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(54) **Locking device for securing a cover to a frame**

Verschlussvorrichtung für Revisionsschächte

Dispositif de fermeture de regard de visite ou d'inspection

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(56) References cited:
**EP-A- 1 059 389 DE-B- 1 273 442
FR-A- 2 424 372 US-A- 3 201 161
US-A- 5 340 232**

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Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a locking device applicable preferably to covers or gratings with hinged opening which are mounted on the frame of a drainage channel for collecting and channeling rain water or other liquids, or is likewise foreseen for housing electric wiring.

[0002] The object of the invention is a simple and robust locking device constituted essentially by a swivel handle which facilitates the operations of opening and closing in an effective manner, comprising a latch or bolt which engages in a groove or mortise defined in the frame of the channel, and also forming part of this invention is the means used to guarantee the closed position of the handle consisting essentially in a resilient plate which provides a spring effect maintaining the handle depressed and consequently the latch introduced in the groove thereby avoiding the accidental opening of the handle and consequently of the cover.

BACKGROUND OF THE INVENTION

[0003] The drainage gutters or channels located in roadways for collection of rain water or other liquids comprise a cover or grating through which the liquid penetrates and is channeled toward the channel, the gratings being usually fixed on the channel by means of screws.

[0004] When the grating is disassembled, it is firstly necessary to unscrew the screws and next lift the grating up and extract it manually, resulting in an excessively tedious operation as a consequence of the difficulties that arise from unscrewing screws usually affected by corrosion and from the excessive weight of the grating.

[0005] In another alternative solution to the employment of screws, mention is made of the French patent FR 1599317 which discloses a grating with extraction handles which extends underneath in bolts which once rotated disengage from the frame of the channel. Once the handles have been disengaged, if it is intended to gain access to the interior of the channel it will be necessary to proceed to the total extraction of the grating with the inconveniences which this operation involves, particularly for the excessive weight of the said grating.

[0006] With the object of facilitating the manipulation and closing of pipe gratings, the applicant of the present invention has developed a drainage channel with a hinged grating or cover, which constitutes the object of the European Application EP 98941430.5 and which resolves the aforementioned problem satisfactorily facilitating in a simple manner the assembly and removal of the grating. Contrary to other systems, it provides the possibility of being hinged between the horizontal closed position and an open position of approximately 135° guaranteeing accessibility to the interior thereof, as well as incorporating means of closing consisting essentially

of an horizontal pin or bolt which is inserted in a hole defined in the frame of the channel. A locking device according to the preamble of claim 1 is disclosed in US-A-3 201 161.

[0007] The frame of the channel has a stepped configuration with a wing projected inwardly which together with a hinge stop define a space through which the axle of the hinge of the grating is introduced, which can only be extracted or inserted in the frame of the channel when the grating is positioned vertically upward. For any other orientation of the grating between the closed horizontal position and the position of maximum opening at 135° the hinge of the grating cannot be extracted from the frame.

[0008] Moreover it has to be pointed out that this type of hinged gratings incorporates in some cases locking devices which are not suitable for all applications, since for example when they are set in airports, the extra pressures produced in their surroundings by aircraft turbines can cause the undesired opening of the locking device and therefore the detachment of the gratings from the channel.

[0009] The development of a locking device mechanism, of special application for hinged gratings which assures reliably the closed position of the grating with respect to the channel is made feasible by the invention which is disclosed below.

DESCRIPTION OF THE INVENTION

[0010] The locking device for securing a cover to a frame which constitutes the object of the present invention facilitates in a simple and effective manner the engagement between the cover or grating and the frame of a drainage channel in the closed position, by means of incorporating in the grating a swivel handle which has a lower latch or bolt which engages in a groove or mortise provided in the frame of the channel, with the special particularity of incorporating an a resilient angular plate fixed to the grating by a vertical wing and placed over the handle to avoid the accidental disengagement of the handle and assuring the closed position.

[0011] The drainage is of the type comprising a back frame intended to receive the hinge of the grating which will swivel around this, and a front frame provided with a groove or mortise in which the latch of the handle is inserted in its closed position.

[0012] The handle is configured by means of a body of elongated general configuration which is placed in a housing provided in the upper surface of the grating, said housing comprising a rear transversal recess in which are supported corresponding lateral projections which extend from the front end of the body of the handle, and also the handle comprises in its middle sector, corresponding protuberances which extend to both sides and which together with the lateral projections constitute the surface supporting the handle on the housing of the grating in its closed position, with its lower latch inserted in

the groove defined in the frame of the channel.

[0013] For the purpose of assuring the closure of the handle, the latter comprises a resilient angular plate which produces an spring effect, the vertical wing of which fits in a slot, which is extended underneath from the base of the rear transversal recess described above.

[0014] From the vertical wing of the plate, an horizontal wing extends over the body of the handle preventing the swivelling of the handle and therefore the latch from disengaging out of the groove of the frame avoiding its accidental opening.

[0015] When it is intended to open the grating, the handle must therefore be pushed upward by its foremost end endeavouring to overcome the resistance presented by the horizontal wing off the plate until the disengagement of the groove is achieved, so that once the latch is released from the groove of the frame, it will allow the grating to swivel.

DESCRIPTION OF THE DRAWINGS

[0016] To complete the description that is being made and for the purpose of assisting in a better understanding of the characteristics of the invention, in accordance with a preferred example of practical embodiment of the same, said description is accompanied, as an integral part thereof, with a set of drawings which illustrates in a no limitative form the following:

Figure 1 shows a perspective view of the drainage channel and grating in which the location of the handle is shown.

Figure 2 shows a perspective view of the grating with the closing handle and the securing resilient plate, in the closed position.

Figure 3 shows a sectional view of the grating in the closed position showing the locking device constituted by the handle and the latch thereof inserted in the groove defined in the frame of the channel, and also the plate is shown.

Figure 4 shows a perspective view of the grating with the handle pushing against the plate during the opening of the handle.

Figure 5 shows a plan view of the grating which shows the handle without the resilient plate, the lateral projections of the handle being appreciated in detail housed in the recess defined in the surface of the grating, as well as the slot provided in the recess for the insertion of the vertical wing of the plate not shown.

Figure 6 shows a perspective view of the handle.

Figure 7 shows a perspective view of the resilient

plate.

PREFERRED EMBODIMENT OF THE INVENTION

[0017] As shown In the figures the locking device is of preferred application for covers or gratings (1) with hinged opening which swivel with respect to a rear frame (2) which delimits above next to a front frame (3) a drainage channel (4) to conduct water or also foreseen to house electric wiring.

[0018] The locking device consists in a handle (5) of elongated body, located in a housing (8) defined in the grating (1), comprising a lower latch (6) which engages in a groove (7) provided in the front frame (3) of the channel (4), and also it comprises an resilient angular plate (9) fixed by a vertical wing (15) to the grating (1) and from which projects a horizontal wing (10) which extends over the handle (5) which prevents the undesired opening of the handle (5) presenting a resistance to the lifting of the handle (5) during the disengagement of the latch (6) from the groove (7) for subsequent opening of the grating (1).

[0019] The handle (5) incorporates two lateral projections (11) on its frontal end which engage in a rear transversal recess (12) defined in one end of the housing (8) of the grating (1), and also it comprises protuberances (13) on both sides of the body in its middle area, which protuberances (13) rest on the walls of the housing (8) in their horizontal closed position.

[0020] In the aforementioned rear recess (12) of the housing (8) of the grating (1), is provided an slot (14) which is prolonged underneath the base of the recess (12) in correspondence with the front wall which delimits said recess (12), for housing the vertical wing (15) of the resilient plate (9).

[0021] The handle (5) moreover shows a rear projection (17), from which the inferior surface of the body is prolonged, curved in order to facilitate the insertion of a finger for the purpose of lifting the handle (5).

[0022] The horizontal wing (10) of the resilient plate (9) comprises an slightly upwardly inclined rim (16) for the purpose of facilitating the progressive inclination of the handle (5) in contact with the resilient plate (9) during the swivelling movement corresponding to the opening operation.

[0023] Also the resilient plate (9) incorporates in its vertical wing (15) individual holes (18) intended to receive mounting means (19) for the fixing to the grating (1).

Claims

1. Locking device for securing a cover to a frame of preferred application for covers or gratings (1) with hinged opening which swivel with respect to a rear frame (2) which delimits above next to a front frame (3) a drainage channel (4), comprising a handle (5) of elongated body, located in a housing (8) provided in the grating (1), said handle presenting a lower latch

(6) such as to engage in a groove (7) of the front frame (3) of the channel (4), **characterized in that** it also comprises a resilient angular plate (9) fixed by a first, vertical wing (15) to the grating (1) and from which projects a second, horizontal wing (10) which extends in an upper and slightly separated arrangement over the handle (5), thus preventing accidental opening of the handle (5) by presenting a resistance to the lifting of the handle (5) during the disengagement of the lower latch (6) from the groove (7) for subsequent opening of the grating (1).

2. Locking device for securing a cover to a frame according to claim 1 **characterised in that** the handle (5) incorporates two lateral projections (11) in its front end which engage in a rear transversal recess (12) of the housing (8) of the grating (1), and also comprising on both sides of the elongate body in its middle area protuberances (13) which rest on the walls of the housing (8) in its horizontal closed position.
3. Locking device for securing a cover to a frame according to any of the previous claims **characterised in that** the housing of the grating has a rear recess (12) comprising a slot (14) prolonged underneath the base of the recess and in correspondence with its front wall, said recess (14) constituting the housing for the vertical wing of the resilient plate (9).
4. Locking device for securing a cover to a frame according to the preceeding claims, **characterised in that** the handle (5) comprises a curved rear projection (17) from which the lower surface of the body of the handle is prolonged, in order to facilitate the insertion of a finger for the purpose of lifting the handle (5).
5. Locking device for securing a cover to a frame according to the preceeding claims, **characterised in that** the resilient plate (9) comprises, on its first, horizontal wing (10), a slightly upwardly inclined rim (16) for the purpose of facilitating the progressive inclination of the handle (5) in contact with the plate (9) during the swivelling movement corresponding to an opening operation.
6. Locking device for securing a cover to a frame according to the preceeding claims, **characterised in that** the resilient plate (9) incorporates in its vertical wing (15) individual holes (18) intended to receive fixing means (19) for fixing to the grating (1).

Patentansprüche

1. Verschlussvorrichtung für Revisionsschächte der bevorzugten Anwendung für Deckel oder Gitter (1) mit Scharnieröffnung, die sich am hinteren Gehäuse

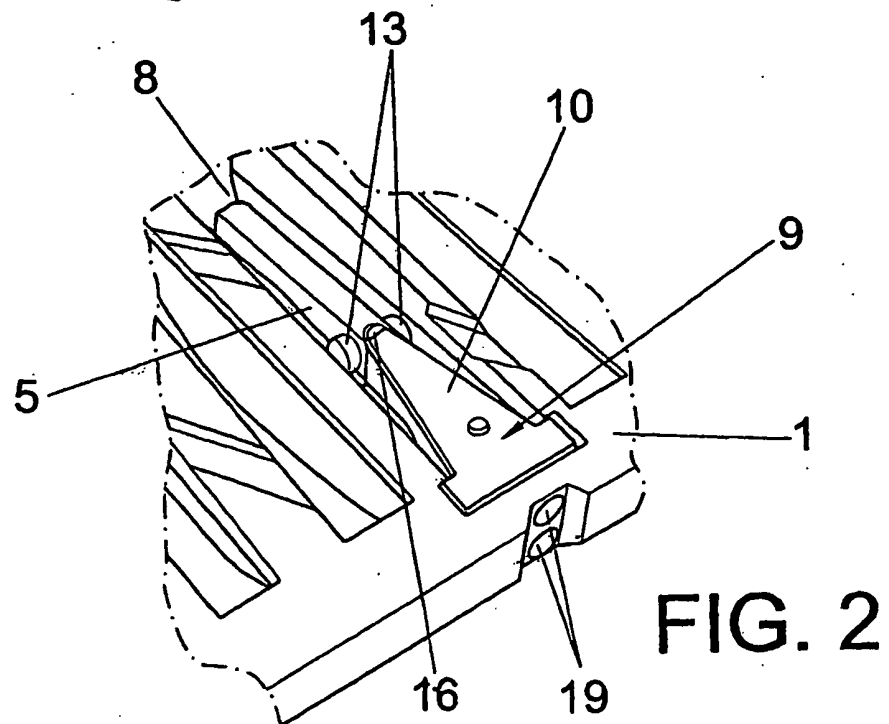
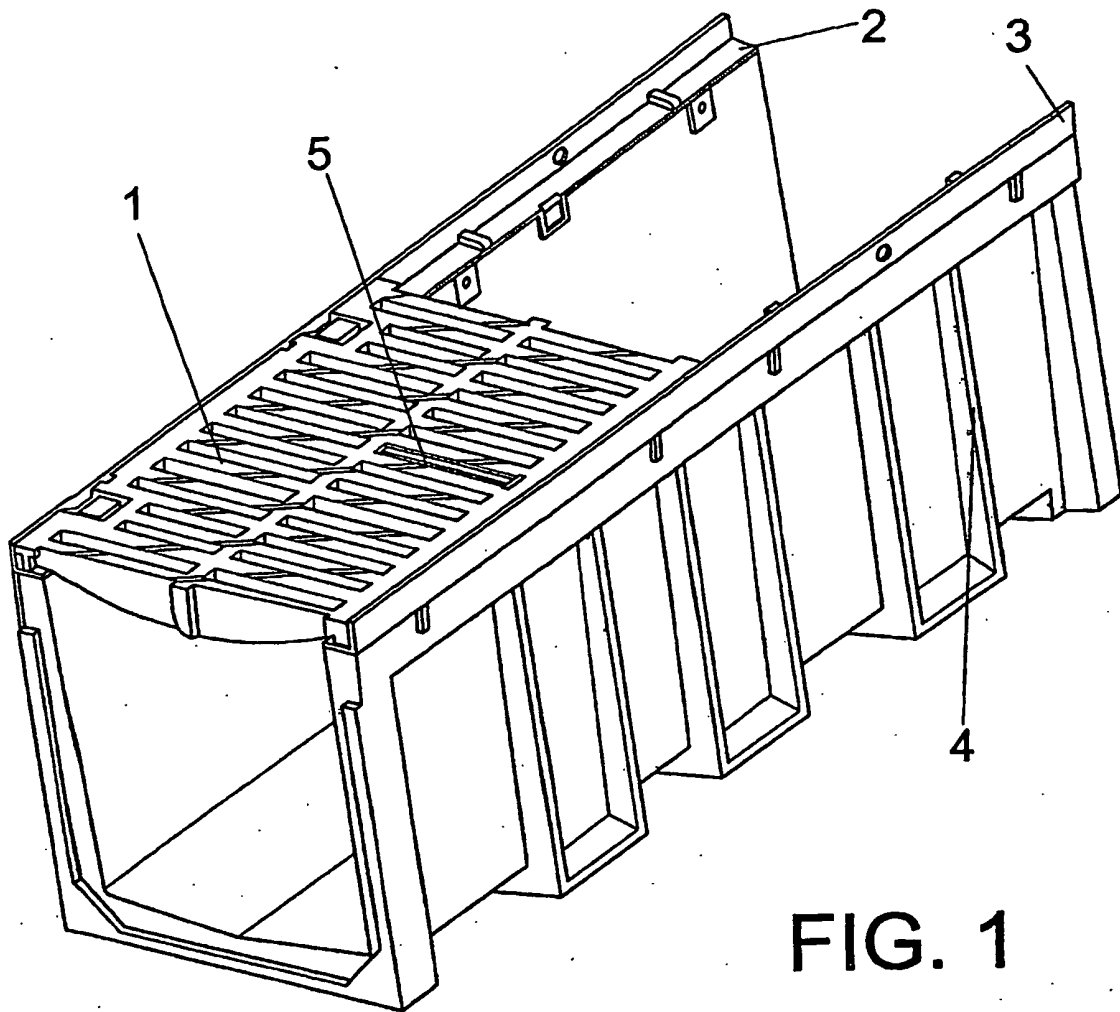
(2) drehen, das das vordere Gehäuse (3) von einem Abflusskanal (4) abgrenzt und einen Griff (5) aus einem längeren Körper beinhaltet, der in einem Gehäuse (8) sitzt, welches in dem Gitter (1) angebracht ist. Der genannte Griff hat einen unteren Riegel (6) der in eine Vertiefung (7) des vorderen Gehäuses (3) des Kanals (4) einrastet, der wiederum eine eckige Widerstandsplatte (9) beinhaltet, die durch einen ersten senkrechten Flügel (15) am Gitter (1) befestigt ist und von dem ein zweiter waagerechter Flügel (10) ausgeht, der in einer höheren und separaten Einrichtung über dem Griff (5) endet und somit das unbeabsichtigte Öffnen des Griffes (5) durch den Widerstand beim Anheben des Griffes (5) während des LöSENS des unteren Riegels (6) aus der Vertiefung (7) zum Öffnen des Gitters (1) verhindert.

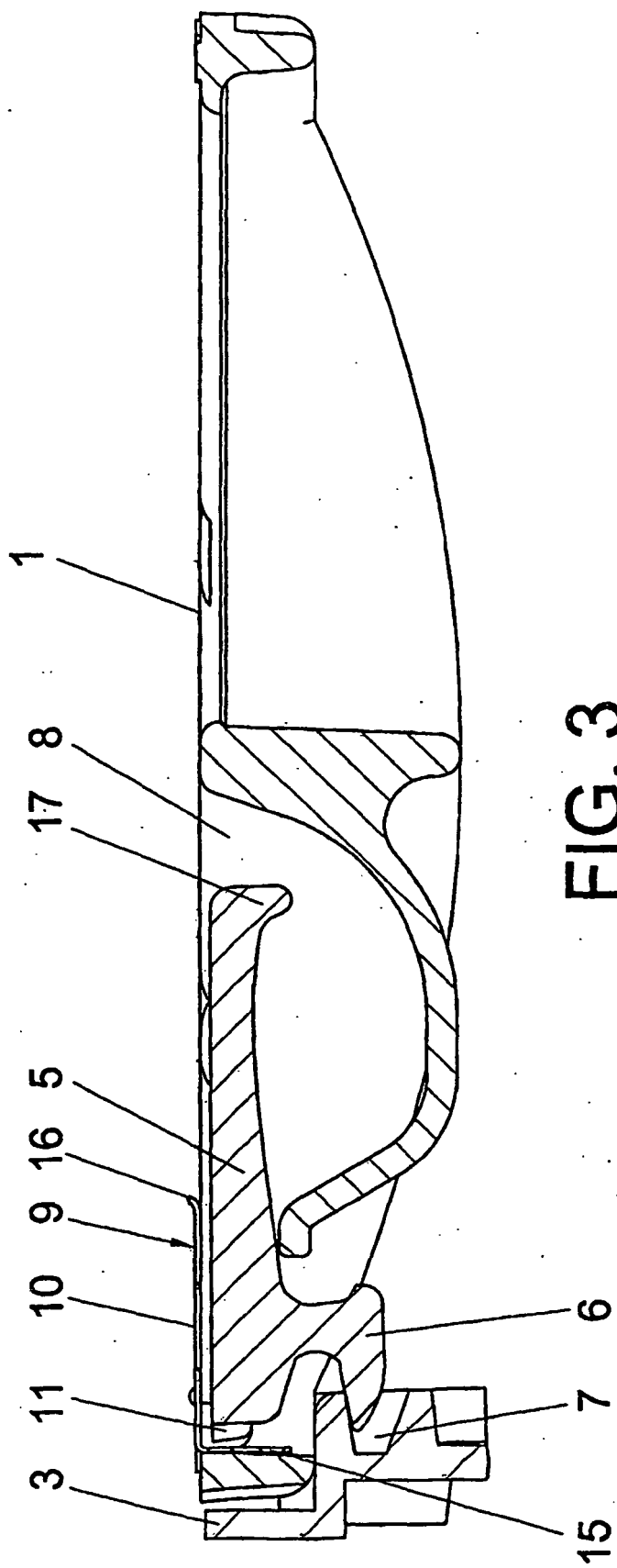
2. Verschlussvorrichtung für Revisionsschächte entsprechend dem Anspruch 1, der darin besteht, dass der Griff (5) zwei seitliche Überstände (11) am vorderen Ende beinhaltet, die in eine hintere Quervertiefung (12) des Gehäuses (8) des Gitterständers (1) einrasten und an beiden Seiten des langen Körpers in dessen mittleren Bereich Verdickungen (13) aufweisen, die an den Gehäusewänden (8) in waagerechter geschlossener Position bleiben.
3. Verschlussvorrichtung für Revisionsschächte entsprechend den vorherigen Ansprüchen die darin bestehen, dass das Gehäuse des Gitters eine Vertiefung (12) mit einem Schlitz (14) besitzt, der unter dem Boden der Vertiefung und entsprechend der Vorderwand verlängert ist, die genannte Vertiefung (14) bildet das Gehäuse für den senkrechten Flügel der Widerstandsplatte (9).
4. Verschlussvorrichtung für Revisionsschächte entsprechend der vorhergehenden Ansprüche, die darin bestehen, dass der Griff (5) eine gekrümmte hintere Ausdehnung (17) besitzt, von der aus die Unterfläche des Körpers verlängert ist, um das Einführen eines Fingers zum Anheben des Griffes (5) zu erleichtern.
5. Verschlussvorrichtung für Revisionsschächte entsprechend der vorhergehenden Ansprüche, die darin bestehen, dass die Widerstandsplatte (9) auf dem ersten waagerechten Flügel (10) eine leicht nach oben geneigte Fassung besitzt, um die zunehmende Neigung des Griffes (5) zu ermöglichen, und die während des Drehmoments der Öffnung mit der Widerstandsplatte (9) in Kontakt kommt.
6. Verschlussvorrichtung für Revisionsschächte entsprechend der vorhergehenden Ansprüche, die darin bestehen, dass die Widerstandsplatte (9) auf dem ersten senkrechten Flügel (15) einzelne Löcher (18) beinhaltet, die der Aufnahme von Halterungsvorrich-

tungen (19) zur Befestigung des Gitters (1) dienen.

Revendications

1. Dispositif de fermeture pour fixer un couvercle à un cadre, de préférence pour des couvercles ou des grilles (1) dotés d'une ouverture à charnière qui pivote par rapport à un cadre arrière (2) qui délimite sur le dessus, à côté d'un cadre avant (3), un canal de drainage (4), comprenant une poignée (5) à corps allongé, disposée dans un logement (8) situé dans la grille (1), la poignée présentant un loquet inférieur (6) pouvant s'engager dans une rainure (7) du cadre avant (3) du canal (4),
caractérisé en ce qu'
il comprend également une plaque angulaire élastique (9) fixée par une première aile verticale (15) à la grille (1) et à partir de laquelle part une seconde aile horizontale (10) qui s'étend dans un plan supérieur légèrement séparé au-dessus de la poignée (5), afin d'empêcher une ouverture accidentelle de la poignée (5) en présentant une résistance au levage de la poignée (5) pendant le désengagement du loquet inférieur (6) hors de la rainure (7) destiné à ouvrir ensuite la grille (1).
2. Dispositif de fermeture pour fixer un couvercle à un cadre selon la revendication 1,
caractérisé en ce que
la poignée (5) comprend deux saillies latérales (11) à son extrémité avant, qui s'engagent dans un évidement transversal arrière (12) du logement (8) de la grille (1), et comprend également sur les deux côtés du corps allongé, dans sa zone médiane, des bossages (13) qui reposent sur les parois du logement (8) dans sa position fermée horizontale.
3. Dispositif de fermeture pour fixer un couvercle à un cadre selon l'une des revendications précédentes,
caractérisé en ce que
le logement de la grille possède un évidement arrière (12) comprenant une fente (14) qui se prolonge sous la base de l'évidement et en correspondance avec sa paroi avant, l'évidement (14) constituant le logement pour l'aile verticale de la plaque élastique (9).
4. Dispositif de fermeture pour fixer un couvercle à un cadre selon l'une des revendications précédentes,
caractérisé en ce que
la poignée (5) comprend un prolongement arrière courbé (17) à partir duquel la surface inférieure du corps de la poignée, se prolonge pour faciliter l'insertion d'un doigt pour ouvrir la poignée (5).
5. Dispositif de fermeture pour fixer un couvercle à un cadre selon l'une des revendications précédentes,
caractérisé en ce que
6. Dispositif de fermeture pour fixer un couvercle à un cadre selon l'une des revendications précédentes,
caractérisé en ce que
la plaque élastique (9) comprend dans son aile verticale (15) des orifices individuels (18) servant à recevoir des moyens de fixation (19) pour la fixation de la grille (1).





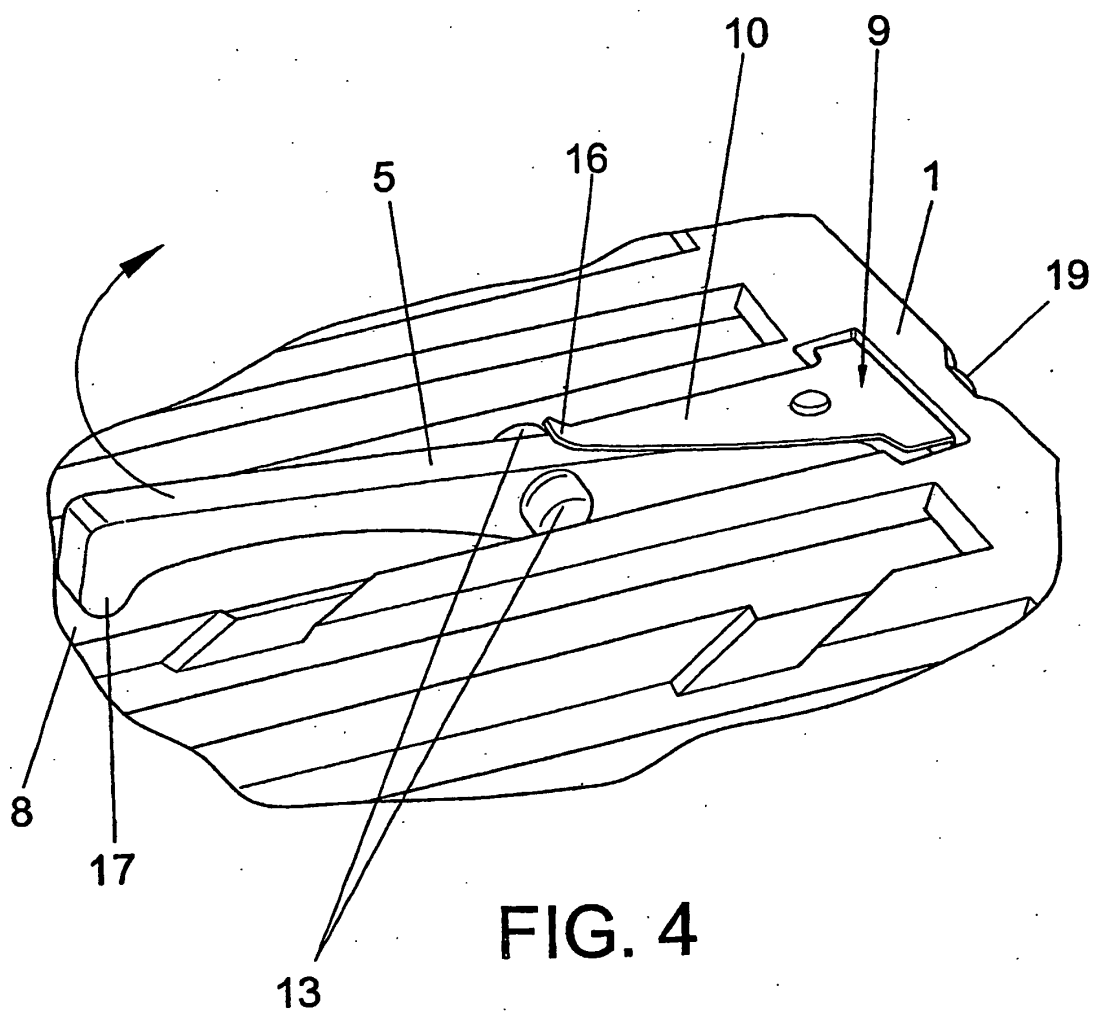


FIG. 4

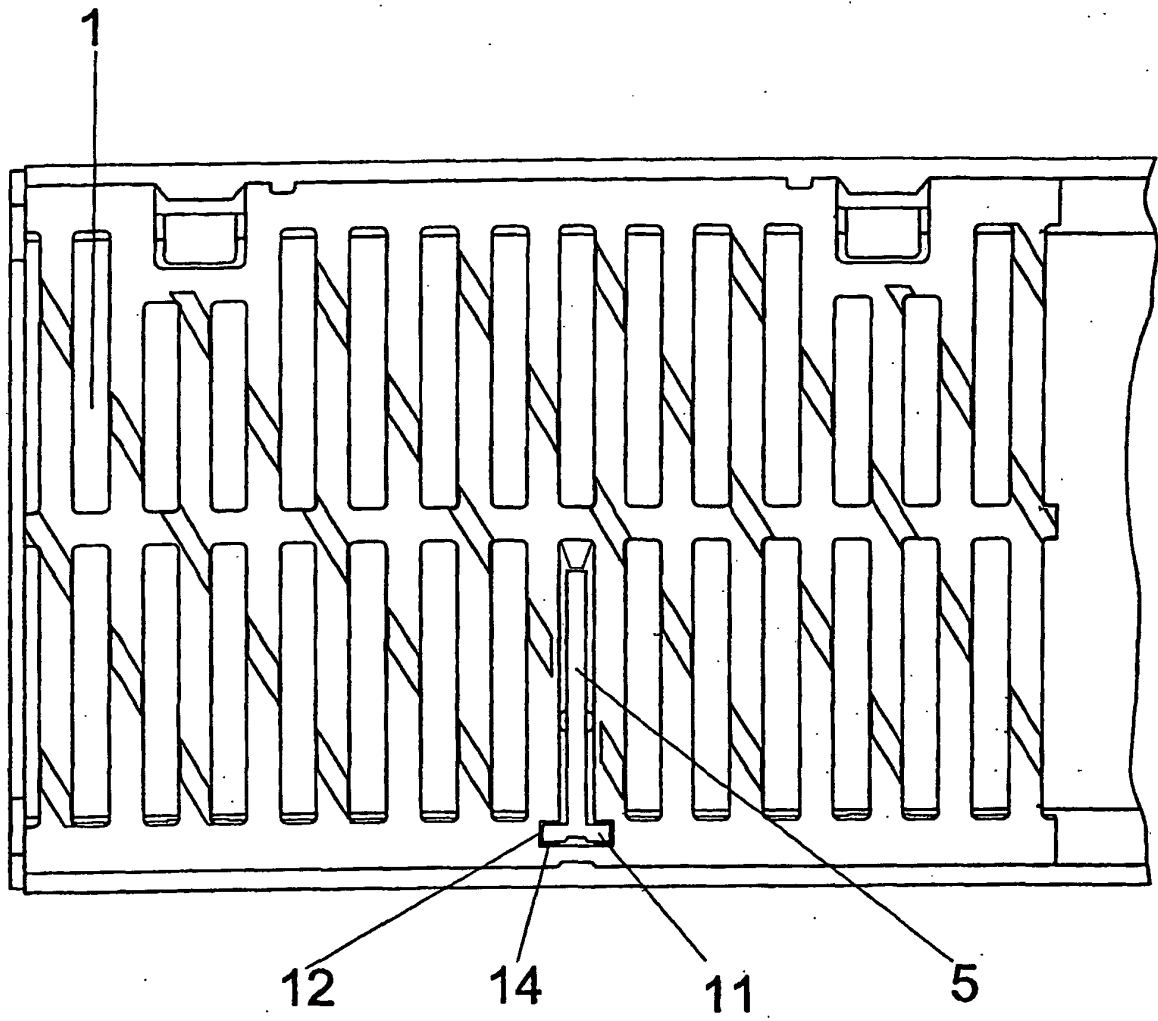


FIG. 5

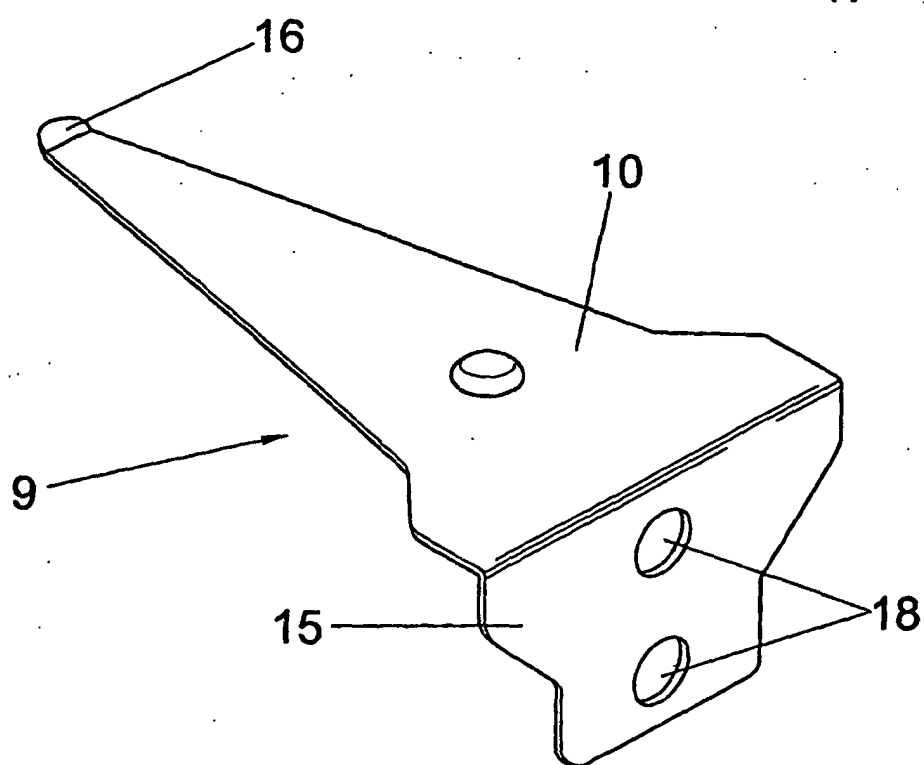
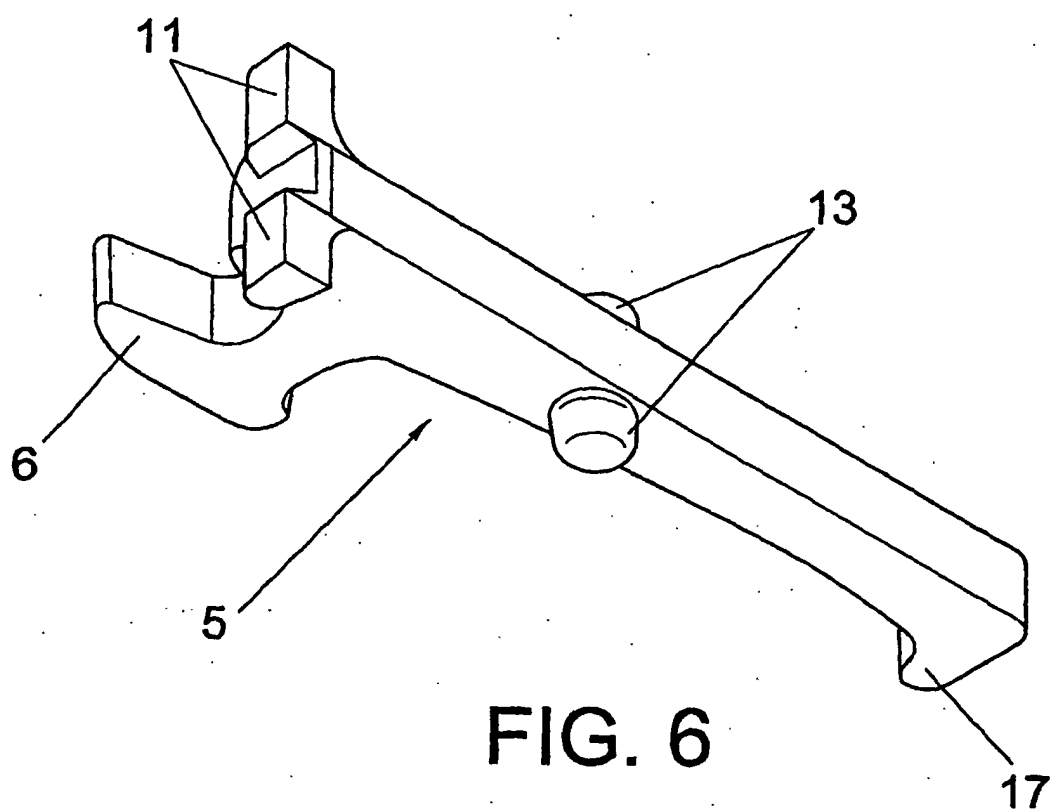


FIG. 7