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(54) **Device for closing and opening the boot lid or rear hatch of a motor vehicle.**

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EP-A-0 143 087
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FR-A-2 527 255
US-A-3 304 755

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Description

The present invention relates to devices for closing and opening the boot lid or rear hatch of a motor vehicle having a locking mechanism.

More particularly, the invention is concerned with a closing and opening device of the type comprising a hollow support body in which a push button carrying a cylinder lock is slidable, and a release member for the locking mechanism which is slidable with the push button and movable relative thereto, as a result of the rotation of the cylinder lock, between an inoperative position corresponding to the locked position of the lock cylinder in which the sliding of the push button does not cause the release of the locking mechanism, and an operative position corresponding to the open position of the lock cylinder in which the sliding of the push button causes the release of the locking mechanism and then, in use, the opening of the boot lid or hatch of the vehicle.

In closing and opening devices of this type, it is also known to effect the rotation of the release member from its operative position to its inoperative position, and vice versa, automatically by means of a servo-mechanism connected to the rotatable release member and operated by an electrical central locking system for the motor vehicle doors. Such an electrical system is normally controlled by the push button or operating lever for locking and unlocking the vehicle door at the driver's position.

A device of this type is known from US—A—3304755 wherein an actuating member is rotatable between the operative and inoperative positions and only operable either by using the proper key or by electrical means which are controlled independently of use of the key. In detail, this prior art document discloses a cylinder lock actuator, comprising a casing, a lock cylinder mounted within said casing for combined rotatable and axially slidable movement relative thereto, said cylinder being adapted to be selectively locked against rotation within said casing and being freely slidable therein at all times, a mechanism operating member to be actuated, and an actuating disc mounted on said cylinder for rotation as a unit therewith or rotation independently thereof and for sliding movement therewith relative to said casing. The disc includes an actuating lug extending axially of said cylinder and an ear extending radially thereof. Lost motion pin and slot means are provided for connecting said disc and said cylinder for rotation of said disc either in response to selected rotation of said cylinder or independently thereof between an operative position juxtaposing said lug to said operating member for engagement therewith in response to sliding movement of said cylinder and an inoperative position locating said lug remote from said operating member to prevent such engagement. Power-operated means are mounted on said casing and means are provided for connecting said power-operated means to said radial ear for rotation of said disc between said positions thereof by said power-operated means independently of rotation of said cylinder and for sliding movement of said disc with said cylinder relative to said power-operating means. Means for selectively energising said power-operated means are also provided.

A device of this type with a rotatable release member is described also in European Patent Application 143 087 in the name of the same Applicants, the application falling under Article 54(3) of the European Patent Convention. Furthermore in this device, the lock cylinder can take up a second open position to locate the release member in its operative position independently of the condition assumed by the servo-mechanism, which is of the reversible type.

The object of the present invention is to improve a device of the type disclosed in US—A—3 304 755 so that the lock cylinder can take up a second open position to locate the release member in its operative position independently of the condition assumed by the servo-mechanism.

According to the invention, this object is achieved by virtue of a device according to claim 1.

Preferably, the connecting part of the body of the release member has an aperture which is elongate in the direction of sliding of the release member and the can means include an eccentric pin controlled by the lock cylinder and engaged in an aperture in the body of the release member. This aperture has a first elongate arm disposed like the aforesaid aperture and in which the pin is inserted in the first open position of the lock cylinder, and a second elongate arm inclined obliquely to the first arm and in which the pin is inserted in the locked position and in the second open position of the lock cylinder.

To advantage, the body of the release member is formed by a single piece of moulded plastics material.

The invention will now be described in detail with reference to the appended drawings, provided purely by way of non-limiting example, in which:

Figure 1 is a partially-sectioned schematic longitudinal view of a closing and opening device for the boot lid or rear hatch of a motor vehicle, in accordance with the invention,

Figure 2 is a side elevational view taken on the arrow II of Figure 1,

Figure 3 is a cross-sectional view taken on the line III—III of Figure 1,

Figure 4 is a cross-sectional view taken on the line IV—IV of Figure 1, and

Figures 5, 6 and 7 are three views similar to Figure 3 illustrating the device in three different operating conditions.

In the drawings, a hollow cylindrical support body is indicated 10 and is intended to be fitted into an aperture formed in the boot lid or rear hatch, not illustrated, of a motor vehicle, with the interposition of a grommet 12.

A push button 14 having a hollow initial part 16 is axially slidable in the body 10 against the action of a helical compression spring 18. The initial part 16 constitutes the fixed member of a cylinder lock 22 the rotatable cylinder of which is indicated 24.

The rotatable cylinder 24 is of conventional type and, in known manner, has check plates 26 for cooperating in known manner with axial recesses 25 in the initial part 16.

As illustrated in greater detail in Figure 4, the rotatable cylinder 24 has two diametrally-opposed shaped axial appendages 30 at its front end, which are engaged in corresponding recesses 32 in a rotor 34.

The rotor 34 carries an axial pin 36 disposed eccentrically relative to the axis A of the lock 22 and inserted in a recess 38 in a release member, generally indicated 40.

The release member 40 is constituted by a one-piece body of moulded plastics material slidable within the push button 14 in a direction B perpendicular to the axis A of the lock 22, coincident with the axis of movement of the push button 14.

The body 40 forms on one side an attachment part 42 with a slot 44 elongate parallel to the direction of movement B, and on its opposite side a radial operating arm 46 disposed beneath the body 10 for cooperating frontally, in the manner explained below, with an operating member 48 whose movement causes the release of the locking mechanism of the boot lid or hatch and then its opening.

The recess 38, the upper part of which is defined by a top plate 50, is generally L-shaped with a first elongate arm 38a parallel to the direction of movement B of the member 40 and a second elongate arm 38b inclined slightly to the arm 38a.

The slot 44 in the member 40 is intended to house slidably a rod 52 forming part of a reversible servo-mechanism, for example of the nut-and-bolt type, operated by a conventional electrical central locking system for the vehicle doors. This servo-mechanism is controlled in known manner through the push button or control lever for locking and unlocking the vehicle door at the driver's position.

The rotatable cylinder 24 of the cylinder lock 2 has, in known manner, a keyhole 54 for receiving a suitable key by which the rotatable cylinder can be rotated.

The operation of the device of the invention will now be described.

The rotatable cylinder 24 of the lock 22 is arranged to take up three different angular positions which will be termed "first open position", "locked position" and "second open position" below. In these positions, the keyhole 54 is in the positions illustrated in full outline, broken outline and chain lines, respectively, in Figure 2.

The movement from the first open position to the locked position is effected by rotation of the cylinder 24 through 90° in a clockwise sense, and the movement from the locked position to the second open position is effected by further rotation of the cylinder 24 through about 75° in the clockwise sense.

The first open position corresponds to the condition of engagement of the servo-mechanism with the key being removable. The release member 40 and its control member 46 can assume the configuration illustrated in Figure 3 or that illustrated in Figure 5 according to the command received from the servo-mechanism. In the first case (Figure 3) the release member 40 is in the inoperative position with the control part 46 spaced from the operating member 48, while in the second case (Figure 5) the release member 40 is in the operative position with the control part 46 frontally facing the operating member 48. The movement of the release member 40 between the operative and inoperative positions is achieved automatically by means of the rod 52 of the servo-mechanism which, as stated previously, is controlled by the electrical central locking system for the vehicle doors: the condition of Figure 5 corresponds to the unlocked position of the push button or locking lever and unlocks the driver's door, while the condition of Figure 3 corresponds to the locked position of this lever or push button. Consequently, the opening of the boot lid or hatch of the vehicle is prevented when the central locking system is in the locked condition, while the boot lid or hatch can be opened when the system is in the unlocked condition. In fact, in the first case, the release member 40 and hence its control part 46 are kept in the inoperative position of Figure 3 by the servo-mechanism, whereby any sliding of the push button 14 against the action of the spring 18 and the simultaneous axial advance of the member 40 do not allow the operating member 48 to act.

In the second case, the release member 40 and its control part 46 are kept in the operative position of Figure 5 by the servo-control, whereby pushing of the push button 14 and the simultaneous advance of the member 40 cause the part 46 to bear against the operating member 48 and consequently move the latter to open the boot lid or hatch.

In other words, when the lock 22 is in the first open position, the servo-mechanism allows the release member 40 to be positioned automatically in the inoperative position in which operation of the member 48 is prevented, even in the operative position in which this operation would be allowed. Clearly, during the sliding of the release member 40 between the operative and inoperative positions, relative movement is achieved between the eccentric pin 36, which remains stationary, and the arm 38a of the aperture 38 of the release member 40.

In the closed position of the lock 22 illustrated in Figure 6, in which the key can be removed, the eccentric pin 36 is rotated through 90° in a clockwise sense relative to the position of Figure 5 and is disposed in the initial zone of the arm 38b of the aperture 38, and the release member 40 is kept in the inoperative position. In effect, the part 46 of the member 40 is spaced from the operating

member 48 so that the opening of the boot lid or hatch of the vehicle is always prevented and cannot be enabled even by the servo-mechanism, whatever the position assumed by the push button or lever for locking and unlocking the driver's door.

If the rotatable cylinder 24 is rotated further towards the second open position, in which the key cannot be removed, the eccentric pin 36 is disposed in correspondence with the end portion of the arm 38b of the aperture 38, in the manner illustrated in Figure 7. The release member 40 is again disposed in the operative position with the part 46 facing the member 48 frontally, so that the boot lid or hatch of the vehicle can be opened by a push on the push button 14 whatever the position assumed by the servo-mechanism.

It should be noted that, during the return of the eccentric pin 36 to that of Figure 6 or to that of Figure 1 as a result of the rotation of the rotatable cylinder 22 in the anticlockwise sense, the release member 40 is always in the inoperative position, that is, unable to operate the member 48.

Claims

1. Device for closing and opening the boot lid or rear hatch of a motor vehicle having a locking mechanism, of the type comprising a hollow support body in which a push button (14) carrying a cylinder lock (22) is slidably received, and a release member (40) for the locking mechanism which is slidable with the push button (14) and movable relative thereto between an inoperative position corresponding to the locked position of the lock cylinder (22) in which the sliding of the push button (14) does not cause the release of the locking mechanism, and an operative position corresponding to a first open position of the lock cylinder (22) in which the sliding of the push button (14) causes the release of the locking mechanism and then, in use, the opening of the boot lid or rear hatch, and a servo-mechanism connected to said release member (40) for moving the release member from the operative position to the inoperative position, and vice versa, said servo-mechanism being operated by an electrical central locking system for the motor vehicle doors, wherein the lock cylinder (22) has a second open position to locate the release member (40) in its operative position independently of the condition assumed by the servo-mechanism; the release member (40) being slidable transversely to the direction of sliding (A) of the push button (14) and having an operating projection (46) for cooperating frontally with an actuating member (48) for unlocking the locking mechanism of the boot lid or rear hatch, and a connecting part (42, 44) for connecting it to the servo-mechanism, the release member (40) and the lock cylinder (24) having respective cooperating cam means (36, 38) shaped so as to allow the sliding of the release member (40) from the operative position to the inoperative position, and vice versa, by means of the said servo-mechanism only when the lock cylinder (24) is in its first open position and so as to keep the release member (40) in the operative position when the lock cylinder (24) is in the second open position or in the operative position when the lock cylinder (24) is in the closed position.

2. Device according to claim 1, characterised in that the part for connecting the release member (40) to the said servo-mechanism (52) has an aperture (44) which is elongate in the direction of sliding (B) of the release member (40), and in that the cooperating cam means include an eccentric pin (36) controlled by the lock cylinder (24) and engaged in an aperture (38) in the body of the release member (40) having a first elongate arm (38a) disposed like the connecting aperture (44) and in which the eccentric pin (36) is inserted in the first open position of the lock cylinder (24), and a second elongate arm (38b) inclined transversely relative to the first arm (38a) and in which the eccentric pin (36) is inserted in the locked position and in the second open position of the lock cylinder (24).

3. Device according to claim 2, characterised in that the body of the release member (40) is formed from a single piece of moulded plastics material.

Patentansprüche

1. Vorrichtung zum Schließen und Öffnen des Kofferraumdeckels bzw. der Hecktür eines mit einem Schließmechanismus ausgestatteten Kraftfahrzeugs, mit einem hohlen Trägerkörper, in dem ein einen Schließzylinder (22) tragender Druckknopf (14) gleitbar aufgenommen ist, und einem Entsperrglied (40) für den Schließmechanismus, das zusammen mit dem Druckknopf (14) gleiten kann und relativ zu diesem bewegbar ist zwischen einer der Schließstellung des Schließzylinders (22) entsprechenden Ruheposition, in der die Gleitbewegung des Druckknopfes (14) kein Entsperren des Schließmechanismus bewirkt, und einer einer erste Öffnungsstellung des Schließzylinders (22) entsprechenden Arbeitsposition, in der die Gleitbewegung des Druckknopfes (14) das Entsperren des Schließmechanismus und dann beim Gebrauch das Öffnen des Kofferraumdeckels bzw. der Hecktür bewirkt, sowie mit einem mit dem Entsperrglied (40) verbundenen Servomechanismus zum Bewegen des Entsperrglieds aus der Arbeitsposition in die Ruheposition und umgekehrt, wobei der Servomechanismus durch ein elektrisches Kraftfahrzeugtür-Zentralverriegelungssystem betätigbar ist und der Schließzylinder (22) eine zweite Öffnungsstellung besitzt, in der das Entsperrglied (40) unabhängig von dem Zustand des Servomechanismus in seine Arbeitsposition eingestellt wird, wobei das Entsperrglied (40) quer zu der Richtung (A) der Gleitbewegung des Druckknopfes (14) gleiten kann und einen Betätigungsansatz (46) für das frontale Zusammenwirken mit einem Betätigungsglied (48) zum Entriegeln des Schließmechanismus des Koefferraumdeckels bzw. der

Hecktür sowie ein Verbindungsteil (42, 44) zu seiner Verbindung mit dem Servomechanismus aufweist, während das Entsperrglied (40) und der Schließzylinder (24) jeweils zusammenwirkende Nockenmittel (36, 38) besitzen, die so geformt sind, daß sie die Gleitbewegung des Entsperrglieds (40) aus der Arbeitsposition in die Ruheposition und umgekehrt mit Hilfe des Servomechanismus nur dann zulassen, wenn der Schließzylinder (24) sich in seiner ersten Öffnungsstellung befindet, und daß sie das Entsperrglied (40) in seiner Arbeitsposition halten, wenn der Schließzylinder (24) sich in der zweiten Öffnungsstellung befindet, oder in seiner Arbeitsposition, wenn der Schließzylinder (24) sich in der Schließstellung befindet.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß das Teil zum Verbinden des Entsperrglieds (40) mit dem Servomechanismus (52) eine Öffnung (44) besitzt, die in Richtung (B) der Gleitbewegung des Entsperrglieds (40) eine langgestreckte Ausdehnung hat, und daß die zusammenwirkenden Nockenmittel einen von dem Schließzylinder (24) gesteuerten Exzenterstift (36) umfassen, der in eine Öffnung (38) in dem Körper des Entsperrglieds (40) eingreift, die einen ersten Längsschlitz (38a) bildet, der in gleicher Weise angeordnet ist wie die Verbindungsöffnung (44) und in den der Exzenterstift (36) in der ersten Öffnungsstellung des Schließzylinders (24) eingeführt wird, und einen zweiten Längsschlitz (38b), der gegenüber dem ersten Längsschlitz (38b) transversal geneigt ist und in den der Exzenterstift (36) in der Schließstellung und in der zweiten Öffnungsstellung des Schließzylinders (24) eingeführt wird.

3. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß der Körper des Entsperrglieds (40) als einstückiges Kunststoff-Formteil ausgebildet ist.

Revendications

1. Dispositif de fermeture et d'ouverture du couvercle de coffre à bagages ou du capot arrière d'un véhicule à moteur ayant un mécanisme de blocage, du type comprenant un corps creux de support dans lequel un bouton-poussoir (14) portant un verrou (22) à barillet peut coulisser, et un organe de libération (40) du mécanisme de blocage, qui peut coulisser avec le bouton-poussoir (14) et mobile par rapport à lui entre une position de repos correspondant à la position bloquée du barillet (22) du verrou, dans laquelle un coulissement du bouton-poussoir (14) ne provoque pas alors la libération du mécanisme de blocage, et une position de travail correspondant à une première position d'ouverture du barillet (22), dans laquelle le coulissement du bouton-poussoir (14) provoque alors la libération du mécanisme de blocage puis, pendant l'utilisation, l'ouverture du couvercle du coffre ou du capot arrière, et un servomécanisme connecté à l'organe de libération (40) afin qu'il déplace cet organe de libération de la position de travail à la position de repos et inversement, le servomécanisme étant commandé par un système électrique central de verrouillage des portes du véhicule à moteur, dans lequel le barillet (22) du verrou a une seconde position d'ouverture assurant le positionnement de l'organe de libération (40) en position de travail indépendamment de l'état du servomécanisme, l'organe de libération (40) pouvant coulisser transversalement à la direction de coulissement (A) du bouton-poussoir (14) et ayant une saillie de manoeuvre (46), destinée à coopérer en avant avec un organe de manoeuvre (48) de déverrouillage du mécanisme de blocage du couvercle de coffre ou du capot arrière, et une partie de connexion (42, 44) destinée à le connecter au servomécanisme, l'organe de libération (40) et le barillet (24) ayant des dispositifs respectifs à cames coopérantes (36, 38) dont la configuration est telle que l'organe de libération (40) peut coulisser de la position de travail à la position de repos et inversement sous la commande du servomécanisme uniquement lorsque le barillet (24) est dans sa première position d'ouverture et de manière que l'organe de libération (40) soit maintenu en position de travail lorsque le barillet (24) est dans sa seconde position d'ouverture ou dans la position de travail lorsque le barillet (24) est dans la position de fermeture.

2. Dispositif selon la revendication 1, caractérisé en ce que la partie de connexion de l'organe de libération (40) au servomécanisme (52) a une ouverture (44) qui est allongée dans la direction de coulissement (B) de l'organe de libération (40), et en ce que le dispositif à cames coopérantes comporte un ergot excentrique (36) commandé par le barillet (24) et coopérant avec une ouverture (38) formée dans le corps de l'organe de libération (40) et ayant une première branche allongée (38a), disposée de la même manière que l'ouverture de connexion (44) et dans laquelle l'ergot excentrique (36) pénètre dans la première position d'ouverture du barillet (24), et une seconde branche allongée (38b) inclinée transversalement par rapport à la première branche (38a) et dans laquelle l'ergot excentrique (36) est introduit dans la position bloquée et dans la seconde position d'ouverture du barillet (24).

3. Dispositif selon la revendication 2, caractérisé en ce que le corps de l'organe de libération (40) est formé en une seule pièce de matière plastique moulée.

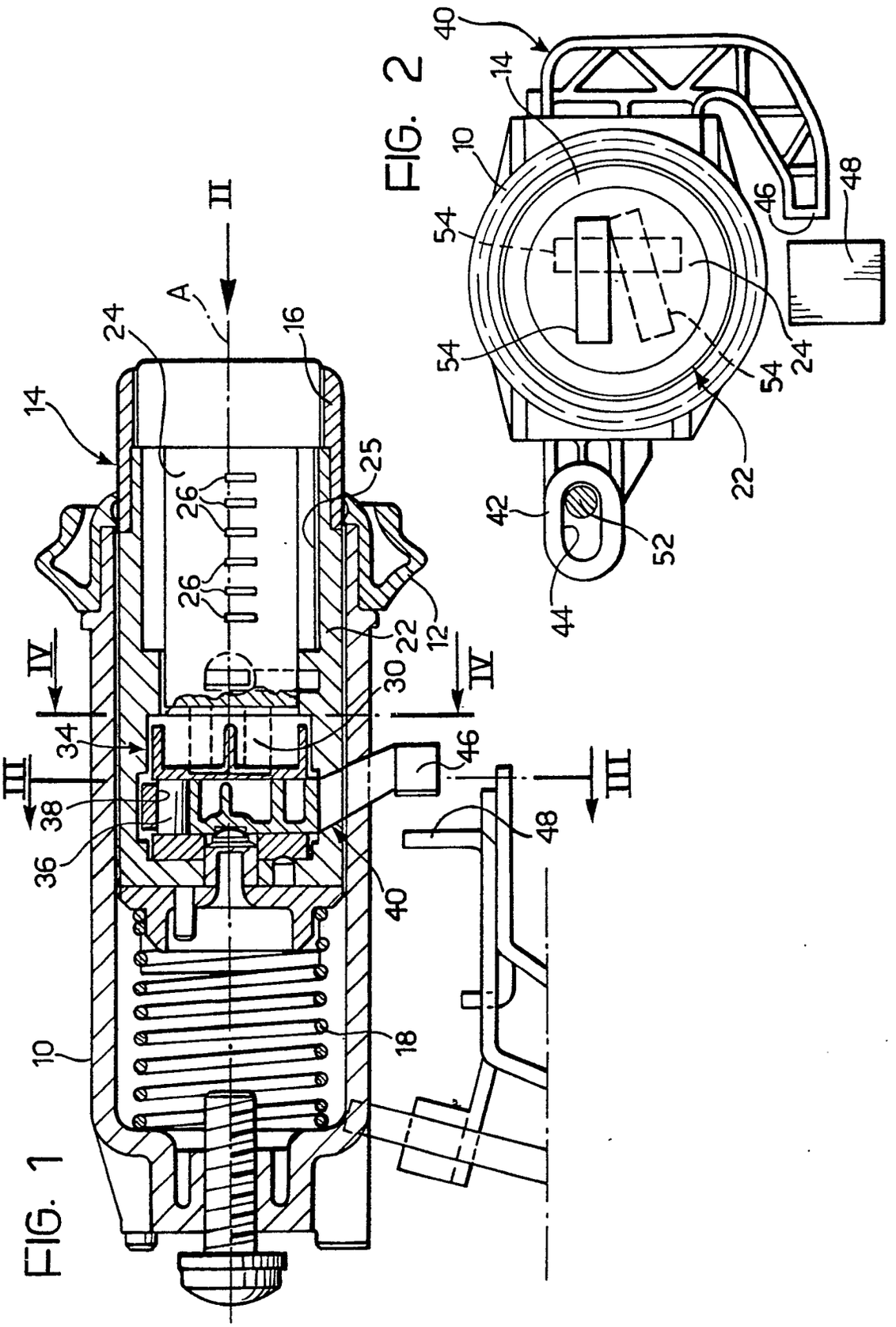

II
A
24
16
14
25
26
26
22
12
IV
IV
30
34
III
III
46
38
48
36
40
10
18

FIG. 1

40
14
10
46
48
54
54
24
54
22
42
52
44

FIG. 2

FIG. 3

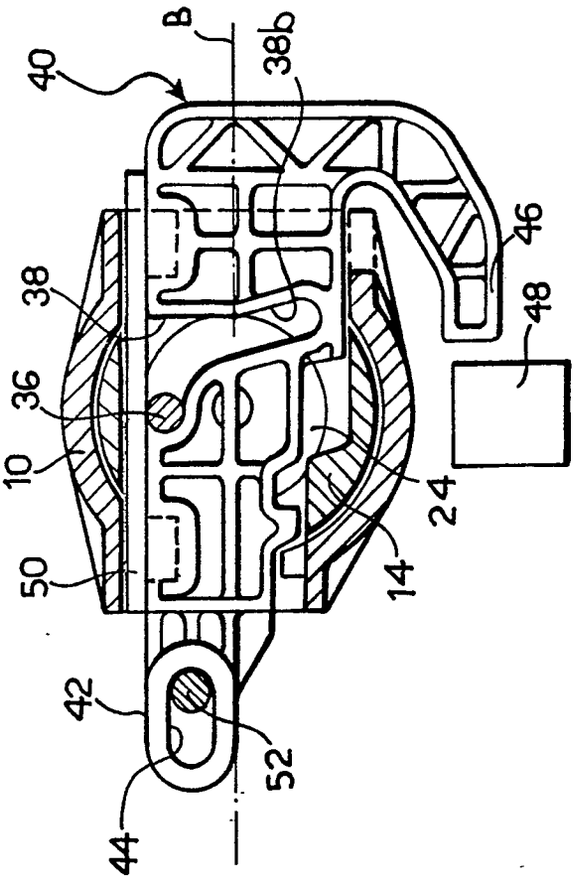
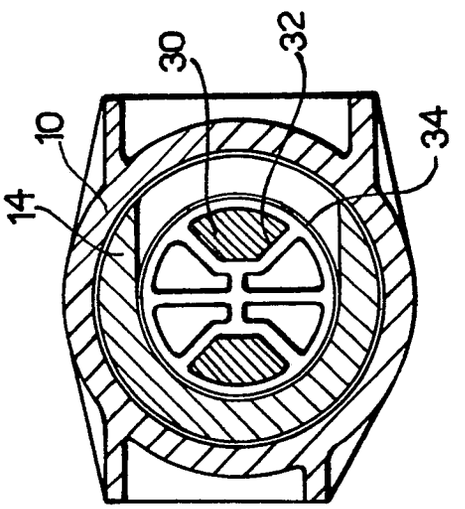


FIG. 4



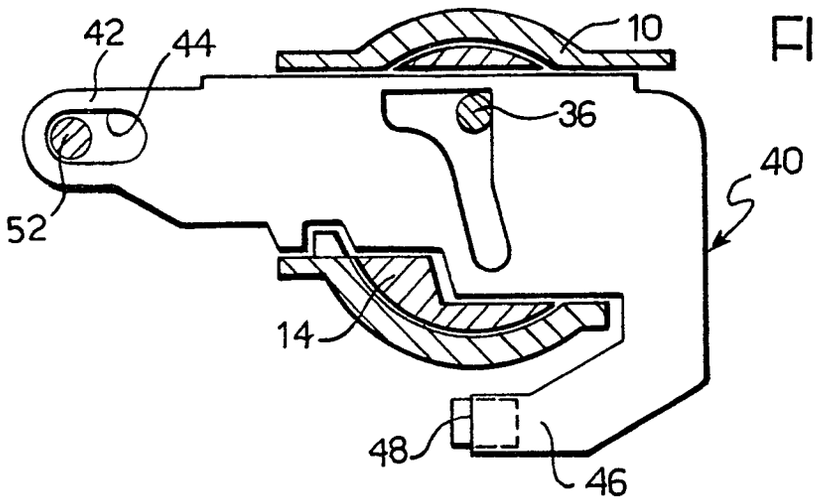


FIG. 5

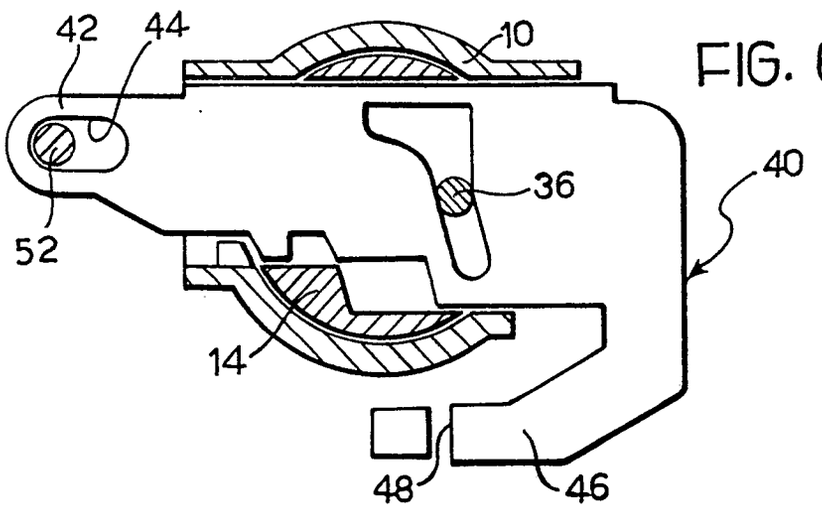


FIG. 6

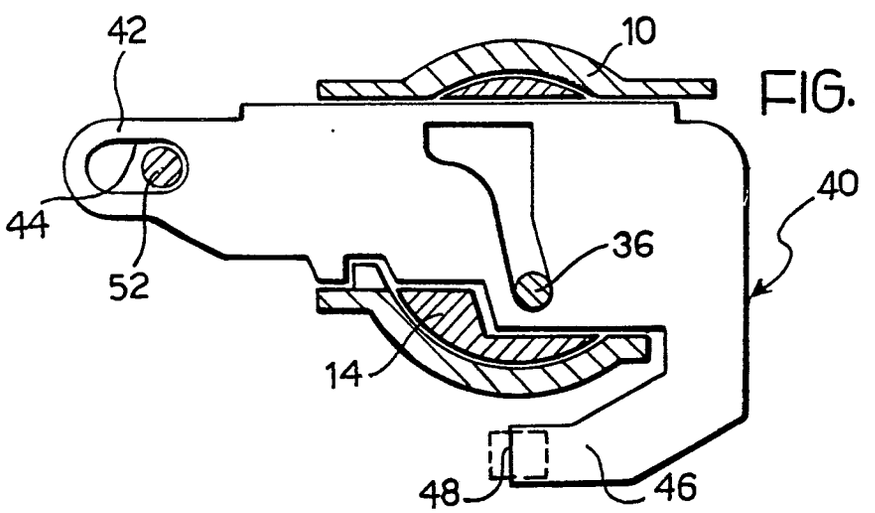


FIG. 7