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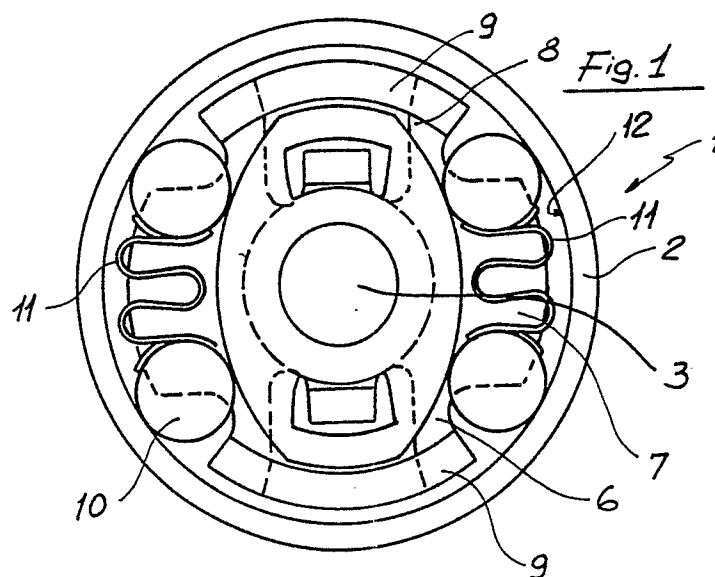
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54 **Anti-forcing for manually-operated window winders of motor vehicles.**

57 The present invention relates to a device for manually-operated window winders for motor vehicles, which makes it practically impossible the glass of the door windows to be let down from the outside.

It comprises a set of rolling members (10), such as balls pushed and self-stabilized by contrast springs (11) in radial direction, so as to counteract the force resulting from the forcing open of the window glass, with at the same time making it easier said glass to be actuated by means of the inner handle.



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"ANTI-FORCING FOR MANUALLY-OPERATED WINDOW WINDERS OF MOTOR VEHICLES"

The present invention relates to an anti-forcing device for manually-operated window winders of motor vehicles, practically consisting of a set of rolling members acting against the inner circumferential surface of the box-shaped body which contains the mechanisms which enable the same glass to be let up and down from the interior, by means of the purposely provided handle.

It is known that for long years all mechanisms which make it possible the glass of motor vehicle doors to be let down or up have comprised at least one mechanism which performs the task of preventing the same glass to be actuated from the outside, by being forced to get down, obviously in order to access the car in order to commit a theft, or to damage the same car.

The most widely known among these mechanisms consist in an axial contrast spring, directly mounted on the spindle of the handle, and acting as a contrast force between the shoulder of the revolutionary spindle and the box containing the components performing the task of letting the glass up and down, by means of the traditional handle.

As a consequence, also the necessary force is increased, which the user has to apply in order to drive the manually-operated window winder; according to laboratory tests, such force is estimated to be of 1.7 N.

The present invention partially reduces said force, while simultaneously improving the anti-forcing security, whose characteristics are required in many Countries by the technical specifications relevant to the window winders for motor vehicles. It comprises a set of rolling members, such as, e.g., balls placed in a radial position, pushed by contrast springs, so as to act as an antifriction force along the inner circumferential surface of the box which contains all of the mechanisms of the window winder.

In practice, when the device is actuated by means of the handle, the balls are compressed in the revolution direction through the contrast springs, with the anti-friction force being thereby discharged.

On the contrary, when a force is applied to the glass in order to force it open, the balls remain pushed against the inner circumferential surface of the box-shaped container, thus blocking the window winder.

From the disclosure of the present form of practical embodiment, one can understand that the present device is the technically most advanced solution against the forced letting down of the glasses of motor vehicles, and it should be stressed that, inasmuch as the axial spring is got

rid of, the actuation of the window winder from the interior of the vehicle, with the necessary force being now of approximately 0.4 N only, also results must easier.

These purposes, characteristics and advantages will be still better evidenced by the following disclosure in detail, which is given for the purpose of merely illustrating the purview of the finding without limiting it, by referring to the figures of the hereto attached illustrative drawing tables, wherein:

Figure 1 shows an inner front view of the device of the invention;

Figure 2 shows an inner front view of the device, wherein the dynamics are evidenced according to which the movement of the balls takes place during the step of rotation of the handle in order to let the window down; and

Figure 3 shows a schematic sectional view of the device according to the invention, showing the sectorized plate.

Referring to the above cited figures of the hereto attached drawings, the device 1 according to the present invention comprises a box-structured container body 2 of cylindrical shape, inside which the drive spindle 3 is contained, which spindle is integral with the gear wheel 4 which, as known, acts on the rack cable which causes the glass to go up and down.

On the spindle 3, towards the interior 5 of the door, a plate 6 with four radial sectors 7, 8 is mounted, wherein two from said sectors, indicated by the reference numeral 7, comprise an inwards-bent lip 9 which, when the handle is rotated, acts on the circumferential balls 10, slightly loading the contrast springs 11 in order to reduce the force of adhesion to the inner circumferential wall 12 of the box-structured body 2 as extensively as possible.

In practice, when the handle 13 is rotated, as it is evidenced in Figure 2, two from the four balls 10 - in diametrically opposite positions - get disengaged from the circumferential-wall 12, and simultaneously push the corresponding ball situated at the opposite end of the contrast spring 11, thus reducing the actuation force.

This kind of action takes place when the handle is rotated in either direction, but cannot take place when the glass is forced open, in that said glass transmits the force to the gear wheel 4 only, and not to the sectorized plate 6 acting on the balls.

It is clear that as the rolling members, instead of balls, rollers or runners could be indifferently used as well - which, obviously, do not modify the dynamics of operation of the present invention, but, on the contrary, make more general its use, in order to adapt it to any types of vehicles, also as a

function of the manufacturing costs.

Finally, the fact should be stressed that the present form of practical embodiment does not limit to itself the scope of the invention, but, on the contrary, it should be understood that many modifications, additions, changes or substitutions may be supplied to the present device, without thereby departing from its protection scope, as such a scope also results defined in the hereto appended claims.

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Claims

1. Anti-forcing device for manually-operated window winders characterized in that it essentially comprises a set of rolling members, loaded by contrast springs and acting along the inner circumferential wall of the container body, in order to act as a block against the action of forcing of the window glass open.

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2. Device according to claim 1, characterized in that said rolling members, when the handle is rotated in order to cause the glass to go up or down, make it possible the actuation force to be decreased, in that the rolling members corresponding to the rotation direction are pushed by the sector plate, so as to eliminate their friction against the inner walls, while simultaneously favouring the advancement of the opposite rolling members, by thrust-loading the contrast springs.

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3. Device according to claim 1, characterized in that after the actuation of the window winder by means of the inner handle, the rolling members, thanks to the contrast springs, take again their stable position against the inner wall of the cylindrical box-structured body, evenly distributing the adhesion force in order to oppose the largest resistance to the forcing of the window glass open.

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4. Device, according to claim 1, characterized in that the rolling members performing the function of contrast and brake elements can be balls, rollers or runners, and can be inserted in such a number as to secure the highest security against the opening, as a function of the size and of the mechanical characteristics of the window winder.

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5. Anti-forcing device for manually-operated window winders of motor vehicles, as hereinabove disclosed, and as illustrated in the figures of the hereto attached drawing tables, for the hereinabove specified purposes.

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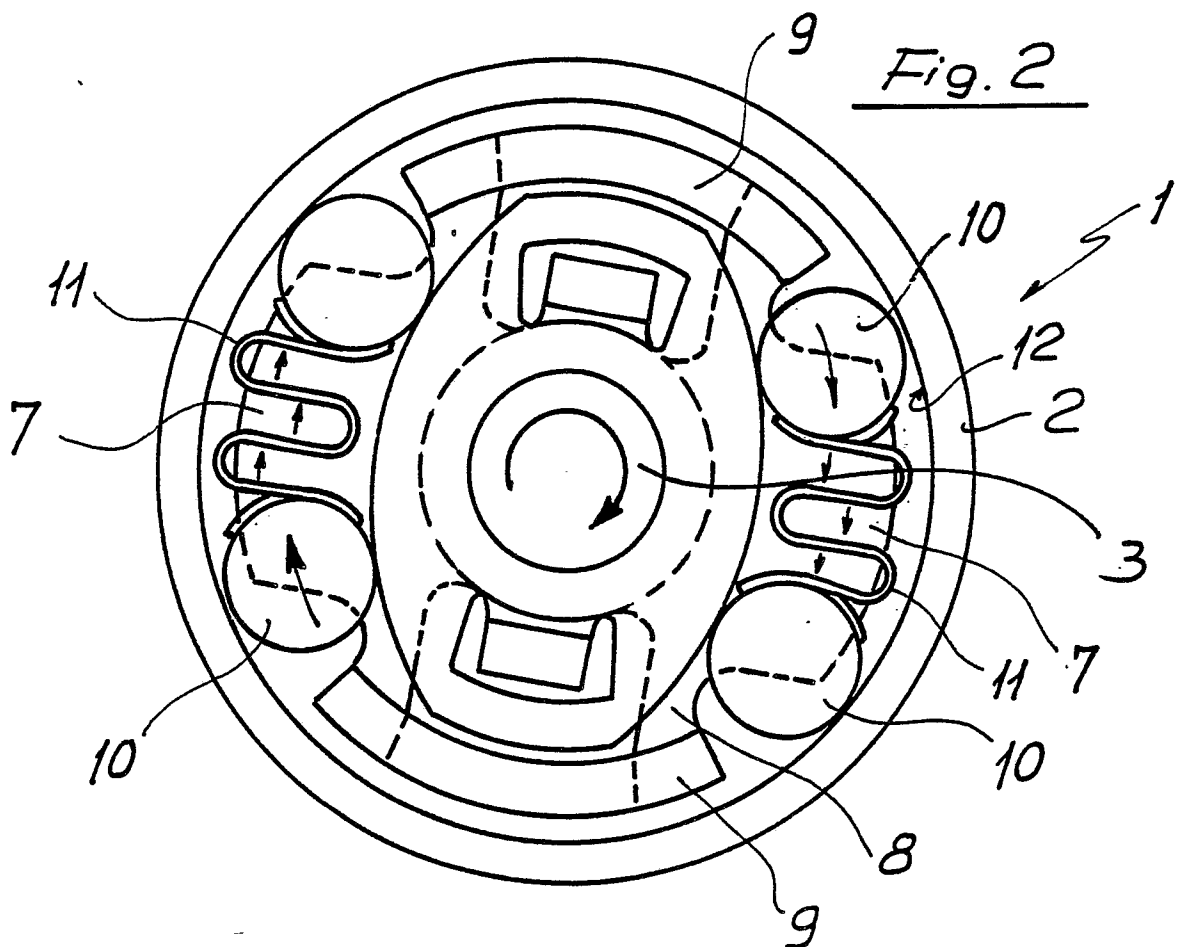
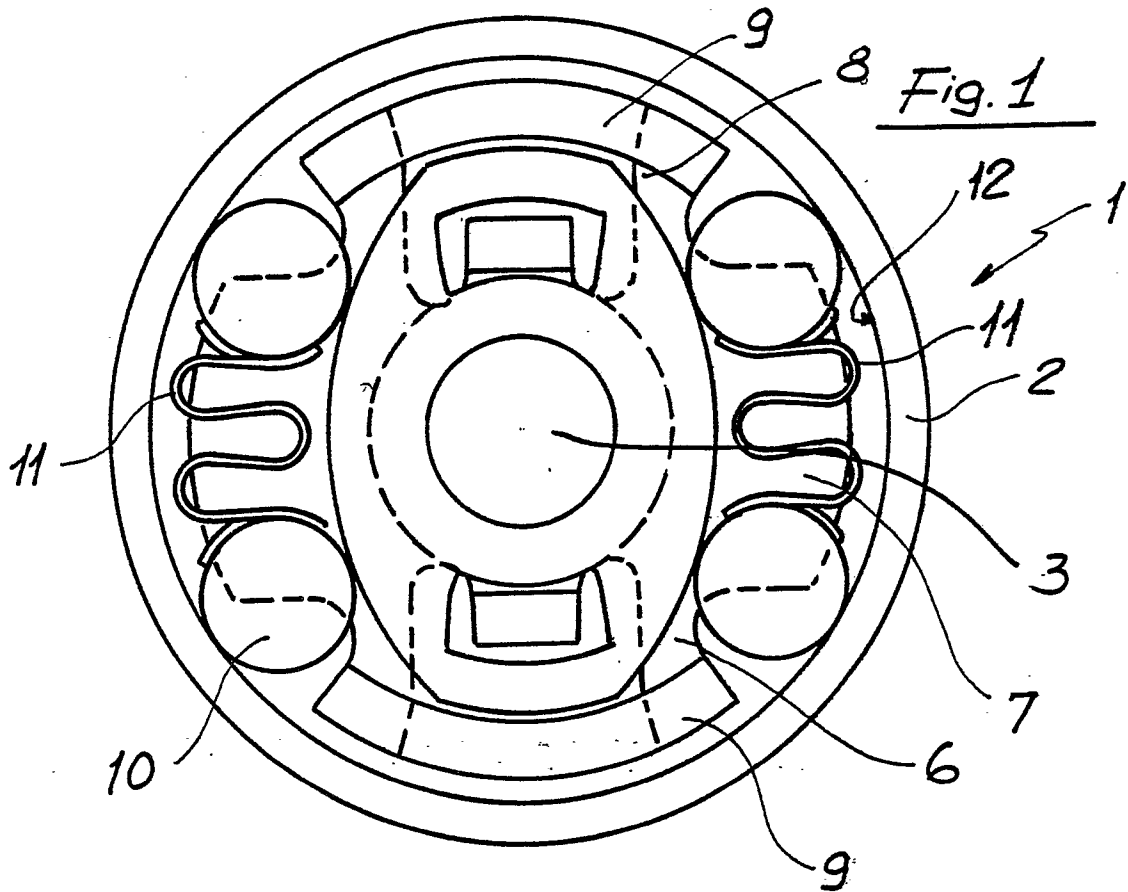
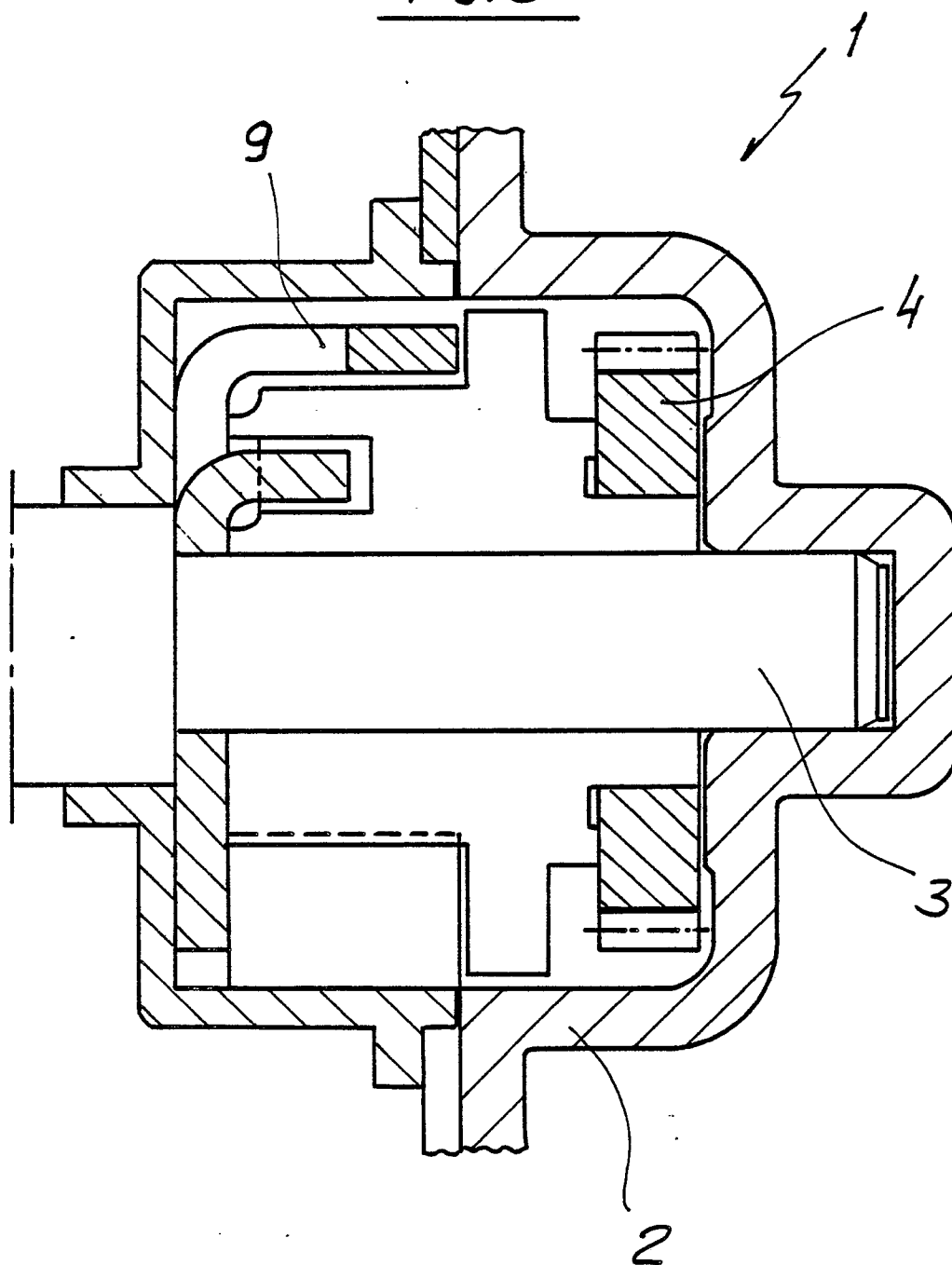


Fig. 3





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.4)
X	FR-A-2 391 391 (INDUSTRIAS TECHNO MATIC) * Page 1, lines 1-5; page 2, lines 3-11; page 3, lines 8-38; page 4, lines 1-29; page 5, lines 3-11; page 6, lines 12-31; figures 1,2,3,5,6 *	1-5	E 05 F 11/50
X	DE-A-3 442 308 (INA WÄLZLAGER SCHAEFFLER KG) * Page 5, lines 11-36; page 6, lines 1-31 *	1,3,4,5	
A	---	2	
A	US-A-2 260 119 (MARSHALL) * Page 2, column 1, lines 11-75; column 2, lines 1-43; figures 1-10 *	1,4,5	
A	DE-A-2 651 607 (KUSTER & CO.) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			E 05 F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26-10-1988	Examiner NEYS B.G.
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	