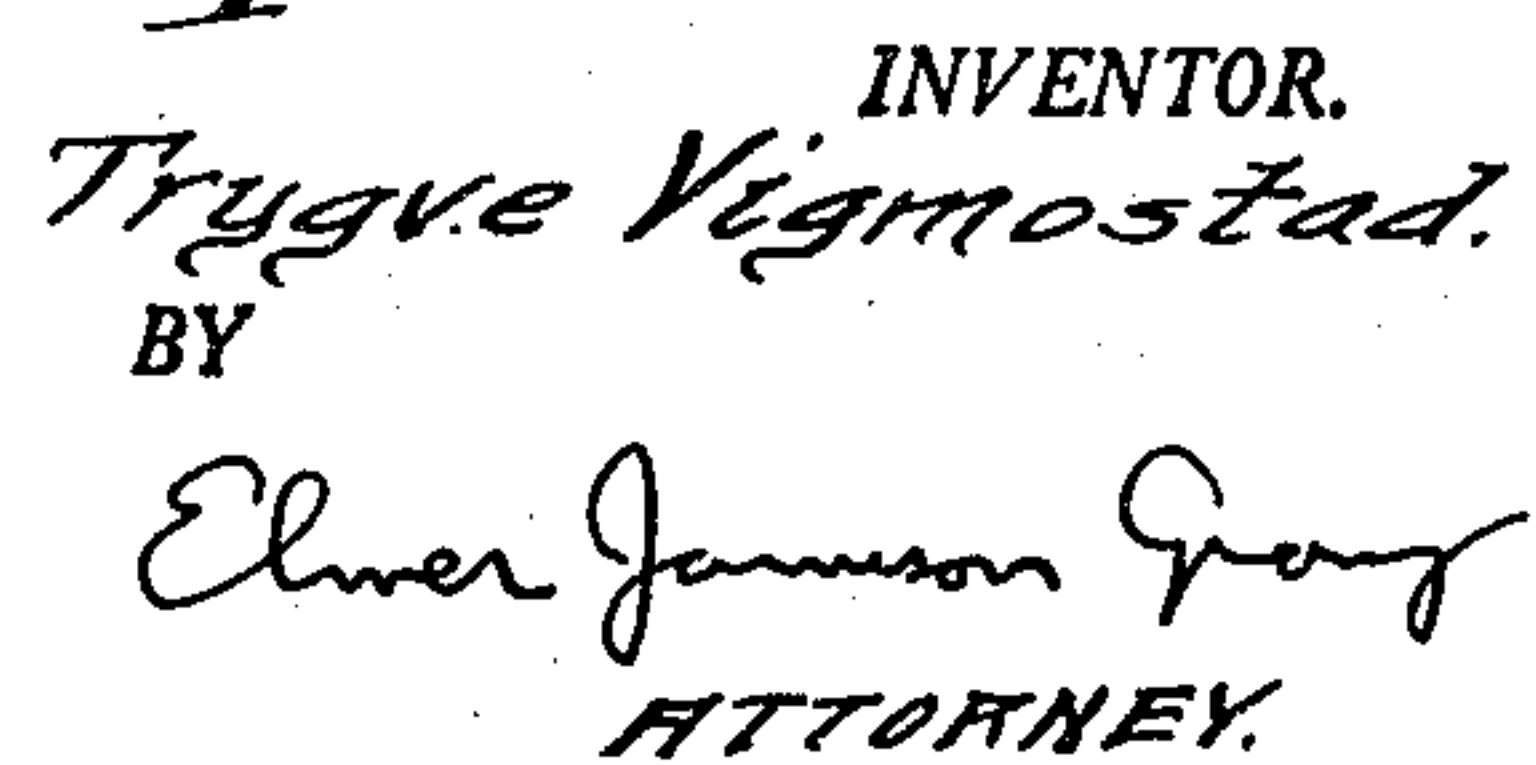


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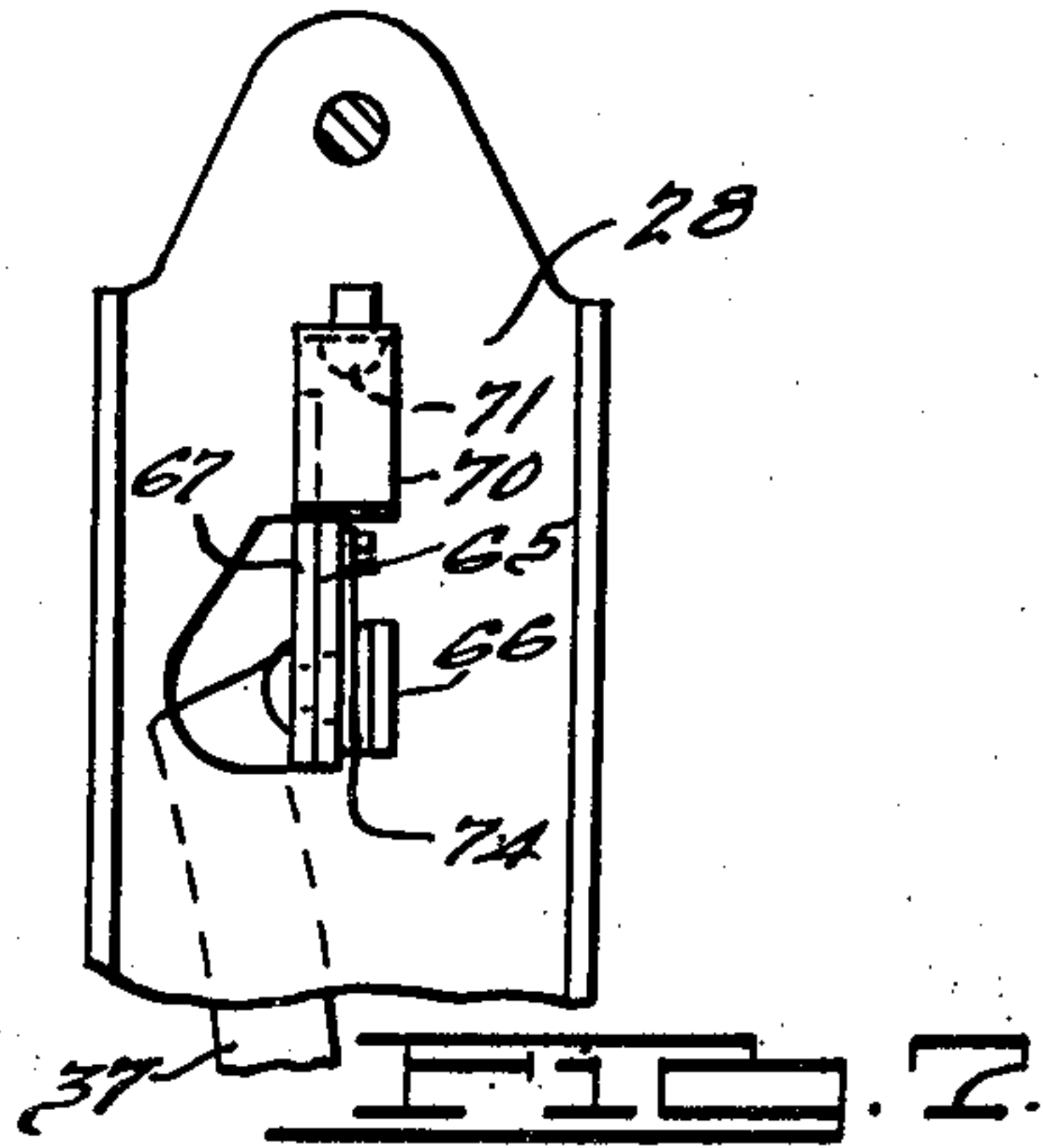
DECK LID LOCK

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2,709,910

## DECK LID LOCK

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9 Claims. (Cl. 70—144)

This invention relates to a self-latching latch mechanism of the type which is particularly adapted for latching an automobile rear deck lid in closed position with respect to the vehicle body.

An object of the present invention is to provide an improved latch mechanism for a swinging closure, such as for an automobile rear deck lid, which is of simplified and comparatively tamper proof construction and which is particularly adapted for key actuation with a minimum of force or load on the key.

In accordance with the illustrated embodiment of the invention the latch mechanism comprises a swinging control lever pivoted intermediate its ends on the lid structure and having a latch device pivoted on the lower end thereof. Spring means cooperating with the lid structure and latch device is provided for urging the latch device bodily with the lever to a latching position. The latch device at the latching position projects from the lever so as to engage a fixed keeper on the vehicle body when the lid structure is moved from open to closed position. The latch device is pivoted on the control lever so as to be swung relative thereto in a direction away from the keeper upon engagement with the latter during closing of the lid, thereby permitting the latch device to pass by the keeper into latching engagement therewith. Swinging of the latch device relative to the lever in the opposite direction is prevented by abutting portions on the lever and latch device. The lever is normally blocked against swinging movement by detent means engageable with the upper end of the lever and preferably controlled by key actuated means. In order to unlock the deck lid the key is turned thereby moving the detent means out of blocking relation to the control lever. In this condition the lever and latch device are free to be swung bodily against the tension of the spring upon lifting the deck lid. As this operation occurs the latch device is backed away from the keeper, this movement of the latch device being accompanied by a corresponding movement of the lower end of the lever. Hence, as the lid is swung upwardly toward open position the latch device clears the keeper whereupon the spring returns the control lever and the latch device carried thereby to their normal positions.

By virtue of the improved construction a single spring is feasibly employed to swing the lever and latch device as a unit to the latching position and also to resist independent pivotal movement of the latch device. Although in opening the lid the force transmitted by the latch device to overcome the resistance of the spring is through a relatively short length of the lever below its pivot, no great effort is needed to swing the lid upwardly to open position. It will be noted that a relatively long length of the lever is provided above its pivot so that the force applied to open the lid structure is readily overcome by a comparatively light force exerted by the key actuated detent means. In consequence, a lightweight detent means is feasibly employed which is easily actuated by the turning of a key.

Other objects of the invention will appear in the follow-

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ing description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Fig. 1 is a fragmentary vertical section through the latch mechanism for an automobile rear deck lid, taken longitudinally of the vehicle body in the direction of the arrows substantially along the line 1—1 of Fig. 2.

Fig. 2 is a fragmentary transverse section taken in the direction of the arrows substantially along the line 2—2 of Fig. 1, showing the mechanism in latching engagement with the keeper.

Fig. 3 is a view similar to Fig. 2, but showing the keeper engaging or latch device swung bodily from the latching engagement, as during opening of the lid.

Fig. 4 is a fragmentary horizontal section showing the key actuated detent means, taken in the direction of the arrows substantially along the line 4—4 of Fig. 2.

Fig. 5 is a fragmentary section showing the keeper engaging or latch device, taken in the direction of the arrows substantially along the line 5—5 of Fig. 2.

Fig. 6 is a view similar to Fig. 1, but showing a modification of the present invention.

Fig. 7 is a fragmentary transverse section showing the modified key actuated detent means, taken in the direction of the arrows substantially along the line 7—7 of Fig. 6.

It is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring to Figs. 1 through 5, a particular embodiment of the present invention is illustrated by way of example with the vertically swinging rear deck lid A of a vehicle body B. An outer panel 10 of the body B terminates adjacent the rear deck opening in an outwardly opening channel portion 11 containing a rubber-like weather seal and cushioning strip 12, Fig. 1. An inner transverse reinforcing plate 13 extends along the lower rear edge of the deck opening and is preferably welded to the base of the channel portion 11. Adjustably secured to the forward or inner surface of the plate 13 by a pair of bolts 14 and nuts 15 is a base 16 of a generally channel-shaped fixed keeper structure having rearwardly directed and transversely spaced channel sides, Figs. 1 and 2. Bolt holes 17 and 18 in the plate 13 and base 16 respectively for the bolts 15 and elongated horizontally and vertically respectfully afford limited adjustment of the keeper structure with respect to a latch mechanism on the lid A described below. Looking rearwardly at the keeper structure, Figs. 2 and 3, an upper portion 19 of the left channel side thereof extends transversely toward the right channel side and terminates in a depending guide flange 20. Similarly a transverse upper portion 21 of the right channel side of the keeper structure terminates in a latch engaging or keeper flange 22 declined toward the flange 20 and spaced therefrom.

The rear deck lid A comprises in the present instance spaced inner and outer panels 23 and 24, the former having a lower edge, when the lid is closed, terminating in a rearwardly extending bottom flange 25, which in turn terminates in a depending flange 25. The lower edge of the outer panel 24 overlies the flange 26 and terminates in an inbent flange 27 to complete a triple thickness overlap flange which snugly overlaps the strip 12 when the lid A is closed.

A channel-like latch support 28 is provided with an upper base portion flush against the rear surface of the



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inner panel 23 and is secured thereto by a bolt 29 and nut 30. Transversely spaced channel sides 31 extend rearwardly from the lower portions of the support 28 into a forwardly offset bay 23a of the panel 23 and terminate in lateral wings 32 flush with the forward surface of the bay 23a in abutting relation. Bottom flanges 33 of the wings 32 rest on the bottom panel flange 25 and are secured thereto by screw and nut assemblies 34. Below the flanges 33, the support 28 projects through an opening in the flange 25 as a channel-like tongue or guard 35 adapted to extend downward between the flanges 20 and 22 when the lid is closed.

Above the tongue 35, the support 28 is formed with a forward embossment 36 comprising a vertical bearing plate for a swinging locking lever 37 pivotally connected intermediate its ends to the plate or embossment 36 by a forwardly extending flanged stud 38. The latter is non-rotatably keyed to the plate 36 and is provided with a journal portion 39 adjacent the forward face of the plate 36 on which the lever 37 is pivoted to swing transversely with respect to the vehicle body B when the lid A is closed, Figs. 1 and 2. An enlarged spring retaining head 40 of the stud 38 confines the lever 37 adjacent the plate 36.

As indicated in Fig. 2, the lever 37 comprises a long arm extending upward from the pivot 39 and a shorter arm extending downward from the pivot 39, the shorter arm terminating above the lower end of the tongue 35 in a latch supporting projection 41 having its left edge, Fig. 2, offset to the right to provide an overhang or abutment shoulder 42. Sleeved over the projection 41 is a pivotal keeper engaging or latch device 43 having a rectangular opening through which the projection 41 extends and being pivoted on a pivot pin 44 extending through the projection 41 and front and rear walls of the device 43 in parallelism with the stud 38. Thus the lever 37 and device 43 are pivotal about parallel axes.

A left hand wall 45 of the device 43, Fig. 2, underlies and abuts the shoulder 42 to limit clockwise swinging of the device 43 with respect to the lever 37. The front and rear walls of the device 43 extend to the right of the pivot 44 and are joined by a keeper engaging portion 46, Fig. 5. The latter comprises the right hand wall of the device 43 and is inclined to extend perpendicularly to the keeper flange 22 and to engage the underside thereof in latching engagement when the lid A is closed, Fig. 2. Projecting rearwardly from the upper edge of the rear wall of the device 43 is a spring retainer 47 which is engaged under tension by the outer end of a spiral spring 48. From the retainer 47, the spring 48 extends spirally inward counterclockwise about the stud 38 and is retained against rotation within a kerf 49 in the enlarged stud head 40.

By the above described construction, the spring 48 is tensioned to swing the latch device with respect to the lever 37 clockwise about the pin 44 and bodily with the lever 37 counterclockwise about the pivot axis of the journal portion 39, Fig. 2. The counterclockwise swinging of the lever 37 is limited by abutment between the latter's upper end and the left channel side wall of the support 28 against which the upper end of the lever 37 normally rests when the lid A is open. It is apparent that in order to move the tongue 35 of the support 28 vertically from the keeper structure, as upon opening of the lid A from the position of Fig. 2, the lever 37 must yield clockwise against the tension of the spring 48 so as to swing the latch device bodily from the latching engagement, Fig. 3. This action is readily accomplished, unless the lever 37 is otherwise blocked against clockwise pivoting, by virtue of the inclined keeper engaging wall 46 which cams the device 43 downward and clockwise about the pivot 39 as the lid A is raised. During this action, the latch device 43 is blocked against clockwise swinging with respect to the lever 37 by reason of the abutment

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between the lever's shoulder 42 and the left wall 45 of the latch device.

The channel sides of the support 28 are flared outward at 50 above the wings 32, the left hand flared portion being broadened to comprise a platform 50a on which a swinging detent 51 is pivoted by means of a pin 52 adjacent the upper end of the lever 37. The detent 51 is provided with a forwardly extending blocking shoulder 53 adapted to be swung vertically into and out of the path of clockwise pivoting of the lever 37. A transverse portion 54 of the detent extends to the right of the shoulder 53 in Fig. 2, then rearward at 55 to terminate in a nib or tongue 56, Fig. 4. The nib 56 projects into a notch 57 of a rotatable detent operator 58 splined on a rearwardly extending stem 59 of a cylinder lock within a housing 60. The latter is suitably secured to the outer deck lid panel 24 by screws 61 and contains a lock mechanism operated by a key 62.

The lock mechanism may be conventional if desired and is operative upon insertion and turning the key 62 to rotate the stem 59. As is apparent in Fig. 2, upon counterclockwise rotation of the stem 59, the operator 58 is rotated counterclockwise to raise the nib 56 and shoulder 53 about the pivot 52 and to free the upper end of the lever 37 for clockwise swinging. Thus the lid A may be raised from the closed position by clockwise yielding of the lever 37 about the pivot 39 and against the tension of the spring 48, Fig. 3. Immediately after the device 43 clears the keeper flange 22 upon opening of the lid, the lever 37 will be returned counterclockwise to the latching position by the spring 48, whereat the upper portion of the lever 37 abuts the left hand channel sidewall of the support 28. The stem 59, operator 58 and detent 51 may then be returned to the locking position of Fig. 2 by clockwise turning of the key 62, whereupon the latter may be withdrawn from the lock if desired.

The lower edge of the device 43 in the latching position inclines toward the right from the pivot 44 so as to engage the keeper flange 22 upon closing of the lid A and to swing the device counterclockwise against the tension of the spring 48 and independently of the lever 37. Thus the latch device 43 readily yields for passage of the keeper flange 22 upon closing the lid A. When the flange 22 clears the lower edge of the device 43, the latter is swung by the spring 48 to the limit of clockwise movement and into latching engagement with the lower edge of the flange 22, Fig. 2. By virtue of the comparatively small leverage between the keeper engaging portion 46 and the pivot 44 of the latch device, counterclockwise yielding of the latter against the spring tension is achieved by the application of a slight closing force to the lid A. The structure may be designed so that the weight of the lid itself will be adequate to provide the final closing force.

A modification of the detent and detent operating mechanism is illustrated in Figs. 6 and 7 wherein the latching mechanism is substantially the same as described above. In Fig. 6, the upper end of the swinging locking lever 37 is offset rearwardly at 37a and extends upward through an opening 28a in the channel base of the support 28. A pivotal detent 65 is pivoted on a fixed flanged stud 66 secured within a projection 67 lanced from the channel base of the support 28 at a location forward of the latter. The stud 66 extends axially through the projection 67 and detent 65 perpendicularly to the pivot pins 38 and 44.

The detent 65 is provided with an integral projection 68 which extends rearwardly through an opening 28b in the channel base of the support 28 to swing about the axis of the stud 66 into and out of the path of clockwise swinging of the upper end of the lever 37. Another projection 69 of the detent 65 extends upward from the pivot 66 and is provided at its upper portion with a plunger engaging flange 70 which extends transversely across the forward end of a plunger 71 movable longitudinally of



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the vehicle body B when the lid A is in closed position, Fig. 6. The plunger 71 extends rearward from the flange 70 through an opening 28c in the channel base of the support 28 and into a lock housing 72 secured to the deck lid panel 24 by the screws 61, similarly to the manner of attachment of the housing 60. The housing 72 contains a plunger 73 extending rearwardly of the panel 24 and adapted to be unlocked and pushed forward, thereby to move the plunger 71 forward into abutment with the flange 70 to swing the detent 65 and projection 68 counterclockwise out of the path of the lever 37. When the pressure applied to push the plunger 73 forward is released, the latter and plunger 71 are returned by spring means contained within the housing 72 to their rearward positions, Fig. 6, whereat the plunger 73 may be locked against forward movement. The plunger type lock mechanism may be conventional and is accordingly not discussed in detail herein.

Upon release of the lever 37 for clockwise swinging, the deck lid is opened as discussed above. Upon return of the plungers 71 and 73 to their rearward positions, a coil spring 74 around the stud 66 and engaged therewith and with a flange 75 of the detent 65 yieldingly urges return of the latter clockwise to the detent position, whereat the projection 68 is positioned in the path of clockwise swinging of the lever 37, Fig. 6.

I claim:

1. In a latch mechanism, a swinging lid or closure having a support, a swinging lever pivoted on the support, a latch device pivotally mounted on the lever, spring means connecting said support and device to urge the latter to a latching position and to resist swinging movement of said lever in a given direction, said latch device being pivoted on the lever to engage a keeper and to be swung thereby in one direction relative to the lever out of latching position upon swinging the lid toward closed position, means comprising a part on said latch device engageable with a part on said lever to block swinging of the latch device in the other direction with respect to said lever, detent means pivotally mounted on the support and engageable with said lever to block swinging movement thereof oppositely from said given direction, and key actuated means for pivotally moving said detent means to disengage the same from said lever thereby freeing the lever and latch device for bodily swinging movement away from the keeper upon moving said lid toward open position.

2. In a latch mechanism, a swinging lid or closure having a support, a vertically extending lever pivoted intermediate its ends on the support, a latch device pivotally mounted on the lower end of the lever to engage a keeper and to be swung thereby in one direction relative to the lever out of latching position upon swinging the lid toward closed position, means comprising a part on said latch device engageable with a part on said lever to block swinging of the latch device in the other direction with respect to said lever, detent means engageable with the upper end of said lever to block swinging movement thereof, means for disengaging said detent means from the lever thereby freeing said lever and latch device for bodily swinging movement out of latching position upon swinging said lid toward open position, and means subjecting said support and latch device to tension yieldingly resisting said bodily swinging movement comprising spring means connecting said support and latch device and yieldingly urging the latter to the latching position.

3. In a latch mechanism, a swinging lid or closure having a support, a vertically extending swinging lever pivoted intermediate its ends on the support, a latch device pivotally mounted on the lower end of the lever, spring means connecting said support and device to urge the latter to a latching position and to resist swinging movement of said lever from the latching position, said latch device being pivoted on the lever to engage a keeper and to be swung thereby in one direction relative to the

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lever out of latching position upon swinging the lid toward closed position, means comprising a part on said latch device engageable with a part on said lever to block swinging of the latch device in the other direction with respect to said lever, detent means pivotally mounted on the support and engageable with the upper end of said lever to block swinging movement thereof from the latching position, and key actuated means for pivotally moving said detent means to disengage the same from said lever thereby freeing the lever and latch device for bodily swinging movement away from the keeper upon moving said lid toward open position.

4. In a latch mechanism, a swinging closure movable to and from a closed position with respect to a keeper, a swinging lever pivoted on the closure, a latch device pivoted on the lever, a spring disposed between and exerting force on said closure and device to urge the latter and lever to a latching position, said device being pivoted on the lever to engage the keeper and to be swung thereby from the latching position in one direction relative to the lever to pass by the keeper upon movement of the closure to its closed position, blocking portions on said lever and device engageable to block swinging of the latch device from the latching position in the other direction relative to said lever, said lever being pivoted on the closure to swing the latch device bodily from the latching position for passage by the keeper upon movement of the closure from said closed position, and detent means releasably engageable with the lever to hold the latter against movement from the latching position.

5. In a latch mechanism, a swinging closure having a support, a swinging lever pivoted on the support, a latch device pivoted on the lever to engage a keeper to be swung thereby in one direction with respect to said lever from a latching position upon swinging of said closure toward its closed position, means comprising a part on said lever engageable with a part on said latch device at said latching position to block pivoting of said device oppositely to said one direction with respect to said lever, detent means engageable with said lever to block swinging thereof, means for disengaging said detent means from said lever to free the same for bodily swinging from said latching position, and means yieldingly resisting said bodily swinging comprising spring means disposed between and exerting force against said support and device to urge the latter to the latching position.

6. In a latch mechanism, a swinging closure movable to and from a predetermined position with respect to a keeper, a locking lever pivoted on the closure, a latch device pivoted on the lever, resilient means engaging said closure and latch device with force urging the latter to a latching position, means to block swinging of the latch device from the latching position in one direction with respect to said lever, and detent means releasably engageable with the lever to hold the latter against swinging from the latching position.

7. In a latch mechanism, a swinging closure movable to and from a predetermined position with respect to a keeper, a locking lever pivoted on the closure, a latch device pivoted on the lever, resilient means engaging said closure and latch device with force urging the latter to a latching position, means comprising a part on said lever engageable with a part on said latch device to block swinging of the latch device from the latching position in one direction with respect to said lever, and detent means releasably engageable with the lever to hold the latter against swinging from the latching position.

8. In a latch mechanism for a vehicle deck lid having a support and movable to and from a closed position with respect to a fixed keeper on the vehicle body, a locking lever pivoted on the support, a latch device pivoted on the lever, resilient means engaging said support and latch device with force urging the latter and lever in one direction with respect to said support to a latching position, means comprising a part on said lever engageable with a



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part on said latch device to block swinging of the latter from the latching position in said one direction with respect to said lever, movement limiting means on said support engageable with said lever to block pivoting thereof in said one direction at a predetermined location adjacent said latching position, and detent means releasably engageable with said lever to hold the latter against pivoting oppositely said one direction.

9. In a latch mechanism for a vehicle deck lid having a support and movable to and from a closed position with respect to a fixed keeper on the vehicle body, a vertically swinging locking lever pivoted intermediate its ends on said support and having a lower end below said keeper when said lid is at the closed position, a vertically swinging latch device pivoted on the lower end of said lever for swinging toward and from the latter in folding and unfolding movements, resilient means engaging said support and latch device with force urging unfolding movement of the latter, means comprising a part on said lever engageable with a part on said device blocking unfolding movement of the latter at a predetermined unfolded posi-

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tion with respect to said lever, said device at the unfolded position extending upward from the lower end of said lever at the latching position and underlying said keeper when the lid is at the closed position, detent means engageable with the upper end of said lever at the latching position to block swinging thereof, means for disengaging said detent means from said lever to free the same for swinging from the latching position upon opening movement of the lid, said device being foldable toward said lever when engaged by said keeper upon closing of said lid.

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