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[33] Great Britain

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[54] LOCATING AND LOCKING DEVICES
10 Claims, 5 Drawing Figs.

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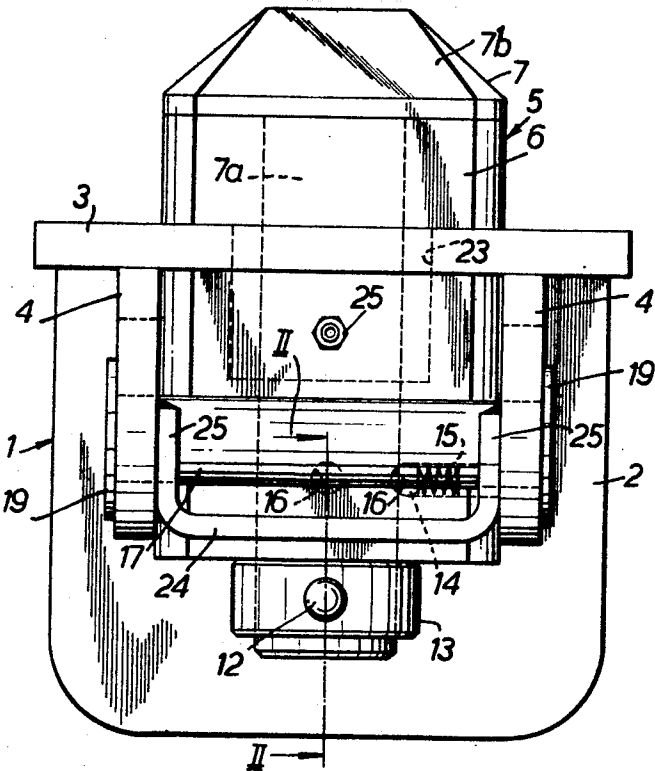
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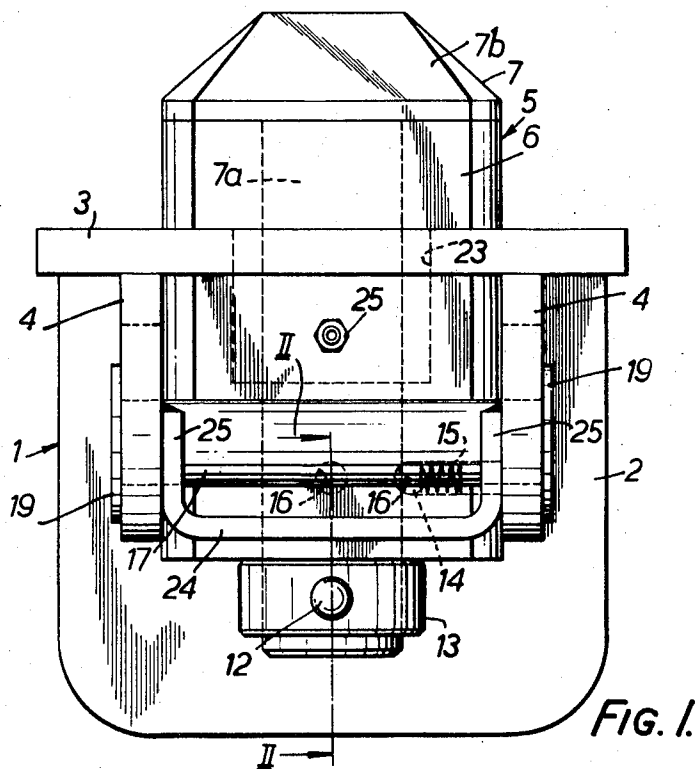
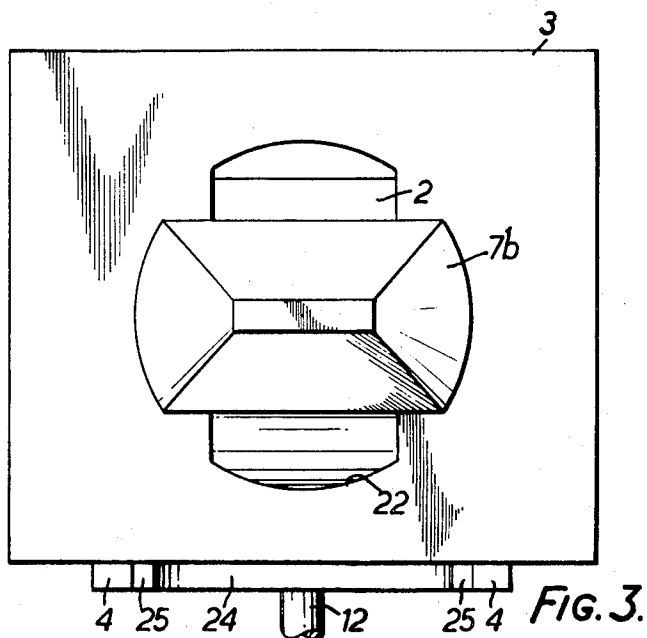
[50] Field of Search 248/361,
361A; 105/369A, 368T, 366.4, 366.6, 366.8

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ABSTRACT: A locating and locking device, for fitting to a freight container transport vehicle, comprises a mounting body for fitting to the vehicle and within which is housed a container locating body from the upper end of which projects the head of a rotary locking bolt mounted in the body. The bolt is rotatable manually between locking and unlocked positions and the locating body is movable within the housing between two levels, namely an upper level providing a locating position in which it projects above the housing and a lower level providing a retracted position below the upper surface of the body. The body is formed on one side for engagement with the adjacent side of the locating body to retain the latter in the locating position, and means are provided which act to retain the locating body towards said side of the body in order to maintain said engagement therewith and which are manually operable to allow the body to be disengaged for movement between said locating and retracted positions.





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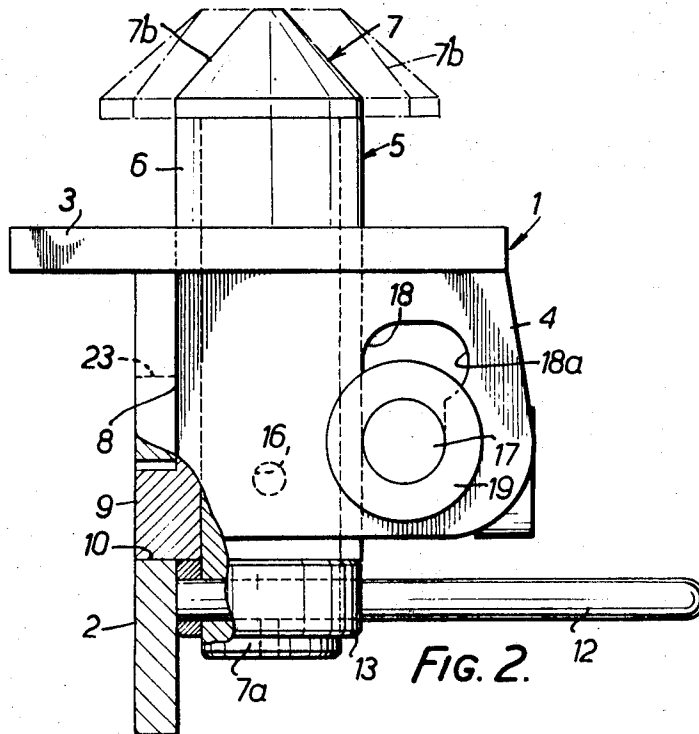


FIG. 2.

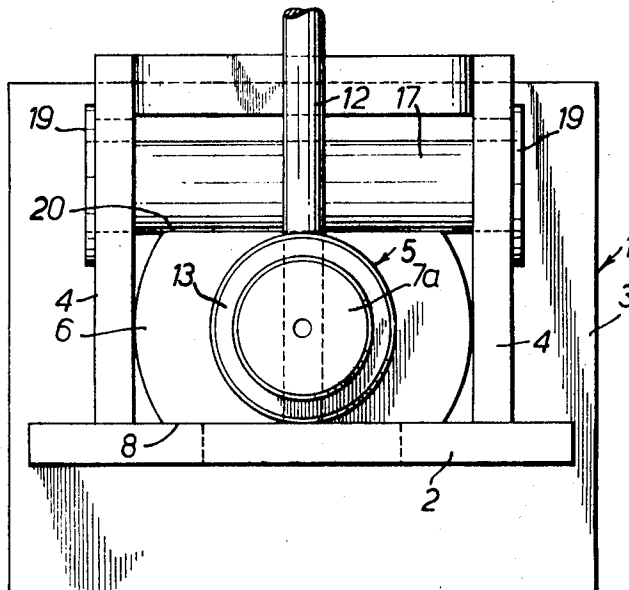


FIG. 4.

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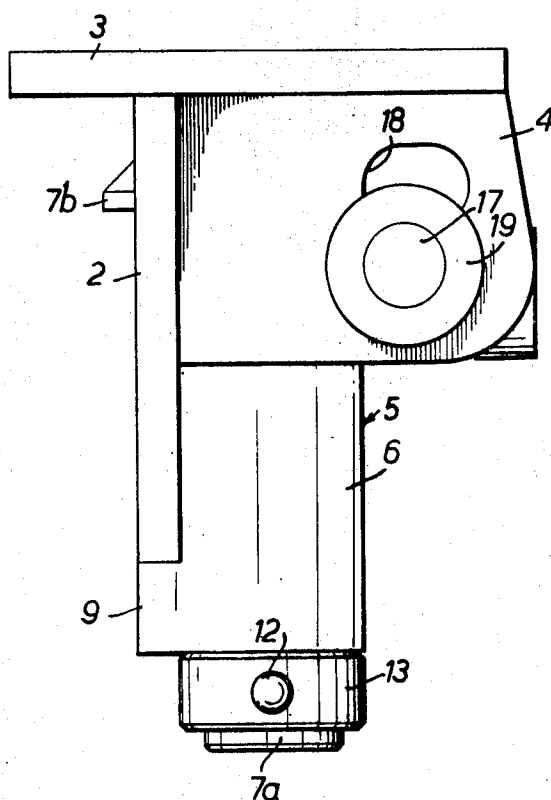


FIG. 5.

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LOCATING AND LOCKING DEVICES

This invention relates to devices for use to locate and lock transport containers in position on vehicle trailers and the like.

The use of freight containers is now widespread and increasing daily, particularly for international transport, using containers built to I.S.O. standards. These standards lay down not only the size and external dimensions of standard containers but also the form of corner castings to be used, and new and converted vehicle trailers are now being fitted at suitable positions with devices which engage the bottom corner castings of a container thereby to both locate and hold down the latter.

According to the invention a locating and locking device for fitting to a freight container transport vehicle comprises a mounting body for fitting to the vehicle and within which is housed a container locating body from the upper end of which projects the head of a rotary locking bolt mounted in the locating body, the bolt being rotatable manually between locking and unlocked positions and the locating body being movable within the housing between two levels, namely an upper level providing a locating position in which it projects above the housing and a lower level providing a retracted position below the upper surface of the mounting body, the mounting body being formed on one side for engagement with the adjacent side of the locating body to retain the latter in the locating position, and means which act to retain the locating body towards said side of the mounting body in order to maintain said engagement therewith and which are manually operable to allow the locating body to be disengaged for movement in the mounting body between said locating and retracted positions.

Preferably said engagement of the two bodies is provided by a recess or aperture in the mounting body which is engaged by a projection on the adjacent side of the locating body, which projection is desirably in the form of a rectangular block. The mounting body may be a casting, but in preferred embodiments is a steel fabrication with a backplate which is utilized for mounting purposes and in which an aperture to suit the locating body projection is formed.

The means which act to retain the locating body, in a preferred embodiment, take the form of a locking bar or rod which extends horizontally and laterally of the locating body, this bar or rod being urged by gravity to a lower retaining position and being liftable by hand to an upper inoperative position in which it provides adequate clearance for the locating body to be disengaged from the backplate and retracted. The bar or rod projects at both sides of the mounting body, and has end flanges by which it is retained and by which it can be gripped and lifted. Thus it is of generally dumbbell shape, and it is movable in generally vertical slots in the sidewalls of the mounting body, which slots are preferably of increased width at the upper ends to provide said adequate clearance for retraction of the locating body. Alternatively, the same result may be achieved by using inclined slots of constant width.

The means which act to retain the locating body may alternatively comprise a locking shaft which operates in the manner of an eccentric and engages the locating body on the opposite side thereof, this shaft being rotatable to an unlocked position in which it allows adequate clearance for movement of the locating body sufficient to free the retaining projection from the corresponding recess or aperture, or disengage whatever other engaging formation may be used, and thus allow movement to the retracted position. The bolt will normally have an operating handle which projects horizontally at its lower end, and although it is preferred that a separate locking shaft with its own handle or a locking bar should be employed the arrangement may alternatively be such that one-handle operation is provided. In this case turning of the bolt handle may operate, through rotary cam means, to urge the locating body to said one side of the mounting body and into retaining engagement therewith.

The locking shaft when such provided is preferably disposed horizontally, with the associated handle at one end, and pro-

vided with spring-loaded detent means which holds in either the locking or the unlocking position, and the eccentric action may be provided by a projecting platelike rib which is disposed longitudinally and projects radially from the shaft. The locking shaft and the bolt are preferably both provided with handles which in the unlocked position project horizontally out of the mounting body so as to give a visible indication that they are not in the locking positions.

Preferably the locating body, bolt and locking handles are completely removable from the mounting as a central assembly, and for this purpose they desirably drop down out through the bottom of the mounting body. Thus when the vehicle is to be used for more conventional purposes, i.e. not as a container transporter, the central assemblies can be removed and transferred to another vehicle which is to be used as a container transporter, and hence all vehicles need not be provided with a complete set of devices. In addition, the mountings can readily be cast or fabricated in a form cheap enough for them to be fitted as standard to all vehicles by the manufacturer, the central assemblies being supplied as an extra only if required with a new vehicle or as an accessory at a later date. This construction also has the advantage that the mounting does not collect water or dirt, or become clogged or fouled up, as the mounting body can readily be made such that there is ample clearance for any rain and normal dirt to fall through even if the central assembly is present in the retracted position. If any dirt should lodge it can easily be removed with a wire brush if the assembly is dropped out.

Preferably the side of the mounting body provided with the aperture engaged by the locating body projection to retain the latter in the locating position, when such an engaging formation is used, has a second aperture which is used to locate the body in the retracted position. This aperture may be provided by a cutout section at the top edge of said backplate and be arranged for engagement by the head of the bolt if the central assembly is dropped down from the locating position with the bolt in the locking position and after the locking shaft (or bar) has been moved to the unlocked position. With such a construction location in the retracted position is desirably assisted by engagement of said projection of the locating body beneath the apertured side of the mounting body so that when the assembly is retracted it can be dropped right down and completely removed by turning the bolt to the unlocked position.

If it is desired means may be provided to prevent removal of the assembly in one movement from the locating position with the locking shaft (or bar) and the bolt both moved to the unlocked positions; such means preclude such removal inadvertently or the assembly dropping out accidentally when traveling, and in a preferred form comprise an abutment which fouls the bolt handle when the latter is in the unlocked position before the assembly has been tilted sufficiently within the mounting for the locating body projection to be disengaged. This abutment may be provided by a bar welded across the mounting body immediately above the bolt handle. Alternatively there may be provided a groove in the locating body and fouls the head of the locking bolt if the assembly is lowered when the bolt is in the unlocked position.

The locating body is preferably in the form of a truncated cylinder, i.e. with concentric and part-cylindrical opposite sidewalls interconnected by two-plane parallel walls, and the head of the bolt is desirably of known elongated ridgelike shape which closely overlies and fits the described body shape in the unlocked position and projects at right angles thereto in the locking position.

One form of locating and locking device in accordance with the invention is illustrated in the accompanying drawings and will now be described by way of example. In the drawings:

FIG. 1 is a front view of the device,

FIG. 2 is a side view partly cut away and sectioned on the line II-II in FIG. 1,

FIG. 3 is a plan view,

FIG. 4 is an underneath view, and

FIG. 5 is the same view as FIG. 2 but illustrates the device with a central locating and locking assembly thereof in a retracted position.

A fabricated mounting body 1 which is hereinafter referred to as a "housing," is fabricated from a steel backplate 2 welded to a top seating plate 3 and two-spaced sideplates 4 which do not extend for the full depth of the backplate 2 and which are spaced inwardly of the sides of the latter. The central assembly 5 is slidable between the sideplates 4 and has a locating body 6 of said truncated cylindrical shape, with the shaft 7a of a rotary bolt 7 passing completely through the body 6 and journaled therein. One flat side 8 of the locating body 6 (FIGS. 2 and 4) fits against the backplate 2 and has a rectangular projecting block 9 which engages in a lower aperture 10 in the backplate 2 whereby to locate the assembly in the container locating position illustrated in the drawings.

The bolt 7 has a head or "anvil" 7b which projects above the locating body 6 and has a ridgeline form which exactly overlies that body in the unlocked position, as shown in the drawings. An operating handle 12 attached to the bottom of the bolt shaft 7a projects horizontally therefrom and at right angles to the backplate 2 in the unlocked position, whereby to give a visual indication of that position. The handle 12 passes diametrically through a collar 13 mounted on the bolt stem 7a and which engages the bottom surface of the locating body 6 for axial location of the bolt 7. A spring-loaded detent ball 14 (FIG. 1) mounted in a radial bore 15 adjacent the bottom of the locating body 6 is spring loaded towards the bolt shaft 7a and is engageable with any one of three peripheral recesses 16 in that shaft whereby to retain the bolt 7 in the central unlocked position illustrated or in either of two locking positions displaced 90° either side of the unlocked position. The locking position of the bolt head 7b is shown in broken lines in FIG. 2.

The assembly 5 is retained against the backplate 2 by a circular locking bar 17 which extends horizontally and through generally vertical slots 18 in the sideplates 4. At each projecting end the locking bar 17 has a radial flange 19 provided by a welded-on collar—the result being a dumbbell-like shape which is captive in the housing. The bar 17 is a free but close fit at the bottom ends of the slots 18, to which it is urged by gravity to define the locking position illustrated in the drawings. In this locking position the bar 17 engages the adjacent side 20 of the locating body 6, whereby to retain the latter against the backplate 2 and maintain the engagement of the projection 9 in the aperture 10. The upper ends of the slots 18 are of enlarged width away from the backplate 2 as clearly shown in FIG. 2, to provide what could be termed an asymmetric keyhole shape, and the bar 17 can be lifted by hand into the enlarged ends 18a of the slots to define the unlocked position.

The seating plate 3 has an aperture 22 in the form of a cross which provides a sliding fit for the locating body on one axis and on the other axis provides clearance for the bolt 7b if the assembly 5 is dropped down with the bolt 7 in the locking position. The backplate 2 has an upper edge aperture 23 which is open at the top, and thus if the assembly 5 is dropped with the bolt 7 in the locking position the anvil 7b passes through the seating plate 3 and engages the bottom edge of the backplate aperture 23, thereby to retain the assembly 5 in a retracted position. To allow such movement of the assembly 5 the locking bar is first lifted to the unlocked position in the ends 18a of the slots 18, and this allows clearance for the assembly 5 to be tilted within the housing 1 sufficiently for the projection 9 to be disengaged from and clear the aperture 10 whereupon the assembly 5 can drop down to the retracted position. In this position, as shown in FIG. 4, the projection 9 engages below the backplate 2 and the assembly 5 is retained on release of the locking bar 17 which drops back under gravity to the locking position.

Means are provided to ensure that the center assembly 5 must be lowered within the housing 1 with the bolt 7 in a locking position. The result is to preclude any possibility of the assembly dropping out accidentally or being removed inadver-

tently as when the bolthead 7b has been lowered into the backplate aperture 23 it prevents downward extraction of the assembly 5 and also prevents the bolt 7 being turned back to the unlocked position until the assembly 5 has first been raised to bring the head 7b above the housing 1. To this end a safety bar 24 in the form of a steel strip is disposed horizontally across the front of the housing 1 immediately above the bolt handle 12, this bar having up-turned end portions 25 which are respectively welded to the inner sides of the sideplates 4. If an attempt is made to lower the assembly 5 with the bolt 7 in the unlocked position, i.e. with the handle 12 projecting at right angles to the backplate 2 below the safety bar 24, the handle fouls the bar 24 before the assembly 5 has been tilted sufficiently within the housing 1 for the projection 9 to leave the engaged backplate aperture 10. However, when the handle 12 is turned to one or other side to a locking position it no longer passes beneath the safety bar 24 and the necessary tilting movement of the assembly 5 to allow the latter to be lowered is not impeded.

It will be appreciated that the described embodiment provides a construction which can be such that the presence of the safety bar 24 provides a completely captive assembly 5 which cannot be removed although it is fully retractable when desired. However, if it is required that the assembly 5 should be removable, while the safety bar 24 still prevents accidental removal by ensuring that the assembly 5 must be lowered with the bolt 7 in a locking position, this can be achieved in either of two ways. The first of these is to dimension the parts so that the assembly 5 can be partially lowered with the bolt 7 in a locking position and so that while the bolt head 7b is still above the top of the housing 1 there is sufficient clearance below the safety bar 24 for the bolt handle to be turned back to the unlocked position with the assembly 5 still in its tilted position within the housing; when the bolt 7 is returned to the unlocked position in this manner the assembly can be completely withdrawn downwardly from the housing. The second way of achieving a removable assembly involves a slight modification is that the upper aperture 24 in the backplate 2 is made sufficiently wide, at least at an appropriate position, to allow the bolt head 7b to be turned to the unlocked position after the assembly 5 has been lowered into the housing 1 with the bolt 7 in a locking position.

In addition to the obvious advantages of a central assembly 5 which can be desired be completely removable but yet cannot be removed inadvertently or fall out accidentally, and which can be retained in the retracted position shown in FIG. 5 within a housing through which water and dirt can pass and hence does not collect, the described device has the additional advantage that the bolt shaft 7a is supported within the locating body 6 over substantially its whole length. This provides maximum strength and rigidity, bearing in mind that a shaft 7a of large diameter can be used. An inset grease nipple 25 fitted to the locating body 5 provides for simultaneous greasing not only of the bolt shaft 7a but also the spring-loaded detent 14 arrangement.

The vertical clearance of the projection 9 within the backplate aperture 10 shown in FIG. 2 has the additional function of allowing the central assembly 5 to float vertically when in the locating and locking position. In its locating position the bolt head 7b has the correct clearance with respect to the seating plate 3 to suit a standard container corner bracket, and the ability of the complete assembly to lift through approximately one-fourth inch allows flexing of the transport vehicle, when travelling over uneven surfaces, without imposing serious strain on the vehicle or the container. This is a particularly important feature with a container transporter in which the locating devices are mounted not on a flatbed but on outriggers. Another advantage of the described construction is that it is symmetrical about a centerline at right angles to the backplate. Thus all the parts are "unhanded" and the same device can be used at either side of a vehicle.

We claim:

1. A locating and locking device for fitting to a freight container transport vehicle, comprising a mounting body for fitting to the vehicle and within which is housed a container locating body from the upper end of which projects the head of a rotary locking bolt mounted in the locating body, the bolt being rotatable manually between locking and unlocked positions and the locating body being movable within the housing between two levels, namely an upper level providing a locating position in which it projects above the housing and a lower level providing a retracted position below the upper surface of the mounting body, the mounting body being formed on one side for engagement with the adjacent side of the locating body to retain the latter in the locating position, and means which act to retain the locating body towards said side of the mounting body in order to maintain said engagement therewith and which are manually operable to allow the locating body to be disengaged for movement in the mounting body between said locating and retracted positions.

2. A device according to claim 1, wherein said engagement of the mounting and locating bodies is provided by a recess or aperture in the mounting body and a projection on the locating body.

3. A device according to claim 2, wherein the mounting body is a steel fabrication with a backplate utilized for mounting purposes and which is also formed with said recess or aperture.

4. A device according to claim 1, wherein the means which act to retain the locating body comprise a locking bar or rod which extends horizontally and laterally of the locating body, which bar or rod is urged by gravity to a lower retaining position and liftable by hand to an upper inoperative position in which it provides adequate clearance for the locating body to

be disengaged from retaining engagement with the mounting body and retracted therein.

5. A device according to claim 1, wherein the means which act to retain the locating body comprise a rotary locking shaft which operates in the manner of an eccentric and engages the locating body on the side thereof remote from the retaining engagement of the latter with the mounting body.

6. A device according to claim 1, wherein the locking bolt has an operating handle which projects horizontally at the lower end of the bolt.

7. A device according to claim 2, wherein the side of the body formed with said recess or aperture has a second recess or aperture which is engaged to locate the locating body in the retracted position.

8. A device according to claim 1, wherein the locating body, locking bolt and locking handle or handles are completely removable from the mounting body as an assembly.

9. A device according to claim 8, wherein on removal the assembly drops out through the bottom of the mounting body and means are provided which prevent removal of the assembly in one movement.

10. A device according to claim 6, wherein the assembly is retracted into the mounting body with the locking bolt in the locking position when the head of the bolt engages the mounting body to retain the assembly therein, and said means preventing complete removal in one movement comprise an abutment which fouls the bolt handle when the bolt is in the locking position in the event of an attempt to move the assembly within the mounting body sufficiently to clear the retaining engagement operative to retain the assembly in the locating position.

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