July 5, 1932. C. L. JOHNSON 1,866,309

LEVER LOCKING MECHANISM

Filed Feb. 28, 1927

Fig-1

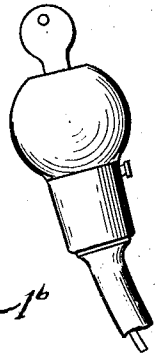


Fig-2

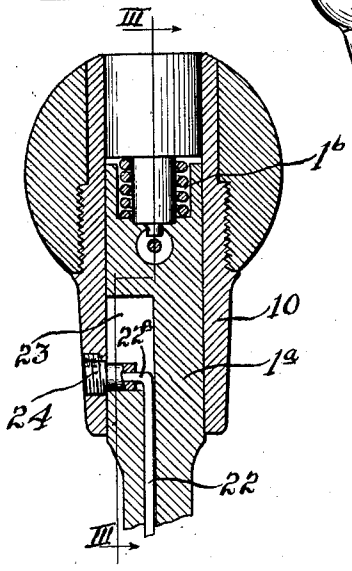


Fig-3

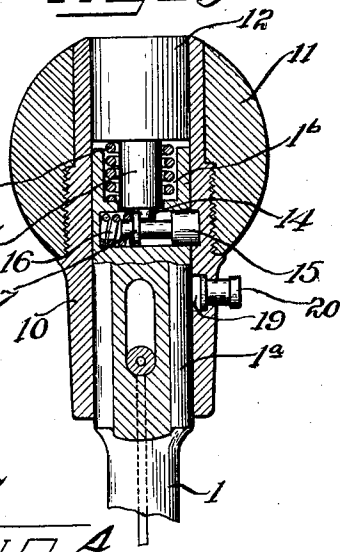


Fig-4

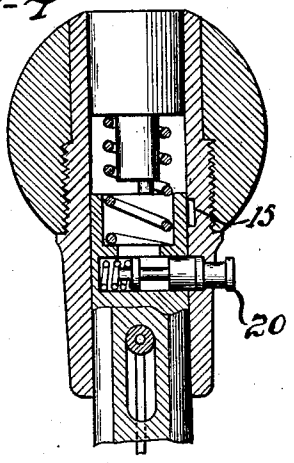
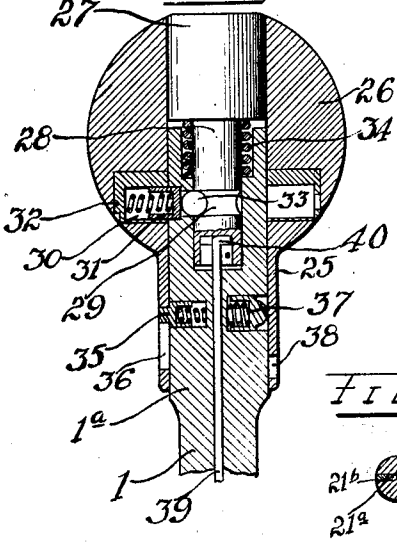


Fig-5



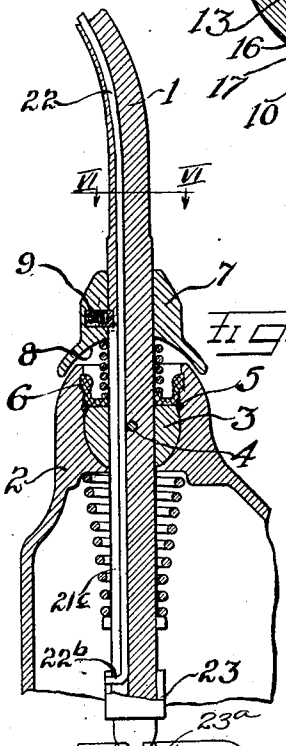


Fig-6

Inventor

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by Charles G. Kelly Atty

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UNITED STATES PATENT OFFICE

COLVIN L. JOHNSON, OF ST. LOUIS, MISSOURI, ASSIGNOR, BY MESNE ASSIGNMENTS, TO FRANK C. WEBB, OF ST. LOUIS, MISSOURI

LEVER LOCKING MECHANISM

Application filed February 28, 1927. Serial No. 171,448.

This invention relates to a lever locking mechanism and particularly to a mechanism which may be effectively used in locking the gear shift levers or other control levers of automotive vehicles to prevent unauthorized operation thereof.

It is an important object of this invention to provide a lever locking mechanism wherein the control means for the locking mechanism form a part of the lever handle and are slidable on the lever.

It is also an important object of this invention to provide a locking mechanism of the kind described wherein both the locking and unlocking operations are effected by a movement of the slidable casing at the handle end of the lever.

It is another important object of this invention to provide a lever locking mechanism embodying interiorly releasable means for locking a cover over the lever pivot.

A further important object of this invention resides in the provision of a lever locking mechanism which is simple, durable and relatively inexpensive and which may be conveniently locked and unlocked by manipulation of the lever handle.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawing.

The invention (in a preferred form) is illustrated in the drawing and hereinafter more fully described.

On the drawing:

Figure 1 is a fragmentary central vertical section with parts shown in elevation and parts broken away illustrating a gear shift lever and locking mechanism embodying the principles of the present invention.

Figure 2 is an enlarged fragmentary vertical section taken through the lever handle and locking mechanism associated therewith with parts shown in elevation.

Figure 3 is a view similar to Figure 2 taken along the line III—III of Figure 2.

Figure 4 is a view similar to Figure 3 showing the handle portion in unlocked position.

Figure 5 is a view similar to Figure 3 showing a modification wherein the locking bolt is mounted in the handle portion casing.

Figure 6 is a section on the line VI—VI of Figure 1 showing the method of forming the internal longitudinal passage through the lever.

As shown on the drawing:

The reference numeral 1 indicates a gear shift lever which is pivotally mounted in a transmission housing cover 2 on the usual ball 3, the ball ordinarily being secured to the lever by a pin 4. The ball 3 and the lever 1 are secured from longitudinal movement relative to the cover 2 by means of a locking wire 5 inserted in the groove in the wall of the cover portion directly above said ball. Undesirable vibration of the lever in its pivotal mounting is prevented by a gasket or washer 6 which is secured in the recess in the cover 2 directly above the ball 3 and the wire 5. Access to the pivotal mounting of the lever is prevented by a cover member 7 which has a concave under-surface 8 and which is lockingly secured to the lever by a spring-pressed internal plunger 9 which engages in a recess in said lever. The method of releasing said spring-pressed plunger 9 will be described hereinafter.

The upper end of the lever 1 is provided mounted on said enlarged portion 1^a is a recessed at its upper end as at 1^b, and slidably mounted on said enlarged portion 1^a is a cylindrical casing 10 which has secured thereto an annular member 11 with a spherical surface whereby the casing 10 and said member 11 afford a substantially ball-shaped handle for the lever 1. Mounted in the upper end of the casing 10 with its outer end flush with the upper end of said casing is a lock cylinder 12 which is provided at its inner end with a plug 13 rotatable relative thereto through the insertion of a suitable key in the cylinder, said plug 13 in turn being provided with an eccentric projection 14 which acts when the lock cylinder is rotated to withdraw a lock bolt 15 from a recess 15^a formed in the inner wall of the casing 10. Said lock bolt 15 is slidably mounted in a lateral recess in the enlarged portion 1^a of the lever 1 and is normally urged outwardly

relative to the surface of said enlarged portion 1^a by means of a helical spring 16 which is engaged between the end of the recess and a shoulder 17 formed on said bolt 15. The bolt 15 is reduced in diameter between said shoulder 17 and its outer end to afford a recess for the reception of the eccentric projection 14, said eccentric projection 14 contacting that face of the shoulder 17 opposite the end of the spring 16 when the plug 13 is rotated to retract the bolt 15.

The casing 10 and the mechanism carried thereby are normally urged upwardly by a helical spring 18 engaged in the recess 1^b between the inner end of the cylinder 12 and the end of the lever portion 1^a at the bottom of said recess 1^b. When the plug 13 is rotated to retract the lock bolt 15, the spring 18 will force the casing 10 and the parts carried thereby upwardly into the position shown in Figure 4 at which time the bolt 15 will snap into a recess 19 and retain the casing 10 in said position shown in Figure 4 which will be noted hereinafter as unlocked position. This retaining of the casing 10 in unlocked position prevents accidental downward movement of said casing during normal manipulation of the lever and when it is desired to push the casing 10 downwardly into the position shown in Figure 3, it is only necessary for the operator to press inwardly on the laterally extending button 20 which is reciprocably mounted in the casing 10 and the end of which communicates with the recess 19. This pressure on the button 20 will push the bolt 15 out of the recess 19 and will permit the casing to be pushed downwardly by the application of pressure to the end of the handle portion.

The reciprocable movement of the handle portion on the end of the lever 1 controls a mechanism for locking said lever from operation in a manner which will now be described. Said lever 1 is provided with a longitudinal passage 21 (Figure 6) in which a wire connecting rod or link 22 is reciprocably mounted. The upper end of the wire 22 terminates in a lateral portion 22^a which extends into an elongated recess 23′ formed in the enlarged portion 1^a at the end of the lever 1 permanently secured in the casing 10, and extending into said recess 23′ is a blind stud or set screw 24 into which the lateral portion 22^a of the connecting rod or wire 22 extends and is secured.

The passage 21 through the lever is preferably formed by milling a groove in said lever and then closing the outer end of said groove by the insertion of a wall 21^a and welding compound 21^b therein, after which the outer surface of the lever is smoothed and buffed to provide virtually an integral construction with the interior passage 21. That portion of the groove formed in the lever below the cover member 7, however, in the present instance, is preferably not closed so that that portion of the passage 21 below said cover member 27 is in effect only a groove in the lever which is clearly shown in Figure 1 and which I have designated by the reference numeral 21^c.

The connecting rod or wire 22 is provided at its lower end with a lateral projection 22^b which is connected to a sleeve or collar 23 slidably mounted on the lower extremity of the lever 1 and adapted to engage when in its lowermost position in an aperture in some fixed object inside the transmission housing or cover or between the gear shifting forks to lock the lever from operation in a manner which is well known. In Figure 1 I have shown the ring 23 as adapted to engage in aperture 23^a in gear shift blocks 23^b. It will thus be apparent that when the casing 10 and the parts carried thereby are in the position shown in Figure 4, it is only necessary for the operator to press inwardly on the button 20 and downwardly on the handle portion afforded by said parts to force the locking sleeve or collar 23 downwardly until the bolt 15 snaps into the recess 15^a and locks said handle portion in the position shown in Figure 3. This downward movement of the handle portion will, of course, serve to move the sleeve or collar 23 downwardly into locking engagement in the manner previously referred to. The plunger 9 is in practice released by a probe or wire inserted from the bottom of the lever in slot 21^c.

In Figure 5, I have shown a slight modification of the construction just described wherein a casing 25 embodying a spherical handle portion 26 is slidably mounted on the enlarged upper end 1^a of the lever 1. Said casing 25 has rotatably secured in its upper end a lock cylinder 27, the lower end of which is provided with a plug 28 which projects into an axial recess formed in the upper end of the enlarged portion 1^a of the lever 1. The plug 28 is provided with an eccentric groove 29 near its lower end, said groove 29 communicating with the lateral recess in the enlarged portion 1^a, said lateral recess in turn communicating with a recess 30 in the handle portion 26. The lateral recess in the enlarged portion 1^a is enlarged at its outer end to receive the closed end of the locking bolt 31 which is normally urged toward the lever by a helical spring 32. Engaged between the eccentric groove 29 and the inner end of the locking bolt 31 is a ball 33 which acts when the cylinder 27 and plug 28 are rotated to force the bolt 31 out of the recess in the enlarged portion 1^a and thus permits the sleeve 25 and handle portion 26 to be moved upwardly. This upward movement of the sleeve portion 25 and handle portion 26 is effected by a helical spring 34 which is positioned between the lower face of the lock

cylinder 27 and the bottom of an enlarged axial recess formed in the enlarged portion 1a of the hand lever 1. Slidable movement of the sleeve 25 and handle portion 26 in an upward direction is limited by a spring-pressed pin 35 which is mounted in a lateral recess in the enlarged portion 1a of the lever 1 and the outer end of which projects into a longitudinal slot 36 formed in the sleeve 25. Said handle portion 26 and sleeve 25 are further locked against accidental movement from the upper or unlocked position by a spring-pressed rounded detent 37 which may be released by the finger of the operator and which engages in the aperture 38 formed in the sleeve 25 when said sleeve and the handle portion are in upper or unlocked position. Movement of the sleeve and handle portion is communicated to a locking collar similar to the locking collar 23 through a wire rod or link 39 similar to the wire rod or link 22, the upper end of said wire rod or link 39 being connected to the lower end of the plug 28 by a swivel connection as shown at 40.

It will be apparent from the foregoing description that I have provided a lever locking mechanism which may be conveniently and effectively used to lock levers such as automobile gear shifting levers and the like from unauthorized operation. The mechanism which I have provided is very easy and convenient to lock and unlock being only necessary to push the release button 20 or 37 and press downwardly on the handle to effect the locking operation and being only necessary to insert a key in the lock cylinder and rotate the same thereby to permit the unlocking operation to automatically take place. By reason of the construction which I have provided, it is possible to retain the desired neat appearance and small dimensions of a usual gear shift lever and at the same time have the lever equipped with the improved locking mechanism of my invention.

I am aware that numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted, otherwise than necessitated by the prior art.

I claim as my invention:

1. The combination with a lever having a longitudinal passage therethrough, of a casing embodying a lever handle slidably and non-rotatably mounted on one end thereof, a spring between said casing and the end of the lever for urging said handle into unlocked position, control means connected at one end to the casing and extending through said passage, means connected to said control means and slidably mounted on the lever adjacent the other end thereof for locking the same from movement, and key-released means for locking the casing and lever against relative longitudinal movement.

2. The combination with a lever, of a handle portion slidably fitted over one end of said lever, a spring for normally holding the handle portion in a predetermined position relative to the lever, means for locking the handle portion and lever from relative movement, and means controlled by said handle portion for locking the lever from movement.

3. The combination with a lever, of means including a connection between said means and said lever for causing said means to be at all times held against rotation and said means being slidably mounted on one extremity of the lever and adapted to be grasped to operate the lever, and means controlled by said slidably mounted means for locking the lever from movement.

4. The combination with a lever, of means including a connection between said means and said lever for causing said means to be at all times held against rotation and said means being slidably mounted on one extremity of the lever and adapted to be grasped to operate the lever, and a second means slidably mounted on said lever and controlled by said first mentioned slidably mounted means for locking the lever from movement.

5. The combination with a gear shift lever, of a sleeve slidably mounted at the upper extremity thereof, a ball handle secured to the sleeve, a lock cylinder mounted in the end of the sleeve, a bolt slidably mounted in the end of the lever and adapted to lock in a recess in the sleeve, an operative connection between the lock cylinder and said bolt, and means for locking the lever from operation connected to said sleeve.

6. The combination with a gear shift lever, of a sleeve slidably mounted at the upper extremity thereof, a ball handle secured to the sleeve, a lock cylinder mounted in the end of the sleeve, a bolt slidably mounted in the end of the lever and adapted to selectively engage in two recesses in the sleeve, an operative connection between the lock cylinder and the bolt for withdrawing the bolt from one of said recesses, laterally extending means for withdrawing the bolt from the other recess, and means for locking the lever from operation connected to said sleeve.

7. In combination, a gear shift lever, means associated with a lower portion of said lever for locking said lever in a given position, and a handle member fitted over and telescoped by the upper end of said lever for controlling the operation of said means, said member being at all times held against rotation and being arranged to unlock said lever by sliding it on said lever.

8. In combination, a gear shift lever, a slidable handle member telescoped by the upper end of said lever, a lock associated with

said handle member for locking it against movement, means associated with the lower portion of said lever for locking said lever against movement, and means for operatively connecting said lock to said lower means, said lock including a plunger mounted in said upper end of the lever and arranged to engage in a slot in said handle member to lock said handle against movement.

9. In combination, a gear shift lever, a slidable handle member telescoped by the upper end of said lever, a lock associated with said handle member for locking it against movement, means associated with the lower portion of said lever for locking said lever against movement, means for operatively connecting said lock to said lower means, said lock including a plunger mounted in said upper end of the lever and positioned to engage in a slot in said handle member to lock said handle against movement, and manually operable means associated with said handle member for releasing said plunger from said slot.

10. The combination with a gear shift lever and a pivotal mounting therefor, of a cover over the pivotal mounting, there being a slot in said lever, and mean for securing the cover to the lever comprising a member extending into said slot and arranged to be forced out of said slot by a probe inserted in the slot from the lower end of the lever.

11. In combination, a gear shift lever, a handle member slidably mounted and at all times held against rotation on said lever for controlling the locking of said lever against movement, a connection between said handle and lever for preventing the handle from being rotated on said lever, means for locking said handle member against movement in one position and for holding it against movement in another position, key operated means for releasing said member from the locked position, and manually operable means for releasing said handle member from the other position.

12. In combination, a gear shift lever, a handle member slidably mounted on said lever for controlling the locking of said lever against movement, means for locking said handle member against movement in one position and for holding it against movement in another position, key operated means for enabling the release of said member from one of said positions, manually operable means for releasing said handle member from another position, and a spring in said handle member for automatically causing said handle member to be forced to its unlocked position when the handle member is released from its locked position.

13. In combination, a gear shift lever, a handle member slidably mounted on said lever for controlling the locking of said lever against movement, means for locking said handle member against movement in one position and for holding it against movement in another position, key operated means for enabling the release of said member from one of said positions, manually operable means for releasing said handle member from another position, a spring in said handle member for automatically causing said handle member to be forced to its unlocked position when the handle member is released from locked position, and means connected to said handle member for locking the lever against movement when said handle member is locked against operation.

14. In combination, a lever, a handle member slidably mounted thereon, means for latching said handle member from movement relative to said lever in one position, means operable by said handle member for locking said handle member from movement relative to said lever in another position, and key responsive means for releasing said handle member from said last said position.

15. In combination, a lever, movable means on said lever adjacent an end thereof, movable means operable by said first said means adjacent the other end of said lever for locking the same from operation, means for latching said first said means in unlocked position and locking said first said means in locked position, and key controlled means for releasing said last said means from locked position, said latch means including means manually releasable from latched position independently of the key of said key control means.

In testimony whereof I have hereunto subscribed my name at St. Louis, Missouri.

COLVIN L. JOHNSON.