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E2A ACT A162 A190 A195 A504 A550

(56) Documents Cited

GB 2190128 A GB 1096148 A GB 0960762 A

US 4428608 A US 4307906 A

(58) Field of Search

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(54) Toggle fastener

(57) A toggle fastener comprises a lever 22 pivoted on a first axis on mounting plate 10, and a pivotally mounting bail 24, 28 on a second axis 30. The bail is to engage in jaw 26 in keeper 14 and the fastener becomes secured when the plate 10, bail 24 and lever 22 are all substantially parallel. When the fastener is in the secured position pivotal movement of the bail is prevented or limited by a laterally projecting lug 32 provided to rest adjacent the bail or a projection 50 (Figure 3) to be received in a recess 52. A spring-loaded catch 34 holds the lever 22 in the secured position.

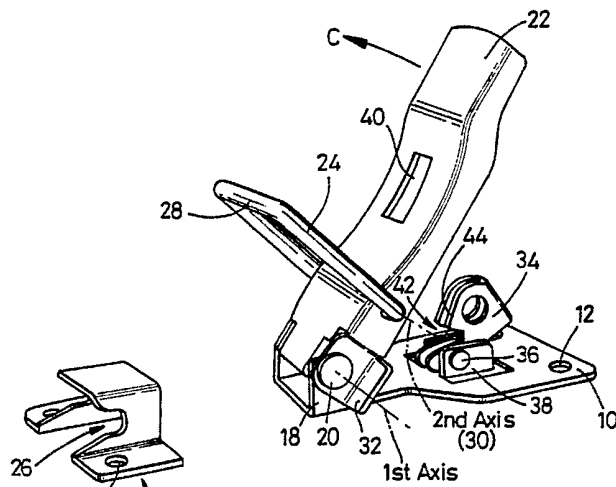


Fig. 1

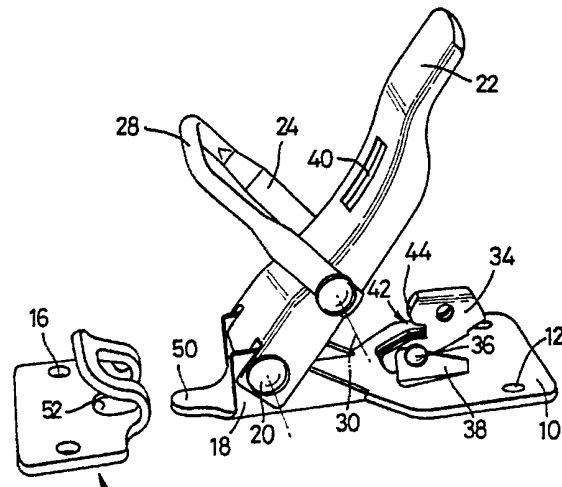
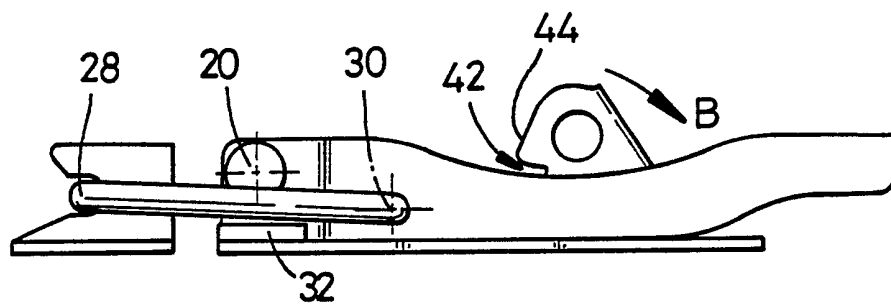
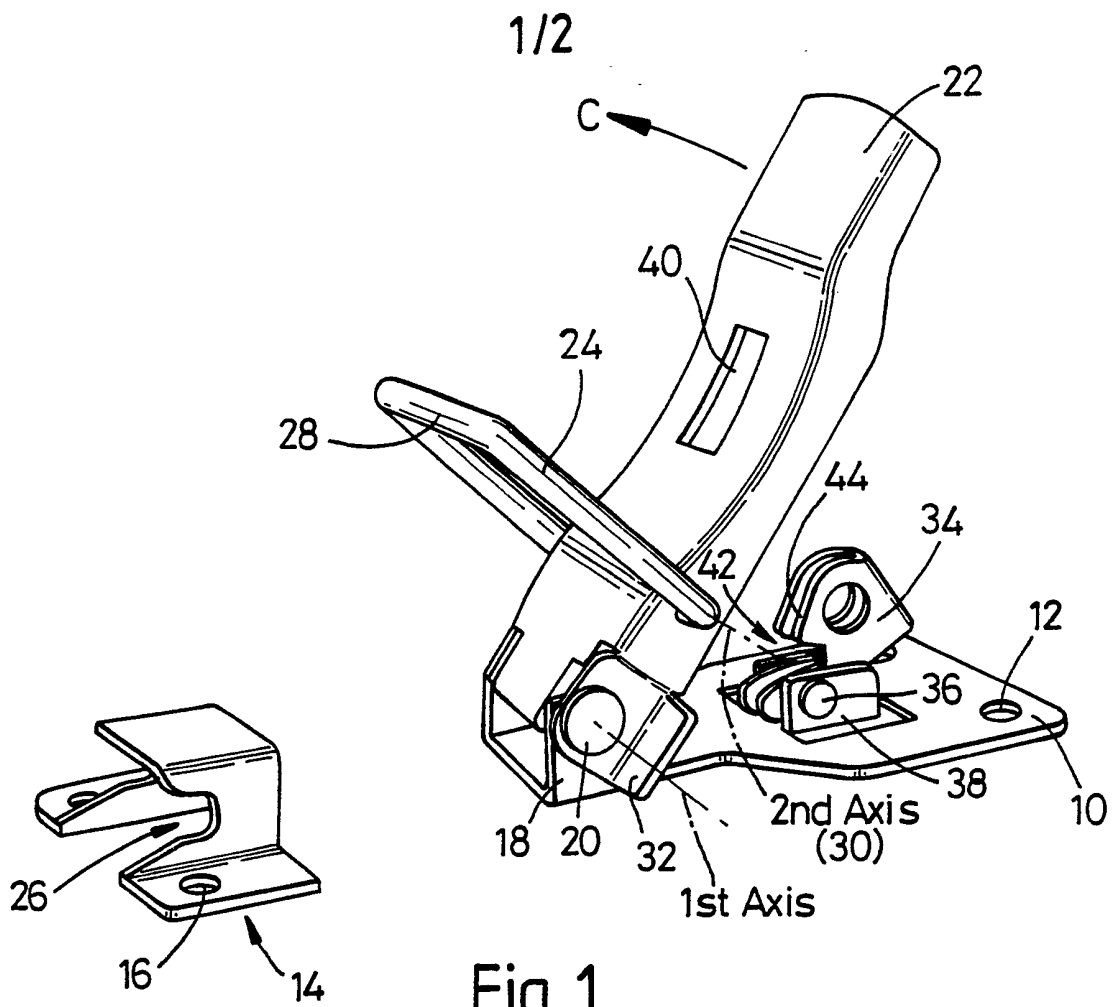


Fig. 3

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

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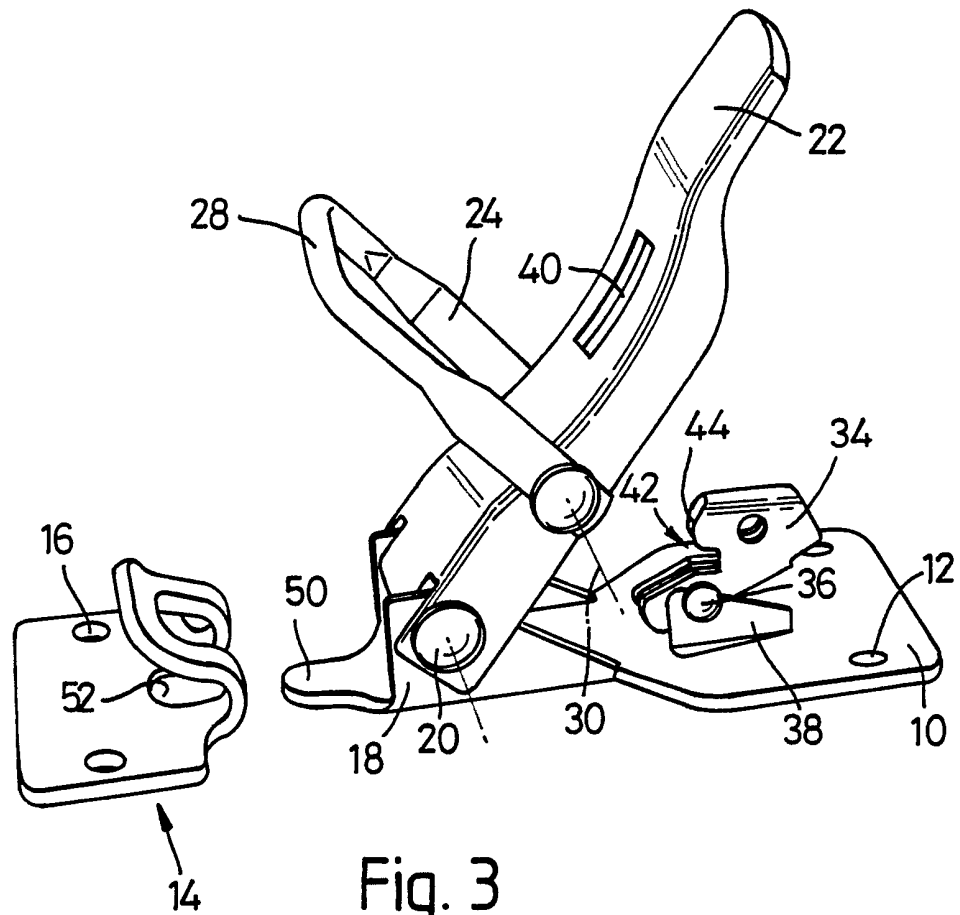


Fig. 3

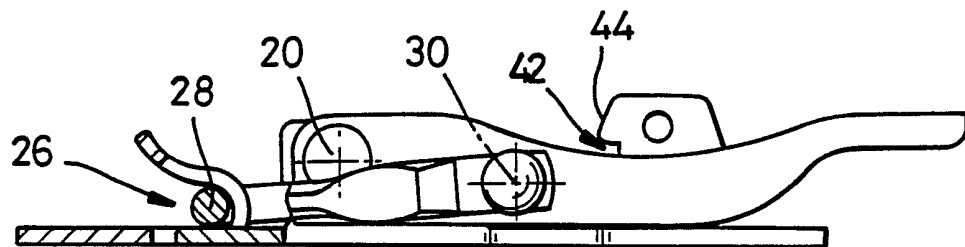


Fig. 4

TOGGLE FASTENER

This invention relates to toggle fasteners.

A toggle fastener may be defined as one which comprises two components to be fixed on the respective parts namely a mounting plate and a keeper which are to be releasably fastened together. The plate provides a pivotal mounting on a first axis for a hasp lever, and the latter provides a pivotal mounting on a second axis for a bail, claw or other component (herein called 'bail') which is apt to engage with the keeper. The first axis lies between the keeper and the second axis when the fastener is engaged. In the engaged position, a line of engagement between the keeper and bail may be generally co-planar with the first and second axes, but usually the design is such that the second axis crosses a plane containing the said line of engagement and the first axis during the final stage of a fastener closing movement and this 'overcentre' movement provides a security of fastening, that is holds the fastener in the closed position against inadvertent release. Additional security means may be provided for example in the form of a catch which has to be moved against a spring before the hasp can be returned overcentre to release the bail, or in the form of a lug which extends through a movable part and is apertured to take a padlock or seal. A toggle fastener as defined in the foregoing words (with or without the additional security means) is conveniently called 'of the kind referred to' and represents the starting point of the present invention.

The problem with fasteners of the kind referred to is that in the engaged position one or other end of the bail may act as a hinge and allow relative movement of the parts which are secured. Thus for example a panel fixed by toggle fasteners on opposite edges may vibrate with the respective bails acting as swinging links. Simple toggle fasteners are not recommended for this kind of use for this reason, although they are often so used and are maligned when they do not perform as expected.

The object of the invention is to solve this problem.

According to the invention, a toggle fastener of the kind referred to is provided with means for preventing pivotal movement of the bail on the hasp in at least one direction, independent of the overcentre action, and when the fastener is in a secured position.

In one possibility, the pivoting is prevented by the provision of projections on the hasp which can engage the bail between the second axis and the keeper after conclusion of the overcentre action in closing.

In another possibility, a projection on the mounting plate is arranged to abut the bail preferably in the region of the keeper. However, in both possibilities, the 'engagement' may involve a tolerance to allow a limited amount of movement. This may enable the fastener of the invention to be used to pull a part down against a compressible seal, and to allow the seal to recover slightly re-establishing a small clearance.

The invention is now more particularly described with reference to the accompanying drawings wherein:

Figure 1 is a perspective view of a first embodiment of the invention, in an open position;

Figure 2 is a side elevation of the same in the closed engaged position;

Figures 3 and 4 are views similar to Figures 1 and 2 but of a second embodiment.

Turning first to Figure 1, a fastener comprises a mounting plate 10 having holes 12 for example for screw attachment to a first part, and a keeper 14 likewise pierced at 16 for attachment to a second part.

The plate 10 has lugs 18 bent up and co-axially pierced to receive pin 20 lying on the first axis.

Hasp lever 22 is of hollow box-like construction

being hinged on the first axis and having co-axial apertures to journal bail 24 on the second axis 30. In this embodiment the bail is a wire loop, but in other embodiments (not further described herein) it may be of construction similar to the hasp. The hasp is provided with lateral lugs 32 adjacent the axis 20 and located as far away from the axis 30 as possible in the direction towards the keeper, for the purposes of the invention as further described herein.

Keeper 14 has jaws 26 to receive the end part 28 of the bail.

The bail 24 is engaged in the jaw 26, if necessary by pivoting the hasp in the direction of the arrow C in Figure 1. The hasp is then returned and moved to the Figure 2 position and this draws the parts together, and after the first and second axes together with the axis of the bail part 28 pass the co-planar position, and go overcentre, the position of Figure 2 is realized. The slight overcentre movement normally holds the parts securely engaged. However, additional catch means may be provided as illustrated, in this case in the form of spring loaded catch 34 pivoted on pin 36 between lugs 38 struck out of the mounting plate and disposed so as to project through slot 40 in the hasp. The catch has a jaw 42 to engage in end edge of the slot and a cam edge 44. The catch automatically engages by virtue of a trapped spring when the hasp is moved to the Figure 2 position, and can be released to allow release of the fastener by displacing the catch in the direction of the arrow B in Figure 2.

In the engaged position, if the part to which plate 10 is fixed attempts to move in the direction of the arrow A in Figure 2 relative to the part to which the keeper 14 is fixed, it can only do so by pivoting about one or other end of the bail, i.e. about the axis 30 or the axis of the part 28. In either case the pivoting is prevented by the lugs 32, possibly after a clearance has been taken up. The clearance is or may be exaggerated in Figure 2 for clarity. It will be seen that in the

absence of lugs 32 the bail could act as a swinging link to allow such movement.

Turning now to Figures 3 and 4, the mounting plate 10 is now provided with a projection 50 shaped to be received in a recess 52 in the keeper 14. In the engaged position of the fastener, the projection 50 is received in the recess 52, and may be a relatively close fit therein. As best seen in Figure 4, the projection 50 underlies the bail part 28 in the jaw 26 and hence positively prevents any movement of the mounting plate 10 and the associated parts in the direction of the arrow A in Figure 4. Other parts of Figures 3 and 4 having the same function as those in Figures 1 and 2 are identified by corresponding reference numerals.

CLAIMS

1. A toggle fastener comprising a mounting plate and a keeper, a hasp lever pivoted to the mounting plate on a first axis near to the keeper, and a bail pivoted to the hasp lever on a second axis more remote from the keeper and for engagement with the keeper, and further comprising means preventing pivotal movement of the bail in at least one direction and about at least one end of the bail when the fastener is in secured position.
2. A toggle fastener as claimed in Claim 1 wherein the hasp is provided with at least one lateral projection disposed so that when the fastener is secured said projection lies between the ends of the bail in proximity thereto so as to be abutted by the bail and prevent movement of the bail.
3. A toggle fastener as claimed in Claim 2 wherein the hasp is provided with a pair of oppositely extending lateral projections and said projections are located so as to be in close juxtaposition to the plane of said mounting plate when the fastener is in said secured position.
4. A toggle fastener as claimed in Claim 1 wherein said mounting plate is provide with a projection arranged so as to abut the bail when the fastener is in said secured position.
5. A toggle fastener as claimed in Claim 4 wherein said projection is located at the end of the mounting plate adjacent the keeper, and in said second position lies coplanar with said keeper and in a recess in said keeper whereby the projection and keeper together serve for lateral location of the parts.
6. A toggle fastener as claimed in Claim 5 wherein the bail comprises a transversely extending portion engaged with said keeper and said projection underlies said transversely extending portion in the secured position of the fastener.

7. A toggle fastener substantially as described with reference to Figures 1 and 2 or Figures 3 and 4 of the accompanying drawings.

Relevant Technical Fields

Search Examiner
P A MAKIN

(i) UK Cl (Ed.M) E2A (ACT, ACHB)

(ii) Int Cl (Ed.5) E05C 19/14

Date of completion of Search
28 MARCH 1994

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Documents considered relevant following a search in respect of Claims :-
1-7

Categories of documents

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| <p>X: Document indicating lack of novelty or of inventive step.</p> <p>Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p>A: Document indicating technological background and/or state of the art.</p> | <p>P: Document published on or after the declared priority date but before the filing date of the present application.</p> <p>E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.</p> <p>&: Member of the same patent family; corresponding document.</p> |
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Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2190128 A (POTTER) see projections 41 and 33	1-5
X	GB 1096148 (BLASINGAME) see projections 90	1,4,5
X	GB 960762 (BREEDEN) whole document	1
X	US 4428608 (COOKE) whole document	1
X	US 4307906 (SCHENK) whole document	1

Databases:The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).