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(54) **EQUIPMENT FOR FACILITATING THE MAKING OF, AND THE CLEANING UNDER, A BED**
AUSRÜSTUNG ZUR ERLEICHTERUNG DES BETTENMACHENS UND SÄUBERNS UNTER DEM BETT
ÉQUIPEMENT AIDANT À FAIRE UN LIT ET À NETTOYER SOUS UN LIT

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Description

[0001] The present invention relates to an equipment for making the bed in the form of a raiseable and lowerable bed supported by a horizontally carried cantilever placed under the bed and running in a framework mounted on the floor, the cantilever and the bed being balanced by a counterweight mounted to a line which is running over a guide roller attached at the upper end of the framework.

[0002] Making beds and cleaning under them, especially hotel beds, are an ergonomic problem for cleaning staff. Persons are making the bed with the body in a position which is unfavourable to the human body and causes a heavy load, especially on the back. Therefore, it is desirable to perform the bedmaking operation in a position which is more optimal for the body.

[0003] When the bed is removed from the floor the space below the bed is made accessible which makes it easier to clean the room. Cleaning under the bed is especially associated with another position which is not an optimum for the human body.

[0004] The purpose of the present invention is to provide an equipment for facilitating the cleaning of hotel rooms and making hotel beds and in this way reduce the physical loading of the cleaning staff. By removing the bed from the floor also cleaning under the bed is facilitated, a space which otherwise is not an easily accessible space.

[0005] The invention also makes it possible to turn the bed in the horizontal plane around the head end to increase the accessibility between two beds forming a double bed or between a bed and a wall when making the bed and cleaning.

[0006] Today there exists no product solving this problem with making beds and cleaning under them.

[0007] A known solution for moving the bed to a height more adapted for bedmaking is described in patent ES2203282. This solution does not liberate the floor under the bed, since a part of the bed remains on the floor and the problem of cleaning under the bed remains. The bed also remains restrained in its upper position, which makes a bed having its longitudinal side towards a wall, not easily accessible from both the longitudinal sides.

[0008] EP-A-1 216 633 discloses a raisable bed of the general type to which the present invention relates. The bed frame is supported by carriages arranged for moving along vertical rails. Each carriage consists of two parts which are supported in a mutually tiltable manner via a horizontal axis, one of the parts being mounted to the bed frame and the other being movably supported by the vertical rail(s). The two parts are connected by an adjustment device having an overload device to avoid damages on the bed construction in case of overloading the bed. For a predetermined load on the bed the connection between the two parts thus is released and the bed frame is allowed to swing in vertical direction to an angled position.

[0009] According to the invention the bed can thus be moved between its lower position and its upper position while maintained horizontally to move the bed to a height above the floor, which is more suitable for the human body. The bed is supported by a cantilever which is running in a framework. The bed and the cantilever are balanced by a counterweight, which is connected to a line running over a guide roller mounted at the upper end of the framework.

[0010] The bed is guided in its horizontal plane only in the lower position of the bed. This means that the bed is resting fixed on the floor when it is used as a bed. When the bed is moved to its upper position it is turnable in the horizontal plane around the frame structure. This means that a bed located with the longitudinal side towards a wall can be turned and access is obtained to both sides of the bed. In the case of a double bed, formed of two single beds placed adjacent to each other, each bed is turned individually around its own framework to separate the beds. Access between the both beds is then obtained and making the double bed is facilitated.

[0011] According to an advantageous embodiment the counterweight is somewhat heavier than bed and cantilever, which means that the bed will strive to reach its uppermost position in all other position except for its lowermost, fixed position. In its lowermost position the bed is fixed in vertical direction by means of a locking means. When the bed is made and shall be moved to its lower position it is moved down with the aid of some kilo of the weight of the user's body and is again fixed in its lower position by the locking means.

[0012] According to yet an advantageous embodiment the locking means is deactivated, when the bed shall be moved from its lower to its upper position by means of a foot actuated lever located near the floor at the foot end of the bed.

[0013] To more clearly explain the invention an embodiment of the equipment, chosen as an example, will now be described in greater details with reference to the enclosed drawings, on which figure 1 shows in side view an embodiment of the equipment mounted in a room, figure 2 shows a general view of those parts which are shown in greater details in the following figures, figure 3 shows the framework in a side view, figure 4 shows a side view illustrating the lever for activating the equipment, figure 5 shows how the bed in its lower position is fixed in a holder, and figure 6 is a cross section view through the plane A-A according to the figure 5 illustrating the locking means.

[0014] The bed 1 is mounted on a cantilever 8 running in a framework 3 between its lower position against the floor 7 and its upper position. A counterweight 9 is running along the framework, mounted on the floor, which counterweight is connected to the cantilever 8 by means of a line 12, which is running via a guide roller 2, which is mounted in the upper end of the framework.

[0015] The framework 3 mounted to the floor is located at the head end of the bed, which in the room is situated

towards a wall 6. The equipment is not visible to the observer but is hidden behind an end of the bed 14.

[0016] The cantilever 8 consists of one part mounted under the bed 1 and one part running in the framework 3. Wheels 13 are running in the framework 3 and transfer the torque caused by the mass of the bed to the framework. The cantilever is locked in the framework in all directions except for the vertical direction in which the counterweight, connected to the line 12, is lifting the bed.

[0017] The mass of the counterweight is somewhat heavier than the mass of the bed, which means that in all positions, except for the lower position of the bed, the counterweight is striving downwards, which results in a movement upwards of the bed.

[0018] By adapting the length of the line 12 the length of the movement for the equipment can be adjusted, which means that the level of the upper position can be varied.

[0019] In the lower position the bed is fixed in the horizontal plane by a holder 4 in which position the cantilever is fixed by means of a locking means 11. The locking means overcomes the forces in vertical direction caused by the counterweight 9 and maintains the cantilever 8 in the holder 4.

[0020] In the holder 4 there are a number of teeth, into which the locking means 11 hooks.

[0021] The locking means 11 is mounted in the cantilever 8 and comprises a plate spring which strives towards its outer, by the spring force unloaded position. The locking means can be operated by a lever 5, connected by a tube to its inner position. The locking means 11 then returns to its outer position because of the spring force.

[0022] The lever 5 is mounted at the short end of the cantilever 8 close the floor 7, which makes the lever easily operable by the foot 10.

[0023] When the cantilever 8 is not fixed to the holder 4 it can be turned around the framework which guides and limits the range of movement of the cantilever.

Claims

1. Equipment for making and cleaning under a bed in the form of a raiseable and lowerable bed (1) supported by a horizontally carried cantilever, placed under the bed and running in a framework mounted on the floor, said cantilever and said bed being balanced by a counterweight (9) mounted to a line (12), which runs over a guide roller (2) mounted at the upper end of the framework, and said bed being movable while maintained horizontally between an upper position and a lower position, **characterized in that** the bed in its upper position is turnable in the horizontal plane in the framework around one of its ends for increasing accessibility when making the bed and cleaning.

2. Equipment for making the bed and cleaning under the bed according to claim 1, **characterized in that** the bed in its lower position is fixed and positioned.
3. Equipment for making the bed and cleaning under the bed according to claim 1, **characterized in that** the bed is lifted to the upper position by means of a counterweight.
4. Equipment for making the bed and cleaning under the bed according to claim 3, **characterized in that** the counterweight is heavier than the bed.
5. Equipment for making the bed and cleaning under the bed according to claim 4, **characterized in that** the force which strives to lift the bed because of the counterweight is locked by a locking means.
6. Equipment for making the bed and cleaning under the bed according to claim 5, **characterized in that** the locking means is released by a lever, actuated by the foot, for moving the bed to its upper position.
7. Equipment for making the bed and cleaning under the bed according to any one of the preceding claims, **characterized in that** the equipment for making the bed and cleaning under the bed which would otherwise be visible are hidden by a bed end.

Patentansprüche

1. Ausrüstung zum Bettenmachen und Säubern unter einem Bett in Form eines hochfahrbaren und absenkbaren Betts (1), die von einem horizontal getragenen Ausleger gestützt wird, unter dem Bett platziert wird und in einem Rahmen läuft, der auf dem Boden montiert ist, wobei der Ausleger und das Bett durch ein Gegengewicht (9) im Gleichgewicht gehalten werden, das an einer Schnur (12) montiert ist, die über eine Führungsrolle (2) läuft, die an dem oberen Ende des Rahmens montiert ist, und wobei das Bett beweglich ist, während es horizontal zwischen einer oberen Position und einer unteren Position gehalten wird, **dadurch gekennzeichnet, dass** das Bett in seiner oberen Position in der horizontalen Ebene in dem Rahmen um eines seiner Enden zur besseren Zugänglichkeit beim Bettenmachen und Säubern drehbar ist.
2. Ausrüstung zum Bettenmachen und Säubern unter dem Bett nach Anspruch 1, **dadurch gekennzeichnet, dass** das Bett in seiner unteren Position befestigt und positioniert ist.
3. Ausrüstung zum Bettenmachen und Säubern unter dem Bett nach Anspruch 1, **dadurch gekennzeichnet, dass** das Bett mittels eines Gegengewichts in

- die obere Position gehoben wird.
4. Ausrüstung zum Bettenmachen und Säubern unter dem Bett nach Anspruch 3, **dadurch gekennzeichnet, dass** das Gegengewicht schwerer ist als das Bett. 5
 5. Ausrüstung zum Bettenmachen und Säubern unter dem Bett nach Anspruch 4, **dadurch gekennzeichnet, dass** die Kraft, die anstrebt, das Bett aufgrund des Gegengewichts anzuheben, durch ein Blockiermittel blockiert ist. 10
 6. Ausrüstung zum Bettenmachen und Säubern unter dem Bett nach Anspruch 5, **dadurch gekennzeichnet, dass** das Verriegelungsmittel von einem Hebel gelöst wird, der durch den Fuß betätigt wird, um das Bett in seine obere Position zu bewegen. 15
 7. Ausrüstung zum Bettenmachen und Säubern unter dem Bett nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Ausrüstung zum Bettenmachen und Säubern unter dem Bett, die ansonsten sichtbar wäre, von einem Bettende versteckt ist. 20
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5. Equipement pour faire le lit et nettoyer sous le lit selon la revendication 4, **caractérisé en ce que** la force qui s'efforce de lever le lit à cause du contrepoids est verrouillée par un moyen de verrouillage.
 6. Equipement pour faire le lit et nettoyer sous le lit selon la revendication 5, **caractérisé en ce que** le moyen de verrouillage est débloqué par un levier, actionné par le pied, pour déplacer le lit dans sa position supérieure.
 7. Equipement pour faire le lit et nettoyer sous le lit selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'équipement pour faire le lit et nettoyer sous le lit, qui autrement serait visible, est caché par une extrémité de lit.

Revendications

1. Equipement pour faire un lit et nettoyer sous un lit sous forme d'un lit (1) se relevant et s'abaissant supporté par un porte-à-faux porté horizontalement, placé sous le lit et passant dans une structure montée sur le sol, ledit porte-à-faux et ledit lit étant équilibrés par un contrepoids (9) monté sur une corde (12) qui passe sur un rouleau de guidage (2) monté à l'extrémité supérieure de la structure, et ledit lit étant mobile tout en étant maintenu horizontalement entre une position supérieure et une position inférieure, **caractérisé en ce que** le lit dans sa position supérieure peut être tourné dans le plan horizontal dans la structure autour de l'une de ses extrémités pour augmenter l'accessibilité quand on fait le lit et nettoie. 30
35
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2. Equipement pour faire le lit et nettoyer sous le lit selon la revendication 1, **caractérisé en ce que** le lit dans sa position inférieure est fixé et positionné. 45
3. Equipement pour faire le lit et nettoyer sous le lit selon la revendication 1, **caractérisé en ce que** le lit est levé dans la position supérieure au moyen d'un contrepoids. 50
4. Equipement pour faire le lit et nettoyer sous le lit selon la revendication 3, **caractérisé en ce que** le contrepoids est plus lourd que le lit. 55

Fig. 2/6

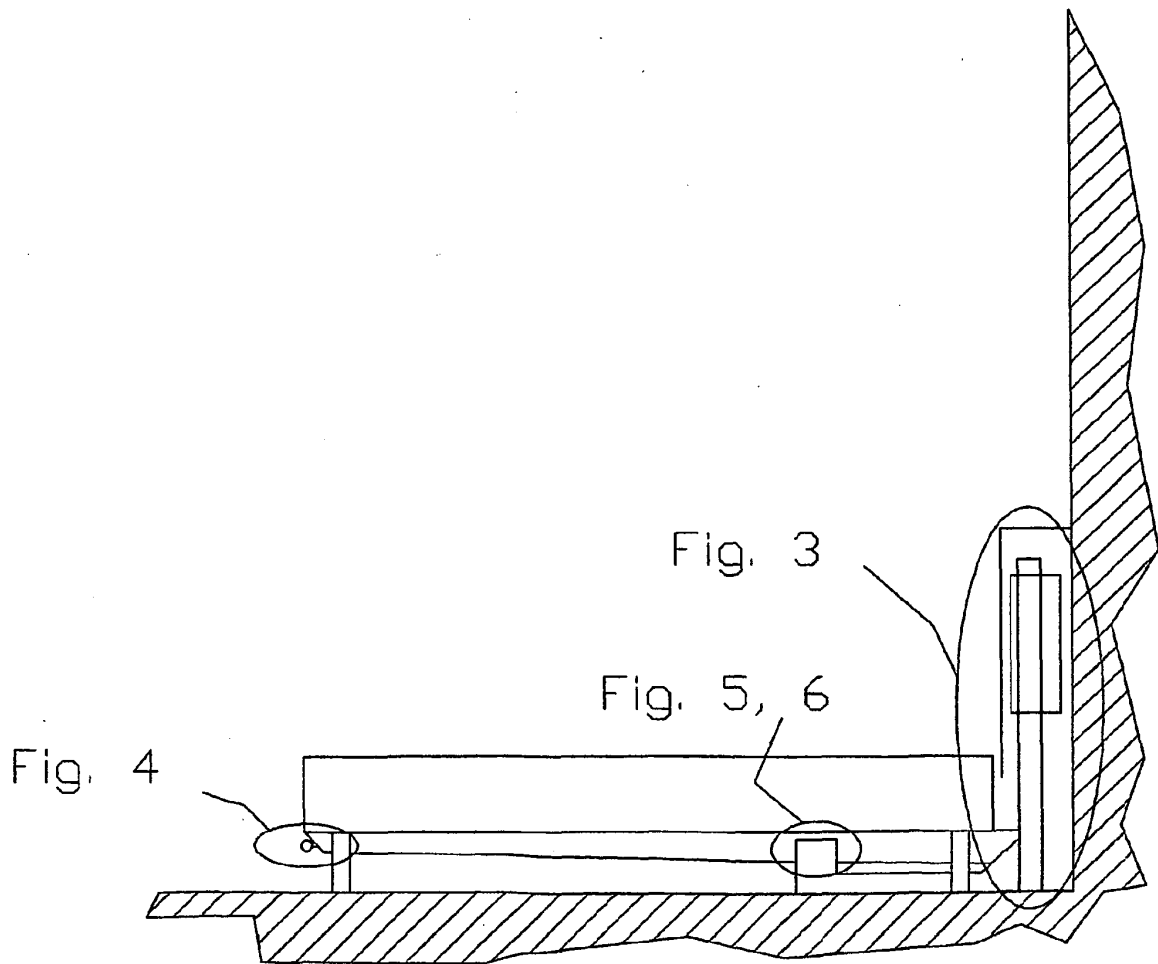


Fig. 3/6

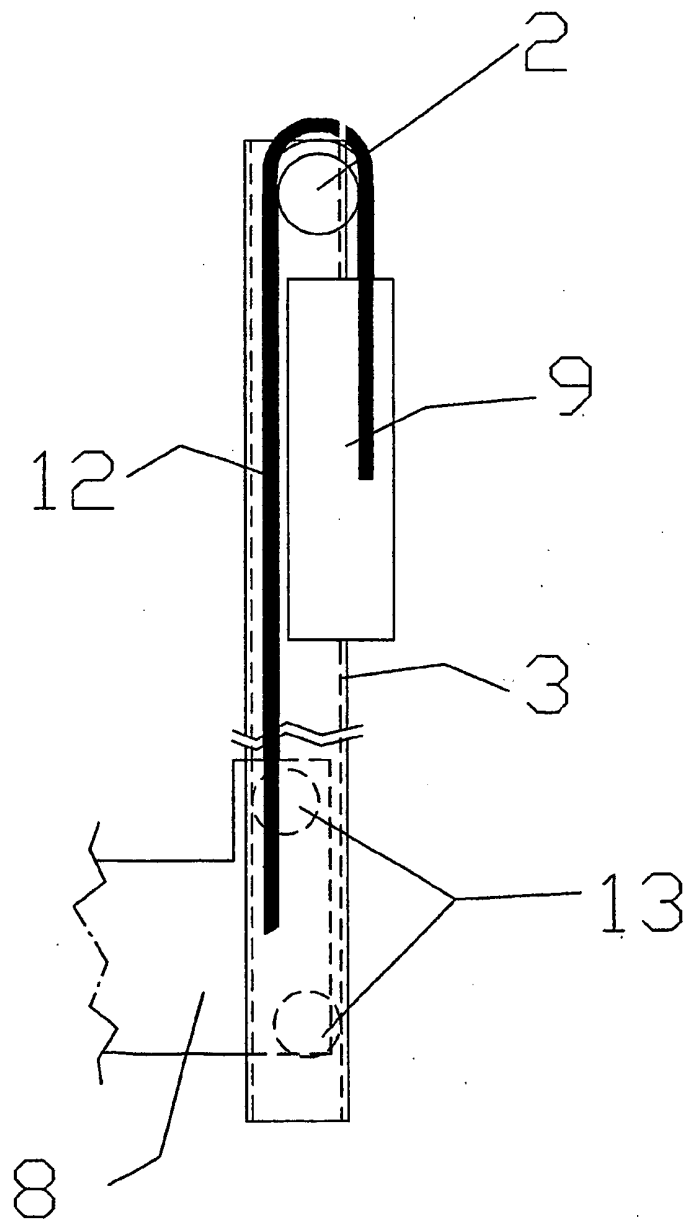


Fig. 4/6

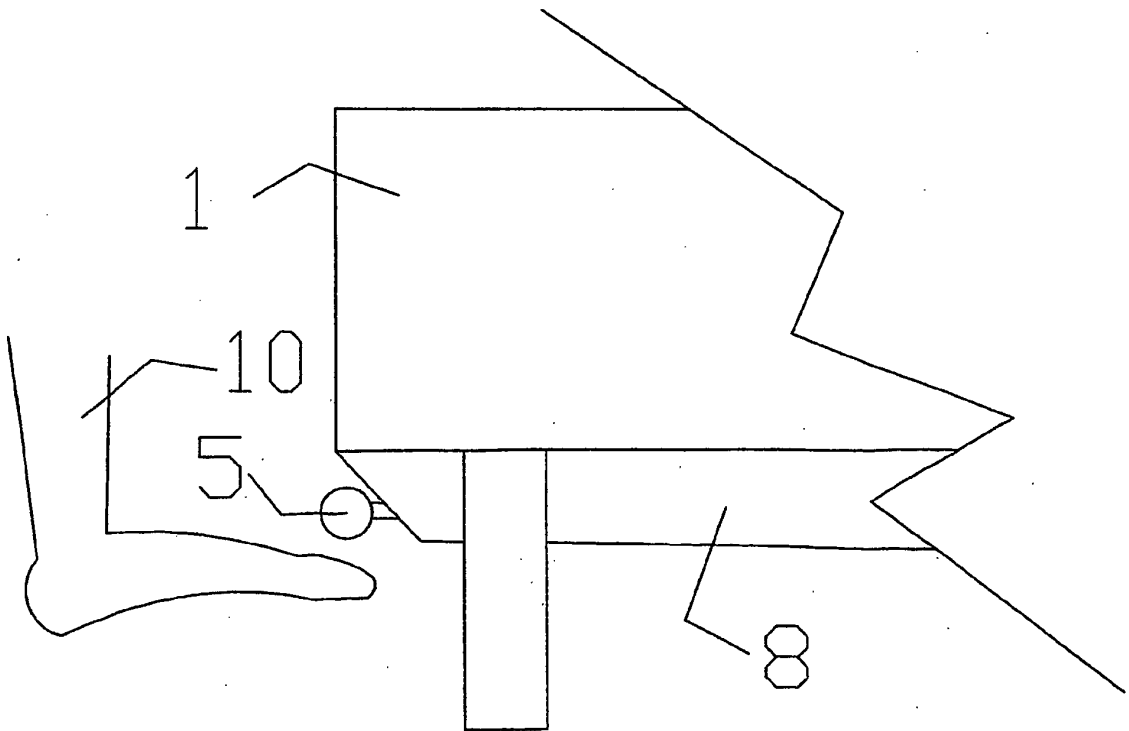


Fig. 5/6

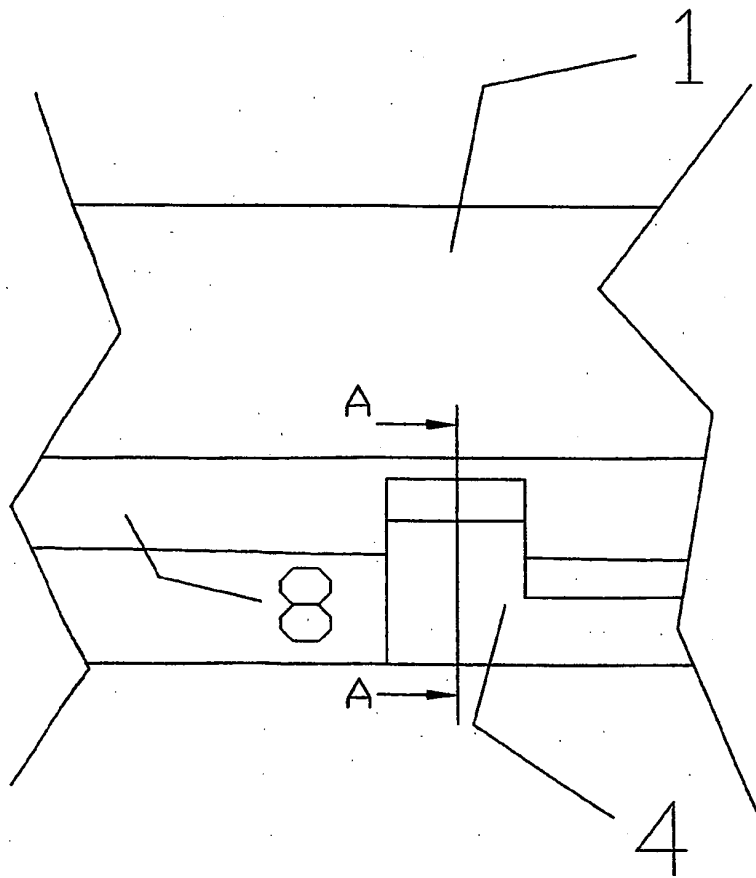
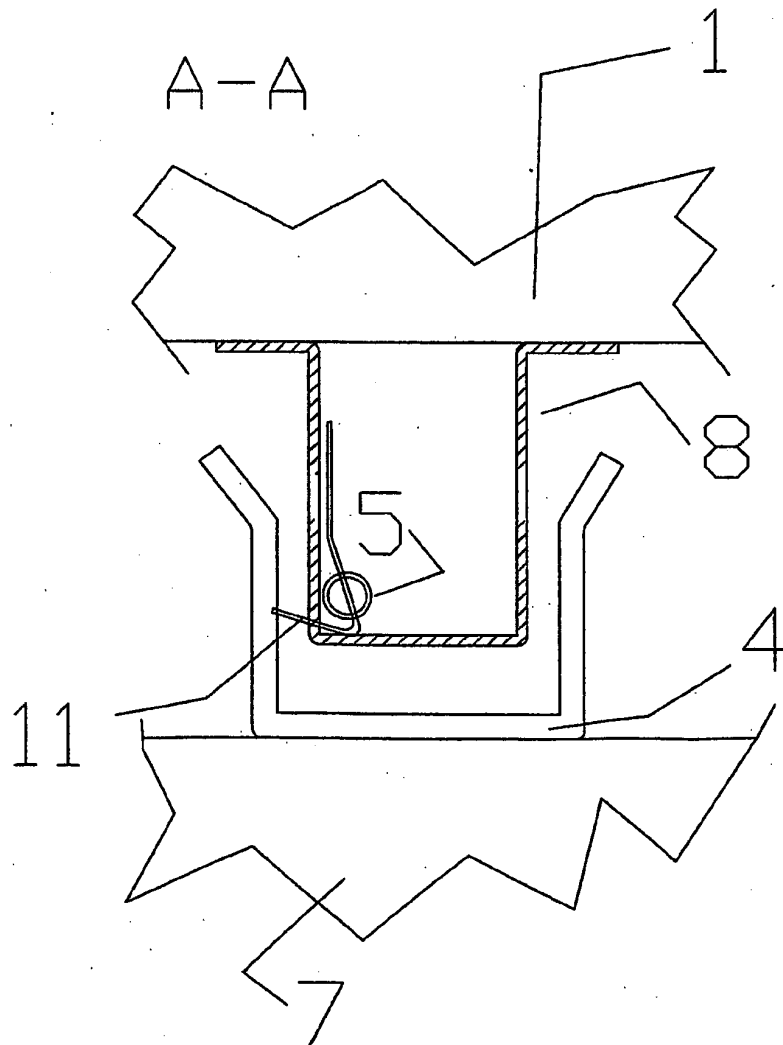


Fig. 6/6



REFERENCES CITED IN THE DESCRIPTION

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