each corner juncture, additional walls define magnet recesses. For example, walls 102 and 104 define magnet recess 106. A similar magnet recess is formed at each corner of the housing 90. The magnet and its pole pieces, illustrated in FIGS. 15 and 16, are identical to the same structures described with respect to FIGS. 8 and 9. Accordingly, the same reference numerals are applied. Magnet recess 106 is of sufficient size as to accept the magnet 40, with its assembled pole pieces 42 and 44, and permit adequate freedom of the pole pieces. In other words, the width of magnet recess 106 is just slightly larger than the overall thickness of the assembly of pole pieces 42 and 44 on magnet 40, and the height and depth of the recess are similarly slightly larger than the similar dimensions of the magnet with its pole pieces. Thus, the magnet and its pole pieces can be inserted within the recess, as is shown in FIG. 16.

For magnet and pole piece retention within magnet recess 106, retainer strap 108 is employed. Retainer strap 108 has securing flanges 110 and 112 which rest in flange recesses, one of which is shown in 114, at the outer edge of magnet recess 106. By employment of a suitable adhesive, the securing flanges are retained in their flange recesses, to hold retainer strap 108 across the center of the magnet recess opening. Any convenient adhesive can be used, depending on the materials. If the materials are compatible polymer composition materials, a solvent cement could be employed. However, when they are noncompatible, as when retainer strap 108 is made of metal and the balance of the housing is made of polymer composition material, an epoxy resin, or the like, can be employed.

The width of retainer strap 108 is such that it engages only on magnet 40. The pole pieces are free to extend beside and beyond retainer strap 108 so that their position is limited only by the dimple and the hole arrangement shown in FIG. 9. Thus, the magnet assembly is retained in place, but the pole pieces are permitted to relatively slide to accommodate uneven surfaces.

Similarly to the housing 10, housing 90 is employed in conjunction with a steel surface, such as the side of a desk. When a telephone handset connector is positioned adjacent a desk

side, the housing 90 is engaged over the connector and moved against the desk side. The magnets hold the housing in place to cover, restrain and position the connector. This is accomplished without damage to the steel panel, the desk or other equipment. Furthermore, it is readily removable and repositionable.

The material of the housings, and of their parts, except for the magnet and pole pieces, can be any convenient material. Since economic construction can be accomplished by injection molding, the preferred material is a fairly rigid, thermoplastic, injection-moldable, synthetic polymer composition material. Such material is also compatible with the desirable deformability and resiliency of fingers 80 and 82, as well as ribs 39 and 66. Accordingly, injection moldable, synthetic polymer composition material is the preferred material.

This invention having been described in its preferred embodiment, and alternative embodiments suggested, it is clear that this invention is susceptible of numerous modifications and embodiments within the ability of those skilled in the art and without the exercise of the inventive faculty.

What I claim is:

1. A housing, said housing being particularly adapted for the covering of telephone connectors, said housing comprising:

walls defining a main housing structure having an open side and an open interior, said open interior being sufficiently large to accept a telephone connector;

engaging means in said housing, said engaging means being directed toward the open side of said housing; and retaining means engaged in said engaging means for retaining said housing in place, said retaining means comprising:

a magnet housing having closed sides and having first and second open ends, said magnet housing being of sufficient size to accept a magnet and magnet pole pieces; and

a rib extending across one of said open ends of said magnet housing, said rib being of such dimension as to be engageable by a magnet within said magnet housing but not engageable with the magnet pole pieces so that the magnet pole pieces are free to extend out of said magnet housing on opposite sides of said rib.

2. The housing of claim 1 wherein a magnet having two pole pieces on opposite sides thereof is positioned within said magnet housing so that said magnet lies substantially against said rib and said pole pieces are respectively movable on opposite sides of said rib, and including at least one ridge formed within said magnet housing, said ridge resiliently engaging said magnet so as to retain said magnet within said magnet housing, substantially lying against said rib.

3. The housing of claim 2 wherein said magnet has a hole therethrough and said pole pieces have projections thereon extending part way into said hole, said projections being smaller than said hole so that said pole pieces can move laterally on said magnet, said magnet housing embracing said pole pieces sufficiently closely so that said projections on said pole pieces are restrained within said hole in said magnet when said magnet and said pole pieces are within said magnet housing.

4. The housing of claim 1 wherein said engaging means in said housing comprises first and second engaging claws directed toward each other, and engaging means is provided on said magnet housing, said engaging means on said magnet housing comprising first and second locking feet, said magnet housing and said locking feet being so dimensioned with respect to said engaging means in said housing so that said magnet housing can be laterally slid underneath said housing-engaging means.

5. The housing of claim 4 wherein said magnet housing has an open side for insertion of said magnet into said magnet housing, said open side lying against said housing to close said open side on said magnet housing when said magnet housing is engaged in said housing by means of said engaging means.

6. The housing of claim 4 wherein at least one of said engaging means in said housing, and at least one of said locking feet

on said magnet housing, have locking means thereon so that when said magnet housing is positioned in place in said housing so that said locking feet are retained by said engaging means, said locking means interengage to inhibit lateral sliding of said magnet housing with respect to said housing to inhibit disengagement of said magnet housing with respect to said housing.

7. The housing of claim 6 wherein said locking means comprises a rib on said locking foot and a rib on said engaging means in said housing, said ribs being arranged so that said ribs substantially resiliently deflect and pass each other upon sliding insertion of said magnet housing into said engaging means to inhibit removal of said magnet housing from said engaging means.

8. A housing, said housing being particularly adapted for the covering of telephone connectors, said housing comprising: walls defining a main housing structure having an open side and an open interior, said open interior being sufficiently large to accept a telephone connector;

engaging means in said housing, said engaging means being directed toward the open side of said housing;

a single wallplate integrally provided with retaining fingers thereon, said fingers being located solely in opposition to and engageable with said engaging means in said housing so that said housing can be secured to said wallplate by engagement of said engaging means and said fingers;

said fingers comprising first and second pairs of fingers, each of said pairs of fingers having outwardly facing detent ribs; and

said engaging means in said housing comprising inwardly facing claws, said detent ribs being engageable under said claws to retain said housing on said wallplate.

9. The housing of claim 8 wherein said claws have locking ribs thereunder, and each of said detent ribs has a notch therein, said notch in said detent rib being arranged to engage around said rib on said claw.

10. The housing of claim 9 wherein said fingers are resilient so that, upon engagement of said housing on said wallplate, said fingers resiliently deflect to snap under said claws.

11. A magnet housing comprising:

four walls defining a space adapted to receive a magnet with pole pieces thereon, said magnet housing having an open end;

a rib across said open end of said magnet housing, said rib being positioned to engage a magnet in said magnet housing, and said rib defining first and second spaces, one on each side thereof, so that the pole pieces can extend through said spaces, and

a longitudinal ridge integrally projecting from one of said walls into said space and adjacent said rib, said ridge projecting at a right angle to said rib and being of such dimension to resiliently engage a magnet in said magnet housing to retain the magnet adjacent said rib.

12. The magnet housing of claim 11 wherein:

a magnet has a hole therethrough, and first and second pole pieces are positioned against said magnet, said pole pieces have projections extending into said hole and said magnet, said projections being smaller in size than said hole so that said pole pieces can laterally move a limited distance with respect to said magnet, said magnet being positioned within said magnet housing; and

said magnet housing being spaced from said pole pieces to permit said pole pieces to move with respect to said magnet housing, but said walls and said magnet housing lying sufficiently closely to prevent said projections from leaving said hole in said magnet.

13. A magnet housing comprising:

four walls defining a space, and having first and second open ends opposite each other;

a magnet having a hole therethrough, and first and second pole pieces positioned against said magnet, said pole pieces having projections extending into said hole in said magnet, said projections being smaller in size than said

hole so that said pole pieces can laterally move a limited distance with respect to said magnet, said magnet and pole pieces being positioned within said space defined by said walls, said walls being spaced from said pole pieces to permit said pole pieces to move with respect to said magnet housing, but said walls lying sufficiently closely to prevent said projections from leaving said hole in said magnet;

a rib across said first open end and engaging said magnet, said rib defining first and second spaces, one on each side thereof, so that said pole pieces can extend through said spaces;

a ridge adjacent said rib, said ridge being of such dimension to resiliently engage said magnet in said magnet housing to retain said magnet adjacent said rib; and

locking feet on said magnet housing, said locking feet being adapted to lock said magnet housing against a surface so as to close said second open end of said magnet housing.

14. The magnet housing of claim 13 wherein said locking feet have ribs thereon, said ribs being arranged to restrain lateral movement of said magnet housing out of locked position.

15. A housing, said housing being of such size as to be engageable over a cable connector on a telephone handset, said housing comprising:

a top, opposite sides, and opposite ends, said top, said sides and said ends being connected together to form an open-sided housing; and

walls within said housing, said walls being connected together and being connected to at least one of said sides and at least one of said ends to form a rectangular magnet-retaining recess in at least two corners of said housing, a retaining strap secured across the open face of said magnet-retaining recess to retain a magnet within said recess.

16. The housing of claim 15 comprising:
a magnet having a hole therethrough;

first and second pole pieces magnetically engaged against said magnet;

projections on said pole pieces projecting into said hole in said magnet, said projections being of smaller size than said hole so that said pole pieces have restricted lateral freedom with respect to said magnet, said magnet and said pole pieces being positioned within said magnet-retaining recess; and

said strap being engaged across the open face of said recess to engage said magnet, said strap being narrower than the open face of said recess so that said pole pieces can extend out of said open face of said recess on opposite sides of said strap.

17. The housing of claim 16 wherein first and second flange recesses are formed adjacent said magnet-retaining recess, said strap having flanges thereon, said flanges being engaged in said flange recesses, and being secured therein so as to retain said strap with respect to said magnet-retaining recess.

18. The housing of claim 17 wherein said flanges are adhesively retained within said flange-retaining recesses.

19. A magnet housing comprising:

four walls defining a space, and having first and second open ends opposite each other;

a magnet and a pair of pole pieces positioned within said space defined by said walls, said pole pieces being positioned against and retainedly engaged by said magnet and walls,

a rib across said first open end and engaging said magnet; and

locking feet on said magnet housing, said locking feet being adapted to lock said magnet housing against a surface so as to close said second open end of said magnet housing.

20. The magnet housing of claim 19 wherein said locking feet have ribs thereon, said ribs being arranged to restrain lateral movement of said magnet housing out of locked position.

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