June 17, 1952 E. D. RAPISARDA 2,601,056

SECTIONAL HOUSING CONSTRUCTION AND SUPPORT MEANS THEREFOR

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Fig. 2.

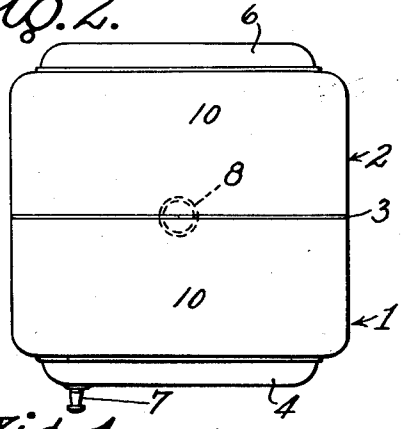


Fig. 4.

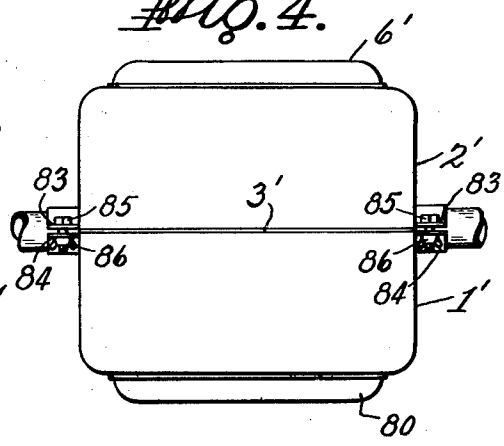


Fig. 1.

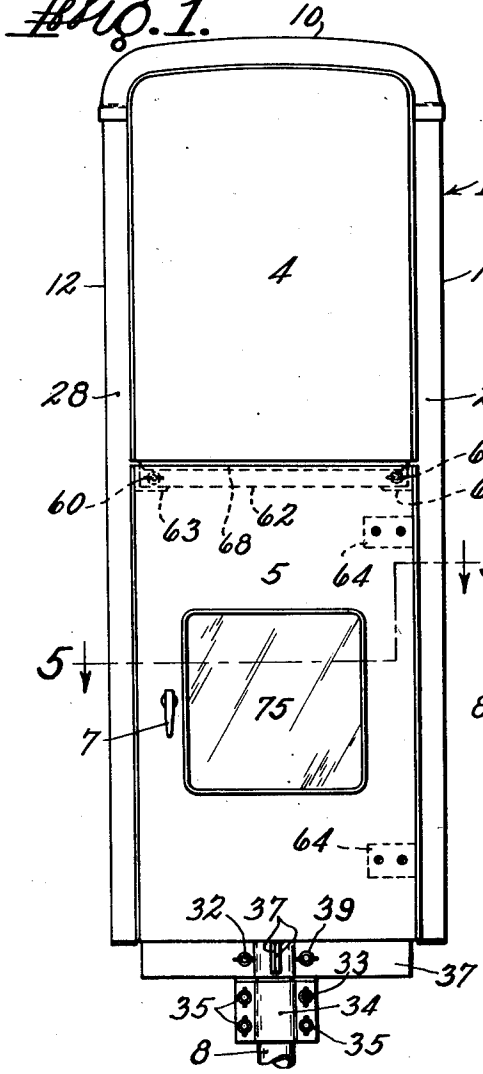
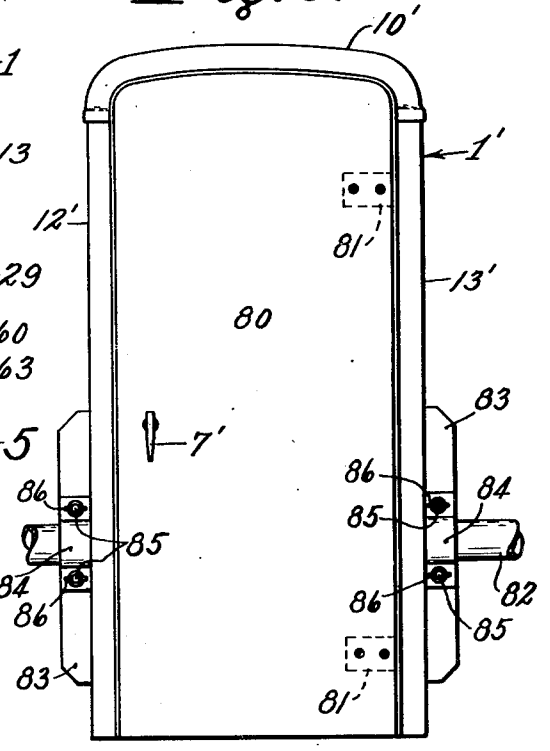


Fig. 3.



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Fig. 5.

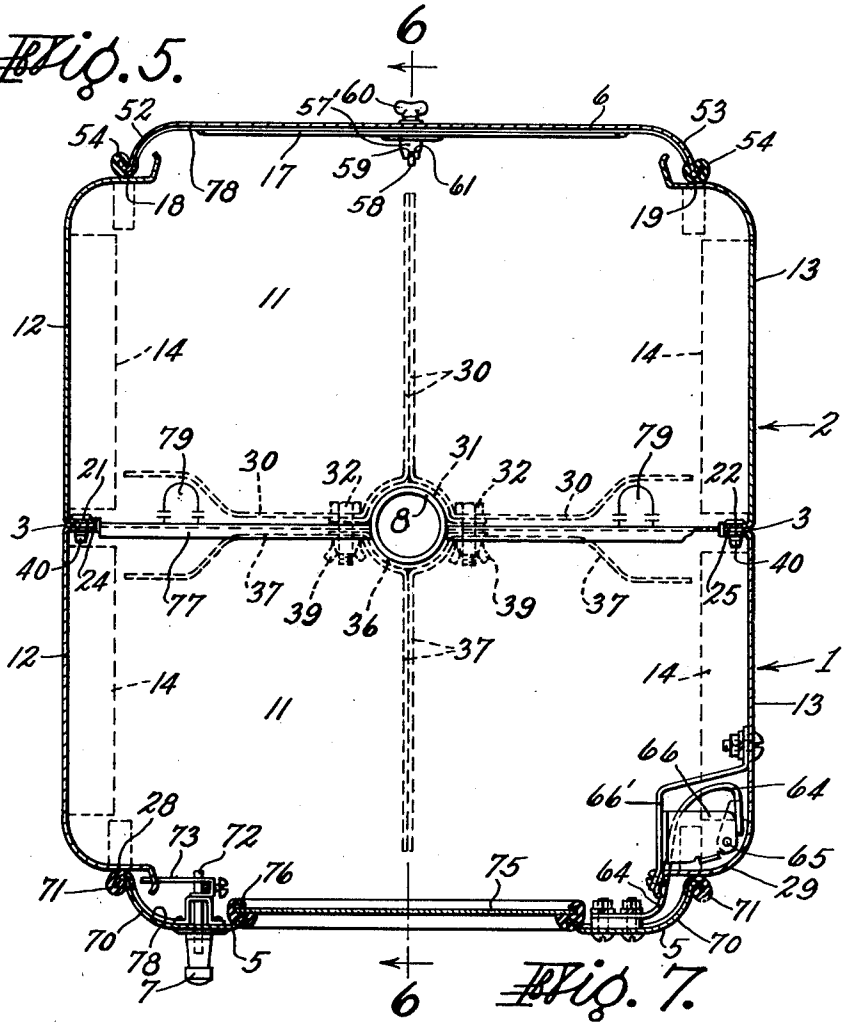


Fig. 7.

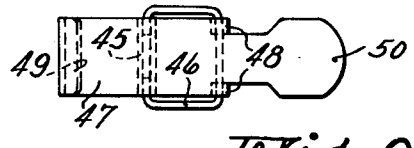


Fig. 8.

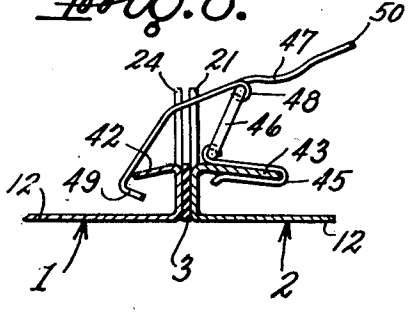
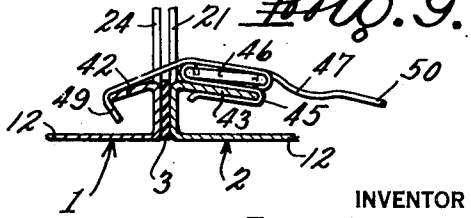


Fig. 9.



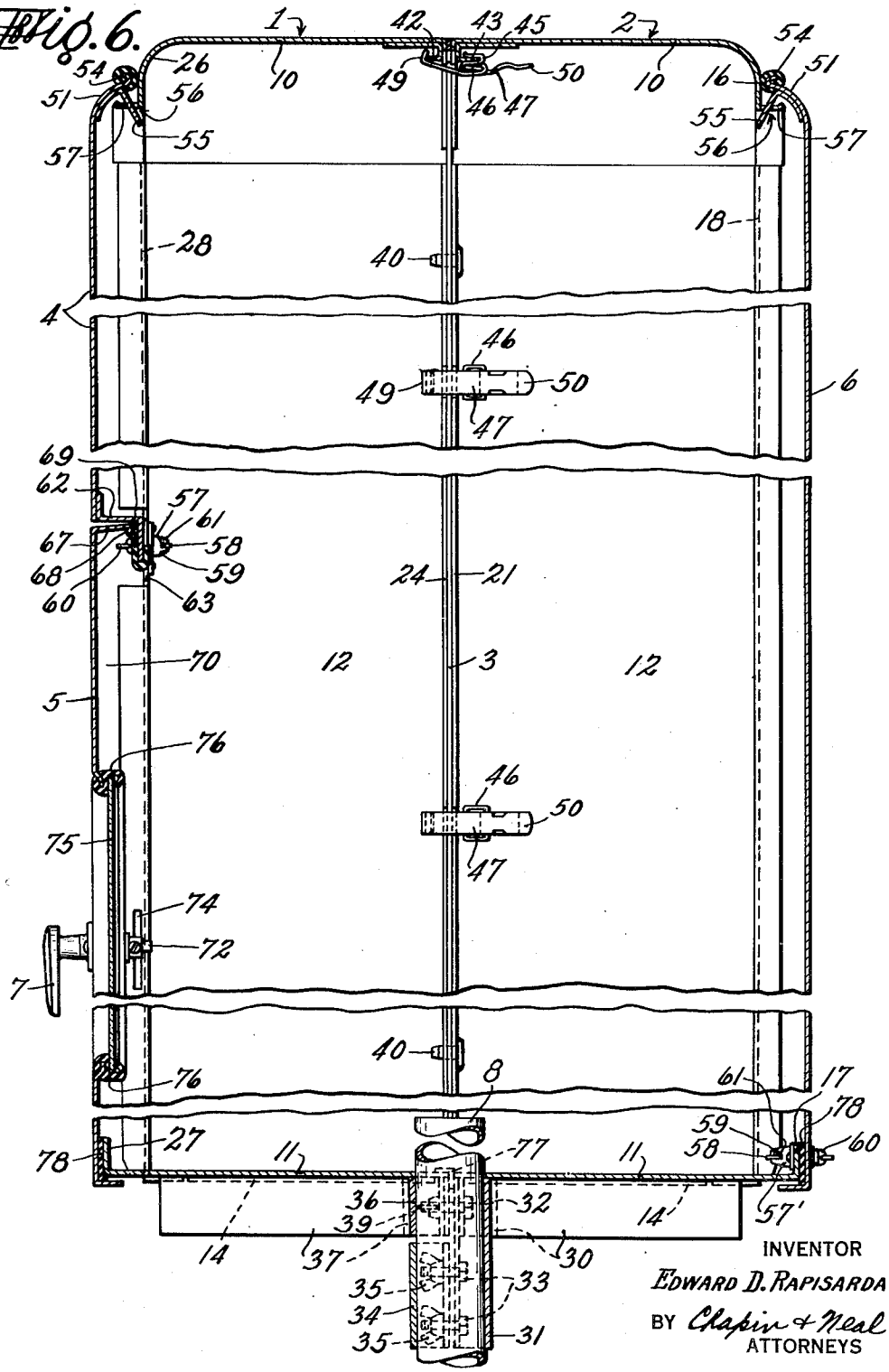
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Fig. 6.



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Fig. 10.

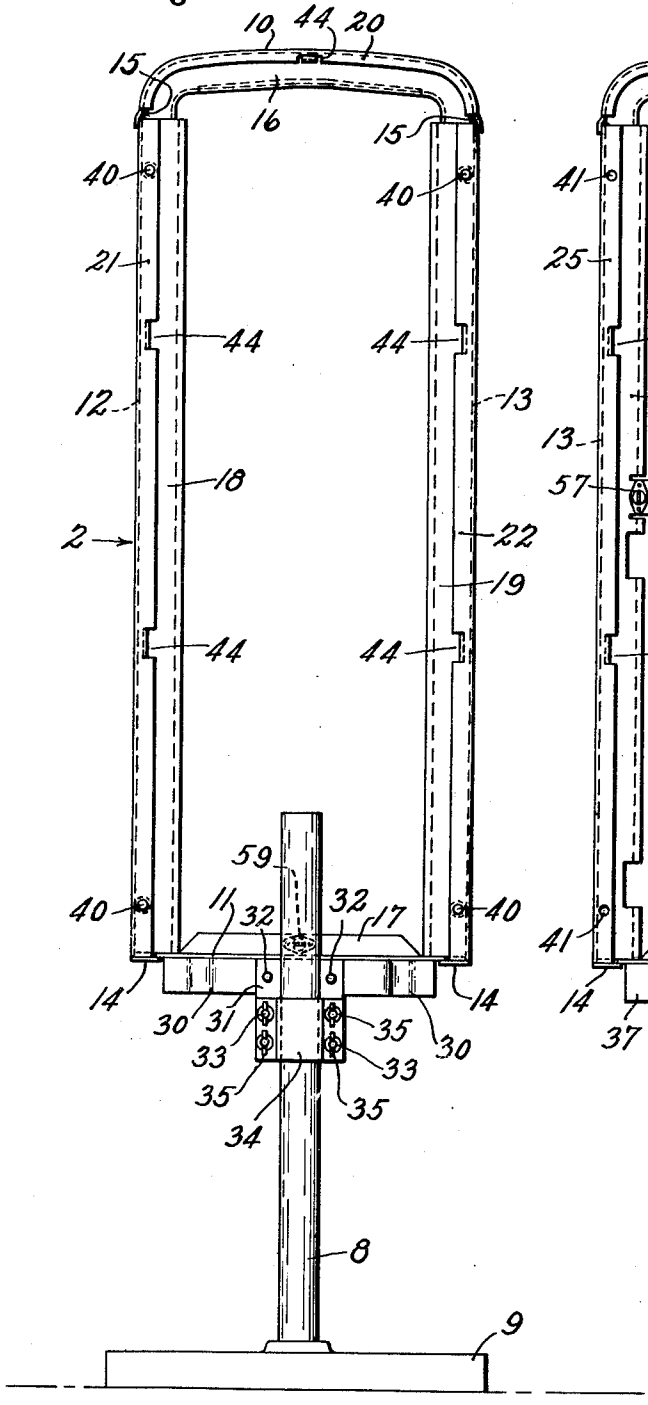
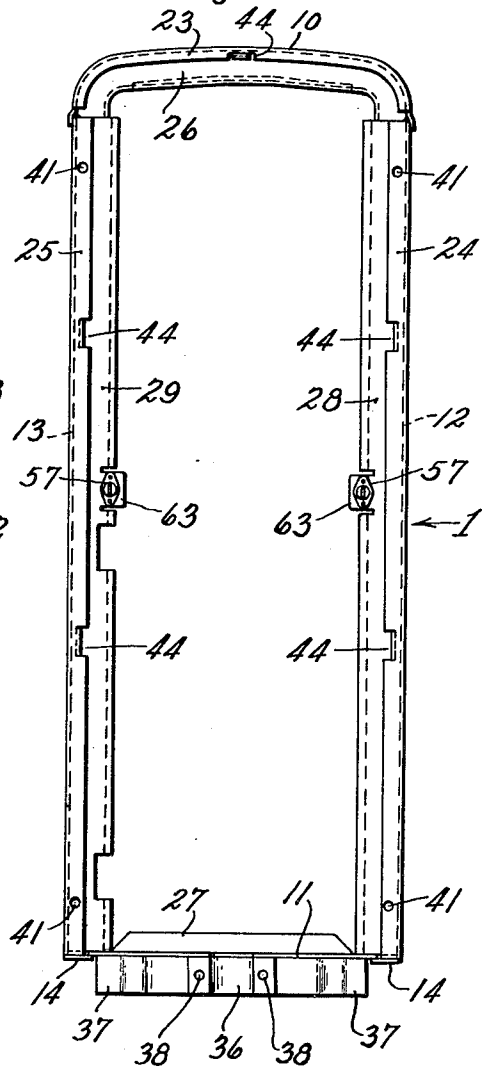


Fig. 11.



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2,601,056

SECTIONAL HOUSING CONSTRUCTION AND SUPPORT MEANS THEREFOR

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Application August 9, 1949, Serial No. 109,340

1 Claim. (Cl. 220—3.92)

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This invention relates to a sectional housing construction, which is particularly adapted for use as a protective housing for apparatus, such as measuring instruments, valves, regulators and control devices of various forms.

In petroleum refineries, chemical manufacturing plants and the like, there exist many such instruments, valves, regulators and controls, both indoors and outdoors, which need to be housed in order to protect them from mechanical injury or from damage by water, dust, dirt, heat or cold. It has been common, heretofore, for carpenters to build individual box-like enclosures around such apparatus but these are relatively expensive, not pleasing in appearance and not readily demountable as they should be in order to gain free access to the apparatus when required.

This invention has for an object to provide a sectional form of housing, constructed of light weight, pressed material, capable of being mass produced at low unit cost, and capable of being assembled without the use of tools about existing apparatus in the field to provide a protective enclosure. With the housing sections of this invention, a single workman without any special skill, can build around the desired apparatus in the field a protective housing, which affords ample mechanical strength, is pleasing in appearance and affords easy and complete access to the apparatus from all sides, whenever required.

The invention is disclosed by way of illustrative example in the accompanying drawings, in which:

Fig. 1 is an exterior front elevational view of one form of sectional housing embodying the invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is an exterior front elevational view of another form of sectional housing embodying the invention;

Fig. 4 is a top plan view of the housing shown in Fig. 3;

Fig. 5 is a sectional plan view taken on the line 5—5 of Fig. 1 and drawn to a larger scale;

Fig. 6 is a fragmentary sectional elevational view taken on the line 6—6 of Fig. 5;

Fig. 7 is a plan view of a quick-acting clamp used for holding the body sections of the housing together;

Figs. 8 and 9 are elevational views of the clamp shown in released and clamping positions respectively; and

Figs. 10 and 11 are elevational views showing separately the two body sections of the housing.

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Referring to these drawings; the housings shown are sectional and constructed to enable the parts to be assembled in the field around existing apparatus such as measuring instruments, valves and the like, whereby to build around the apparatus, easily, quickly and without the use of tools, a complete protective enclosure.

The housing of Figs. 1 and 2 includes front and rear body sections 1 and 2, respectively, which are held together with an intervening gasket 3; upper and lower front cover sections 4 and 5; and a back cover section 6. The lower front cover section is in the form of a hinged door, having a handle 7 and a suitable latch, operated by it. The housing is adapted to be mounted on a suitable support, usually the support for the instrument or other device which is to be housed, and in this particular case, a stanchion 8 rising from a floor plate 9.

Referring to Figs. 10 and 11, which respectively show the rear and front body sections prior to assembly, each has a top wall 10 of slightly arched formation, a flat bottom wall 11 and left and right side walls 12 and 13 interconnecting the top and bottom walls and forming an enclosure. These four walls are fastened together in any suitable way, in this case by welding together overlapping parts. For example, the flange 14, which is inturned from the lower end of each side wall beneath the bottom wall 11, is welded to the latter. Also, the two depending ends of the top wall 10 are welded, interiorly of the casing, to the adjacent tops of the side walls, as at 15. The rear section 2 has rear marginal flanges 16, 17, 18, 19 inturned from and at right angles to the rear edges of the walls 10, 11, 12 and 13, respectively, and front marginal flanges 20, 21 and 22 inturned from and at right angles to the walls 10, 12 and 13, respectively. The front section 1 is like the rear section and has similar marginal flanges but since the side shown in front in Fig. 11 engages the side of section 2 shown in front in Fig. 10, the flanges which are considered front ones in Fig. 10 are rear ones in Fig. 11 and vice versa. Thus, the section 1 has rear marginal flanges 23, 24 and 25 on its top, and side walls, respectively, and front marginal flanges 26, 27, 28 and 29 on its top, bottom and side walls, respectively. The back flanges 23, 24, 25 of section 2 are drawn toward the front flanges 20, 21 and 22, respectively, and clamped against the intervening gasket 3, as will be clear from Fig. 5.

The bottom wall of the rear section (Figs. 5 and 10) has welded to it two brace bars 30, each of which is bent approximately into right angu-

lar form (Fig. 5) except that its corner is bent inwardly to form a concave, quarter-cylindrical seat. These two seats jointly receive the upper part of the semi-cylindrical portion of a pipe clamp 31, the ears of which are welded to the bars 30. Also welded to the ears of the clamps, near the top thereof, are a pair of studs 32. The clamp 31 projects below bars 30 and has welded thereto two other pairs of studs 33. The rear section 2 is secured to stanchion 8 by drawing a front clamp 34 toward the described rear clamp 31 by means of wing nuts 35, threaded on the studs 33, which pass through holes in the front clamp. The rear section may thus be rigidly held to the stanchion.

The front section 1 (Figs. 5 and 11) has a similar pipe clamp 36 fixed to similar brace bars 37, welded to the underside of its bottom wall 11. The ears of this clamp have holes 38 (Fig. 11) to receive the upper pair of studs 32, shown in Fig. 10. The front section is put in place with its rear flanges against the front flanges of the rear section and the studs 32 passing through holes 38. Then, wing nuts 39 (Figs. 1 and 5) are threaded on studs 32 to draw clamp 36 toward the upper part of clamp 31 to grip the stanchion 8 therebetween. Thus, the front section may also be clamped firmly to the stanchion.

The rear section (Figs. 5 and 10) has fixed to and projecting forwardly from its front marginal flanges 21 and 22, dowels 40 which enter holes 41 formed in the rear marginal flanges 24 and 25 of the front section. The engagement of these dowels and holes insures the alignment of the corresponding walls of the front and back sections. These sections are further held together by quick-acting clamping devices, which draw together the adjacent pairs of flanges 21 and 24 and 22 and 25. Wherever one of these devices is applied, portions 42 and 43 of the flanges 21 and 24, or 22 and 25 as the case may be, are bent inwardly, as shown in Figs. 8 and 9. Thus are formed the recesses 44, shown in Figs. 10 and 11. These recesses will serve to show where the various clamping devices are located.

One of these clamping devices is shown in Figs. 7, 8 and 9. A U-shaped spring clip 45 is shaped to fit over, and frictionally grip, the bent over part 43 of flange 24. This clip has one end rolled over one cylindrical cross bar of a rectangular link 46, forming a fixed fulcrum for the latter. A lever 47 has parts 48 which are rolled over the other cylindrical cross bar of link 46 to provide a pivotal connection, located intermediate the ends of the lever. At one end of the lever, is a hook 49 and at the other end a handle 50. In use, the clip 45 is applied to the member 43, as shown in Fig. 8, and the hook 49 is placed over the end of member 42. Then handle 50 is pressed toward the member 43 and moved into the position shown in Fig. 9, wherein it is held by a toggle action. The pairs of flanges 21 and 24, or 22 and 25, as the case may be, will be firmly pressed against the intervening gasket 3 and held together.

The large opening between the marginal flanges 16, 17, 18 and 19 of the rear section 2 is closed by the cover 6. As shown in Figs. 5 and 6, this cover is pressed to form substantially quarter-round top and side marginal flanges 51, 52 and 53, which respectively abut the rear marginal flanges 16, 18 and 19. Preferably, a gasket 54 is applied to these cover flanges to seal the joint. The cover 6 is hung on the rear section 2 by a hook 55 (Fig. 6), fixed to the inner face of the cover near its upper end and extending into and through a slot 56, formed centrally in the outturned lower and trough-forming edge 57 of flange 16. The cover 6 is first hung up by engaging the hook 55 in slot 56, after which the cover is swung inwardly, about the engaged hook and slot as a pivot, until the gasket 54 abuts the rear flanges 16, 17 and 18 on the rear section. The cover is then fastened centrally near its lower end with any suitable sort of quick-acting fastener. As shown, a member 57' is fixed to the inside face of flange 17 and this member has a slot therethrough, to freely pass a pin 58 and a cross bar 59 fixed on the inner end of the cross bar. The outer end of pin 58 is fixed to a thumb piece 60 and is rotatably mounted centrally of and near the lower end of cover 6. On the inner end of member 57' are two cams 61 for engagement one with each end of cross bar 59. The pin 58 and cross bar 59 slide freely through the slot in member 57', when the cover 6 is moved into closed position. Then, the thumb piece 60 is given a quarter turn which causes the cross bar 59 to be moved inwardly, by the engagement of its ends with cams 61 to draw the cover tightly in place.

The upper section 4 of the front cover is hung up at its upper end in the same way as the rear section. It has a hook 55 to engage in slot 56 of a trough-forming member 57 of the top front marginal flange 27. To the lower edge of cover 4 is fixed a Z-bar 62, and the ends of the inner vertical leg of such bar abut one with each of two plates 63, fixed one to each of the front marginal flanges 28 and 29 of the front section 2. Two quick-acting fasteners, of the type described for the rear cover, are used to fasten the ends of the inner vertical leg of the Z-bar 62 to plates 63, the parts of these fasteners being given the same reference numerals as before.

The door 5 has fixed thereto upper and lower hinge arms 64 (Fig. 5). The outer end of each arm is connected by a pin 65 to a bracket 66, fixed to a strap 66, which in turn is secured at one end to side wall 13 and at the other end to flange 29. The door 5 has an inturned top flange 67 (Fig. 6), sloping outwardly and downwardly to shed water and terminating with a downturned part 68 which, when the door is closed, abuts a gasket 69 mounted on the inner vertical arm of Z-bar 62. This gasket is cut out to clear the thumb pieces 60. The door 5 also has curved side flanges 70, the inner ends of which carry gaskets 71 to abut the marginal front side flanges 28 and 29 of the front section 11 when the door is closed. The door handle 7 is fixed to a shaft 72, to the inner end of which is fixed a latch 73, engageable in a slot 74 (Fig. 6) provided in flange 28. The cover 5 may, if desired, have a window 75 therein held in place in an opening in the door by a gasket 76.

While not necessary for all purposes, the bottom of the instrument housing may be made tight, if desired. A gasket 77 of angle section is laid with one horizontal leg lying on top of and along the rear edge of the bottom wall 11 of the front section so that the vertical leg of a gasket lies between and the mating inner edges of the two bottom walls 11. These bottom wall sections may be cut to closely fit the walls which abut it and suitable gaskets applied where necessary, as indicated for example at 78 in Figs. 5 and 6.

Knock out portions 79 (Fig. 5) may be provided in the bottom wall 11 of either section (usually the back section) to permit the entry of

pipes, conduits or the like virtually through the parting plane between the two body sections.

In Figs. 3 and 4, a modification of the housing construction is shown. Parts in Figs. 3 and 4 which correspond to parts in Figs. 1 and 2 have been given the same reference numerals with the addition of a prime. There are, as before, front and back body sections 1' and 2', held together with a gasket 3' between them, and there is a rear cover 6', constructed and fastened as before. The front cover, in this case, consists of a single section 80, in the form of a door constructed in the same way as the cover section 6 but hung on hinges 81 which may be similar to those described for door 5. Door 80 may have a handle 7' operating a latch the same as before described in connection with door 5.

The housing of Figs. 3 and 4 is mounted in a different way, being supported from a horizontal pipe 82. Plates 83 are suitably fastened one to each side wall 12' and 13' of the rear section along the front thereof so that these plates form outward extensions of the sides in substantially coplanar relation with the front marginal side flanges 21 and 22 of the rear section. Centrally between the ends of each plate 83 is a seat for pipe 82. A front clamp plate 84 is provided for each plate 83 and through each plate 84 pass a pair of studs 85. Wing nuts 86, threaded on the studs 85, draw the plates 84 and 83 together to grip the pipe 82 therebetween. The front section will be accurately located relatively to the rear section by dowels and it will be held to the rear section by quick-acting clamps, such as were described in connection with the other form of the invention.

In use, the apparatus, to be housed in, is mounted on some form of support, such for example as the stanchion 8. This is usually hollow and may serve as a conduit for wires, tubes or other necessary connections to the apparatus. In the case of a valve or regulator, this may be mounted in a pipe line, such as shown at 82 in Figs. 3 and 4. The housing of this invention uses the same support that is provided for the apparatus and provides the parts wherewith to build around such apparatus the desired protective housing.

A single operator can handle the light weight sections and assemble them quickly without the use of tools. He first places the rear body section 2 so as to surround the apparatus and so that the clamp 31 seats on stanchion 8 at the desired height. Then, he applies clamp plate 34 to studs 33 and by the wing nuts 35 tightens the clamps against the stanchion. The front section is then placed against the back section with the dowels 40 entering the holes 41 an accurately locating the top, bottom and side walls of the two sections in alignment. The clamp 36 will then seat on stanchion 8 and the wing nuts 39 are then applied to studs 32 to draw the two clamps 31 and 36 together to grip the stanchion 8. The two body sections are then tightly held together by the quick-acting toggle clamping devices described which are applied to the mating side and top flanges. Then, the cover section 6 is put in place by engaging its hook 55 in slot 56, swinging the cover into abutment with the marginal top and side flanges and securing it in position by a quarter turn of fastener 60. The hinged door 5 is applied at the factory. The operator swings the door wide open and then applies the top cover section 4 in the same way that cover 6 was applied, after which the door is swung closed and latched and the housing is complete.

It will be obvious that the kind of covers used is a matter of choice. Both covers can be of the same type as cover 6; both can be full length hinged doors, such as 80, or a combination of the two, such as 4 and 5. But the cover, however constructed, should be demountable or capable of being readily opened, as are the doors.

In the case of the form of housing shown in Figs. 3 and 4, the toggle clamping devices are solely relied on to hold the front section to the rear section and only the latter is clamped to the pipe 82.

It will thus be seen that a protective housing can be readily constructed without the use of tools about whatever form of apparatus it is desired to house. The housing, so constructed, is pleasing in appearnace, has the necessary mechanical strength and is readily demountable. In a short time, the operator without the use of tools can take the housing apart and gain access to all sides of the apparatus, as may be needed for service, adjustment or repair, and the housing parts can be replaced quickly and conveniently. Several housings may be arranged side by side in battery formation and access had to the housed apparatus through the front and rear covers.

The housing described lends itself readily to air conditioning. It can be heated or cooled and its humidity controlled as required, and it can be insulated and made proof against the entrance of water or dust and dirt. The housings can thus be used outdoors as well as indoors. The housing sections are of light weight and can be produced in quantities at low unit cost.

Thus, the invention affords a sectional housing which can be assembled around existing apparatus in the field by unskilled labor and without the use of tools to form a protective housing and the housing is so sectionalized or divided that ready access can be had to all sides of the apparatus when required.

What is claimed is:

A sectional housing adapted to be assembled about and enclose an instrument mounted on a fixed support and comprising, front and rear matching box-like sections, each consisting of a top wall, a bottom wall and two side walls interconnecting the top and bottom walls to form a rectangular enclosure, the edges of corresponding walls of the two sections adapted to abut along a plane, said sections having an opening formed partly in one and partly in the other and crossing the meeting plane of the two sections, said opening adapted to receive and closely fit the instrument support, a two-part clamp one part of which is fixed solely to the rear section adjacent said opening and the other part of which is separate from both sections, said clamp parts adapted to encompass said support, means for drawing said clamp parts together to fix the rear section only to said support, clamping means inside said enclosure for fastening the front section to the rear section, said front and rear sections having front and rear walls respectively, connected to the non-abutting edges of said top, bottom and side walls and forming a closure for said enclosure, at least one of said front and rear walls being easily removable to gain access to the interior clamping means.

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