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(54) **Locking device for shutters**

(57) A shutter locking device comprising a bar (22) hinged to a wing (4) of the shutter and movable between a configuration in which its ends engage in a first hook element (38) rigid with said wing and in a second hook element coplanar with said first element, and a configuration in which said first and second hook elements are disengaged.

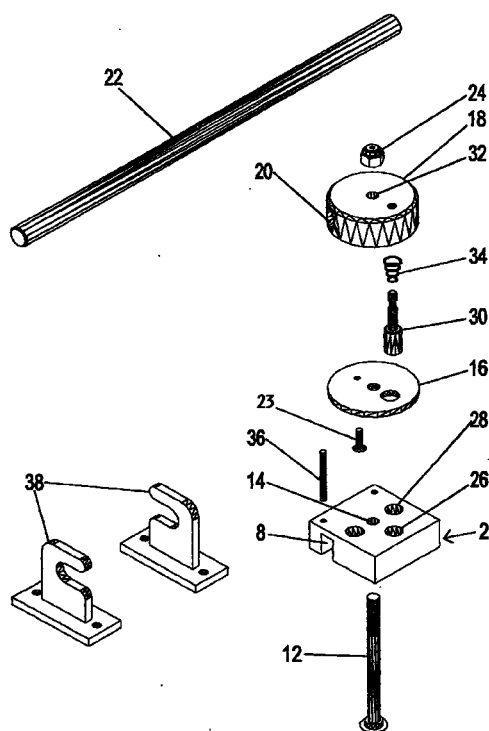


Fig. 1

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Description

[0001] This invention relates to a locking device for shutters.

[0002] The housebreaking method most widely used for forcing shutters is to insert a tool such as a large screwdriver, a crowbar or a flat metal bar between the shutter wings and use this as a lever to force them apart.

[0003] Currently known fastening devices are essentially of three types. A first device, known as an espagnolette, consists of a vertical metal shaft hinged to the free edge of one wing and rotated by operating a metal bar hinged on a horizontal axis to a support fixed to the shaft. The shaft is provided at its ends with two appendices which as a result of its rotation engage corresponding pins projecting from the battens of the shutter, to remain stabilized in this configuration by engaging the bar in a corresponding fork provided on the other wing of the shutter. This device, which is easy to use and assemble, has however very low resistance to tampering, and deforms very easily.

[0004] Another fastening device, known as a cross-bar, consists of a steel bar of rectangular cross-section provided with handles and insertable in support hooks applied to that surface of the shutter wings which faces the interior of the room.

[0005] This system which has proved very robust and offers considerable resistance to tampering, has however the drawback of laborious fastening and unfastening due to the position of the bar, which could slip from the users hands and fall, with danger for persons standing below.

[0006] A third device, known as a latch, consists of a substantially L-shaped bar which slides within rings fixed to one of the wings, to engage in another ring provided on the other wing in a position coaxial to the preceding.

[0007] Said device, which is very simple, robust and easy to use, has a small-dimension bar for reasons of appearance, with the drawback that this can be deformed relatively easily.

[0008] An object of the invention is to eliminate the drawbacks jointly and/or separately present in known devices while providing a device which is easy to assemble and is of low cost.

[0009] A further object of the invention is to provide a locking device which can be used in addition to traditional fastening devices.

[0010] A further object of the invention is to provide a locking device which is of pleasant outer appearance.

[0011] These and further objects which will be apparent from the ensuing description are attained according to the invention by a locking device in accordance with claim 1.

[0012] Some embodiments of the invention are described in detail hereinafter with reference to the accompanying drawings, on which:

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figures 8 and 9

Figure 10

is an exploded perspective view of the locking device of the invention, shows it applied to a shutter, in its configuration prior to shutter fastening, shows an enlarged detail of Figure 2, shows it engaged with the shutter wings, shows it in enlarged detail, shows an embodiment of the invention for application to a louvre shutter, shows it applied to the louvre shutter, show two different engagement systems for use with a single-wing shutter, and shows the device provided with an accessory enabling the wings to be maintained in a semi-open state.

[0013] As can be seen from the figures, the locking device of the invention comprises substantially a parallelepiped block 2 to be fitted to the inner surface of one of the wings 4 of the shutter 6, and comprising a slot 8 for housing the vertical rod 10 of an espagnolette fastening device.

[0014] The block 2 is fixed to the wing 4 by a bolt 12, which passes through a central hole 14 in the block, then through an antifriction disc 16 and a second disc 18 of suitable thickness provided with a non-diametrical hole 20 through which a bar 22 of circular cross-section is inserted and is secured thereto by a screw 23. A self-locking nut 24 engaging the bolt 12 provides stable fixing of the block 2 to the wing 4.

[0015] The block 2 comprises a hole 26 and two diametrical holes 28 for selective engagement by a pin 30 which also engages a corresponding hole 32 provided in the disc 18. In the absence of external force, a spiral spring 34 coaxial to the pin 30 maintains one end of this latter inserted into one of the holes 26, 28 facing it.

[0016] Finally, a peg 36 forming a limit stop for the bar 22, as explained hereinafter, is applied to the inward-facing surface of the block 2.

[0017] The invention also comprises two hook elements 28 which are mounted on the two wings with their recesses facing opposite directions.

[0018] The device of the invention operates in the following manner.

[0019] The block 2 is fixed to the shutter wing 4 by the bolt 12, then with the shutter open one end of the pin 30 is inserted into one of the two diametrical holes 28 in the block 2, its other end emerging from the hole 32, with the bar 22 lying substantially vertical (see Figures 2 and 3).

[0020] When the shutter is to be fastened the user

grips that end of the pin emerging from the disc 18, then pulls it to overcome the elastic reaction of the spring 34 and disengage the other end of the pin 30 from the hole 28 in order to be able to rotate the disc 18 and hence the bar 22 about the block 2 and engage its ends in the recesses of the hook elements 38. The user then releases the pin 30 which, urged by the elastic reaction of the spring 34, engages in the hole 26 to ensure a stable configuration of the disc 18 and consequent stable engagement of the bar 22 in the appendices 38 (see Figures 4 and 5).

[0021] To open the shutter, the operations involved are the reverse of the preceding, to move the bar into a vertical position.

[0022] From the foregoing it is apparent that the device of the invention has numerous advantages, and in particular:

- it offers considerable security by virtue of its robustness,
- it is of low cost because of the simplicity of its component parts,
- it can be applied to existing fastening systems.

[0023] In the embodiment shown in Figure 6, the block 2 is rigid with a bracket 40 bent at 90°C at one end to form one of the hook element 38. This embodiment is advantageous for louvre or slat type shutters in which there is a certain difficulty in fixing the hook elements 38.

[0024] The embodiments shown in Figures 8 and 9 show the device for use on single-wing windows in which one of the hook elements 38 can be fixed to one of the shutter uprights.

[0025] In the embodiment shown in Figure 10, to one end of the bar 22 there is applied a slider 42 comprising a further hole 44 to be engaged on the appendix of the hook element 38. This embodiment enables the wings to be maintained in a partially open position.

Claims

1. A shutter locking device comprising a bar (22) hinged to a wing (4) of the shutter and movable between a configuration in which its ends engage in a first hook element (38) rigid with said wing and in a second hook element coplanar with said first element, and a configuration in which said first and second hook elements are disengaged.
2. A device as claimed in claim 1, characterised in that said bar (22) is rigid with a substantially cylindrical member (18) hinged to a wing of the shutter, said member being pivoted to said wing on a pin (12) which passes through both of these latter, the ends of the bar engaging in two U-shaped elements (38) arranged substantially horizontally with their cavities facing opposite directions.

3. A locking device as claimed in claim 1, characterised in that said bar (22) is housed in a disc member (18) rotatable on a block (2) fixed to a wing of the shutter, a pin (30) engaging said disc member and also engaging the block in one of two holes (26, 28) located 90° apart with respect to the centre of the block, this engagement defining the end position configurations of said bar.

4. A device as claimed in claim 3, characterised in that said pin (30) is elastically urged by a spring (34) to engage in at least one of the two holes provided in the block.

5. A device as claimed in claim 1, characterised in that the block (2) comprises a pin (36) forming a limit stop when rotating the bar into the configuration in which it engages the hook-elements (38).

6. A device as claimed in claim 1, characterised in that to one end of the bar there is applied a slider (42) provided with a hole (44) for engagement with the hook elements (38).

7. A device as claimed in claim 1, characterised in that said hook elements (38) are rigid with the shutter wings.

8. A device as claimed in claim 1, characterised in that said hook elements (38) are rigid with the shutter uprights.

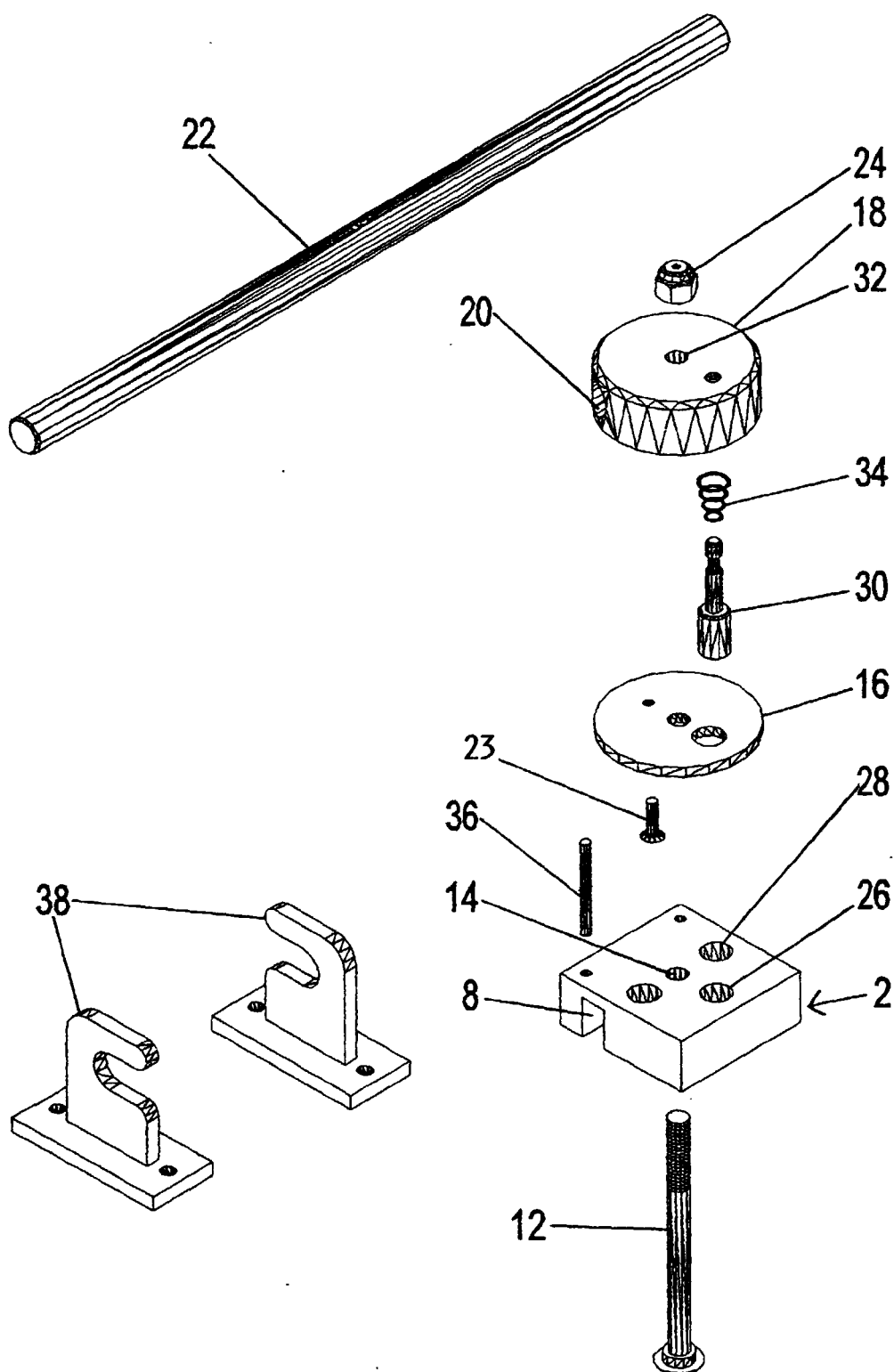


Fig. 1

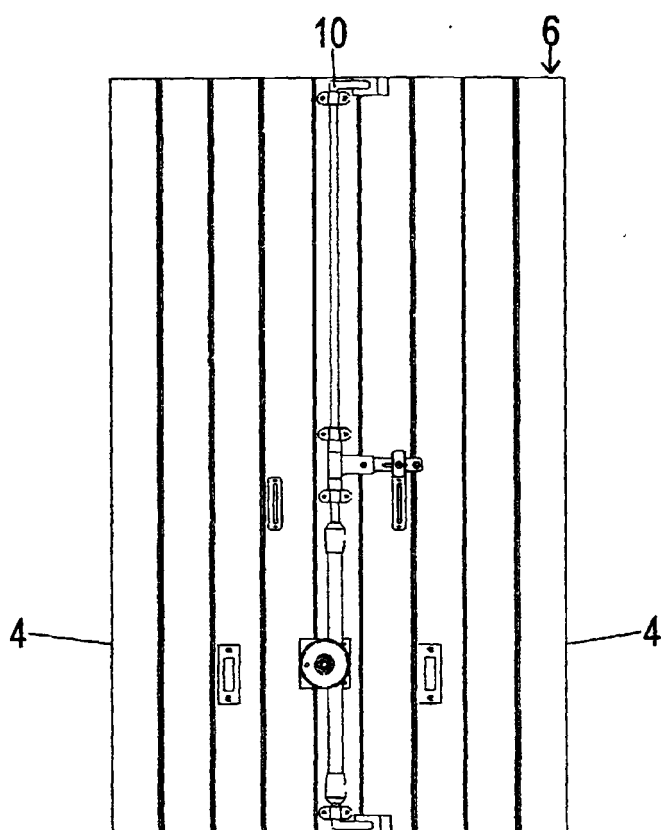


Fig. 2

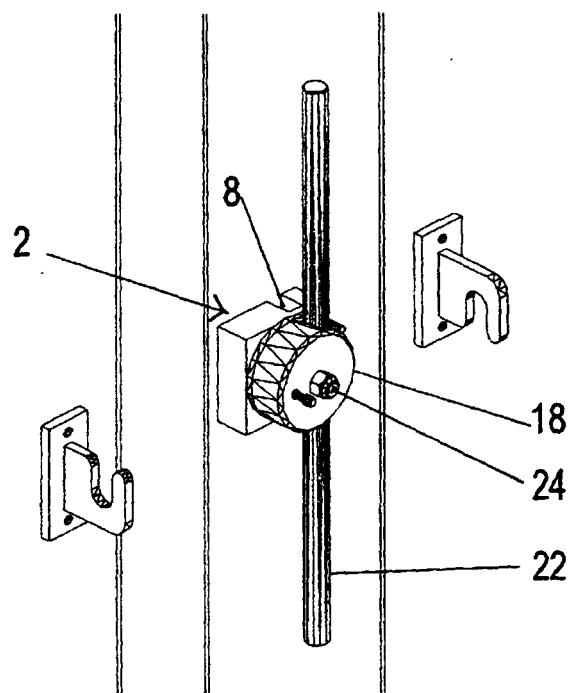


Fig. 3

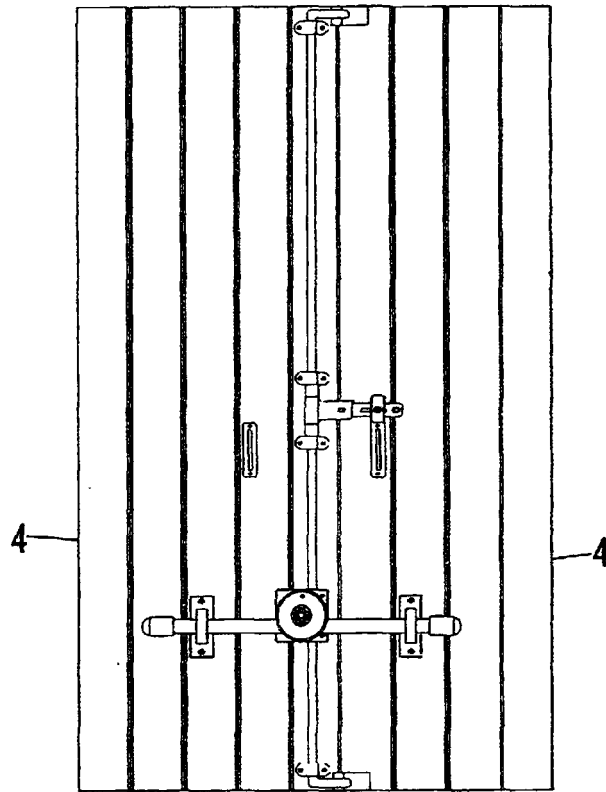


Fig. 4

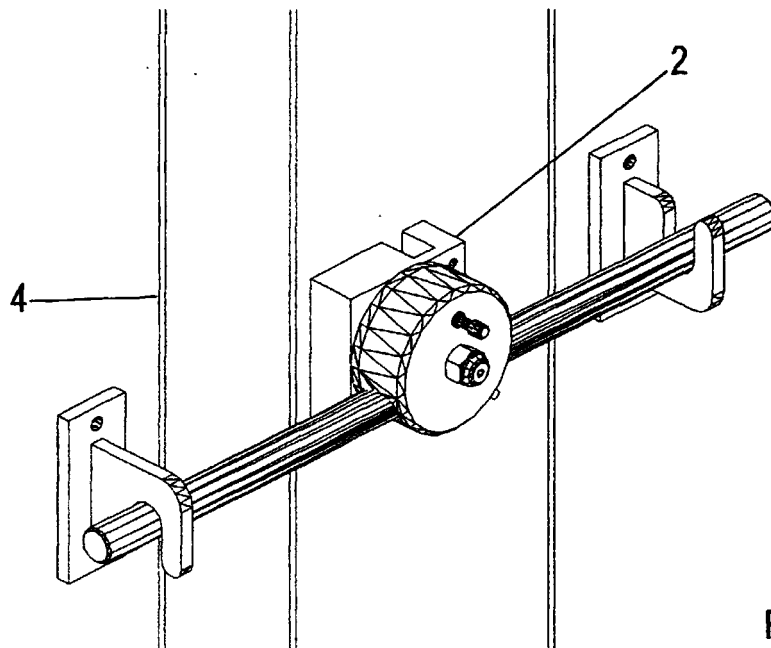
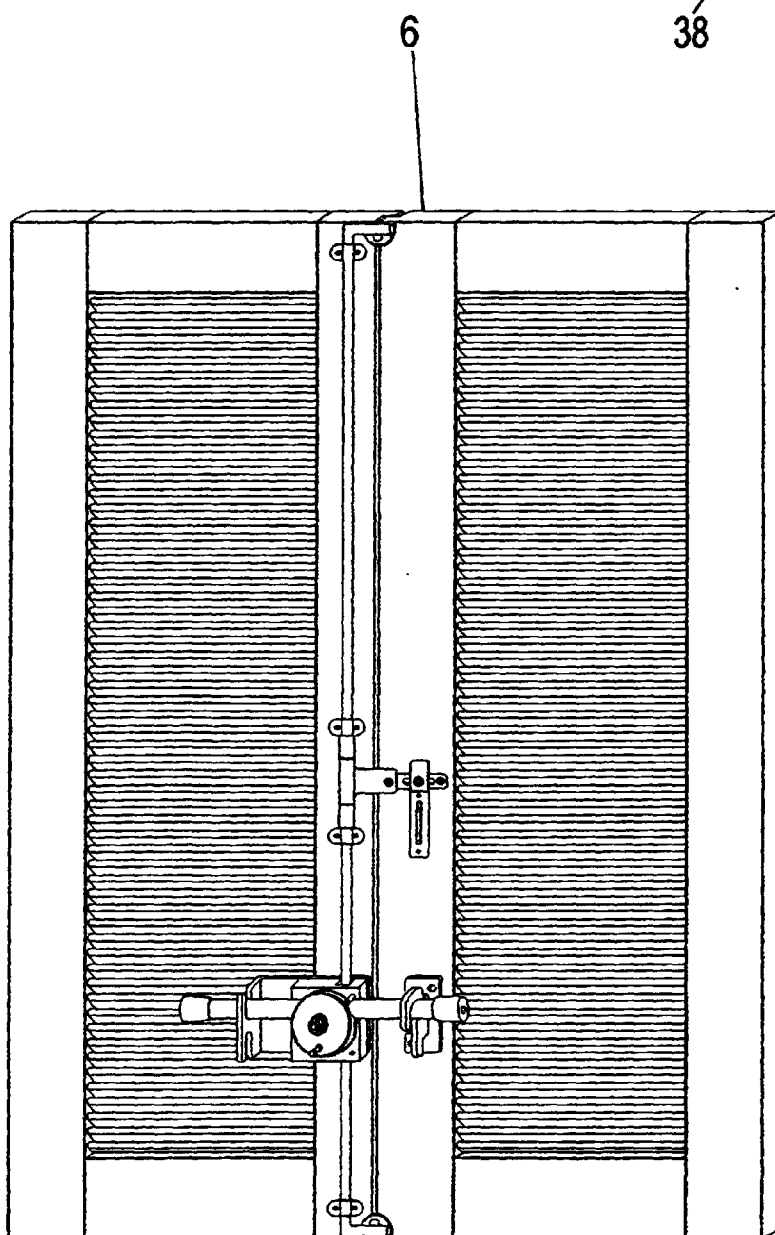
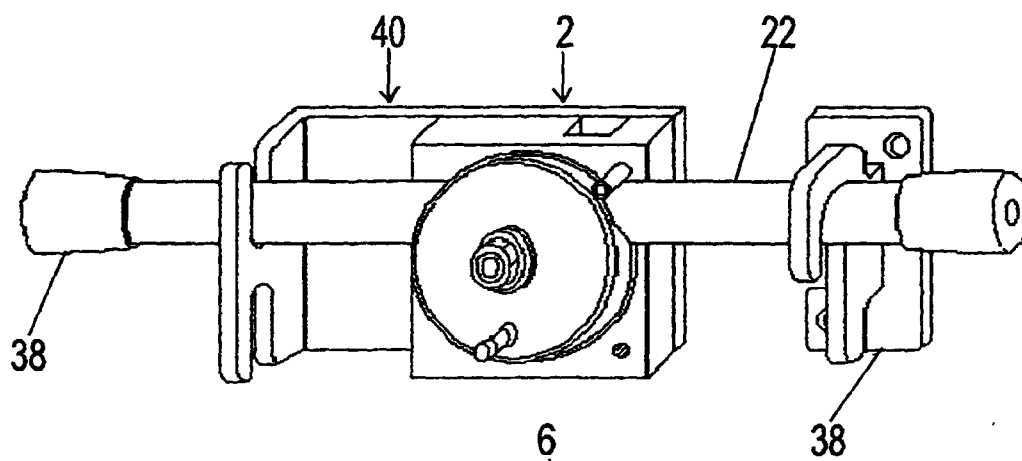


Fig. 5



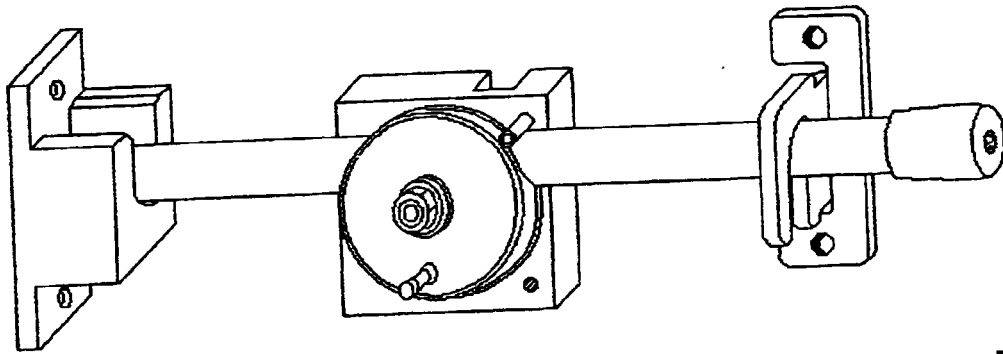


Fig. 8

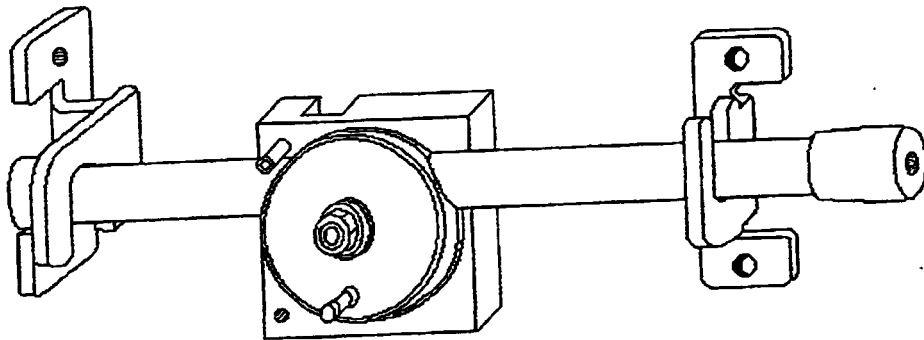


Fig. 9

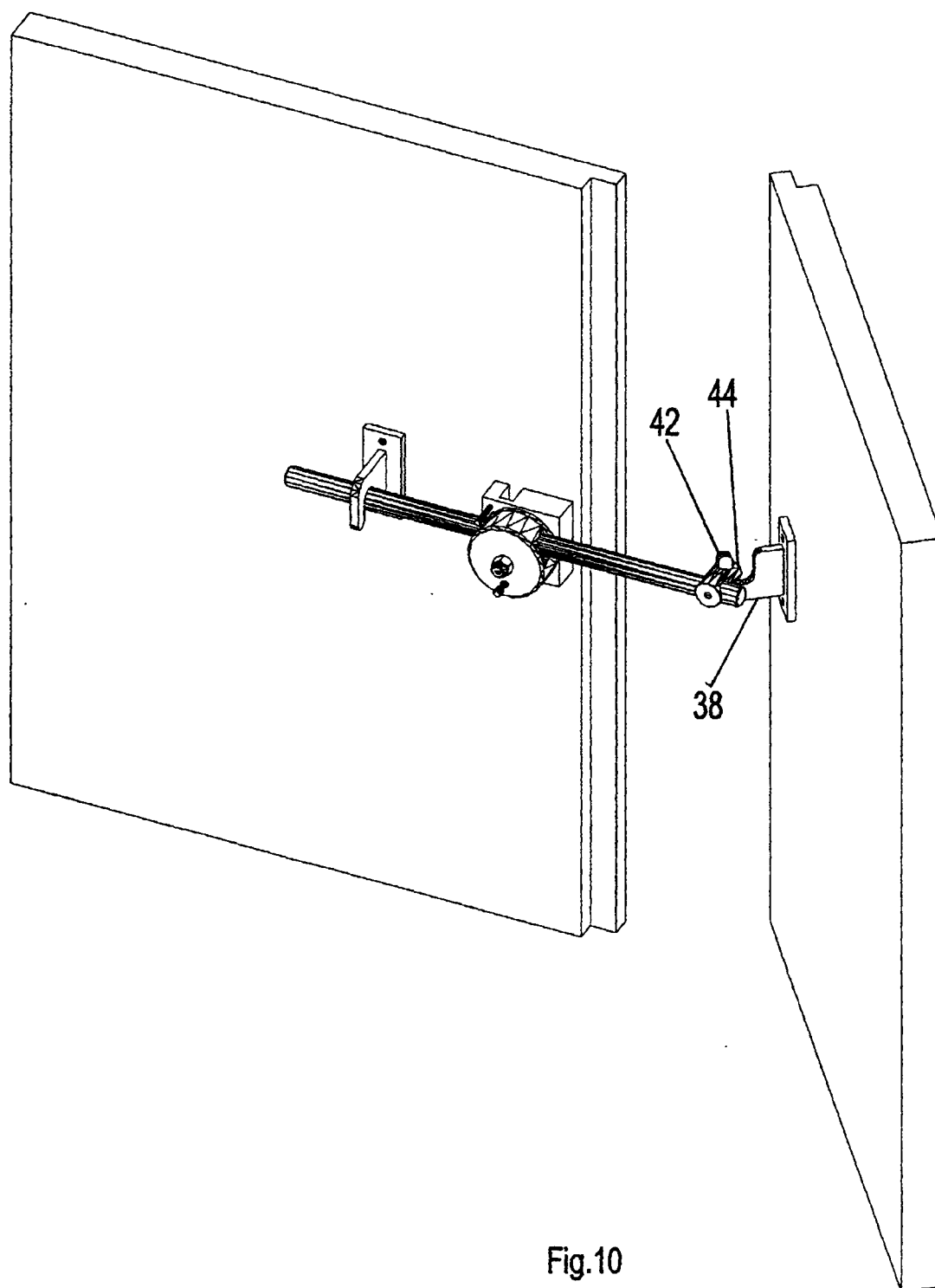


Fig.10



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EUROPEAN SEARCH REPORT

Application Number
EP 00 10 9958

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 23 August 2000	Examiner Van Beurden, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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