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(71) Applicant(s)

Trojan Hardware & Designs Limited
(Incorporated in the United Kingdom)
6 The Benyon Centre, Commercial Road,
Bloxwich, Walsall, WS2 7NQ,
United Kingdom

(72) Inventor(s)

Terence James Dolman

(74) Agent and/or Address for Service

Barker Brettell
138 Hagley Road, Edgbaston,
BIRMINGHAM, B16 9PW, United Kingdom

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INT CL⁷ E05C

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(54) Abstract Title

An adjustable shoot bolt assembly

(57) A shoot bolt assembly comprises a bolt-driving mechanism (Fig. 2, 10) and at least one bolt arm 12b which extends away from the driving mechanism and is arranged to be driven thereby along its length. The or at least one bolt arm comprises a proximal transmission bar portion 14 which at a proximal end is operatively coupled to the driving mechanism, a distal bolt-forming portion 16, a device for coupling such bolt-forming member to the transmission bar in longitudinally adjustable position to form a bolt arm of required length, and a retaining device 20 movable between a first position in which the coupling device can be removed from the bolt arm and a second position in which the coupling device is secured to the bolt arm. A plurality of holes is provided in one of the proximal and distal bolt arm portions and the bolt coupling device comprises a stud or the like which extends through an opening in the other of the proximal and distal bolt arm portions to engage one of the holes whereby the two bolt arm portions are prevented from relative movement. The opening comprises a serrated elongate slot having a plurality of teeth along each side which are adapted to engage with corresponding teeth formed on the bolt coupling stud in a range of positions.

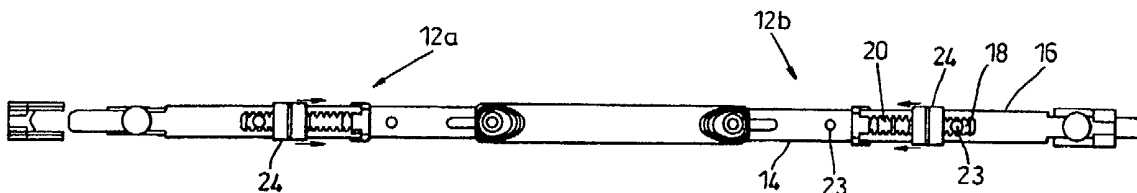


Fig. 1

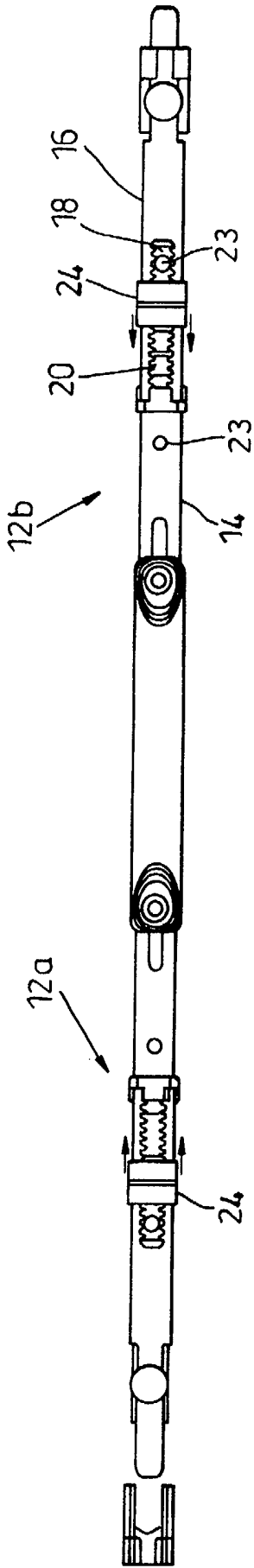


Fig. 1

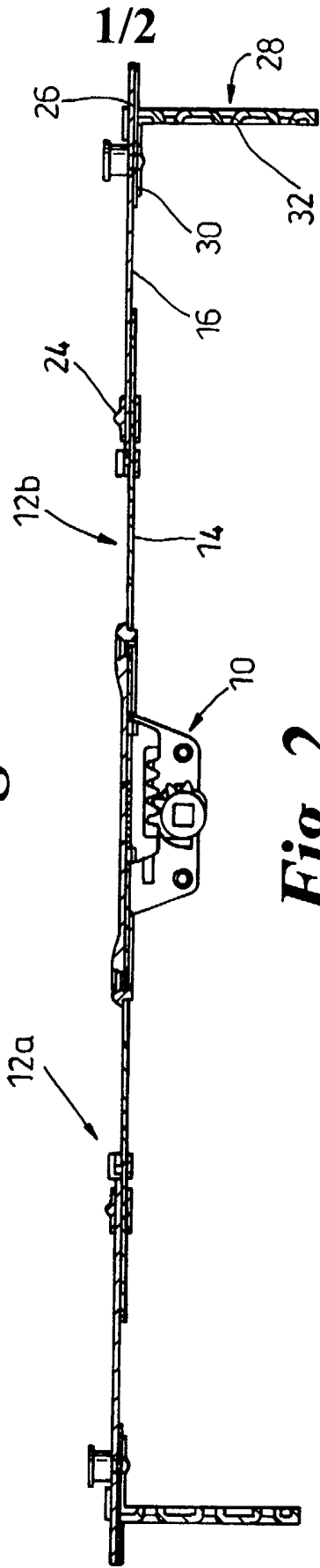


Fig. 2

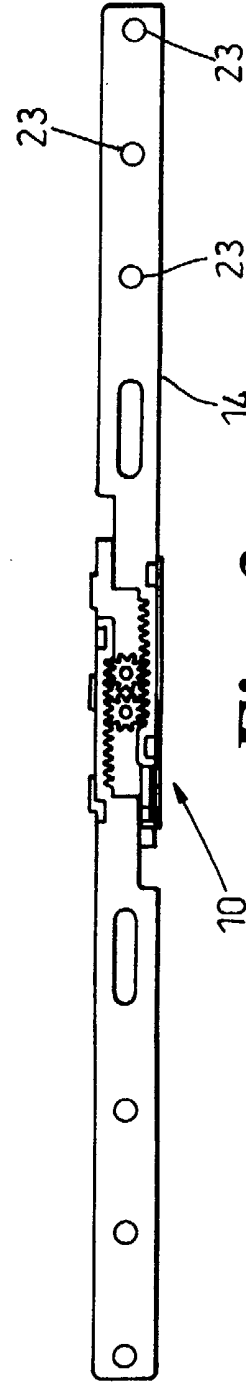


Fig. 3

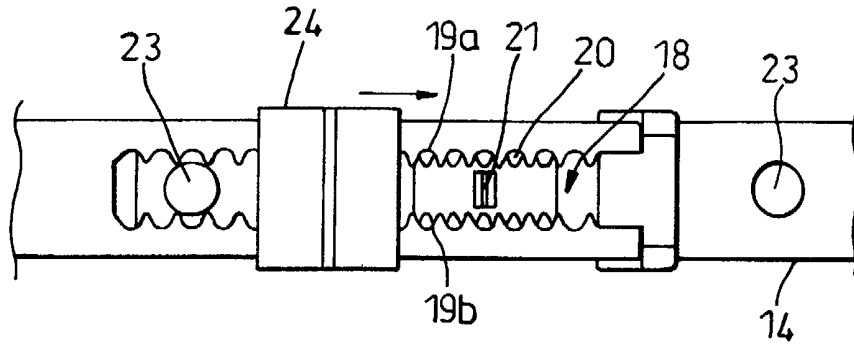


Fig. 4(a)

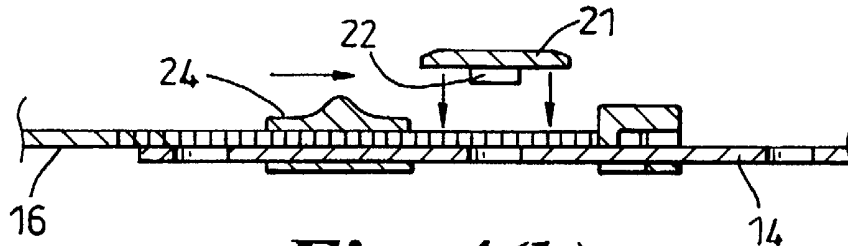


Fig. 4(b)

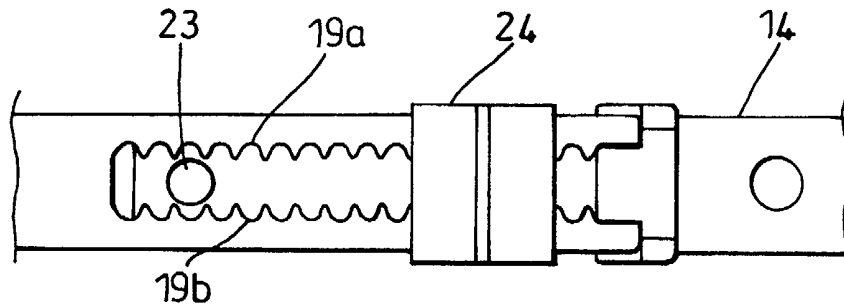


Fig. 5(a)

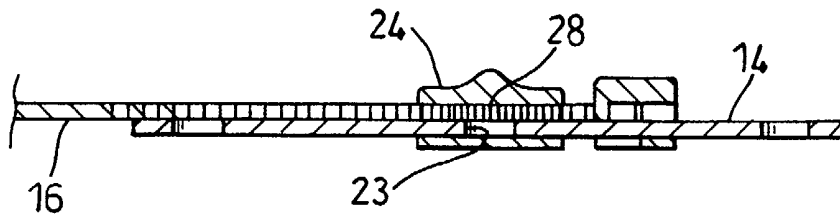


Fig. 5(b)

SHOOT BOLT MECHANISM

This invention is concerned with improvements in or relating to shoot bolt mechanisms such as are used for securing opening windows and doors in closed positions. The invention has particular but not exclusive reference
5 to bi-directional shoot bolt mechanisms.

Such mechanisms comprise a bolt driving means within a housing which is adapted it to be accommodated in a recess in an outer edge face of a window or door. One, or more usually two, bolt arms extend from a front face of the drive mechanism for longitudinal movement. The bolt arms are
10 ordinarily adapted to be accommodated within a shallow channel which extends longitudinally along the outer edge face of the window or door, outer end portions of the bolt arms being a projectable through guides secured to corners of the window or door for engagement with keeps on an adjacent frame. That condition is the locking configuration of the
15 mechanism. In an open or unlocked configuration of the mechanism, the bolt ends are drawn back from the keeps through a corner guides, to permit the window or door to be opened.

It is an object of the present invention to provide improvements relating to the design of shoot bolt mechanism which enable a more convenient
20 installation.

According to the present invention there is provided a shoot bolt mechanism comprising a bolt driving means and at least one bolt arm which extends from the driving means and is arranged to be driven thereby along its length, the or at least one bolt arm comprising a
25 proximal transmission bar portion which is operatively coupled to the driving means at its proximal end, a distal bolt forming portion, means for coupling that the bolt forming portion to the transmission bar in a

longitudinally adjustable position to form a bolt arm of required length, and retaining means movable between a first position in which the coupling means can be removed from the bolt arm and a second position in which the coupling means is secured to the bolt arm.

- 5 The provision of one or more bolt arms which is adjustable in length greatly facilitates installation of the device.

The retaining means is suitably slidable along a portion of the bolt arm between of the first and second positions.

- 10 The shoot bolt mechanism may be provided with bolt arm guiding means which comprises a corner guide through which the or each bolt arm becomes projected for locking.

- Such a construction can greatly shorten fitting time. The fitter can be provided with a largely pre-assembled shoot bolt mechanism comprising at least the driving means, the transmission bar or bars and the guide or guides. With the distal bolt forming portions not yet secured to the transmission bars, the assembly is extensible, permitting the fitter to offer this assembly up to the edge of a window or door in an extended condition and then to contract the assembly to fit the frame. After securing of the assembly to the door or window, and coupling of the distal bolt arm portions to the transmission bars, the mechanism is ready for use.

Embodiments in which there are two said bolt arms extending in opposite directions from said bolt driving means are especially preferred.

- 25 In one preferred construction, the guide and an outer end portion of the bolt arm are arranged telescopically. The guide may in one convenient arrangement form a channel for retention of the relatively slidable bolt arm.

In some preferred embodiments of the invention a plurality of holes is provided in one of the proximal and distal bolt arm portions, and the bolt coupling means comprises a stud or the like which extends through an opening in the other of the bolt arm portions to engage one of the holes,
5 whereby the two bolt arm portions are prevented from relative movement.

The opening may comprise a serrated elongate slot having a plurality of teeth along each side which teeth are adapted to engage with co-operating teeth formed on a bolt coupling means in a range of different positions. The slot is preferably formed in the bolt forming portion of the bolt arm.

10 Thus for example, each side of the slot may be provided with six teeth of equal size and spacing arranged along the slot. The ball coupling means may be provided with two rows each of less than six teeth which complement the teeth of the slot. This allows the bolt coupling means to be securely located in the slot in at least two positions. If the ball
15 coupling means has two rows each of three teeth, it could be located in the slot in three different positions.

In some preferred embodiments of the invention the pitch of the teeth of the slot is a multiple of the pitch of the teeth of the bolt coupling means. This permits a finer adjustment of the position of the bolt coupling means
20 relative to the slot.

The length of the slot in the one bolt arm portion is preferably greater than the spacing between holes in the other bolt arm portion. Alternatively, or in addition, the pitch of the teeth in the slot and or the bolt securing means may be less than the spacing between the holes.

25 The bolt coupling means preferably comprises a stud having a head provided with teeth that co-operate with the serrated sides of the elongate slot and a stem which is engageable with one or other of the said holes.

The stem a may be a sliding fit within the hole in the bolt forming member and that hole is preferably unthreaded. This allows the bolt coupling stud to be dropped into place without the need for any tools.

5 The retaining means may comprise a cover which is slidable along the bolt arm between its first and second positions. This cover may comprise an upper section which, in the second position, covers at least a part of the head of the bolt coupling means to prevent the latter from being withdrawn. An underside of the upper section of the cover may be provided with a protrusion or nib adapted resiliently to engage a
10 corresponding recess in the head of the bolt coupling means.

The cover may thus be at least partially resilient and deformable in a direction away from the head of the coupling stud in order to release the protrusion from the recess before the cover can be slid to the first position. This militates against accidental movement of the cover while
15 allowing it to be released without the need for any tools to be used.

The cover preferably has a lower section which wraps beneath the bolt arm in order to retain it in position. It is suitably formed as a one-piece plastic component.

20 A preferred embodiment of the invention will now be described by way of example only and with reference to the accompanying diagrammatic drawings, in which:

Figure 1 is a part section and elevational view of a shoot bolt mechanism in accordance with the present invention;

Figure 2 is a top plan view of the assembly of Figure 1; and

Figure 3 is an exploded view which shows the internal arrangement of the drive mechanism of the assembly of Figure 1;

Figures 4a and 4b are respectively an enlarged plan view and a corresponding elevational view of the bolt coupling means with the retaining means in its first position; and

Figures 5a and 5b are respectively an enlarged plan view and a corresponding elevational view of the bolt coupling means with the retaining means in its second position.

A shoot bolt mechanism for fitment to a window comprises a handle operated bolt driving mechanism contained within a housing 10. Two bolt arms 12a, 12b extend in opposite directions from the housing and are arranged to be driven in opposite directions along their lengths by operation of the driving mechanism. In use, the driving mechanism (in its housing 10 and illustrated in Figure 3) is accommodated within a recess in an edge face of a window or door (not shown), the transmission bars lying within channels which extend along the outer edge face of the door or window in opposite directions from the recess. The two bolt arms 12a, 12b are identical and only one of them will be described in detail.

The bolt arm 12b comprises a proximal end portion constituted as a transmission bar 14 of flat form. An inner end of the transmission bar is coupled to the driving mechanism housing 10. The bolt arm also comprises a distal end portion 16 on the distal end of which is formed the locking bolt as such. This distal bolt forming member 16 is also in the form of a flat bar but of narrower and deeper section than the transmission bar 14. A proximal end portion of the bolt forming member 16 is formed with an elongate slot 18 which presents a longitudinally-extending serrated side edges 19a, 19b for engagement in selected

positions by serrated sides of a bolt coupling stud 20. An inner end portion of the bolt forming member is secured to the transmission bar by a sliding hinge. This permits the two portions to be slid relative to one another until the unit as a whole is of approximately the correct length.

5 The slot 18 and the bolt coupling stud are shown in more detail in Figures 4a and 4b of the accompanying drawings. The bolt coupling stud 20 comprises a serrated head element 21 which can be inserted into the elongate slot 18 in a variety of positions with the sets of serrations in engagement. It further includes a cylindrical stem 22 which extends
10 downwards from the base of the head 21 to enter any one of three longitudinally spaced apertures 23 in the transmission bar 14.

The bolt coupling stud is retained in place by a retaining means which comprises a sliding cover 24 having a ridged upper surface and a lower section which wraps beneath the bolt arm. The ridge on the upper surface
15 of the sliding cover facilitates manipulation. During installation this cover is slid along the transmission bar 14 towards the driving mechanism. After the bolt arm portions have been a relatively positioned and aligned and the coupling stud has been put in place, the cover is slid across until it overlaps the head 21 of the coupling stud 20. A small nib 28 on the
20 underside of the sliding cover engages a detent in the upper surface of the head 21 of the coupling stud 20. In this manner the two portions of the bolt arm may be secured together with a varying degree of overlap, enabling a bolt arm of a suitable length to be formed for a particular window or door size. The cover can only be removed by applying force to
25 deform it so that the nib is released from the detent.

A distal end portion of the bolt arm 16 is arranged to slide through a slot 26 in a member 28 which forms a corner guide. The corner guide 28 is shaped to embrace a corner of the window or door, the guide comprising

a portion 30 which forms a mounting bar arranged to be secured to the window or door. The corner guide also comprises a head forming portion 32 which extends at right angles to the mounting bar 30, the slot 26 being formed at the junction between the mounting bar and the head.

5 The shoot bolt mechanism is shown prior to use in Figures 4a and 4b of the accompanying drawings. The bolt arm is located in a required position without the coupling means being engaged. In this condition, the transmission bar 14 and a the bolt forming portion of 16 of the bolt arm are adjustable in overlap. In fitting the mechanism to a window or door,
10 the set-up offers the mechanism up to a prepared window or door with a the transmission bars 14 withdrawn but the mechanism otherwise in an extended condition (that is the distance between the two mounting bars 30 is greater than the length of the edge to which the mechanism is to be fitted). When the driving mechanism housing 10 has been inserted into the
15 receiving recess the mechanism is contracted by telescoping to gather the transmission bars are and the bolt and guide assemblers until the mounting bars 30 can each be secured to the window of door. In this position, one of the holes 23 in the transmission bar 14 will be visible through the slot 18. The coupling stud 20 is then placed with the stem 22 entering the hole
20 and its teeth engaging the teeth on the sides of the slot.

The coupling means fixes the bolt arm in length and is itself held in place by sliding the cover across as shown in Figures 5a and 5b of the accompanying drawings. The nib on the underside of the cover resiliently engages the notch in the top of the coupling stud and this prevents it from
25 accidentally sliding off the coupling stud.

CLAIMS

1. A shoot bolt mechanism comprising a bolt-driving means and at least one bolt arm which extends away from the driving means and is arranged to be driven thereby along its length, the or at least one bolt arm
5 comprising a proximal transmission bar portion which at a proximal end is operatively coupled to the driving means, a distal bolt-forming portion, means for coupling such bolt-forming member to the transmission bar in longitudinally adjustable position to form a bolt arm of required length, and retaining means movable between a first position in which the
10 coupling means can be removed from the bolt arm and a second position in which the coupling means is secured to the bolt arm.
2. A shoot bolt mechanism according to claim 1, wherein the coupling means is slidable along a portion of the bolt arm between the first and second positions.
- 15 3. A shoot bolt mechanism according to claim 1 or 2, further provided with bolt arm guiding means comprising corner guides through which the bolt arm becomes projected for locking.
4. A shoot bolt mechanism according to any preceding claim, wherein there are two said bolt arms extending in opposite directions from said
20 bolt-driving means.
5. A shoot bolt mechanism according to any preceding claim, wherein a plurality of holes is provided in one of the proximal and distal bolt arm portions whereby the bolt coupling means comprises a stud or the like which extends through an opening in the other of the proximal and distal
25 bolt arm portions to engage one of the holes whereby the two bolt arm portions are prevented from relative movement.

6. A shoot bolt mechanism according to claim 5, wherein the opening comprises a serrated elongate slot having a plurality of teeth along each side which are adapted to engage with corresponding teeth formed on the bolt coupling means in a range of positions.
- 5 7. A shoot bolt mechanism according to claim 6, wherein the slot is formed in the bolt forming portion of the bolt arm.
8. A shoot bolt mechanism according to claim 6 or 7, wherein the length of the slot in the one bolt arm portion is greater than the spacing between holes in the other bolt arm portion.
- 10 9. A shoot bolt mechanism according to any of claims 6 to 8, wherein the pitch of the teeth in the slot and/or the bolt coupling means is less than the spacing between the holes.
- 15 10. A shoot bolt mechanism according to any of claims 6 to 9, wherein the bolt coupling means comprises a stud having a head provided with teeth that co-operate with the sides of the elongate slot and a stem which is in engageable with one or other of the said holes.
11. A shoot bolt mechanism according to claim 10, wherein the stem of the stud is a sliding fit within an unthreaded hole in the bolt forming member of the bolt arm.
- 20 12. A shoot bolt mechanism according to any preceding claim, wherein the retaining means comprises a cover which is slidable along the bolt arm between its first and second positions.
13. A shoot bolt mechanism according to claim 12, wherein the cover comprises an upper section which, in the second position, covers at least a

part of the head of the bolt coupling means to prevent the latter from being withdrawn.

14. A shoot bolt mechanism according to claim 13, wherein an underside of the upper section of the cover is provided with a protrusion
5 or nib adapted resiliently to engage a corresponding recess in the head of the bolt coupling means.

15. A shoot bolt mechanism according to any of claims 12 to 14, wherein the cover has a lower section wrapping beneath the bolt arm.

16. A shoot bolt mechanism substantially as herein described with
10 reference to the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0219564.2
Claims searched: 1-16

Examiner: Catherine Jones
Date of search: 12 December 2002

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
X	1-4 at least	GB 2363625 A	(NICO) See particularly fig. 5
X	1-4 at least	GB 2336393 A	(SECURISTYLE) See particularly figures 8 and 9
X	1 at least	FR 2741650 A	(JPM C.) See particularly fig. 2
A	-	GB 2335229 A	(TROJAN) See particularly fig. 2
A	-	GB 2368092 A	(TROJAN) See particularly fig. 1
A	-	DE 2206795 A	(BILSTEIN) See particularly fig. 1

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^T:

E2A

Worldwide search of patent documents classified in the following areas of the IPC⁷:

E05C

The following online and other databases have been used in the preparation of this search report:

EPODOC, JAPIO, WPI