Sept. 27, 1949. P. G. FRERER 2,483,042

SECURING MEANS

Filed May 7, 1946

FIG. 1

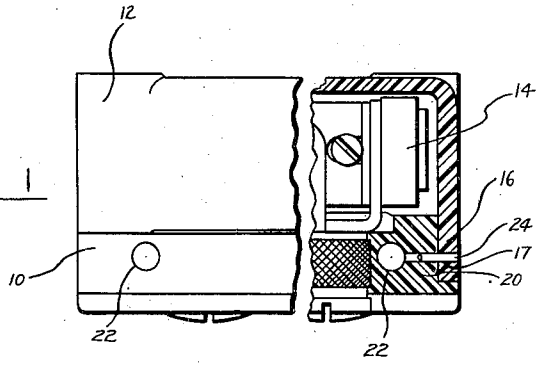


FIG. 2

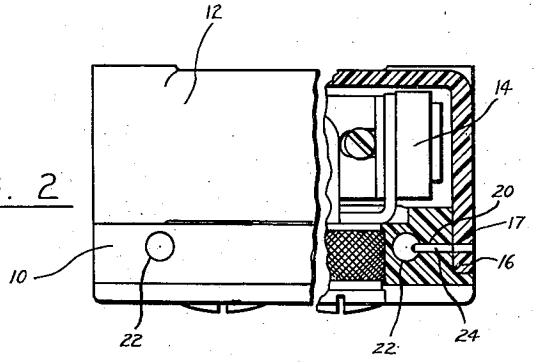


FIG. 3

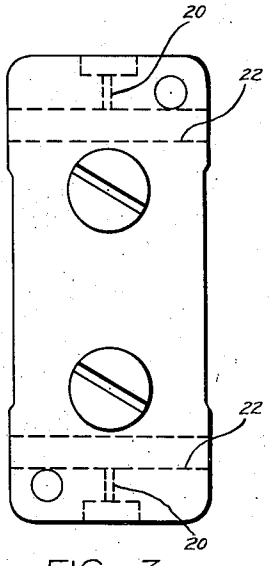


FIG. 4

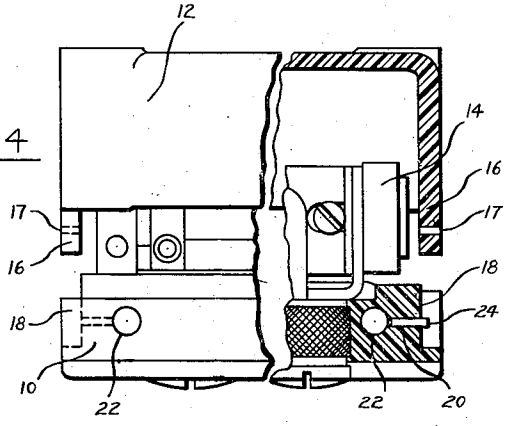
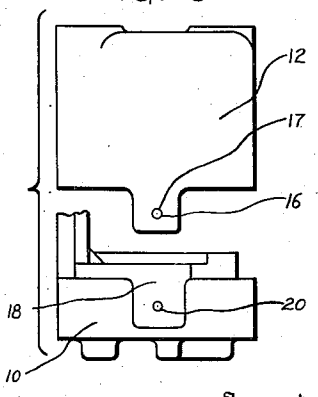


FIG. 5



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SECURING MEANS

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7 Claims. (Cl. 292—137)

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This invention relates to protective housings and more particularly to such a housing of a type which may be disassembled using relatively simple apparatus but yet may not be disasssembled at all by those unfamiliar with its design without destruction of same.

This application is a continuation in part of my copending application, Serial No. 658,602, filed April 1, 1946. As is well known, many complex and delicate pieces of equipment are now placed at the disposal of lay persons to control apparatus, to perform measuring operations, and to render other valuable services. Inasmuch as this apparatus is normally employed by people who are relatively unfamiliar with the mode and manner of its operation and who lack the fundamental knowledge necessary for its adjustment and maintenance, it becomes desirable to prevent access by others than those who have been properly initiated in such knowledge. While rendering the interior of such units inaccessible to those who are not possessed of the special knowledge required, yet the mode of so rendering the interior of the unit inaccessible must be such that it requires little or no additional effort on the part of skilled personnel than would the releasing of more conventional closures.

Accordingly it is a principal object of the invention to provide a new and novel enclosed assembly, the method of opening which is not immediately obvious upon inspection.

Another object of the invention is to provide a new and novel enclosure assembly of a type openable only by those with special knowledge in which the opening may be performed with simple inexpensive tools.

A further object of the invention is to provide a base and cover assembly in which the interrelation of apertures traversing the base affords provision for an unobvious release of the housing from the base.

Other objects and advantages of the invention will in part be obvious and in part be disclosed when the following specification is read in conjunction with the drawings in which;

Figure 1 is a side elevation, partly in section, illustrating the base and housing in a closed relationship.

Figure 2 is a view in elevation, partly in section, illustrating the base and housing with the closure pin driven into the release position.

Figure 3 is a bottom view of the base assembly illustrating the relative aperture orientation.

Figure 4 is a view in elevation partly in section illustrating cover and base in a disassembled position with the closure pin available for removal and

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Figure 5 is an end view showing the base and cover of the assembly in disassembled relationship.

Referring now to the drawings, there is shown a base 10 upon which is mounted a cover 12. The apparatus in conjunction with which the principles of the invention are here illustrated may be an electric switch, such as that shown in my aforementioned co-pending application entitled Snap acting contactor, mounted on the base 10. While closures of this nature are particularly advantageous in connection with such switches, whose calibration and continuity of operation depend upon delicate adjustments which must not be tampered with by the uninitiated, it is understood that this particular combination has been selected for illustrative purposes only and is not to be construed as limiting the scope of the invention which is directed to closures generally.

As is more completely obvious from the aforementioned co-pending application a snap switch assembly, as indicated generally by reference character 14, is mounted on the base 10 and protected from ambient atmospheric conditions by the surrounding cover 12 secured in place over the snap switch assembly 14. The cover 12 is provided with a pair of depending ears 16 to be seen most clearly in Figures 4 and 5. The ears 16 project into a recess 18 located at each end of the base 10. Each of the ears 16 is traversed by an aperture 17 and when the cover 12 is in place upon the base 10 the cover aperture 17 is in register with a corresponding aperture 20 of similar diameter provided in the base 10. The aperture 20 terminates at the wall of a transverse aperture 22 in the base 10, the point of termination being the wall of aperture 22 nearest the recess 18; thus the aperture 20 has an inner extremity and its length is determined by the intersection of its inner extremity with the wall of aperture 22 nearest recess 18. For reasons which will become more obvious, the diameter of the transverse aperture 22, measured in a direction parallel to the length of aperture 20, must be at least equal to and preferably somewhat greater than the difference between the length of the pin 24 and the length of aperture 20. After the base mounted unit 14 has been completely calibrated, the cover 12 is slipped into position on the base 10 with the cover lug aperture 17 in register with the recess apertures 20. The pin 24 is then driven into the cover aperture and the base aperture 20 until the head thereof is substantially flush with the

outer surface of the cover 12. While this provides the neatest assembly, the pin may also be driven in further than this, so long as the head is not driven beyond the inner face of the projecting lug 16, when it would no longer serve its retaining function.

This is the condition in which the completed unit is shipped and placed in service. Should the equipment operate erratically the user, if tempted to gain access to the interior, will gain no clue as to the sole mode of disassembly without destruction, by examination of the exterior. The natural reaction is to attempt to remove pin 24 which cannot conveniently be done; hence, it becomes most probable that the unit will be forwarded to a service center properly equipped both with tools and knowledge. Upon arrival at the service center using a proper tool the pin 24 is driven inwardly until the head thereof is flush with or slightly below the inner face of the recess 18. The cover 12 may now be readily removed and the necessary service operations performed.

Preparatory to re-assembly it is necessary to remove the pin 24. As previously outlined the dimension of the aperture 22, measured parallel to the line of travel of pin 24, is greater than the difference between the length of pin 24 and of aperture 17; hence, it is not necessary to drive the pin 24 into contact with the opposite wall of the aperture 22 and in practice it is only driven so far as necessary to release the cover 12 permitting clearance to remain between the bottom end of pin 24 and the opposing wall of aperture 22.

Removal of pin 24 is effected by forcing a tapered plug within the aperture 22 whereupon the pin 24 rides upwardly and outwardly on the tapered surface, until the head thereof projects beyond the inner face of the recess 18, whence it may be removed by conventional means. Re-assembly is performed as above indicated.

It is desirable that when the unit is completely assembled, the inner end of the pin 24 be not visible within the bore of the intersecting aperture 22, since this would give a clue as to the mode of disassembly. Thus the length of the pin 24 should not exceed the sum of the length of aperture 20 and the cover thickness. It is further desirable that the length of pin 24 be greater than the length of aperture 20, so that when the inner end of pin 24 is driven flush with the wall of aperture 22 at its intersection with aperture 20, the head of pin 24 will protrude beyond the base of recess 18, to permit removal thereof. As an operative criterion, it is clear that the length of the pin 24 must not exceed the sum of the length of aperture 20 and the dimension of aperture 22, measured parallel to the direction of travel of pin 24 within aperture 20, else it will never be possible to disengage the pin 24 from aperture 17 to permit removal of the cover 12.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced thereby.

What is claimed, and desired to be secured by United States Letters Patent is:

1. In a housing; a cover provided with a depending projection; a base adapted to receive said cover and provided with a recess complementary to said projection, with a first aperture extending into said base from said recess and having an inner extremity, and a second aperture disposed transversely of and intersecting said first aperture at the said inner extremity, said first aperture terminating at the wall of said second aperture nearest the said recess; said second aperture having a dimension measured parallel to said first aperture exceeding the depth of said recess; said depending projection having an aperture normally in register with said first aperture; and a pin having a length greater than the depth of said recess and less than the sum of the depth of said recess and the length of said first aperture situated within said projection aperture and within said first base aperture.

2. In a housing; a cover provided with a depending projection; a base adapted to receive said cover and provided with a recess complementary to said projection, with a first aperture extending into said base from said recess and having an inner extremity and with a second aperture disposed transversely of and intersecting said first aperture at the said inner extremity, said first aperture terminating at the wall of said second aperture nearest the said recess; said second aperture having a dimension measured parallel to said first aperture exceeding the depth of said recess; said depending projection having an aperture normally in register with said first aperture; and a pin having a length greater than the depth of said recess, greater than the length of said first aperture, and less than the sum of the depth of said recess and the length of said first aperture situated within said projection aperture and within said first base aperture.

3. In a housing; a cover provided with a depending projection having a predetermined thickness; a base adapted to receive said cover and provided with a recess complementary to said projection, with a first aperture extending into said base from said recess and having an inner extremity and with a second aperture disposed transversely of and intersecting said first aperture at the said inner extremity, said first aperture terminating at the wall of said second aperture nearest the said recess; said second aperture having a dimension measured parallel to said first aperture exceeding said predetermined thickness; said depending projection having an aperture normally in register with said first aperture; and a pin having a length greater than said predetermined thickness and less than the sum of said predetermined thickness and the length of said first aperture situated within said projection aperture and within said first base aperture.

4. In a housing; a cover provided with a depending projection having a predetermined thickness; a base adapted to receive said cover and provided with a recess complementary to said projection, with a first aperture extending into said base from said recess and having an inner extremity and with a second aperture disposed transversely of and intersecting said first aperture at the said inner extremity, said first aperture terminating at the wall of said second aperture nearest the said recess; said second aperture having a dimension measured parallel to said first aperture exceeding said predetermined thickness; said depending projection having an aperture normally in register with said first aperture; and a pin having a length greater than said

predetermined thickness and less than the sum of the length of said first aperture and said dimension of said second aperture situated within said projection aperture and within said first base aperture.

5. In a housing; a first member forming a partial enclosure and having an aperture extending therethrough; a second member cooperating with said first member to form a complete enclosure and having a first aperture adapted to register with said aperture in said first member when said two members are in cooperating relationship said first aperture having an inner extremity, with a second aperture disposed transversely of and intersecting said first aperture at the said inner extremity, said first aperture terminating at the wall of said second aperture nearest the said recess; and a pin situated within said aperture in said first member and within said first aperture; said second aperture having a dimension measured parallel to said first aperture in said second member greater than the length of said pin minus the length of said first aperture in said second member.

6. In a housing; a first member forming a partial enclosure and having an aperture extending therethrough; a second member cooperating with said first member to form a complete enclosure and having a first aperture adapted to register with said aperture in said first member when said two members are in cooperating relationship said first aperture having an inner extremity, with a second aperture disposed transversely of and intersecting said first aperture at the said inner extremity, said first aperture terminating at the wall of said second aperture nearest the said recess; and a pin of length less than the sum of the length of said aperture in said first member and said first aperture in said second member situated within said aperture in said first member and within said first aperture in said second member; said second aperture in said second member having a dimension measured parallel to said first aperture in said second member greater than the length of said pin minus the length of said first aperture in said second member.

7. In a housing, a first member forming a partial enclosure and having an aperture extending therethrough; a second member cooperating with said first member to form a complete enclosure and having a first aperture adapted to register with said aperture in said first member when said two members are in cooperating relationship said first aperture having an inner extremity, with a second aperture disposed transversely of and intersecting said first aperture at the said inner extremity, said first aperture terminating at the wall of said second aperture nearest the said recess; and a pin of length greater than the length of said aperture in said first member and less than the sum of the length of said aperture in said first member and said first aperture in said second member situated within said aperture in said first member and within said first aperture in said second member; said second aperture in said second member having a dimension measured parallel to said first aperture in said second member greater than the length of said pin minus the length of said first aperture in said second member and less than the length of said pin.

PAUL G. FRERER.

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