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(71) Applicant: **GSG INTERNATIONAL S.p.A.**
**40054 Budrio (Bologna) (IT)**

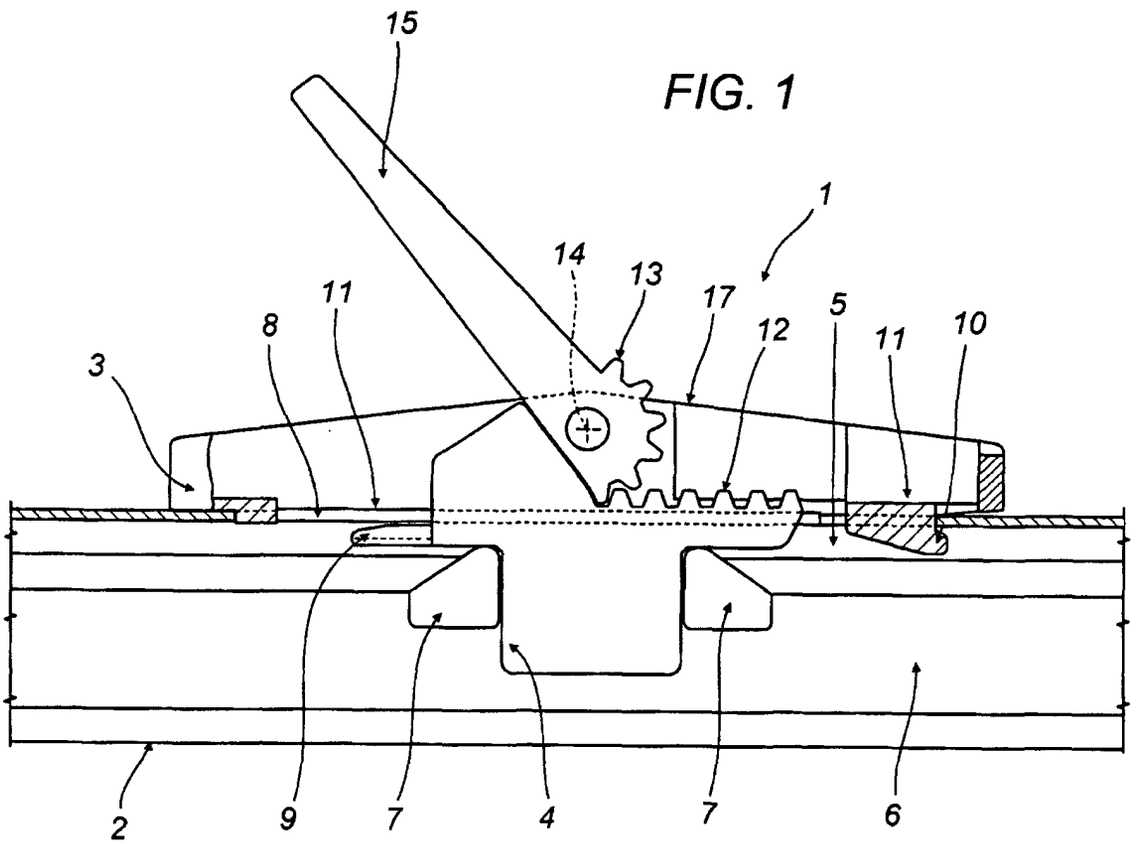
(72) Inventor: **Lambertini, Marco**
**40068 San Lazzaro di Savena (Bologna) (IT)**

(74) Representative: **Lanzoni, Luciano**
**c/o BUGNION S.p.A.**
**Via Goito, 18**
**40126 Bologna (IT)**

## (54) A device for door or window frame sashes, especially for door or window frames made of metal

(57) Described is a device (1) for a door or window frame sash (2), especially a sash (2) equipped with an operating device (6) accessible through a slot (5) used for fitting a handle for the device (6) itself. The device comprises at least one coupling element (4) that can be engaged with the operating device (6) at least to keep the latter in a stable configuration, and mobile elements (11) for fastening the coupling element (4) to the sash (2) at the slot (5).

FIG. 1




EP 1 533 448 A2

## Description

**[0001]** The present invention relates to a device for door or window frame sashes, especially for door or window frames made of metal, applicable to the sash instead of the respective handles at least when the sashes are transported.

**[0002]** In this specification, the term door or window frame is used to mean an assembly consisting of mobile frame or sash and of a fixed frame, the latter being stably installed in a respective opening - for example, an opening made in a wall - and mounting the sash.

**[0003]** It is known that a handle, for example, but without thereby restricting the scope of the invention, a handle of the Cremone bolt type, is usually fitted to the sash when mounting the latter on the frame, normally using tap screws acting on the casing of the handle itself inside the profile constituting the sash.

**[0004]** Handles of the Cremone bolt type usually comprise:

- a handle body, normally prismatic in shape;
- an operating handgrip protruding from one side of the handle body;
- drive elements protruding from the side of the handle body opposite the operating handgrip and designed to actuate the device for closing the sash;
- means for fixing the handle to the sash, the latter having holes or slots in it for the passage of the drive elements and for the fixing means themselves.

**[0005]** The drive elements comprise one or two sliders (depending on the type of window or door frame the handle is fitted to), which, when mounted on the sash, are coupled with drive rods of the opening and closing systems.

**[0006]** These rods normally slide in grooves made in the sash members and are accessible through the aforementioned slot.

**[0007]** Thus, turning the handgrip to defined positions causes the sliders to slide to and remain in defined positions each corresponding to a different configuration of the sash, such as, for example, closed, turn opened or tilt opened.

**[0008]** The fixing means typically include screws (to be inserted from the back of the sash member) and are inserted into through holes made in the sash member itself to join the part of the handle body from which the sliders protrude to the corresponding sash member of the door or window.

**[0009]** In some cases, to improve the fastening of the handle to the sash member (for example in the case of thin sash profiles) a suitably shaped shimming plate, fixed by the screws, is added.

**[0010]** Normally, the handles are fitted to the sashes when the latter are assembled off site and prior to their installation in a building.

**[0011]** This assembly procedure, which is usually performed prior to installation of the frame and, in most cases, in places far away from the site of final installation, has several disadvantages.

**[0012]** Firstly, handling a frame or an individual sash with the handle fitted to and protruding from it creates the risk of damaging the handle and may involve an additional cost to have the handle repaired. For the same reason, fully assembled frames are irregular in shape, occupy more space when packaged and are difficult to stack for transportation purposes, thus increasing their overall volume and thereby raising freight charges. On the other hand, frames or sashes not fitted with handles and stored in a warehouse for a long time or handled by mechanical means may also cause damage and lead to malfunctioning when the door or window is eventually installed due to displacement of the closing devices inside the sash, since, as mentioned above, the drive and operating rods of the sash opening and closing systems are accessible through the slots used to fit the handles.

**[0013]** It should also be noticed that the absence of the handle leads to an unstable fit between the sash and the frame, creating difficulties when handling the door or window.

**[0014]** The aim of the present invention is therefore to overcome the above mentioned drawbacks through the provision of a device that can be easily and reversibly fitted to the sash using the slot made for the handle, so as to seal off and protect the closing device during storage of the door or window frame.

**[0015]** Another aim of the invention is to provide such a device that does not protrude from the sash so as to make packaging and transportation easier and more economical.

**[0016]** Yet another aim of the invention is to provide such a device that acts on the closing device in such a way as to securely hold the sash to the fixed part of the frame at least during transportation or, if the fixed part of the frame is not fitted, to hold the closing device in place in the sash.

**[0017]** The technical characteristics of the invention according to the aforementioned aims may be easily inferred from the contents of the appended claims, especially claim 1, and preferably any of the claims that depend, either directly or indirectly, on claim 1.

**[0018]** Further, the advantages of the invention are apparent from the detailed description which follows, with reference to the accompanying drawings which illustrate preferred embodiments of the invention provided merely by way of example without restricting the scope of the inventive concept, and in which:

- Figure 1 is a schematic side view, with some parts cut away in order to better illustrate others, of a device according to the invention in a first configuration where the device is disengaged from the sash;
- Figure 2 is a schematic side view of the device of Figure 1, with some parts cut away in order to better illustrate others, of a device according to the inven-

tion in a second configuration where the device is engaged with the sash;

- Figure 3 is a schematic side view of another embodiment of the device according to the invention in a condition where it is disengaged from the sash;
- Figure 4 is a schematic side view of the device of Figure 3, in a condition where it is engaged with the sash;
- Figure 5 is a schematic side view of yet another embodiment of the device according to the invention.

**[0019]** With reference to the accompanying drawings, the numeral 1 denotes in its entirety a device for door or window frame sashes 2.

**[0020]** In the embodiment illustrated in Figures 1 and 2, the device 1 comprises a body 3 to which there is slidably fitted an element 4 for coupling, through a slot 5 made in the sash 2, to a device 6 for operating a closing mechanism normally fitted in the sash 2 in such a manner as to lock and secure the sash to a respective fixed frame part.

**[0021]** In other embodiments which are not illustrated, the device 1 may comprise more than one coupling element 4, depending on the technical characteristics of the operating device 6.

**[0022]** The closing mechanism, the door and window frames it is fitted to and the respective hardware referred to in this specification are of substantially known type and described only insofar as their characteristics, especially those of the operating device 6, are relevant to the present invention, as explained in more detail below.

**[0023]** The device 6 comprises contact elements 7 which, in the final frame assembly, are designed to be coupled with respective drive elements of a handle used for closing, turn opening or tilt opening the door or window sash 2, in the most generic sense and without thereby restricting the scope of application.

**[0024]** The coupling element 4 is mobile, relative to the body 3, between an open position, corresponding to an open condition of the device 6, and a closed condition, corresponding to a closed condition of the device 6.

**[0025]** Looking in more detail, therefore, the coupling element 4 can be engaged with the contact elements 7 and is slidably coupled with the mounting body 3 from which it protrudes on two longitudinal guides 8 which are made in the body 3 itself and which are substantially parallel with the slot 5 and with the operating device 6.

**[0026]** As shown in Figures 1 and 2, the device 1 comprises a first fastening element 9, attached to the coupling element 4 and a second fastening element 10 attached to the body 3, both designed to engage the device 1 with the sash 2 at the slot 5, as explained below. The fastening elements 9 and 10 constitute mobile fastening elements 11.

**[0027]** Owing to their positions on the coupling element 4 and on the body 3, respectively, the elements 9 and 10 are reciprocally slidable and a movement of the coupling element 4 advantageously corresponds to a substantially similar movement of the element 9 and vice versa.

**[0028]** When the elements 9 and 10 are in the first position, shown in Figure 1, the device 1 is disengaged from the sash 2, whilst in the second position, shown in Figure 2, the elements 9 and 10 cause the device 1 to be engaged with the sash 2. In the embodiment illustrated, there are two mobile fastening elements 11, one fixed to the element 4 and one fixed to the body 3. In other embodiments that are not illustrated, there may be more than two such fastening elements, depending on the technical characteristics of the sash 2 and of the slot 5 used to fit the handle.

**[0029]** The device 1 further comprises a rack 12, associated with the coupling element 4, and a pinion 13 that meshes with the rack 12, is associated with the body 3 and rotates about an axis 14 substantially perpendicular to the rack 12. Again, in embodiments that are not illustrated, the design of the frame and of the slot 5 may differ from that described above and be such as to require more than one rack 12 and pinion 13.

**[0030]** A lever 15 is associated with the pinion 13, or is made as a single piece with the pinion 13, on the side of the body 3 opposite the coupling element 4, and is used to actuate the coupling element 4 and the fastening element 9 that moves as one with the element 4. The lever 15 is mobile between a rest position, illustrated in Figure 1, where the fastening elements 9 and 10 are at the aforementioned first position, and a working position, illustrated in Figure 2, where the fastening elements 9 and 10 are at the aforementioned second position and the element 4 is associated with the sash 2 and, for example, in the closed position. Depending on transportation and packaging requirements, when the lever 15 is in the working position, that is to say, when the device 1 is engaged with the sash 2, the coupling element 4 might also be in the open position.

**[0031]** Preferably, as shown in Figure 2, the lever 15 lies substantially within the profile of the body 3 so as to reduce the space occupied by the device 1.

**[0032]** In a different embodiment, illustrated in Figures 3 and 4, the device 1 does not have the body 3 and the fastening elements 11 are fitted to the coupling element 4: more specifically, the first fastening element 9 is, in this case too, attached to the coupling element 4, while the second fastening element 10 is connected to the end of a linkage mechanism 16 forming a "toggle" system performing the same function as the pinion 13, lever 15 and rack 12 in the embodiment of Figure 1, that is to say, constituting means 17 for actuating the mobile fastening means 11.

**[0033]** The end of the mechanism which, in the configuration illustrated, consist of a first and a second rod 18 and 19, opposite the one with the second fastening element 10, is rotatably linked to the coupling element 4 substantially at the first fastening element 9 but on the opposite side of the plane in which the sash 2 lies.

**[0034]** The device 1 illustrated in Figures 3 and 4 also

comprises locking and limiting means 20 positioned and operative between the linkage mechanism 16 and the coupling element 4 in such a manner as to keep the mobile fastening elements 11 in the aforementioned second position.

**[0035]** In the specific, non-restricting configuration illustrated, the means 20 comprise a stop piece 21, associated with the coupling element 4, positioned and shaped to stop and retain a pin 22 protruding from the rod 18 forming part of the linkage mechanism 16.

**[0036]** Figure 5 illustrates yet another embodiment of the device 1 according to the invention.

**[0037]** In this embodiment, the coupling element 4 itself is equipped with elastically deformable fastening means 23 by which the element 4 can be fitted to the slot 5. As illustrated, the elastically deformable fastening means 23 comprise deformable elements or studs 24 whose number and size depends on the shape of the slot 5 they are to be fastened to. In this case, as explained below, the coupling element 4 operates substantially like a plug and the device 1 is not designed to act dynamically on the operating device 6 and, more specifically, it simply stops the operating device 6 in a particular configuration, for example that corresponding to the sash closed position; advantageously, in this embodiment, the coupling element 4 comprises gripping means 25 to facilitate engagement and disengagement between the element 4 and the slot 5. The fastening means 11 and the elastically deformable means 23, in their entirety, constitute reversible fixing means for releasably fitting the coupling element 4 to the slot 5.

**[0038]** The device 1 described above is designed to be fitted to a door or window frame, after the frame has been assembled, in the place of the handle. The handle will only be fitted at a later stage, when the frame is installed.

**[0039]** In the embodiment illustrated in Figure 5, the device 1 can be fitted in an easily removable manner in the slot 5 thanks to the action of the elastically deformable fastening means 23 which are pressed into the sash 2.

**[0040]** In this embodiment, the operating device 6 must first be placed in the required configuration, where the coupling element 4 engages with the aforementioned contact elements 7.

**[0041]** In the embodiments illustrated in Figures 1 to 4, the coupling element 4 is engaged with the sash 2 thanks to the relative movement of the mobile fastening elements 11. More specifically, when the coupling element 4 is fitted to the sash 2, the element 4 itself simultaneously acts on the operating device 6, causing it to slide, for example, from an open to a closed condition of the sash 2.

**[0042]** Thus, by operating on the actuating means 17, the device 1 is stably engaged with the sash 2, by moving the fastening elements 11 apart, and, at the same time, the operating device 6 is moved from one position to another. Similarly, the device 1 can be disengaged from the sash 2 by acting on the actuating means 17 to move the fastening elements 11 together again.

**[0043]** It should also be noticed that the devices illustrated in Figures 1 to 4 may be used in conjunction with both one-way and two-way operating devices 6, depending on the movements of the closing mechanism. Similarly, the device illustrated in Figure 5 can also be used with any type of sash and operating device.

**[0044]** In the preferred, non-restricting embodiments described above, the device 1 is made of plastic but it might be made of any other suitable material.

**[0045]** The invention as described above achieves the aforementioned aims.

**[0046]** When the sash has to be transported, the device 1 is applied to the sash, which may be in either the closed or open condition, so that the operating device 6 is held securely in place and protected during transportation.

**[0047]** More specifically, the device 1 can be applied to the sash 2 quickly and easily by simply acting on the fastening elements 11 in such a way as to cause the coupling element 4 to slide against the operating device 6 of the closing mechanism.

**[0048]** Advantageously, once applied to the sash, the device does not protrude from the profile of the door or window frame like a handle would, thus making it much easier to package than a frame fitted with a handle.

**[0049]** Further, the device according to the invention as described herein has a simple structure, which makes it economical to produce and easy to apply and remove. Therefore, fitting the door or window handle can be left to last, when the door or window has already been installed.

**[0050]** It will be understood that the invention described may be useful in many industrial applications and may be modified and adapted in several ways without thereby departing from the scope of the inventive concept. Moreover, all the details of the invention may be substituted by technically equivalent elements.

## Claims

1. A device for a door or window frame sash (2), the sash (2) being equipped with an operating device (6) accessible through a slot (5) used for fitting a handle for the device (6) itself, **characterised in that** it comprises at least one coupling element (4) that can be engaged with the operating device (6) at least to keep the latter in a stable configuration, and mobile reversible fixing means (11, 23) for fastening the coupling element (4) to the sash (2) at the slot (5).

2. The device according to claim 1, **characterised in that** the reversible fixing means (11, 23) comprise elastically deformable fastening elements (24).

3. The device according to claim 1, **characterised in that** the reversible fixing means (11, 23) comprise mobile fastening elements (11) that move between a first position, where the coupling element (4) is disengaged from the sash (2), and a second position, where the coupling element (4) is engaged with the sash (2).

4. The device according to claim 3, **characterised in that** the coupling element (4) is mobile between an open position, where the operating device (6) is open, and a closed position, where the operating device (6) is closed and at least part of the mobile fastening elements (11) are associated with the coupling element (4) and move as one with the coupling element (4) between the first position and the second position.

5. The device according to claim 4, **characterised in that** the coupling element (4) is in the open position when the mobile fastening elements (11) are in the first position.

6. The device according to claim 4, **characterised in that** the coupling element (4) is in the closed position when the mobile fastening elements (11) are in the second position.

7. The device according to claim 4, **characterised in that** the coupling element (4) is in the closed position when the mobile fastening elements (11) are in the first position.

8. The device according to claim 4, **characterised in that** the coupling element (4) is in the open position when the mobile fastening elements (11) are in the second position.

9. The device according to any of the foregoing claims from 5 to 8, **characterised in that** the mobile fastening elements (11) comprise at least one first fastening element (9) attached to the coupling element (4), and at least one second fastening element (10) that moves relative to the coupling element (4).

10. The device according to claim 4, **characterised in that** it comprises actuating means (17) that act on the mobile fastening elements (11) in such a way as to move them between the first and second positions.

11. The device according to claim 10, **characterised in that** the actuating means (17) comprise a linkage mechanism (16).

12. The device according to claim 11, **characterised in that** the linkage mechanism (16) comprises a first rod (18) that is rotatably linked to the element (4) and a second rod (19) that is rotatably linked to the first rod (18), at least one of the mobile fastening elements (11) being attached to a free end of the second rod (19), the first and second rods (18, 19) forming a toggle system.

13. The device according to claim 10, **characterised in that** it comprises locking and limiting means (20) positioned and operative between the actuating means (17) and the mobile fastening elements (11) so as to keep the mobile fastening elements (11) in the second position.

14. The device according to any of the foregoing claims from 5 to 8, **characterised in that** the mobile fastening elements (11) comprise reciprocally slidable fastening elements (9, 10).

15. The device according to claim 14, **characterised in that** the reciprocally slidable fastening elements (9, 10) comprise at least one first fastening element (9) attached to the coupling element (4), and at least one second fastening element (10) attached to a body (3) for slidably supporting the coupling element (4) that protrudes from the body (3).

16. The device according to claim 15, **characterised in that** it comprises actuating means (17) positioned and operative between the body (3) and the coupling element (4) so as to move the coupling element (4) and the first fastening element (9) relative to the body (3).

17. The device according to claim 16, **characterised in that** the actuating means (17) are also designed to lock the fastening element (9) in order to hold the coupling element (4) in the engaged position within the sash (2).

18. The device according to claim 17, **characterised in that** the actuating means (17) comprise at least one pinion (13) that is rotatably associated with the body (3) and meshes with at least one rack (12) associated with the coupling element (4).

19. The device according to claim 18, **characterised in that** the actuating means (17) comprise a lever (15) associated with the pinion (13) in such a way as to turn the pinion (13) relative to the body (3), causing the coupling element (4) to slide, the lever (15) being mobile between a rest position, where the reciprocally slidable fastening elements (9, 10) are in the first position, and a working position, where the reciprocally slidable fastening elements (9, 10) are in the second position.

20. The device according to claim 19, **characterised in that** the lever (15), when it is in the working position,

is at least partly within the profile of the body (3).

**21.** The device according to any of the foregoing claims, **characterised in that** it is made of plastic.

FIG. 1

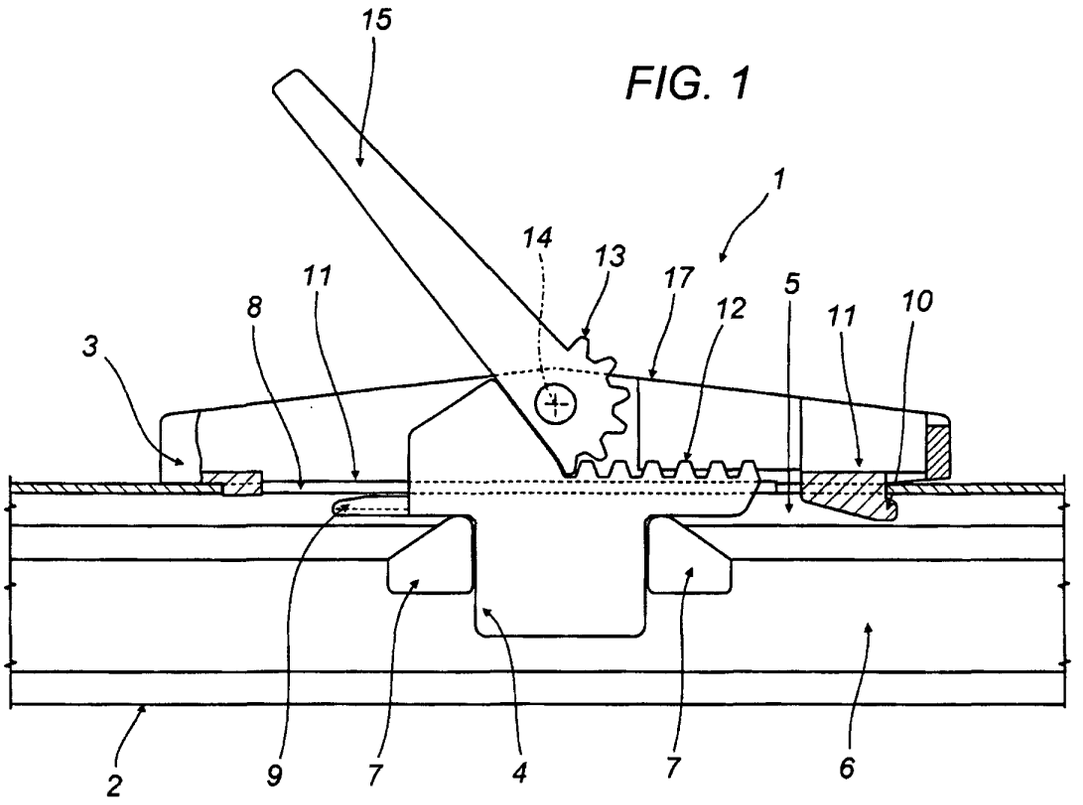

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FIG. 2

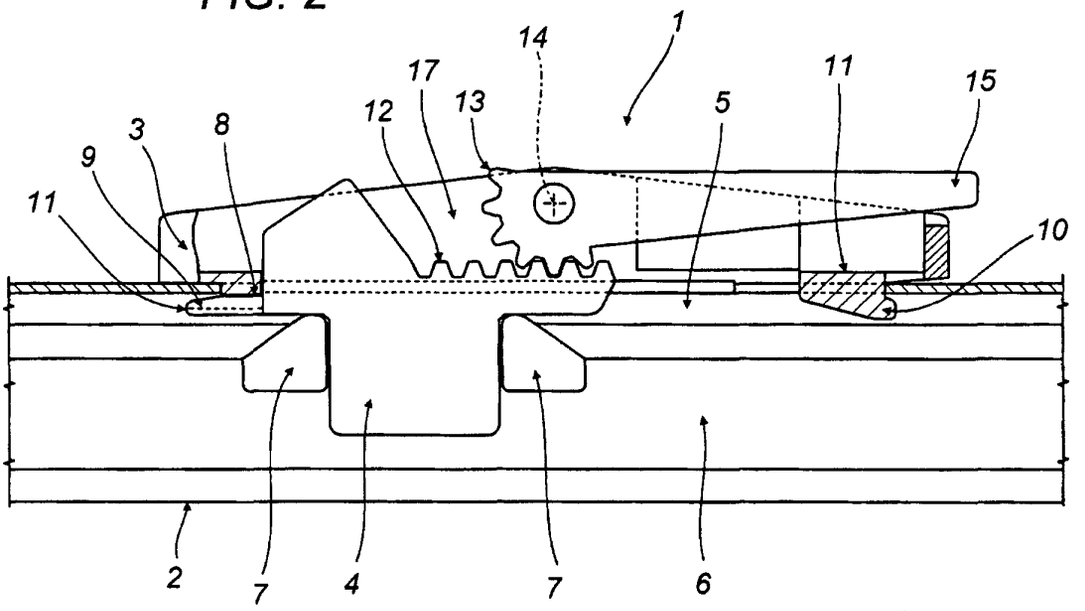
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FIG. 3

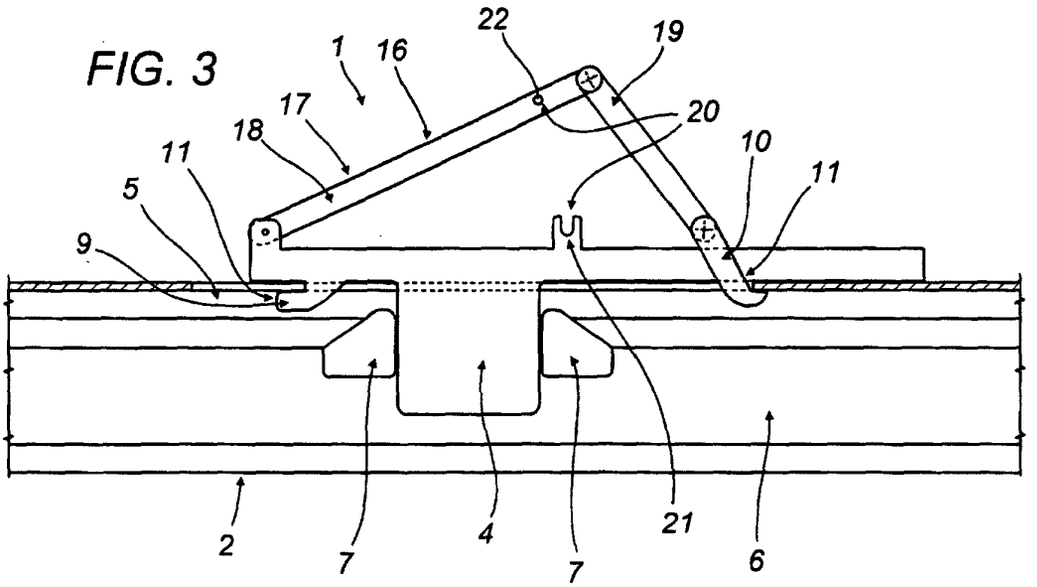


FIG. 4

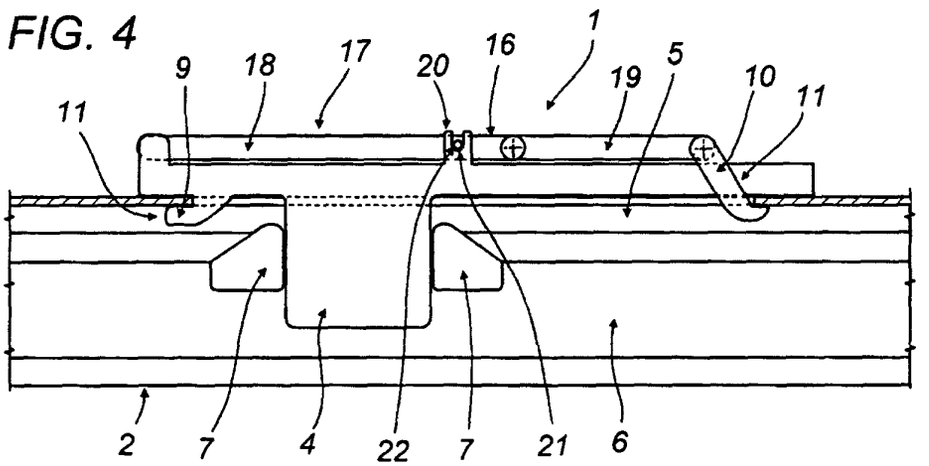


FIG. 5