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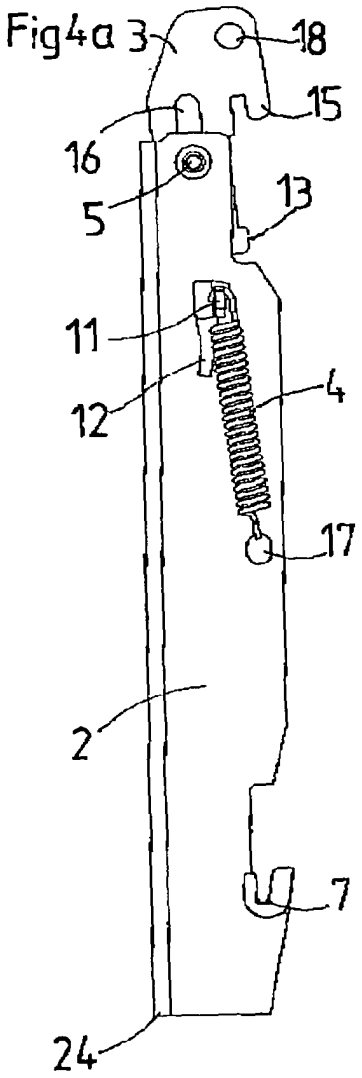
(54) A radiator bracket

(57) The disclosure relates to a radiator bracket (I) for suspending a radiator (8) on a wall. The radiator bracket (1) comprises a rail (2) with a first and second engagement means (6, 7) for cooperation with respective portions of the radiator (8) or fixing devices (9, 10) disposed thereon. At least the first engagement means (6) has a locking device (3). The locking device (3) has a stand-by position and a locking position, where the locking device (3) is pretensioned towards the locking position by spring means (4). The locking device (3) is rotatably and displaceably connected to the rail (2) so that the locking device (3) is moveable in one plane between the stand-by position and the locking position.



EP 2 498 011 A2

Description

TECHNICAL FIELD

[0001] The present invention relates to a radiator bracket for suspending a radiator on a wall, comprising a rail with first and second engagement means for cooperation with respective portions of the radiator or fixing devices disposed thereon, at least the first engagement means displaying a locking device and the locking device having a stand-by position and a locking position, where the locking device is pretensioned towards the locking position by spring means.

BACKGROUND ART

[0002] Brackets for suspending radiators on a substrate, normally a wall, are notorious in their multiplicity. The brackets may have many different designs, and one common type of bracket is the angle bracket, on which the invention in the present application will be used in the preferred embodiment. It is desirable, and often a requirement because of mandatory regulations and/or trade standards that the radiator be held in place by the bracket in a reliable manner. Further aspects which have contributed in the demand for reliable fixing is legislation in respect of product liability which may be applicable to manufacturers of both radiator brackets and the radiators proper.

[0003] In different standard requirements, there are set out different forces with which the radiator must be held in place in compliance with the standard. The force or components of force which is to be counteracted is directed substantially vertically, but certain action from other, transversely directed forces also occur.

[0004] Radiator brackets exist in a plurality of different constructions and designs in which are included different types of wall rails. Many of these designs and constructions include a number of loose parts which must be assembled on site on installation of the bracket and the radiator. The greater the number of loose parts in a construction, the more difficult assembly on site is perceived, and the greater the risk of mistakes in assembly. Loose parts may also involve a certain vulnerability to external action precisely on these parts during the service life of the radiator and the bracket. In particular, this relates to intentional damage to the radiator and its brackets. One example of a bracket where loose parts occur is disclosed in GB 2 249 474 A. This bracket functions per se satisfactorily, but requires a certain assembly on the building site.

PROBLEM STRUCTURE

[0005] There is thus a need in the art to be able to realise an easily assembled and robust bracket which retains the radiator in position with a considerable force.

SOLUTION

[0006] The objects forming the basis of the present invention will be attained if the bracket intimated by way of introduction is characterised in that the locking device is rotatably and displaceably connected with the rail, so that the locking device is moveable in one plane between the stand-by position and the locking position.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0007] The present invention will now be described in greater detail hereinbelow, with reference to the accompanying Drawings. In the accompanying Drawings:

Figs. 1a-c	are a straight side elevation of a bracket according to the present invention and a radiator during three different stages of the suspension of the radiator on the bracket;
Fig. 2	is a perspective view of a rail included in the bracket;
Fig. 3	is a perspective view of a locking device included in the bracket; and
Figs. 4a and b	are straight side elevations of the bracket in a stand-by position and a locking position, respectively.

DESCRIPTION OF PREFERRED EMBODIMENT

[0008] The present invention will now be described in one embodiment where the bracket is exemplified by an angle bracket, which implies that the rail 2 included in the bracket 1 has a cross sectional configuration which substantially corresponds to an L. At the upper end of the rail 2 there is a locking device 3 for retaining the radiator in position when the locking device is in a locked position. The locking device 3 is pretensioned in a direction obliquely downwards by spring means 4 which is more clearly visible in Figs. 4a and 4b. The locking device 3 is connected to the rail 2 by the intermediary of an anchorage member 5 which, in the preferred embodiment, consists of a rivet.

[0009] The locking device 3 is disposed at a first engagement means 6, the upper engagement means in the preferred embodiment. Together with the geometric design of a second engagement means 7, the lower engagement means in the preferred embodiment, the result is that lifting of the radiator 8 is in principle impossible when the locking device 3 is in its locked position.

[0010] Fig. 1a shows the radiator 8 in a position where the lower engagement means 7 is in contact with the lower stirrup 9 of the radiator. The design of the lower engagement means 7 is such that it is possible to lift off

the radiator 8 again when it is angled in this manner. A portion of the rail 2 just above the recess which constitutes the lower engagement means 7 is cut away so that a bevel 21 is obtained, on the one hand for making possible such lifting off, but also for facilitating insertion of the lower stirrup 9 in the engagement means 7. A similar bevel 22 is provided at the upper engagement means 6. From the position illustrated in Fig. 1a, it is now possible to tilt or pivot the radiator 8 inwards towards the bracket 1, i.e. in the direction of the arrow A. The locking device 3 is in its stand-by position, where it is held in place in that a guide means 11 in the form of a guide pin 11 abuts against a heel or a projection 14 at the edge of a slot 12 in which the guide means 11 is in principle moveable. In the stand-by position, the locking device 3 inclines somewhat rearwards with its upper portion more proximal the wall than the lower portion.

[0011] In Fig. 1b, the radiator 8 is shown close to the mounted position, where the locking device 3 has not yet assumed its locking position. The upper stirrup 10 of the radiator has, in Fig. 1b, come into contact with the locking device 3 where its lower portion projects out forwards in an actuator projection 13. This is the first contact between the locking device 3 and the radiator 8 on mounting. A further pressure against the actuator projection 13 of the locking device 3 will entail that the locking device 3 is pivoted about the anchorage member 5. On this pivoting of the locking device 3, the guide means 11 in the slot 12 will accompany this movement, which implies that the guide means 11 loses engagement with the heel 14 on which the guide means 11 has rested. In such instance, the guide means 11 will, together with the locking device 3, move downwards, partly under force of gravity, but principally because of the pretensioning which is realised by the spring means 4.

[0012] The downward movement and the pivoting of the locking device 3 are controlled by the movement of the guide means 11 in the slot 12 which is disposed so that it inclines in relation to the major extent in the longitudinal direction of the rail 2 and in relation to an imaginary vertical line when the rail is disposed in a normal position of use on a wall. The inclination of the slot 12 has for its purpose to retain a certain part of the pivotal movement about the anchorage member 5, at the same time as the locking device 3 moves downwards. The upper portion of the locking device 3 which a catch member 15 moves simultaneously downwards and counter-clockwise about the anchorage member 5 until it catches in the stirrup 10 on the radiator. Thus, the locking device 3 falls forwards in a direction towards the radiator 8 when it is released.

[0013] In Fig. 1c, the locking device 3 has assumed its locking position. In such instance, the locking device 3 has fallen or been pulled downwards by the spring means 4. The downward movement of the locking device 3 has entailed that the anchorage member 5 is now located in the upper region of the oblong hole 16 in the locking device 3. The movement of the locking device 3 has taken place in one plane and is composed of a pivotal movement and a translation movement. The guide means 11 is located in the lower section of the slot 12. The locking device 3 is retained in this position by the spring means 4 which acts between the guide means 11 and the hole 17 in the rail 2. The spring means 4 is disposed such that a considerable force and/or a tool is required in order to dislodge the locking device 3. In order to be able to act on the locking device 3 and release it intentionally, a hole 18 is provided in order for a tool to be able to cooperate therewith.

[0014] Fig. 2 shows the rail 2 included in the bracket 1 in perspective. As was previously mentioned, this rail 2 is, in the preferred embodiment, an angle rail, which implies that it has a substantially L-shaped cross section. The one shank is intended to be placed against a substrate, typically a wall or the like, in order to be anchored against it. To this end, anchorage holes 19 are provided in the rail 2. In order to be able to dispose two or more brackets 1 on the same level beside one another, there is provided an alignment device 20 which, in the preferred embodiment, has the appearance of a notch in the edge of the rail 2.

[0015] On the opposing shank, which extends outwards from the wall or the substrate, there are disposed the upper and lower engagement means 6, 7. The rail is provided with the bevels 21, 22 in order to make for and to facilitate insertion of the edges or stirrups 9, 10 of the radiator 8 in the engagement means 6, 7. During insertion of the radiator or its stirrups 9, 10 in the engagement means 6, 7 and the pivotal movement in order to bring the radiator 8 into position, the radiator may thereby be moved more proximal the engagement means 6, 7 without jolting against the rail 2,

[0016] Uppermost on the rail 2 in Fig. 2, there may be seen a through-going hole 23 for fixing the locking device 3 by means of the anchorage member 5. The anchorage member 5, in the preferred embodiment in the form of a rivet, is disposed so that the locking device 3 is moveable upwards and downwards and is pivotal about the anchorage member 5, but it is not possible to manually remove the anchorage member 5 from the rail 2. The interconnection of the rail 2 and the locking device 3 is made on manufacture of the bracket 1 ex works, and it is thereafter not necessary to carry out any further assembly on the building site.

[0017] Further, the slot 12 is visible on the rail 2. The slot 12 is obliquely directed in relation to the major longitudinal direction of the rail 2 which is parallel with the longitudinal bending line 24 of the rail 2. The oblique direction entails a guiding of the movement of the locking device 3 when the locking device moves in a direction for pretensioning of the spring means 4 (downwards in Fig. 2). That part of the locking device 3 which cooperates with the slot 12, i.e. the guide means 11, will move in a direction towards the bending line 24 of the rail, which implies at the same time, since the locking device 3 is rigid, that the upper portion of the locking device 3 will move towards the front edge of the rail 2, i.e. that the

locking device is dropped forwards.

[0018] The slot 12 is also provided with a heel or a projection 14 for retaining the locking device 3 in the stand-by position until such time as the radiator 8 is to be mounted in position. When the spring means 4 is disposed between the hole 17 and the guide means 11, the pretensioning force will be directed obliquely downwards and forwards, which entails that the force from the spring means 4 will contribute in retaining the guide means 11 in the stand-by position, until such time as the locking device 3 is actuated on its actuator projection 13. When the actuator projection 13 is pressed rearwards in a direction towards the bending line 24 of the rail 2, the pretensioning force acts to guide the guide means 11 primarily along the front edge of the slot 12. The slot 12 has a wider portion at its upper end, which eliminates the risk that the guide means 11 will wedged or jammed in the slot 12 when it is pushed away from the heel 14.

[0019] Fig. 3 is a perspective view of the locking device 3. Uppermost on the locking device 3 in Fig. 3 can be seen the hole 18 which is intended for engagement with a tool in order to move the locking device 3 back to the stand-by position, so that the radiator 8 may be lifted away from the engagement means 6, 7.

[0020] The oblong hole 16 permits an anchorage of the locking device 3 to the rail 2, at the same time as the locking device 3 will be both shiftable as far as the length of the oblong hole 16 permits and pivotal in relation to the anchorage member 5 which is disposed in the hole 23 in the rail 2. Flush with the oblong hole 16 there is also the catch member 15 which grasps over a radiator stirrup 9, 10. Since the purpose of the locking device 3 is to take up outwardly and upwardly directed forces, it is this part of the locking device 3 which will be particularly subjected to load. The anchorage member 5, which will be located flush with the catch member when the locking device 3 is in the locking position, contributes to making a robust construction. The distance between the upper edge of the radiator stirrup and the anchorage member 5 is short, which entails a short fulcrum, and the anchorage member 5 is therefore particularly important for the strength of the bracket on loadings which are directed outwards from the wall. Other constructions and designs of the locking device 3 are however conceivable.

[0021] The actuator projection 13 is disposed at the lower portion of the locking device 3 so that it is this part of the locking device 3 which first comes into contact with the radiator stirrup 10 on mounting which implies that the radiator 8 is pivoted towards the bracket 1 in the manner illustrated in Fig. 1a. In order to ensure that the actuator projection 13 is that part of the locking device 3 which first comes into contact with the radiator stirrup 10, the locking device 3 is moreover disposed, in its stand-by position, to incline rearwards, in a direction towards the wall. This is most clearly visible in Figs. 1a and 1b.

[0022] It will further be apparent from Fig. 3 that the guide means 11 is outwardly angled from the major portion of the locking device 3. As a result, the guide means 11 is disposed to extend through the slot 12 on the rail 2. At the upper edge of the guide means 11 there is disposed a catch 25 which, in the preferred embodiment, permits a reliable fixing of the spring means 4 in order to pretension the guide means 11 and the locking device 3 in a downward direction, as has been described previously.

[0023] Fig. 4a shows a straight side elevation of the assembled bracket 1 when it is located in the stand-by position. The spring means 4 is particularly clearly visible in this view. The spring means 4 extends between the hole 17 in the rail 2 and up to the catch 25 on the guide means 11. The spring means 4 is slightly taut which implies that it exercises a pretensioning force on the guide means 11 and the locking device 3 as a whole. As was mentioned above, the force is directed obliquely forwards and downwards, in a direction away from the wall on which the bracket 1 is to be mounted. The extension of the spring means 4 and thereby the direction of the pretensioning force makes an angle with the extension of the slot 12. The direction of the pretensioning force also makes a contribution, as was mentioned previously, in retaining the guide means 11 on the heel 14 at the edge of the slot 12 when the locking device 3 is in the stand-by position.

[0024] It is clearly apparent in Fig. 4a that the actuator projection 13 projects out a distance in the upper engagement means. When a radiator stirrup is passed into the upper engagement means 6, the actuator projection will be pivoted rearwards, in a direction towards the wall on which the bracket 1 is fixed, and the locking device 3 is given a turn about the anchorage member 5 in a clockwise direction in Fig. 4a. The turning about the anchorage member 5 will also release the guide means 11 from its positioning on the heel 14 in the slot 12 despite the action from the spring means 4, That force which is required for realising release of the guide means 11 is however limited, since the main composant of force from the spring means 4 is directed straight downwards, and the composant of force which is directed laterally, and retains the guide means 11 against the side edge of the slot 12, is limited.

[0025] The oblique inclination of the slot 12 in relation to a vertical line, or the bending line 24 of the rail 2, permits the locking device 3 to be pivoted further clockwise in Fig. 4a about the anchorage member 5, at the same time as the locking device 3 moves downwards. Both the limited extent of the elongate hole 16 and the limited extent of the slot 12 will result in the locking device 3 assuming its locking position where the anchorage member 5 is located in the upper region of the oblong hole 16 and the guide means 11 is located in the lower region of the slot 12. The catch member 15 will then be located inside the radiator stirrup 10 and grasp around its edge. This position of the locking device is shown in Fig. 4b which, like Fig. 4a, is a straight side elevation of the bracket 1.

[0026] In Fig. 4b, the spring means 4 is maximally compressed, in order not unnecessarily to cause any wear

of the material in the spring means 4. The guide means 11, and thereby the locking device 3, is located in its lowermost position, which corresponds to a locking position. It as good as impossible to manually dislodge the locking device 3 in a direction opposed to the force from the spring means 4, since it is difficult to get a grip on the locking device 3 using the fingers. In order intentionally to return the locking device 3 to the stand-by position, engagement with a hook or the like is required in the hole 18 for a tool.

[0027] It may also be ascertained that the locking device 3 in Fig. 4b has been pivoted about the anchorage member 5, so that it assumes a position where the actuator projection 13 is pressed back behind the rail 2.

DESCRIPTION OF ALTERNATIVE EMBODIMENTS

[0028] As was mentioned in passing above, it is possible to apply the present invention also to brackets which comprise other types of rails as well, not only an angle-shaped rail as shown in the preferred embodiment.

[0029] Another way of varying the present invention is to replace the helical draft spring which is used as the spring means 4 by some other type of spring means. Possibly, engagement points in the rail 2 and the guide means 11 may need to be adapted to the type of spring means employed. However, the interesting feature is that the pretensioning force from the spring means 4 makes an angle with the slot 12, in which the guide means 11 is moveable. Further, at least the end positions of the slot 12 must lie on a line which makes an angle with the longitudinal direction of the rail.

[0030] Even though the present invention according to the preferred embodiment has been shown with the anchorage member 5 positioned above the guide slot 12, it is also conceivable, with necessary design and construction modifications, to modify the mutual positioning of these two features. However, the fundamental concept of the present invention is the same.

[0031] The present invention may be modified further without departing from the scope of the appended Claims.

Claims

1. A radiator bracket for suspending a radiator (8) on a wall, comprising a rail (2) with first and second engagement means (6, 7) for cooperation with respective portions of the radiator or fixing devices (9, 10) disposed thereon, at least the first engagement means (6) having a locking device (3) and the locking device (3) having a stand-by position and a locking position, where the locking device (3) is pretensioned towards the locking position by spring means (4), **characterised in that** the locking device (3) is rotatably and displaceably connected to the rail (2) so that the locking device (3) is moveable in one plane between the stand-by position and the locking position.

2. The radiator bracket as claimed in Claim 1, **characterised in that** the locking device (3) includes a guide means (11) for guiding the movement of the locking device (3) between the stand-by position and the locking position.

3. The radiator bracket as claimed in Claim 2, **characterised in that** the guide means (11) includes a guide pin which is moveable in a slot (12) in which the end positions of the guide pin (11) in the slot (12) correspond to the stand-by position and the locking position, respectively.

4. The radiator bracket as claimed in Claim 3, **characterised in that** the slot (12) has a side edge which displays a projection or a heel (14) for retaining the guide pin (11) in the stand-by position.

5. The radiator bracket as claimed in any of Claims 1 to 4, **characterised in that** an anchorage member (5) extends through a hole (23) in the rail (2) and an elongate opening (16) in the locking device (3) so that this may be angled and displaced in relation to the rail (2).

6. The radiator bracket as claimed in Claim 3 or 4, **characterised in that** the end positions of the guide pin (11) are disposed along a line which makes an angle with the longitudinal direction of the rail (2).

7. The radiator bracket as claimed in any of Claims 1 to 6, **characterised in that** the locking device (3), in the stand-by position, makes an angle with the longitudinal direction of the rail (2).

8. The radiator bracket as claimed in Claim 6 or 7, **characterised in that** the lower portion (13) of the locking device (3) is more protracted than its upper portion in the stand-by position.

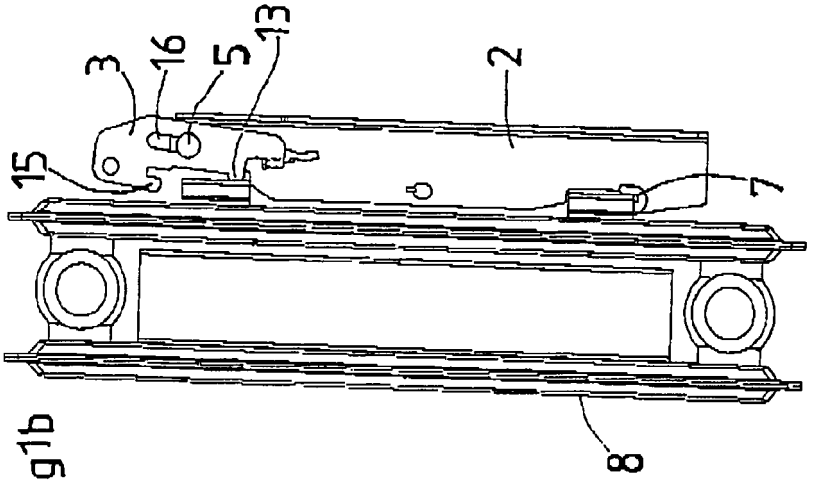


Fig1b

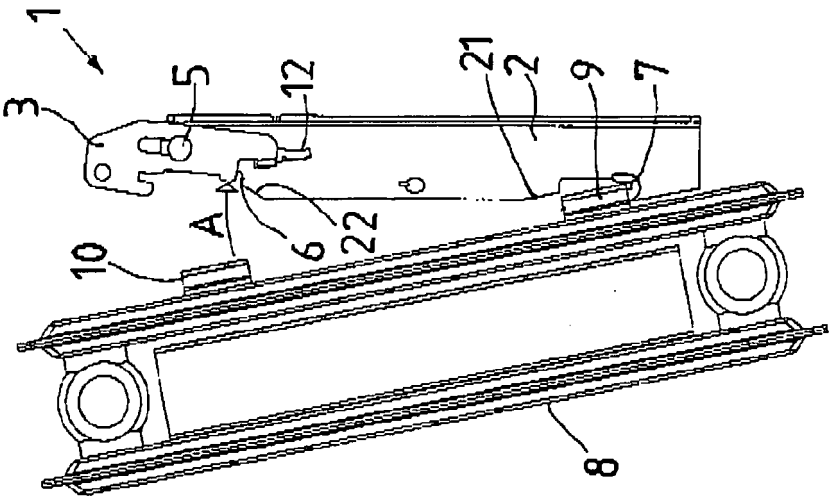


Fig1a

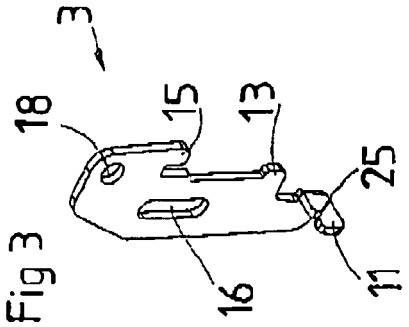


Fig 3

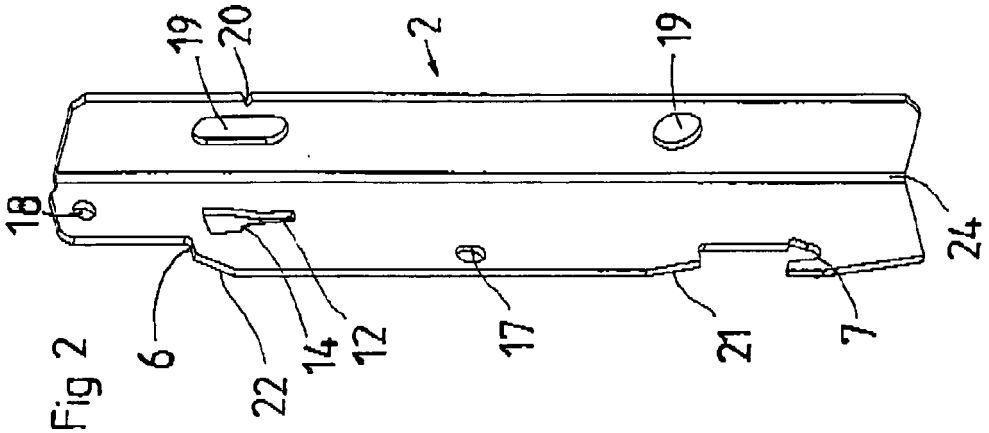


Fig 2

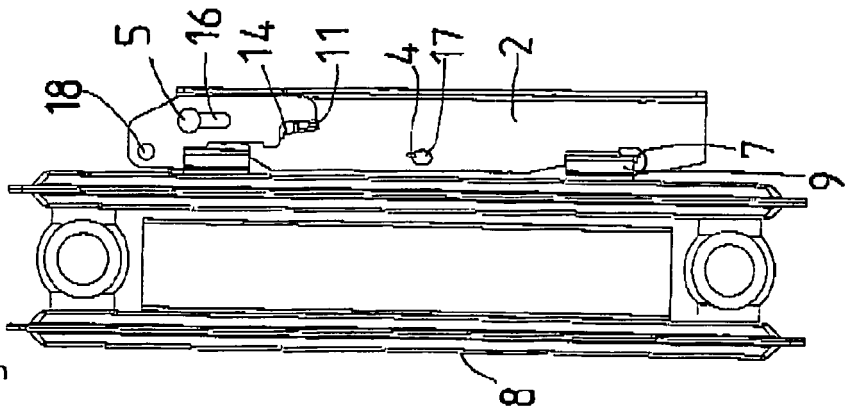


Fig 1c

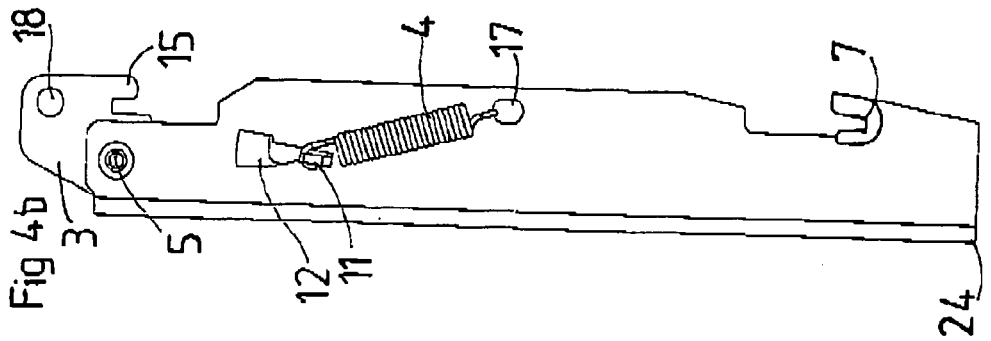


Fig 4b

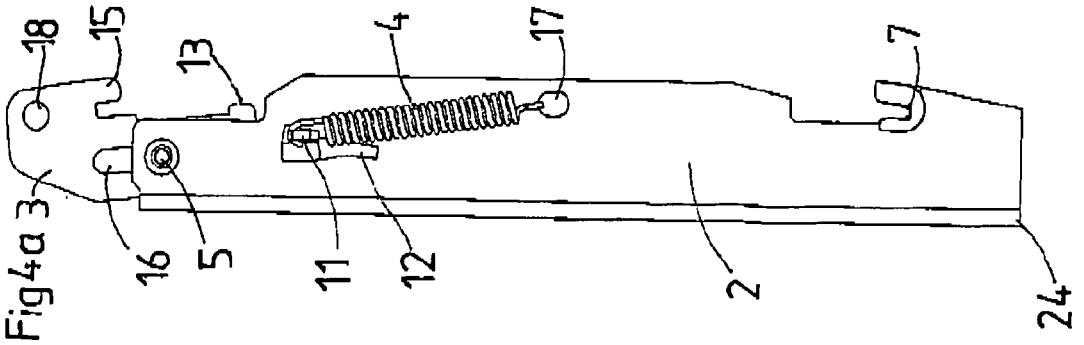


Fig4a

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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