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(71) Applicant:
Meritor Light Vehicle Systems (UK) Ltd
Birmingham B30 3BW (GB)

(72) Inventors:
- **Fisher, Sidney Edward**
  Stirchley, Birmingham B30 3BW (GB)
- **Spurr, Nigel Victor**
  Stirchley, Birmingham B30 3BW (GB)
- **Bland, Timothy**
  Stirchley, Birmingham B30 3BW (GB)

(74) Representative:
Jones, John Bryn et al
Withers & Rogers,
Goldings House,
2 Hays Lane
London SE1 2HW (GB)

(54) Latch mechanism

(57) A latch mechanism (10) having a latch bolt (14) for releasably securing a striker (34) in a closed position, the latch bolt being movably mounted on a chassis (16) of the latch mechanism, and a pawl (12) movably mounted on the chassis and engaging the latch bolt to releasably secure it in a closed position, the chassis including a retention plate and a back plate provided on opposing sides of the pawl and latch bolt, wherein an engagement member is provided on the back plate for retaining the pawl in engagement with the latch bolt following the application of an abnormal load to the latch mechanism.

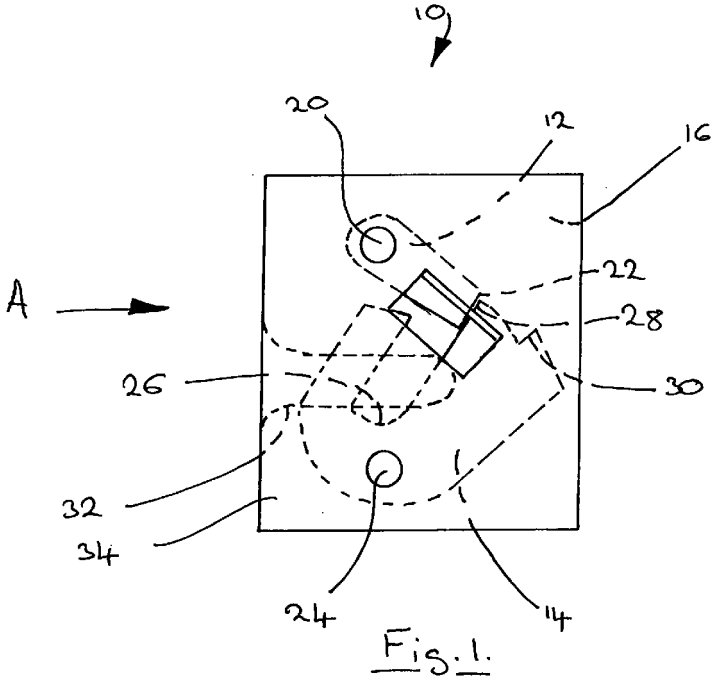

Fig. 1.

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Description

[0001] The present invention relates to latch assemblies and in particular to latch assemblies for releasably securing vehicle doors when such doors are in a closed position.

[0002] When known latch assemblies are used in car doors, and the car has subsequently been involved in a road accident where an impact has deformed the door, the very act of deforming the door has been known to cause the latch assembly to unlatch and allow the door to open.

[0003] It is generally recognised that occupants of a vehicle which is involved in an accident are safer if they remain inside the vehicle during the accident and immediately thereafter until, for example, the vehicle comes to a stop or is no longer in danger. The presence of an open door during an accident increases the chance of an occupant being injured. Furthermore, the structural rigidity of a vehicle passenger cell is enhanced if all doors remain shut.

[0004] A typical vehicle door latch mechanism essentially comprises a rotatable claw mounted on the vehicle door which co-operates with a striker pin mounted on the vehicle body. The action of closing the door causes the claw to rotate to a closed position whereupon it engages and retains the striker pin. The claw is maintained in the closed position by a sprung pawl which abuts an appropriately shaped portion of the claw. In the event of an accident, forces experienced by the latch mechanism can lead to relative movement between the claw and pawl, with the result that the two become misaligned and the pawl no longer maintains the claw in the closed position.

[0005] The present invention seeks to provide a latch mechanism which is less likely to unlatch during an accident.

[0006] According to the present invention there is provided a latch mechanism having a latch bolt for releasably securing a striker in a closed position, the latch bolt being movably mounted on a chassis of the latch mechanism, and a pawl movably mounted on the chassis and engaging the latch bolt to releasably secure it in a closed position, the chassis including a retention plate and a back plate provided on opposing sides of the pawl and latch bolt, wherein an engagement member is provided on the back plate for retaining the pawl in engagement with the latch bolt following the application of an abnormal load to the latch mechanism.

[0007] The engagement member may comprise a punched or folded tab of the back plate. Alternatively, the engagement member may comprises a member attached to the back plate. The back plate may be provided with a single engagement member which is configured so as to engage the pawl, the latch bolt or both. Alternatively the back plate may be provided with a one or more engagement members for the pawl and latch bolt.

[0008] An embodiment of the invention will now be described with reference to the accompanying drawings in which:

Figure 1 shows a diagrammatic side view of a latch mechanism according to the present invention; and Figure 2 shows the end view indicated by arrow A in figure 1.

[0009] Referring to the drawings there is shown a latch mechanism generally designated 10. The mechanism 10 includes a pawl 12, a latch bolt in the form of a claw 14, a retention plate 16 and a back plate 34. The pawl 12 is pivotally mounted via a pivot 20 which is connected to the retention plate 16. in the embodiment shown the pawl pivot 20 is defined by a pin extending between the retention and back plates 16,34 The pawl 12 includes a pawl engagement portion 22.

[0010] The retention plate 16, in conjunction with further components of the latch mechanism 10 (not shown) which do not move relative to the retention plate 16 during use, form a chassis of the latch mechanism.

[0011] The claw 14 is pivotally mounted on a claw pivot 24 which is secured to the retention plate 16. In the embodiment shown the claw pivot is defined by a pin extending between the retention and back plates 16,34 The claw 14 includes a claw jaw 26 and a claw closed engagement portion 28 and a claw first safety engagement portion 30. The retention plate 16 includes a mouth 32.

[0012] In use, the claw jaw 26 releasably secures a striker (not shown) in the mouth 32 of the retention plate 16. The claw 14 can be secured in its closed position, as shown in figure 1, by the pawl 12, and in particular by abutment of the pawl engagement portion 22 with the claw closed engagement portion 28.

[0013] A latch transmission arrangement allows the pawl 12 to be rotated anticlockwise when viewing figure 1 to disengage the pawl engagement portion 22 from the claw closed engagement portion 28, to allow the claw 14 to rotate in an anticlockwise direction and thus release the striker form the mouth 32.

[0014] The latch transmission arrangement typically would be connected to one or more of an inside door handle, an outside door handle, a sill button and a key barrel in order that the various locking and unlatching functions of the latch mechanism can be achieved. Typically several of the components of the latch transmission arrangement, such as levers, would be situated between the plane of the pawl and claw and the back plate. In particular where the latch transmission arrangement includes levers, such levers can be pivoted about the same axis as the pawl or claw (see below).

[0015] As can best be seen from figure 2, the pawl 12 and claw 14 are substantially planar having respective first planar sides 12A and 14A, and second planar sides 12B and 14B. The retention plate 16 is positioned on the respective first sides 12A, 14A of the pawl 12 and

claw 14. The pawl 12 and claw 14 are pivotable about respective pivot axes 12C and 14C which, in the embodiment shown, are substantially parallel.

[0016] Under abnormal conditions, such as when the latch mechanism is secured in a door of a vehicle and the door receives a side impact during a road traffic accident, the retention plate 16 can be distorted with the result that the alignment pivot axes 12C and 14C changes. This can lead to the pawl engagement portion becoming misaligned with the claw closed engagement portion 28, and thereby allowing the door to open.

[0017] To counter this eventuality, the latch mechanism 10 is provided with an engagement portion 36 extending from the back plate 34 towards the pawl 12 and claw 14. In the embodiment shown the engagement portion 36 is in the form of a tab which is folded substantially perpendicular to the rest of the of the back plate. The tab extends towards and, when viewing figure 1, overlies portions of both the pawl 12 and claw 14. When the latch mechanism 10 is subjected to an abnormal load, twisting movement of the pawl 12 and claw 14 is limited by the engagement portion when the pawl 12 and/or claw 14 come into contact therewith.

[0018] In alternative embodiments the engagement portion may formed by a separate member secured to the inner face 38 of the back plate, and separate engagement members may be provided for both the pawl 12 and claw 14.

Claims

1. A latch mechanism having a latch bolt for releasably securing a striker in a closed position, the latch bolt being movably mounted on a chassis of the latch mechanism, and a pawl movably mounted on the chassis and engaging the latch bolt to releasably secure it in a closed position, the chassis including a retention plate and a back plate provided on opposing sides of the pawl and latch bolt, wherein an engagement member is provided on the back plate for retaining the pawl in engagement with the latch bolt following the application of an abnormal load to the latch mechanism.

2. A latch mechanism as claimed in claim 1 wherein the engagement member is formed from the back plate.

3. A latch mechanism as claimed in claim 2 wherein the engagement member is a folded tab of the back plate.

4. A latch mechanism as claimed in claim 3 wherein the tab is folded substantially perpendicular with respect to the back plate.

5. A latch mechanism as claimed in claim 1 wherein the engagement member is a separate member which is attached to the back plate.

6. A latch mechanism as claimed in any preceding claim, wherein the engagement member is positioned so as to engage the pawl when an abnormal force is applied to the latch mechanism.

7. A latch mechanism as claimed in any of claims 1 to 5, wherein the engagement member is positioned so as to engage the latch bolt when an abnormal force is applied to the latch mechanism.

8. A latch mechanism as claimed in any of claims 1 to 5, wherein the engagement member is positioned so as to engage the pawl and the latch bolt when an abnormal force is applied to the latch mechanism.

9. A latch mechanism as claimed in any preceding claim wherein the back plate is provided with a plurality of engagement members.

10. A latch mechanism as defined in any preceding claim in which the retention plate and back plate are provided on opposing sides of at least part of a latch transmission arrangement, the latch transmission arrangement being operable to move the pawl.

11. A latch mechanism as defined in any preceding claim wherein the retention plate is secured relative to the back plate by at least one pin.

12. A latch mechanism as defined in claim 11 in which the at least one pin is positioned on a pivot axis of the pawl or latch bolt.

13. A latch mechanism as defined in claim 11 or 12 in which the at least one pin is positioned on a pivot axis of a lever of the latch transmission arrangement.

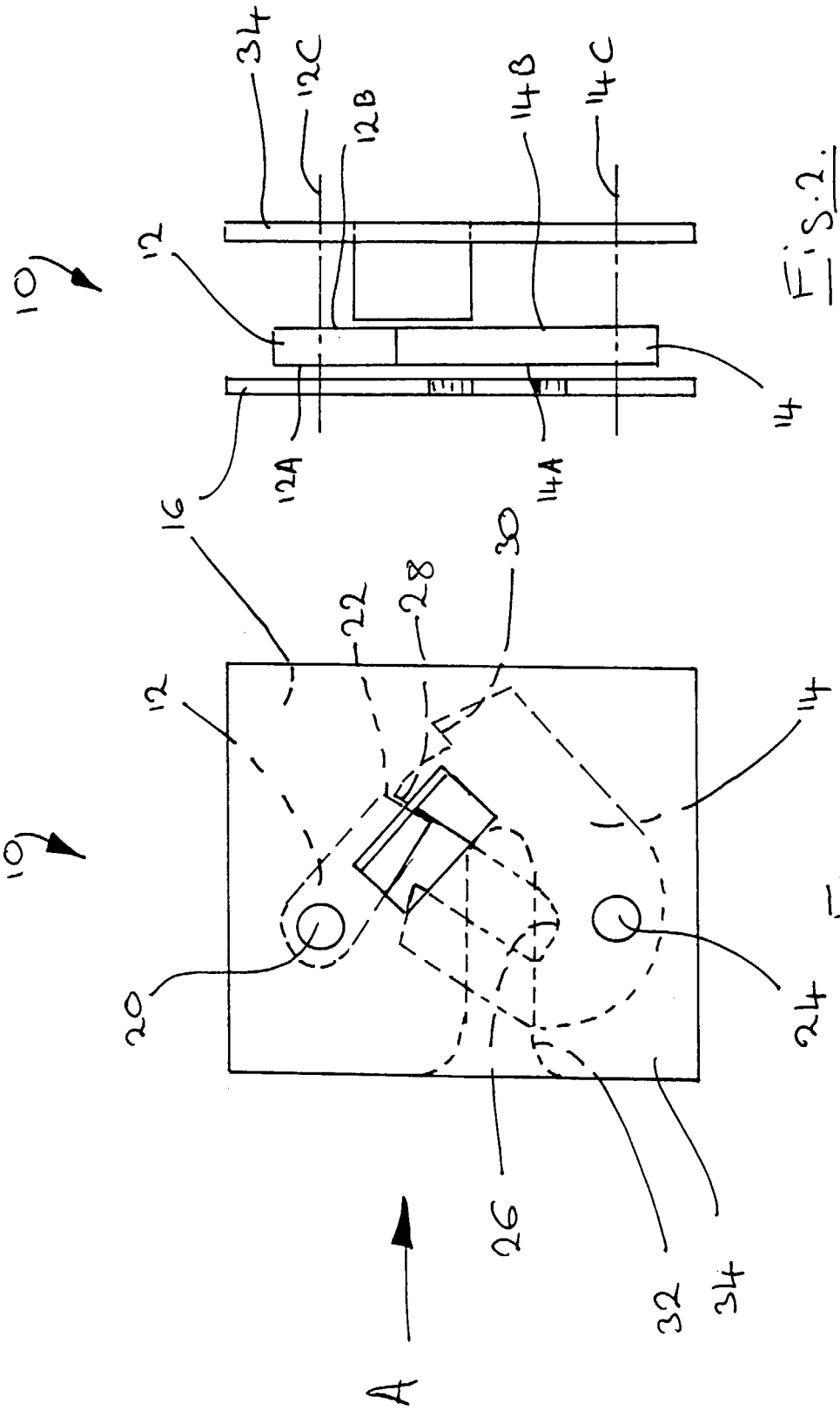
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Fig.1.

Fig.2.

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EUROPEAN SEARCH REPORT

Application Number
EP 00 30 6054

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 4 896 907 A (OHI SEISAKUSHO CO., LTD) 30 January 1990 (1990-01-30) * column 4, line 36 - column 4, line 56; figures *	1-8	E05B65/12
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	23 November 2000	Vacca, R

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 30 6054

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82