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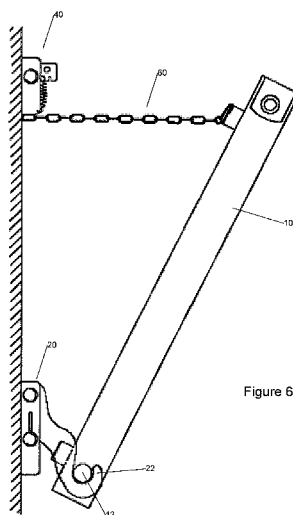


Figure 6

(57) Abstract: The present invention provides a system for pivotally mounting a radiator on a wall such that the radiator may be swung away from the wall at the top to facilitate cleaning and the like, the system comprising: a) an upper bracket to releasably hold an upper portion of the radiator adjacent a wall; and b) at least one adjustable lower bracket for fastening to the wall to support a lower portion of a radiator at a support location spaced away from the wall such that the radiator is able to pivot on the lower bracket and swing away from the wall at the top when released, c) wherein the lower bracket includes an adjustment mechanism to adjust the spacing between the support location and the wall, comprising a wall mounting part having pivotally mounted thereon a hook, the adjustment mechanism providing a plurality of securing points in the wall mounting or hook and having a projection which is securable at a selected one of the securing points, and d) wherein the hook or the wall mounting has a camming surface which, in use, bears against the projection when the hook is pivoted relative to the wall mounting such that angle between the hook and the wall mounting part of the lower bracket is adjustable by adjusting the location of the projection, thereby to adjust the spacing of the support location from the wall.



Wall Mounting for Central Heating Radiators

FIELD OF THE INVENTION

The present invention relates to a wall mounting for central heating radiators. In particular, the present invention relates to a system for pivotally mounting a radiator on a wall, a bracket for supporting a water connection at the bottom of a radiator of a central heating system and an adjustable pivotal radiator system for a central heating system.

BACKGROUND OF THE INVENTION

We have previously described a pivotal wall mounting for a radiator in our patent GB 2,254,412. Further background prior art can be found in: GB2256267A (Wilson et al.), GB2349685A (Hickey), and GB2096451A (Hara).

However, there exists a need for an improved pivotal wall mounting for such pivotal radiators.

STATEMENT OF THE INVENTION

The present invention provides a system for pivotally mounting a radiator on a wall such that the radiator may be swung away from the wall at the top. This can facilitate cleaning and the like. The system comprises: a) an upper bracket to releasably hold an upper portion of the radiator adjacent a wall; and b) at least one adjustable lower bracket for fastening to the wall to support a lower portion of a radiator at a support location spaced away from the wall such that the radiator is able to pivot on the lower bracket

and swing away from the wall at the top when released, c) wherein the lower bracket includes an adjustment mechanism to adjust the spacing between the support location and the wall, comprising a wall mounting part having pivotally mounted thereon a hook, the adjustment mechanism providing a plurality of securing points in the wall mounting or hook and having a projection which is securable at a selected one of the securing points, and d) wherein the hook or the wall mounting has a camming surface which, in use, bears against the projection when the hook is pivoted relative to the wall mounting such that angle between the hook and the wall mounting part of the lower bracket is adjustable by adjusting the location of the projection, thereby to adjust the spacing of the support location from the wall.

In use, the hook may engage with a cylindrical or effectively cylindrical surface around the inlet or outlet, for example a pipe or cylindrical (or hex) surface (into which the threaded pipe fitting is usually fitted) projecting proud of the radiator.

The invention also provides a bracket for supporting a water connection at the bottom of a radiator of a central heating system to enable the radiator to be tilted away from a wall on which the bracket is mounted, the bracket comprising: a hook to support said water connection, and a wall mounting part having a hook mounting element configured to project at right angles from a wall when the bracket is mounted, the a hook mounting element having a pivot mounting the stem of said hook to enable the hook to swing away from the wall when the bracket is mounted, the element having a slot below the pivot; and wherein said bracket further comprises an adjustment mechanism, a first part of said adjustment mechanism comprising said hook mounting element and a second part of said adjustment mechanism comprising said stem of said hook; wherein one of said first and second parts of said adjustment mechanism has a surface, preferably generally convex or arcuate in shape, to provide a camming surface, and wherein the other of said first and second parts of said adjustment mechanism provides a plurality of securing points and has an adjustable support which is securable at a selected one of the securing points, and

wherein, in use, the camming surface bears against the support such that a distance of the part of the hook for supporting said water connection from the wall is adjustable by adjusting a said securing point of the support.

The invention also provides a system for pivotally mounting a radiator on a wall such that the radiator may be swung away from the wall at the top to facilitate cleaning and the like, the system comprising: a) an upper bracket to releasably hold an upper portion of the radiator adjacent a wall; and b) at least one adjustable lower bracket for fastening to the wall to support a lower portion of a radiator at a supporting location spaced away from the wall such that the radiator can pivot on the lower bracket and swing away from the wall at the top when released; c) at least one swivel connector including a pipe-fixed element and a radiator fixed element axially rotatably fluid tight coupled to the pipe fixed element; d) the radiator fixed element having a supporting surface for engaging and pivotally supporting the radiator on a corresponding surface on the adjustable lower bracket.

The invention also provides a system for pivotally mounting a radiator on a wall such that the radiator may be swung away from the wall at the top to facilitate cleaning and the like, the system comprising: a) an upper bracket to releasably hold an upper portion of the radiator adjacent a wall; and b) at least one adjustable lower bracket for fastening to the wall to support a lower portion of a radiator at a supporting location spaced away from the wall such that the radiator can pivot on the lower bracket and swing away from the wall at the top when released; c) the upper bracket having a child proof securing means against release.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the present invention will now be described, by way of example only, and in which:

Figure 1 shows a system for pivotally mounting a radiator on a wall;

Figure 2 shows a close-up of an adjustable bracket for supporting a water connection of a radiator;

Figure 3 shows a cross-section through the water connection of a pivotal radiator;

Figures 4a and 4b respectively show a side and plan view of an upper bracket;

Figure 5a and 5b respectively show a side and plan view of an adjustable lower bracket;

Figure 6 shows the system for pivotally mounting a radiator on a wall of figure 1 where the radiator is pivoted outwards.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Broadly speaking, we will describe an adjustable bracket and system for pivotally mounting a radiator on a wall such that the radiator may be swung away from the wall at the top to facilitate cleaning and the like behind the radiator, without the need to remove the radiator from the wall and/or disconnect the pipes connecting the radiator to a central heating system.

Figure 1 shows a system for pivotally mounting a radiator on a wall. The radiator 10, which is connected to the piping using a swivel connector as described in our previous patent GB2,254,412, is mounted on a wall 1 using the adjustable lower bracket 20 and upper bracket 40. The swivel connector or a lower part 12 of the radiator 10 engages with a hook 22 of the adjustable bracket 20. The hook 22 retains and supports the radiator 10 so that the radiator can pivot (relatively freely) around the axis of the connecting pipes, such that releasing of the upper bracket 40 permits the upper part of the radiator 10 to swing away from the wall as the lower part pivots in the hook 22, as illustrated in figure 6.

Figure 2 shows a close-up of the adjustable bracket 20 for supporting the radiator 10. The bracket 20 comprises a slotted element or wall mounting 24 that is attached to the wall 1 and has a portion projecting generally at right angles from the wall 1 when the bracket is mounted on the wall. The slotted element 24 has a pivot 36 pivotally mounting a stem 30 of a hook 22 to enable the hook to swing away from the wall when

the bracket is mounted. The slotted element 24 further has a slot 26 below the pivot 36 in which an adjustable support 28 is slidably arranged. The adjustable support may be positioned along the slot and fixed at a desired location within the slot. The stem 30 of the hook 22 has a lower edge which may be straight or broadly straight at least along part of its length, or some other suitable shape. However, preferably it has a generally arcuate or convex shape 32 to provide a camming surface.

During use, the camming surface 32 bears against the adjustable support 28 by virtue of the weight of the radiator 10 in the hook 22. Since the pivot 36 is above the adjustable support 28, positioning and fixing the adjustable support 28 within the slot 26 allows the relative distance between the wall 1 and the supported radiator 10 and hook 22 to be adjusted. The camming surface 32 can be manufactured to provide different shapes that enable a greater or lesser change in distance when the position of the adjustable support is varied.

The adjustable support 28 comprises a bolt that may be loosened to permit movement within the slot 26 and then tightened to retain the new position within the slot 26. The skilled reader would of course understand that other releasing and locking mechanisms may be used in place of the bolt.

The stem 30 of the hook 22 further comprises a bulge 34 on the edge opposed to the camming surface 32. The bulge 34 helps to retain the radiator 10 in the hook 22 when the upper portion of the radiator is pivoted away from the wall.

Figure 3 shows a cross section and close up through a connection of a pivotal radiator 10, in the area of the pivotal connector connecting the pipework to the radiator. The joint between the radiator 10 and the respective pipe 52 consists of a swivel connector which comprises three members that are integrated in such a manner as to allow the joint to swivel and to enable the radiator 10 to tilt about the longitudinal axis joining the pipe 5 on the lower portion of the radiator 10, while providing a suitable seal. The swivel joint comprises a pair of tubular adaptor members 54 and 56 and a bolt member 58 designed to hold the adaptor members 54, 56 in a reasonably freely rotatable relationship relative to one another. Member 56 is secured into the radiator, for

example by threading into the matching thread on the inlet/outlet 14 of the radiator. Bolt member 58 is provided with a sealing mechanism (in this case two “O” rings are shown in cross section) so that the passageway F formed by the pipework into the radiator is sealed against leakage of radiator fluids, while permitting rotation of the members 54 and 56 relative to one another, so that the radiator can be swivelled around the axis of members 54 and 56. In use, the stem 30 and hook 22 engage with the swivel joint, preferably engaging on the circumference of member 56, or, alternatively, engaging with an inlet or outlet 14 of the radiator 10. A similar arrangement is used to connect the other port of the radiator to the pipes of the central heating system (not shown).

Figures 4a and 4b respectively show a side and a plan view of an upper bracket of the system according to the present invention. The radiator 10 is releasably held against the wall 1 using the upper bracket 40, which comprises a slotted element 42 projecting at a right angle from the wall 1 when attached to the wall. The slotted element 42 has an engaging element 44 that projects from the slotted element 42 and engages with a retaining bracket 14 of the radiator 10 to hold the upper portion of the radiator in fixed relation to the wall. The engaging element 44 is connected to the slotted element 42 using a sliding arrangement to permit upward movement of the engaging element to release the radiator, shown in the figure as comprising a bolt or other similar securing device holding the engaging element against the slotted element and sliding in the slot of the slotted element. A spring 46 biases the engaging element in a holding position, which engages with the retaining bracket 14 of the radiator 10. An L shaped engaging element as shown in the Figures has been found advantageous by reason of its simplicity in production. The engaging element may also be provided with a security element (not shown) in order to prevent the engaging element being inadvertently released and/or to provide a child resistant release mechanism. This may be in the form of a separate tool for lifting the engaging element. For example the engaging element may be provided with a hole and the tool may be in the form of a lifting device part of which can be inserted into the hole so as to allow lifting of the engaging element, for example, an L shaped wire tool with a loop on the upper arm, so that the lower limb of the L can be inserted into the hole and a finger can be inserted into the loop. Two such tools permit lifting of engaging elements on two retaining brackets simultaneously, as will typically

be used to secure radiators. Instead of a hole, each engaging element can be provided with some alternative mechanism for engaging such a tool, such as a protrusion or hook. The engaging element may be shielded apart from access to this mechanism so that it cannot be lifted without a suitable tool. Another such securing element may be in the form of a means of tightening the bolt, for example which holds the engaging element to the slotted element, using an Allen key, so that the slotted element is no longer slidable against the engaging element. Alternatively, the securing element/child resistant release may be of a form which does not require any additional tool for its operation. Child resistant release mechanisms are known from other fields and can be applied to this field by those skilled in the art. For example they may comprise a device which requires strength and/or manipulative skills which children do not generally possess, such as press and twist arrangements.

Figures 5a and 5b respectively show a side and plan view of the adjustable lower bracket 20. Two positions of the adjustable bracket are shown, where the adjustable support 28 is moved upward within the slot 26 and fixed in position to increase the distance between the wall 1 and the hook 22 and thus the lower portion of the radiator 10.

Figure 6 shows the system of figure 1 where the radiator is pivoted outwards. In this system, a chain 60 having a first end anchored to the wall or the upper bracket and a second end connected to the radiator 10 acts as a limit to the amount that the radiator 10 can pivot away from the wall. The chain 60 therefore stops the radiator, which may be very heavy, falling too far away from the wall and thus injuring a person standing in front of the radiator 10. The length of chain is manufactured to permit access behind the radiator 10 without having to pivot the radiator all the way down to a position perpendicular to the wall (or greater). Preferably the chain or other securing element (for example a cord or tape may be used) length is chosen so that the outward force generated by the radiator on the chain should the radiator be allowed to fall freely from the upright position to the extremity of the chain is such as can be reasonably easily borne by the supporting fixings into the supporting wall to which the radiator is attached. Preferably the chain length is such that the radiator is angled, when in the position when the chain is taught, at less than 30° to the wall, preferably less than 25° .

Should the user wish to pivot the radiator 10 beyond the limited distance provided by the chain, the chain may be removed or unclipped from the radiator and the radiator lowered further. The means for the securing the chain so that it is removable or unclipped may preferably be child proof.

No doubt many other effective alternatives will occur to the skilled person. It will be understood that the invention is not limited to the described embodiments and encompasses modifications apparent to those skilled in the art lying within the scope of the claims at pending hereto.

CLAIMS:

1. A system for pivotally mounting a radiator on a wall such that the radiator may be swung away from the wall at the top to facilitate cleaning and the like, the system comprising:

a) an upper bracket to releasably hold an upper portion of the radiator adjacent a wall; and

b) at least one adjustable lower bracket for fastening to the wall to support a lower portion of a radiator at a support location spaced away from the wall such that the radiator is able to pivot on the lower bracket and swing away from the wall at the top when released,

c) wherein the lower bracket includes an adjustment mechanism to adjust the spacing between the support location and the wall, comprising a wall mounting part having pivotally mounted thereon a hook, the adjustment mechanism providing a plurality of securing points in the wall mounting or hook and having a projection which is securable at a selected one of the securing points, and

d) wherein the hook or the wall mounting has a camming surface which, in use, bears against the projection when the hook is pivoted relative to the wall mounting such that angle between the hook and the wall mounting part of the lower bracket is adjustable by adjusting the location of the projection, thereby to adjust the spacing of the support location from the wall.

2. A system according claim 1 in which at least some of the securing points comprise a slot in the wall mounting or the hook.

3. A system according to claim 1 or 2, wherein the projection comprises a head portion of a nut or bolt.

4. A system according to claim 1, 2 or 3, wherein the camming surface comprises a convex portion of a stem of the hook, and wherein an end of the stem of the hook is pivotally mounted on the wall mounting part of the bracket.

5. A system according to claim 1, 2, 3 or 4, wherein the hook is freely pivotal.

6. A system according to any one of claims 1 to 5, wherein the hook has a bulged portion along its edge opposing the cammed surface to inhibit the radiator from becoming detached from said lower bracket when the radiator is hinged downwards at an angle of greater than 90 degrees to the wall.
7. A system according to any preceding claim wherein, in use, the hook engages with a radiator-fixed element of a swivel connector for the radiator, to support the radiator.
8. A system according to any one of claims 1 to 6, wherein, in use, the hook engages with a cylindrical inlet or outlet surface of the radiator to support the radiator.
9. A system according to any preceding claim, further comprising a removable pivot limit means to limit the pivoting movement of a radiator,
wherein, in use, the removable pivot limiting means limits the pivoting movement of the radiator such that the distance of an upper portion of the radiator away from the wall is limited.
10. A system according to claim 9, wherein the removable pivot limit means comprises a chain having a first end anchored to a wall or the upper bracket and a second end removably attachable to an upper portion of the radiator.
11. A bracket for supporting a water connection at the bottom of a radiator of a central heating system to enable the radiator to be tilted away from a wall on which the bracket is mounted, the bracket comprising:
a hook to support said water connection, and
a wall mounting part having a hook mounting element configured to project at right angles from a wall when the bracket is mounted, the hook mounting element having a pivot mounting the stem of said hook to enable the hook to swing away from the wall when the bracket is mounted, the element having a slot below the pivot; and

wherein said bracket further comprises an adjustment mechanism, a first part of said adjustment mechanism comprising said hook mounting element and a second part of said adjustment mechanism comprising said stem of said hook;

wherein one of said first and second parts of said adjustment mechanism has a generally convex or arcuate shape to provide a camming surface, and wherein the other of said first and second parts of said adjustment mechanism provides a plurality of securing points and has an adjustable support which is securable at a selected one of the securing points, and

wherein, in use, the camming surface bears against the support such that a distance of the part of the hook for supporting said connection from the wall is adjustable by adjusting a said securing point of the support.

12. A bracket as claimed in claim 11 in which at least some of the securing points comprise a slot in said adjustment mechanism.

13. A bracket according to claim 11 or 12, wherein the adjustable support comprises a head portion of a bolt.

14. A bracket according to claim 11, 12 or 13, wherein the hook is freely pivotal.

15. A bracket according to claim 11, 12, 13 or 14, wherein the hook has a bulged portion along a surface opposing the cammed surface.

16. A bracket according to any one of claims 11 to 15, wherein, in use, the hook engages with a swivel connector of a radiator to support the radiator.

17. A bracket according to any one of claims 11 to 15, wherein, in use, the hook engages with an inlet or outlet pipe of a radiator to support the radiator.

18. An adjustable pivotal radiator system for a central heating system, the adjustable pivotal radiator system comprising:

a pivotal radiator having a swivel connector at each of an inlet and an outlet of the radiator adjacent a bottom end of the radiator to permit pivotal rotation of the radiator relative to pipes connected to the inlet and outlet; and

a system for pivotally mounting the radiator according to any one of claims 1 to 10.

19. A system for pivotally mounting a radiator on a wall such that the radiator may be swung away from the wall at the top to facilitate cleaning and the like, the system comprising:

- a) an upper bracket to releasably hold an upper portion of the radiator adjacent a wall; and
- b) at least one adjustable lower bracket for fastening to the wall to support a lower portion of a radiator at a supporting location spaced away from the wall such that the radiator can pivot on the lower bracket and swing away from the wall at the top when released;
- c) at least one swivel connector including a pipe-fixed element and a radiator fixed element, axially rotatably fluid tight coupled to the pipe fixed element;
- d) the radiator fixed element having a supporting surface for engaging and pivotally supporting the radiator on a corresponding surface on the adjustable lower bracket.

20. A system for pivotally mounting a radiator on a wall such that the radiator may be swung away from the wall at the top to facilitate cleaning and the like, the system comprising:

- a) an upper bracket to releasably hold an upper portion of the radiator adjacent a wall; and
- b) at least one adjustable lower bracket for fastening to the wall to support a lower portion of a radiator at a supporting location spaced away from the wall such that the radiator can pivot on the lower bracket and swing away from the wall at the top when released;
- c) the upper bracket having a child proof securing means against release.

21. A system, bracket or adjustable radiator system substantially as herein described with reference to the accompanying drawings.

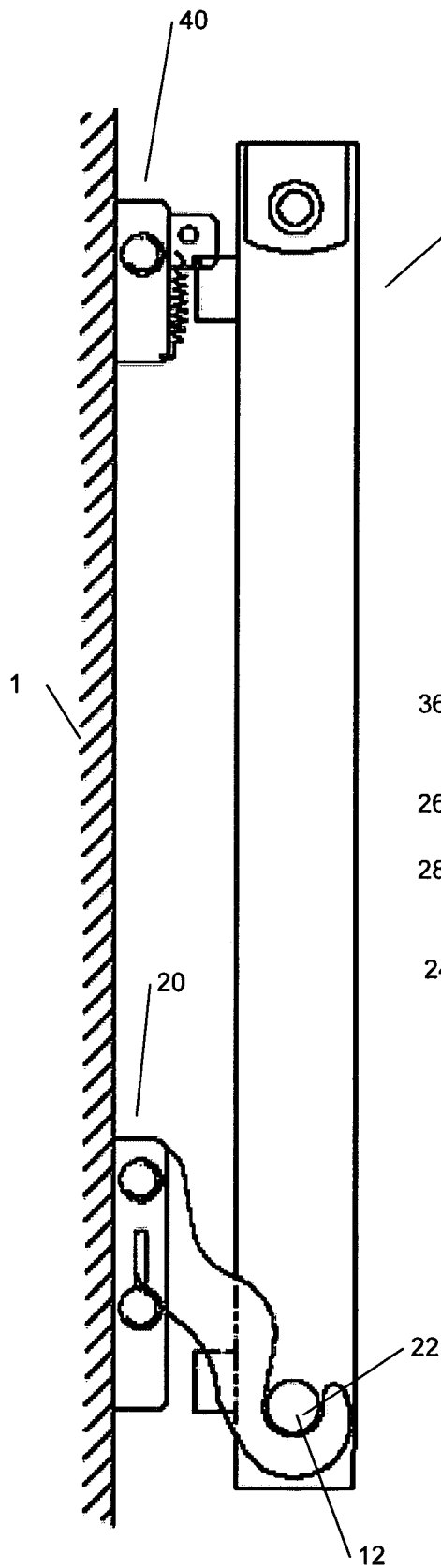


Figure 1

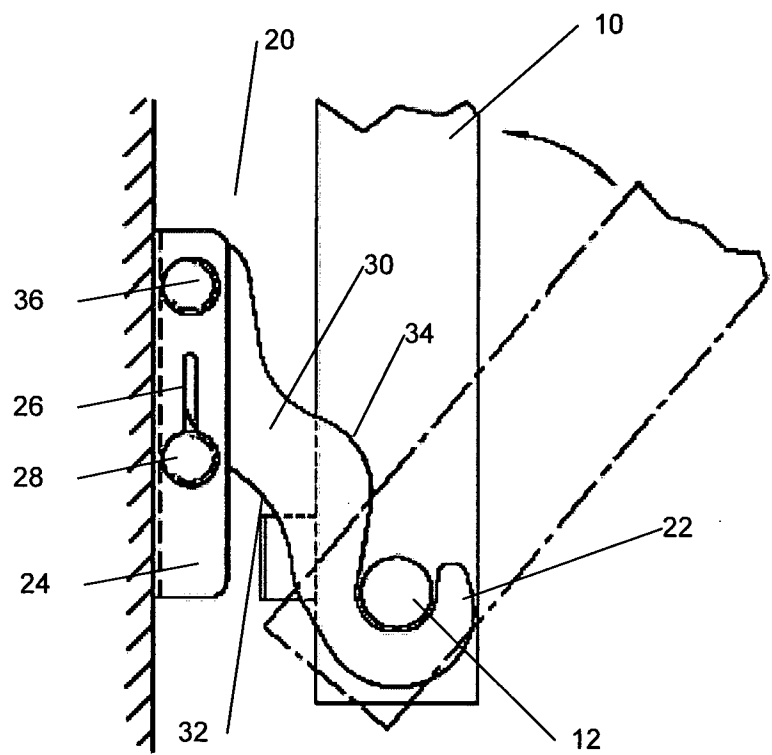


Figure 2

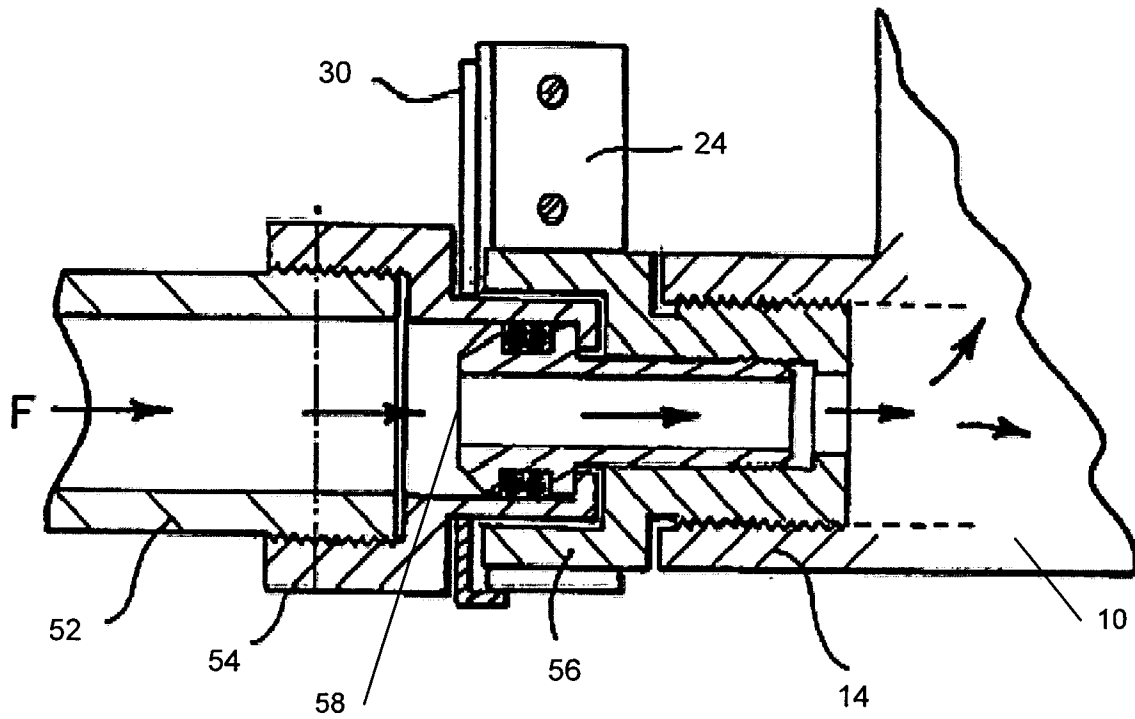


Figure 3

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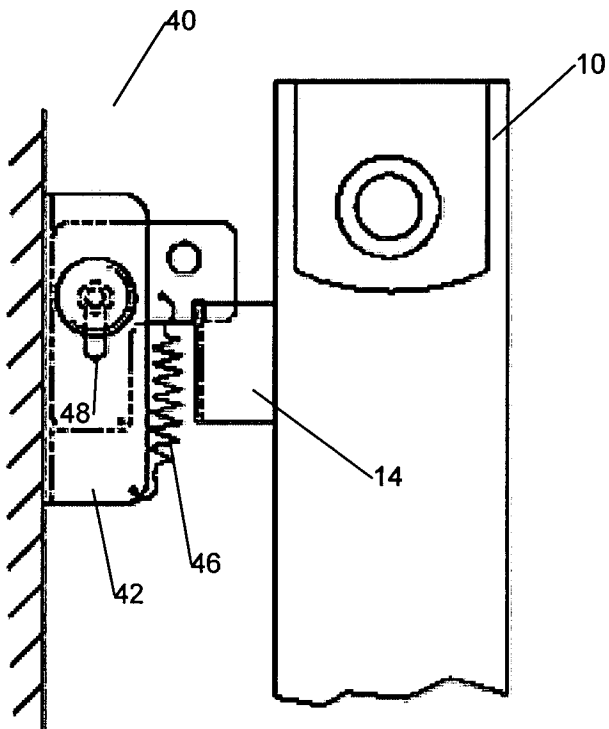


Figure 4a

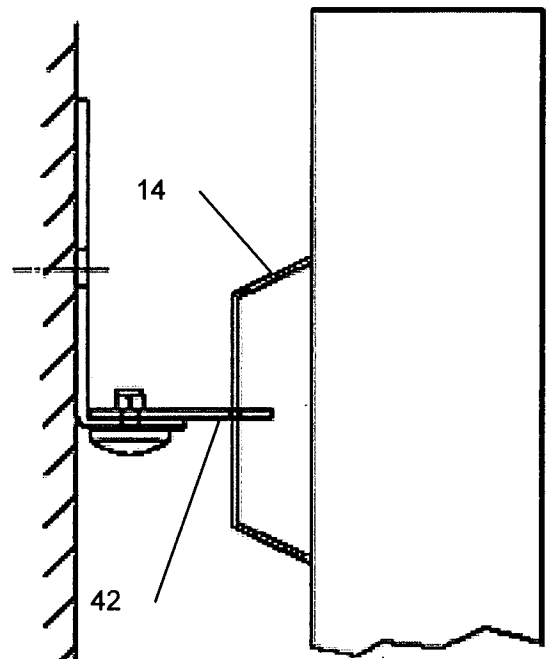


Figure 4b

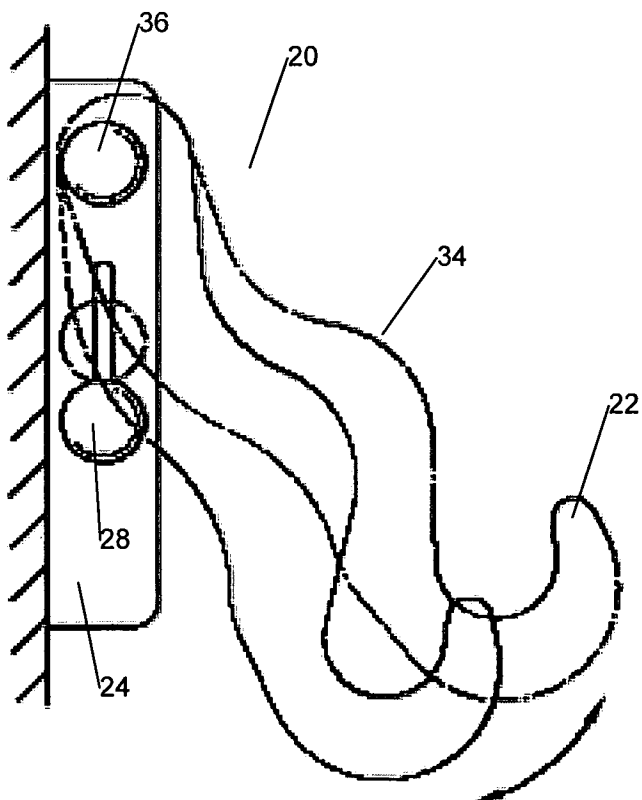


Figure 5a

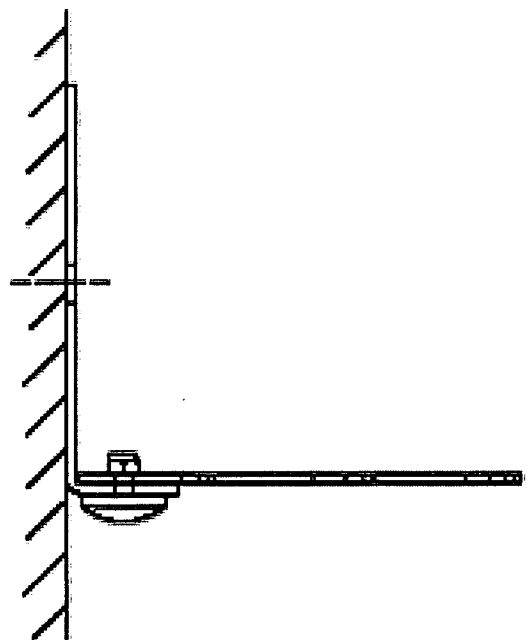


Figure 5b

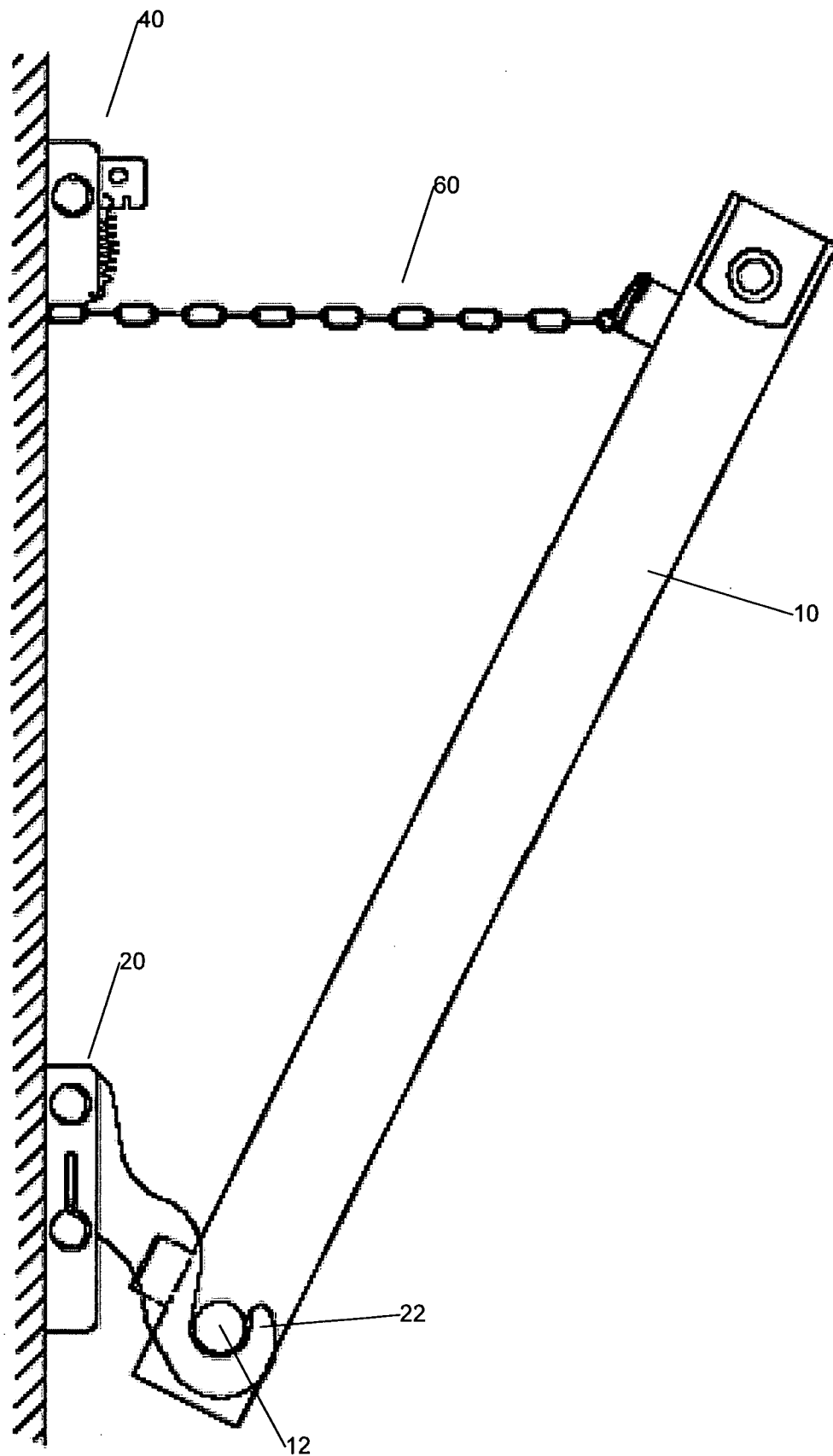


Figure 6