Oct. 18, 1966 D. L. P. HAMILTON 3,279,838

LOCKING SECUREMENT FOR SHEET METAL HOUSING COVER

Filed Jan. 11, 1965

Fig. 1.

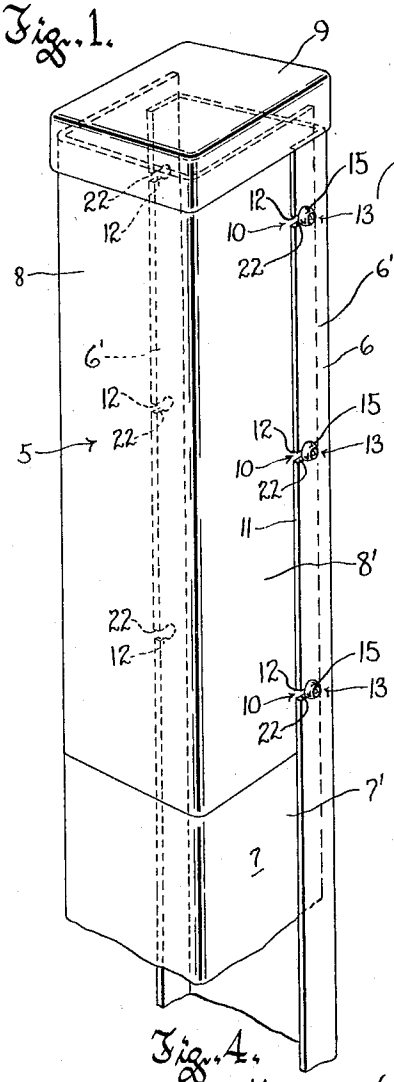


Fig. 2.

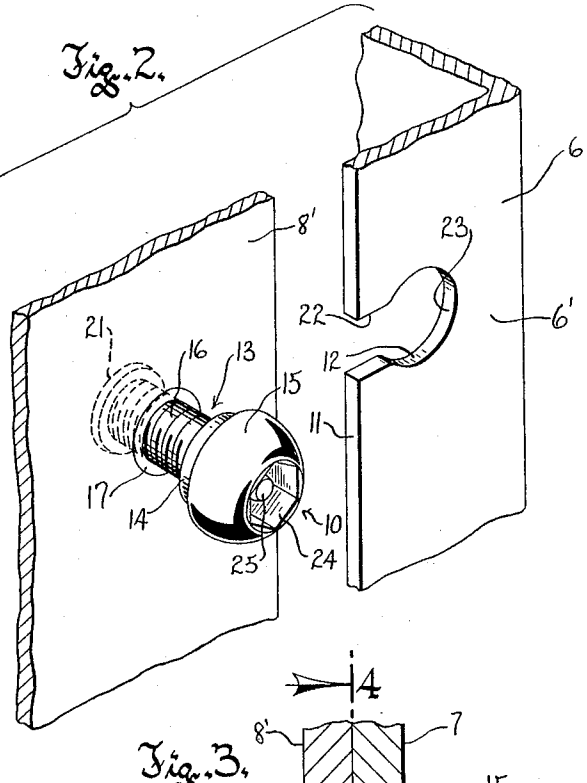


Fig. 3.

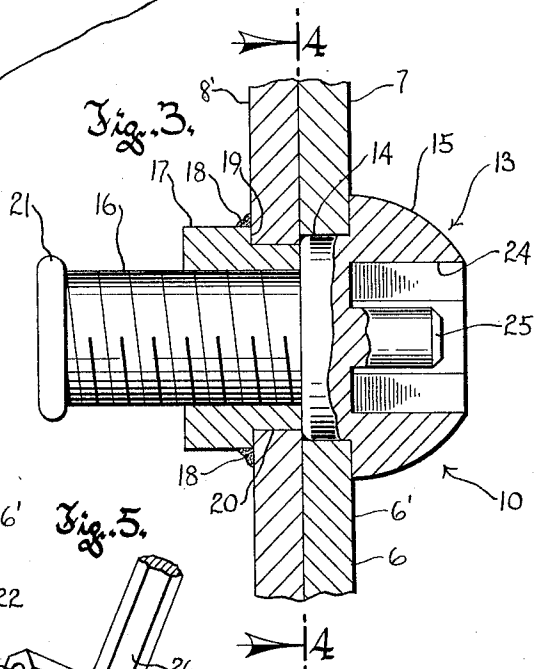


Fig. 4.

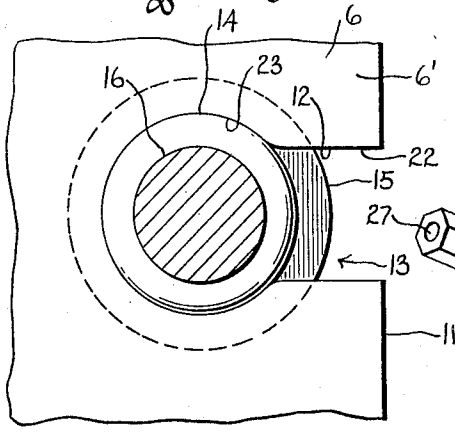


Fig. 5.

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LOCKING SECUREMENT FOR SHEET METAL HOUSING COVER

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4 Claims. (Cl. 292—251)

This invention relates to means for locking a pair of sheet metal members or the like in flatwise superimposed relationship in such a manner that they can be easily separated only by an authorized person, and the invention refers more particularly to very inexpensive means for accomplished a locking or securement function heretofore often assigned to padlocks and cylinder locks.

There are certain types of enclosures which have removable covers that must be rendered tamper proof so that unauthorized persons cannot gain access to equipment housed in the enclosure. As an expample, an underground cable terminal housing, which is usually made of sheet metal, is provided with a large removable cover that permits authorized repair and maintenance personnel to have access to the interior of the housing but which should be secured against removal by unauthorized persons in order to prevent mischief and vandalism. Heretofore, it has been conventional to secure the cover of an underground cable terminal housing by means of a padlock which cost several dollars.

The present invention has for its object the provision of locking securement means for the cover of a cable terminal housing or similar enclosure which can be manufactured and installed at substantially less cost than a padlock, which is inseparable from the structure upon which it is installed so that it cannot be lost or misplaced, and which insures a good, tight connection between the cover and the enclosure.

Another object of this invention is to provide locking securement means of the character described that can be locked and released only by means of a special tool which is not readily available to the general public and which therefore partakes of the nature of a key.

Still another object of this invention is to provide locking securement means of the character described that can be very easily locked and opened, even in a confined space and under poor lighting conditions.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

The accompanying drawing illustrates one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

FIGURE 1 is a perspective view of an enclosure or housing upon which the locking securement means of this invention is installed, the securement means being shown in locked or closed condition;

FIGURE 2 is a fragmentary perspective view on a larger scale showing one of the locking securement means of this invention in unlocked condition, and the adjacent portions of the housing and its cover separated from one another:

FIGURE 3 is a longitudinal sectional view on a still larger scale through one of the locking securement means, shown in locked condition;

FIGURE 4 is a cross sectional view taken on the plane of the line 4—4 in FIGURE 3; and

FIGURE 5 is a perspective view on a small scale of the special tool or key used with the securement means of this invention.

Referring now to the accompanying drawing, the numeral 5 designates generally an underground terminal connector housing or cabinet consisting of an elongated channel 6, preferably formed as a stamping, a lower housing section 7 and an upper cover section 8, both of which sections are sheet metal stampings U-shaped in cross section. The channel 6 not only forms the stationary fixed back of the housing or cabinet but also serves as an anchor post which may be driven into the ground alongside an underground cable, to a depth such that the bottom of the lower housing section, which is open, is slightly above the cable. This places at least a substantial portion of the lower section below ground, but all of the upper cover section is above ground. In use, a loop of the underground cable (not shown) extends up into the housing or cabinet where certain of its wires are attached to terminals for connection with service lines, as shown for instance in the Hamilton Patent No. 2,916,539.

The top of the housing or cabinet is closed by a cap 9 which may be fixed to the upper end of the channel 6 or, as shown, to the upper cover section 8, the securement in either case being effected by spot welding or the like.

As shown, the side walls 7′ and 8′ of the housing sections 7 and 8 are snugly received between the flanges 6′ of the post-forming channel 6.

Since the upper cover section 8 provides a removable access door to the interior of the housing or cabinet, it should normally be locked in place so that unauthorized persons are prevented from tampering with the contents of the housing, and to this end the marginal portion of each of the cover section side walls 8′ is releasably secured to its overlying flange 6′ of the post-forming channel 6, by means of three of the locking securement means 10 of this invention. As the description proceeds, it will become apparent that the particular cross sectional shape of the channel and of the cover section 8 is of no consequence to this invention as long as the overlying portions 6′ and 8′ are substantially flat and one of them has an exposed edge, in this case the edge 11 of each of the flanges 6′; and that in applying the cover, the overlying wall portions move edgewise relative to one another and transversely to the exposed edges 11.

Each of the locking securement means 10 by which the cover section is releasably held in place comprises, in general, a keyhole shaped slot 12 in a flange 6′ opening to its edge 11, and a special screw 13 mounted on the side wall 8′ of the cover section and provided with a shoulder 14 and a peculiar head 15 to coact with the keyhole slot as will be described hereinafter.

The threaded shank 16 of the screw is received in a correspondingly threaded bore in a bushing 17 which is secured to the side wall 8′ of the cover section, as by welding 18. A forwardly facing shoulder 19 defined by a reduced diameter front end portion 20 serves to properly locate the bushing and hold it against axial withdrawal.

At the rear or inner end of its threaded shank the screw has a head 21 which prevents the screw from being turned out of the bushing, and which can be formed by swaging or peening the inner end of the screw after the bushing has been secured in the wall and the shank of the screw has been threaded through it.

The keyhole shaped slot 12 has a narrow mouth 22, of a width just slightly wider than the diameter of the shank portion of the screw, and has a larger substantially round inner portion 23 of a size to snugly receive the shoulder portion 14 of the screw. When the cover 8 is

in its closed position, the inner portion of each slot is coaxial with its adjacent bushing **17** and the shoulder portion on the screw is receivable in the inner portion of the slot to prevent edgewise displacement of the cover relative to the channel **6**. Of course, when the screw is turned out of the bushing far enough to axially disengage its shoulder **14** from the slot **12**, the screw presents no obstruction to relative edgewise movement between the overlying wall portions **6'** and **8'** because the mouth **22** of the slot is wide enough to permit the threaded shank **16** of the screw to pass through it.

The axial length of the shoulder portion **14** on the screw is preferably slightly less than the thickness of the flange **6'**, or at least not greater, so that when the screw is turned all the way in, its head—which, of course, is larger in diameter than the shoulder—clamping engages the flange **6'** and draws the overlying wall portions together.

The head **15** of the screw has a spherical outer surface which fairly well precludes its being gripped with a pair of pliers. To enable torque to be applied to the screw, its head has a coaxial outwardly opening hexagonal socket or well **24**. However, a conventional Allen head wrench cannot be inserted into this socket far enough to get sufficient purchase on the screw because the screw head also has a coaxial prong or tang **25** in the socket that projects outwardly nearly to its mouth. Hence the screw can be turned only by means of a special tool **26** which generally resembles an Allen head wrench but which has a coaxial well **27** opening to its end to accommodate the prong **25** as the tool is inserted into the hexagonal socket **24** in the screw head.

It will be observed that tightening and loosening of the special screws **10** can be readily accomplished in the same manner as with ordinary Allen head screws, but that the special screws in the securement means of this invention are inseparable from the body of the enclosure, due to the heads **21** on their inner ends. Hence the locking securement means of this invention has no small parts that can be lost or mislaid.

From the foregoing description taken together with the accompanying drawing, it will be readily apparent that this invention provides an improved locking securement for holding two pieces of sheet metal or the like in flatwise superimposed relationship, and which can be readily unlocked by an authorized person to permit the two sheets to be separated, without danger of dropping or misplacing any of the parts of the securement means. It will also be apparent that because of its small cost, the locking securement means of this invention is especially well adapted for use in securing and locking the doors or covers of underground cable terminal housings or cabinets.

What is claimed as my invention is:

1. In a housing having a body and a cover with overlying marginal wall portions which move edgewise in opposite directions during displacement of the cover, one of said marginal wall portions having an edge that extends transversely to said directions and is exposed on the exterior of the housing when the cover is in its closed position, means for securing the cover in its closed position in a manner such that only an authorized person can effect expeditious displacement thereof, said means comprising:

(A) a keyhole-shaped slot in said identified marginal wall portion having its mouth opening to said exposed edge and its large inner portion spaced from said edge;

(B) means on the other marginal wall portion providing a threaded bore which opens to both surfaces of said wall portion and which registers with the large inner portion of said slot when the cover is in its closed position, the diameter of said bore being no greater than the width of the mouth of the slot; and

(C) a screw having

(1) a shank portion threadedly received in said bore,

(2) a head at one end of the shank portion, larger than the large inner end portion of the slot,

(3) a substantially cylindrical shoulder at the underside of the head and by which the head is joined to the shank portion, said shoulder having a diameter to be snugly receivable in the large inner end portion of the slot and thus hold the overlying wall portions against edgewise separation while the head holds said wall portions in flatwise engagement upon tightening of the screw, and

(4) a polygonal outwardly opening socket in the head, and a coaxial prong projecting outwardly from the bottom of the socket so that turning the screw to the point where the shoulder is disengaged from said slot requires the use of an Allen head type wrench having a coaxial well therein to accommodate said prong.

2. The structure of claim **1**, wherein the screw has a second head formed on the inner end of its shank portion to prevent disassembly of the screw from said bore.

3. In an underground cable terminal enclosure having an elongated body member which is channel-shaped in cross section, and a cover section which is U-shaped in cross section and has the marginal portions of its side walls snugly received between the flanges of the body member when the cover section is in its closed position, means for securing the cover section in its closed position in a manner such that only an authorized person can effect exepeditious removal of the cover section, said means comprising:

(A) a plurality of keyhole-shaped slots in each flange of the channel-shaped body member, spaced lengthwise thereof with the mouths of the slots opening to the edges of the flanges,

(B) tapped bushings fixed to the inner faces of the side walls of the cover section, one at each part thereof which aligns with the large inner end portion of each keyhole-shaped slot, and

(C) a combined locking and clamping screw threaded in each tapped bushing, each screw having a shank of a diameter to pass freely through the mouth of the adjacent keyhole-shaped slot, a head which is larger than the large inner end of the slot to have clamping engagement with the outer face of the adjacent flange when the cover section is in place and the screw is tightened,

a shoulder portion at the underside of the head, said shoulder portion being of a size to snugly fit the large inner end of the keyhole-shaped slot and hence too large to pass through the mouth of the slot, so that tightening of the screws with the cover section in place disposes all of the shoulders in their respective large inner ends of the slots and clamps the flanges between the heads of the screws and the underlying marginal portions of the cover side walls,

the heads of the screws having substantially spherical outer surfaces and a polygonal socket opening to the top thereof, and

a prong rising from the bottom of the socket so that an Allen head type wrench having a well to accommodate the prong is required to turn the screws.

4. Means for so locking two sheets of metal or the like in flatwise overlying relationship that only an authorized person can readily release them for separation, said means being characterized by the following:

(A) one of said sheets has a substantially keyhole shaped slot opening to one edge thereof, said slot

being narrow at its mouth and having a wider, rounded inner portion;

(B) a bushing fastened on the other of said sheets defines a threaded bore which registers with the rounded inner portion of the slot when the sheets are in said relationship;

(C) a screw at all times confined in said bushing and cooperable with said slot provides for locking the sheets in said relationship, said screw having

(1) a shank portion which is threaded to cooperate with the threads of said bore and which is narrow enough to pass through the mouth of the slot,

(2) means at the inner end of its shank portion to prevent axial withdrawal of the screw out of the bore in one direction,

(3) a coaxial shoulder at the outer end of its shank portion which has a diameter substantially equal to that of the rounded inner portion of the slot and which is receivable in the same to prevent edgewise displacement of said one sheet,

(4) a coaxial head axially outwardly of said shoulder and which has a diameter larger than that of the inner portion of the slot so as to overlie said one sheet and prevent flatwise displacement of it relative to the other,

(5) a coaxial hexagonal socket in said head, and

(6) a coaxial prong in said socket so that said screw can be turned outwardly only by means of an Allen wrench having a coaxial well in which said prong is receivable.

References Cited by the Examiner

UNITED STATES PATENTS

1,100,178	6/1914	Forsberg	339—220 X
1,262,300	4/1918	Blake.	
1,807,494	5/1931	Proctor.	
1,885,231	11/1932	Chong et al.	85—9 X
2,371,801	3/1945	Chester et al.	292—251 X
2,395,377	2/1946	MacLean	85—9
3,164,668	1/1965	Skubal	174—37 X

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