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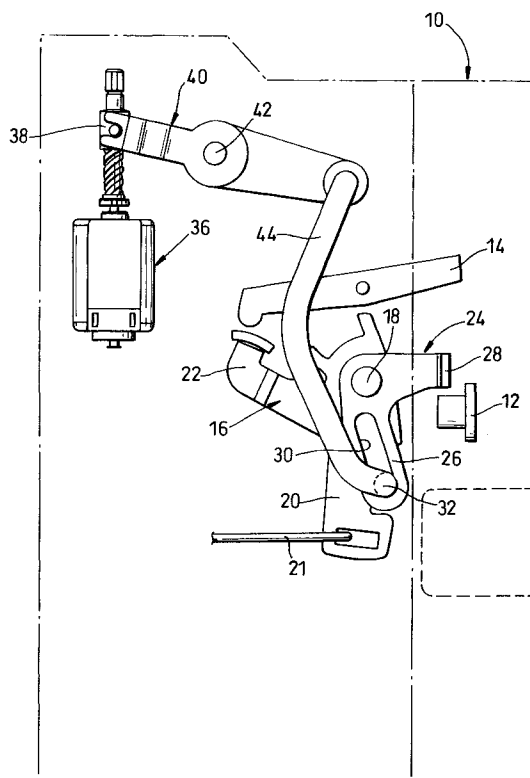
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AL LT LV MK RO SI(30) Priority: **15.07.1997 GB 9714769**(71) Applicant: **Meritor Light Vehicle Systems (UK) Ltd
Birmingham B30 3BW (GB)**(72) Inventor: **Fisher, Sydney Edward****Shirley, Solihull, West Midlands B90 2HB (GB)**(74) Representative: **Spruce, George Philip et al****Withers & Rogers****4 Dyer's Buildings****Holborn****London EC1N 2JT (GB)**(54) **Vehicle door securing mechanism**

(57) A vehicle door securing mechanism including:-

a latch (12) for releasably retaining the door in a closed condition, a latch releaser (16,24,32,36) for selectively unlatching the door, a door lock (14) for selectively preventing unlatching of the closed door by disabling or blocking action of the latch releaser, and a child safety lock actuatable to prevent operation of the latch releaser from the inside of the respective door when closed. The latch releaser includes a release lever (16) having an operative connection to an interior door handle; an unlatching lever (24) pivoted co-axially in overlying relationship to the release lever and interacting with the latch (12), angular displacement of the unlatching lever from a home position causing unlatching of the closed door in use; a drive dog (32) guided by a longitudinal slot (30) of one of the levers for movement between an engaged position at which it engages a drive slot (34) of the other of the levers so that they move in unison and a disengaged child safety position at which the levers are uncoupled for independent movement; and a power actuator (36) linked to the drive dog for selectively effecting the movement under control remote from the inside of the door and/or inaccessible from the inside of the door when closed.

**Fig. 2**

Description

This invention relates to securing mechanisms for latching and selective locking of doors and other closures of vehicles with particular application to the rear passenger doors of cars and light vehicles likely to be accessible to children in the vehicle but remote from immediate adult supervision.

The invention has particular application to mechanisms forming part of locking systems of the kind in which the individual locks, and possibly the latching and unlatching of the related doors, are power operable and interconnected through a central control unit operable from within or outside the vehicle, herein referred to as "central locking systems".

The object of the invention is to provide mechanism incorporating a child safety facility which is convenient and reliable in operation, of simple and durable construction, and in which the child safety condition can be set and cancelled by remote control.

According to the invention there is provided vehicle door securing mechanism including:-

- a) Latching means for releasably retaining the door in a closed condition,
- b) Release means for selectively unlatching the door,
- c) Locking means for selectively preventing unlatching of the closed door by disabling or blocking action of the release means, and
- d) Child safety means actuable to prevent operation of the release means from the inside of the respective door when closed;

characterised in that the release means includes a release lever having operable connection to an interior manually actuable element of the door (eg an interior door handle); an unlatching lever pivoted co-axially in overlying relationship to the release lever and interacting with the latching means, angular displacement of the unlatching lever from a home position causing unlatching of the closed door in use; a drive dog guided for movement longitudinally of a formation of one of said levers between an engaged position at which it engages a drive formation of the other of said levers so that they move in unison and a disengaged child safety position at which the levers are uncoupled for independent movement; and a power actuator linked to the drive dog for selectively effecting said movement under control remote from the inside of the door and/or inaccessible from the inside of the door when closed.

Preferably the release lever also interacts with the locking means whereby movement of that lever in the direction for unlatching the door shifts the locking means, if in a locked condition, to unlocked condition.

An example of the invention is now more particularly described with reference to the accompanying drawings wherein;

FIG 1. is a perspective view of door securing mechanism with parts other than those directly relevant to the invention removed for clarity; and

FIG 2. is a side elevation thereof with a detail of a part shown in FIG.2A.

The securing mechanism, incorporating latching mechanism and locking mechanism of the related door is located by and in a box-like housing 10 shown schematically in the drawings to form a unitary assembly for mounting in the door.

The latching mechanism includes a conventional rotating claw bolt and co-acting pawl operating to releasably retain the door in closed condition, is pawl being released when the door is to be opened as by operation of the interior or exterior door handles by a latch release member 12 shown in part in figure 2. For some applications the latch mechanism may incorporate power operated latching engagement closing the door, for example as described in our co-pending application GB9710602.5 dated 23rd May 1997 and/or power unlatching when the door is to be opened as described in our co-pending application GB9713407.6 dated 26th June 1997. Such power operations will be controlled from a central locking system on the vehicle.

The mechanism further incorporates locking mechanism as referred to above, again of known construction not shown in the drawings apart from a rocking lock/unlock lever 14 in FIG.2 and again the locking mechanism may incorporate power actuation as part of a central locking system in known manner.

Release means of the mechanism includes a release lever 16 fulcrummed on a fixed pivot 18 and having a first downwardly dependant arm 20 operatively linked to an inside handle (not shown) of the related door by a pull rod 21, and a second arm 22 extending generally leftwardly as viewed in the drawings to abut left hand arm of lock/unlock lever 14.

An unlatching lever 24 of bell crank form is also fulcrummed on pivot 18 but can pivot independently of lever 16. A downwardly dependant arm 26 of lever 24 overlies arm 20 of lever 16 while the other arm 28 of lever 24 projects rightwardly and is provided with a terminal projection abutting downwardly against a similar projection of latch release member 12.

Arm 26 defines a drive formation in the form of a longitudinal slot 30 closed at the ends in which is slidably engaged a cylindrical pin serving as a drive dog 32.

The underlying part of arm 20 of lever 16 also defines a drive formation in the form of a bayonet slot 34 best seen in detail view FIG.2A, having a closed upper end but opening from arm 20 downwardly and to the right. Drive dog 32 extends into slot 34.

A child safety power actuator 36, in this example a rotary electric motor having a worm and nut drive output for providing rectilinear motion although it is to be understood that various other forms of power actuator could be used, is mounted within housing 10. The nut

38 moves vertically and is engaged with the left hand arm of a rocking lever 40 pivoted at 42. The distal end of the right hand arm of lever 40 is coupled to drive dog 32 by a generally vertical link 44 so that operation of actuator 36 moves dog 32 from one end to the other of slot 30.

The drawings show the mechanisms in child safety condition, that is actuator 36 has displaced rocking lever 40 clockwise carrying dog 32 to the lowermost end of slot 30. In this position the two levers 16 and 24 are uncoupled for independent movement because dog 32 is at the open end of bayonet slot 34. Thus, operation of the inside handle of the door will merely cause idling movement of release lever 16 while unlatching lever 24 will remain stationary leaving the door securely latched.

The child safety condition is cancelled, making the inside door handle operative, by remote control applying power to actuator 36 to draw dog 32 upwards so that it engages the closed upper end of bayonet slot 34 coupling lever 16 and 24 so that operation of the door handle causes arm 24 to depress latch release member 12 effecting manual unlatching.

In some applications, for improved security, manual operation of the locking mechanism from the inside of the related door is effected by a cill button which is depressed flush with the door trim in locked condition. This is to preclude attempts to unlock the door from the exterior by "fishing" through a window aperture with some kind of tool to engage the cill button. As the button cannot be raised directly to unlock the door, eg in an emergency, the inter-engagement of second arm 22 of release lever 16 with lock/unlock lever 14 is provided, thus whenever the inside door handle is operated, whether or not the child safety has been set, the resulting displacement of release lever 16 will return the lock mechanism to unlocked condition so that the door can be opened, at least from the outside, in an emergency and/or if power actuation should fail, eg due to a flat battery.

It will be understood that variations and adaptations of the above described mechanism may be made as will be apparent to those skilled in the art to suit various operating requirements and constructional needs. The drive dog may take various forms and may be shifted to set or cancel child safety by various types of power actuator, for example a solenoid type actuator could provide direct push/pull shifting of the drive dog or geared angular drive could be provided as by shifting dog 32 along a curved slot. It will also be seen that the closed-ended slot 30 could be provided in the arm 20 of lever 16 with the dog co-acting with an open-ended slot or equivalent formation in arm 26 of lever 24.

Claims

1. A vehicle door securing mechanism including:-

a) latching means (12) for releasably retaining

the door in a closed condition,

b) release means (16,24,32,36) for selectively unlatching the door,

c) locking means (14) for selectively preventing unlatching of the closed door by disabling or blocking action of the release means, and

d) child safety means actuatable to prevent operation of the release means from the inside of the respective door when closed;

characterised in that the release means includes a release lever (16) having an operative connection to an interior manually actuatable element (21) of the door, an unlatching lever (24) pivoted co-axially in overlying relationship to the release lever (16) and interacting with the latching means (12), angular displacement of the unlatching lever (24) from a home position causing unlatching of the closed door in use; a drive dog (32) guided by a longitudinal formation (30) of one of said levers for movement between an engaged position at which it engages a drive formation (34) of the other of said levers so that they move in unison and a disengaged child safety position at which the levers are uncoupled for independent movement; and a power actuator (36) linked to the drive dog for selectively effecting said movement under control remote from the inside of the door and/or inaccessible from the inside of the door when closed.

2. A mechanism as in Claim 1 in which the release lever (16) also interacts with the locking means (14) whereby movement of the release lever in the direction for unlatching the door shifts the locking means, if in a locked condition, to an unlocked condition.
3. A mechanism as in Claim 1 or 2 in which the longitudinal formation guiding the drive dog (32) is a closed slot (30) of the unlatching lever (24).
4. A mechanism as in any preceding claim in which the drive formation is an open-ended slot (34) in the release lever (24).
5. A mechanism as in any preceding claim in which the drive dog (32) is linked to the power actuator (36) by a linkage arrangement including a first part (44) and a second part (40), the first part being a link carrying the drive dog and pivotally mounted on the second part at a position remote from the drive dog.
6. A mechanism as in Claim 5 in which the second part (40) is a pivotally mounted rocking lever having a first arm pivotally mounting the first part (44) and a second arm coupled to the power actuator (36).

7. A mechanism as in Claim 6 in which the second arm is connected to a nut (38) mounted on a threaded shaft, the shaft being rotatable by the power actuator (36).

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8. A vehicle including a mechanism as defined in any preceding claim.

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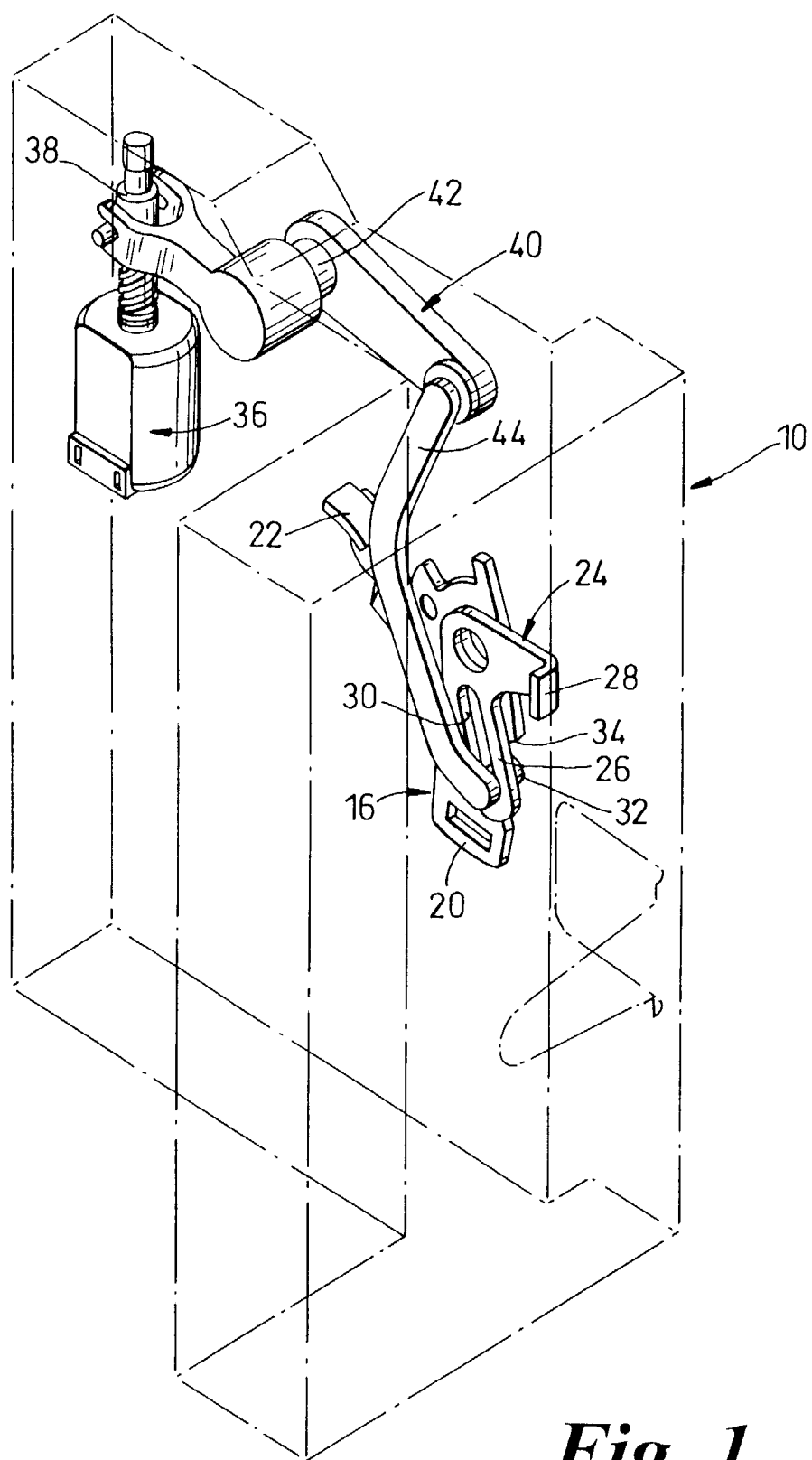


Fig. 1

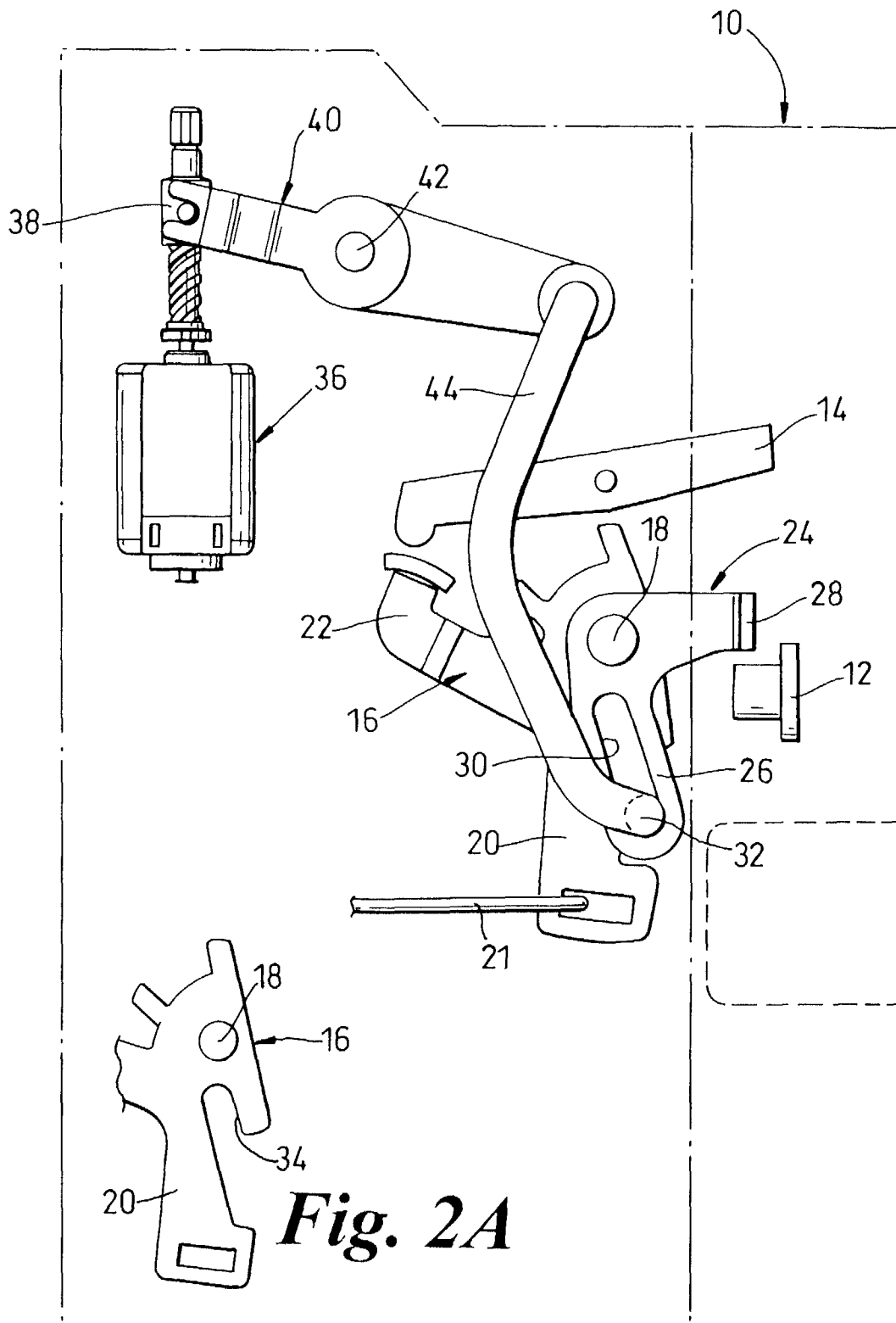


Fig. 2



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EUROPEAN SEARCH REPORT

Application Number
EP 98 30 5548

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	EP 0 775 791 A (ROCKWELL LIGHT VEHICLE SYSTEMS) 28 May 1997	1-3,5,8	E05B65/20 E05B47/00
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X	GB 2 295 643 A (MITSUI KINZOKU KOGYO KABUSHIKI KAISHA) 5 June 1996 * page 14, paragraph 2 - page 15, paragraph 2; figures 5,11-13 *	1,3,5,6,8	
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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 16 September 1998	Examiner Westin, K
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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EUROPEAN SEARCH REPORT

Application Number
EP 98 30 5548

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.6)
P,X	DE 196 38 700 A (KIEKERT AG) 26 March 1998 * the whole document *	1,3,8	
P,X	EP 0 826 855 A (MANNESMANN VDO AG) 4 March 1998 * the whole document *	1,5-8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16 September 1998	Examiner Westin, K
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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