Oct. 14, 1930. H. C. KENNEDY 1,778,294

LOCK

Original Filed Jan. 22, 1926

Fig. 1.

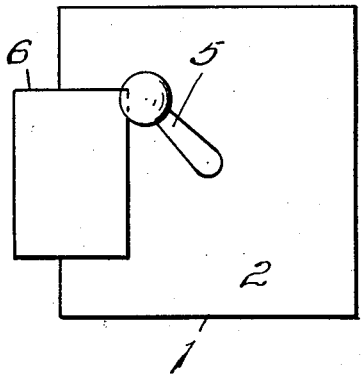


Fig. 2.

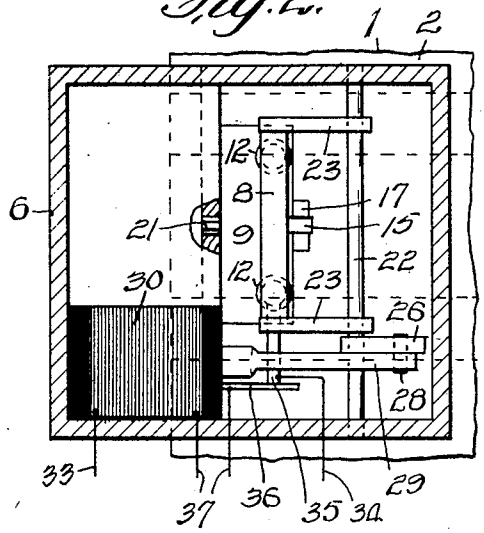


Fig. 3.

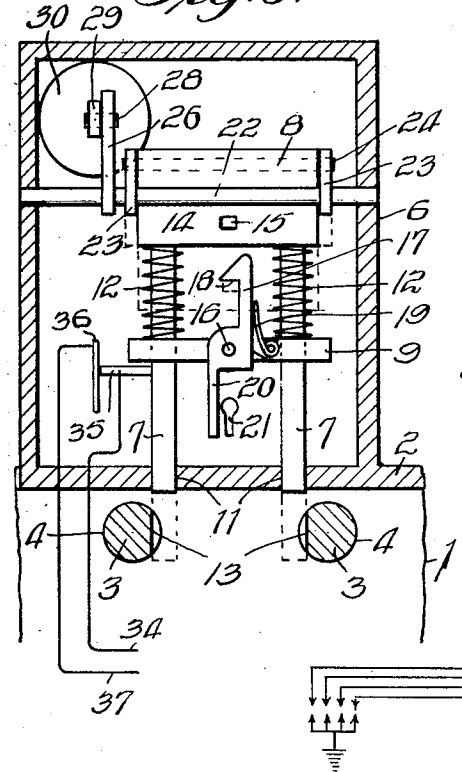
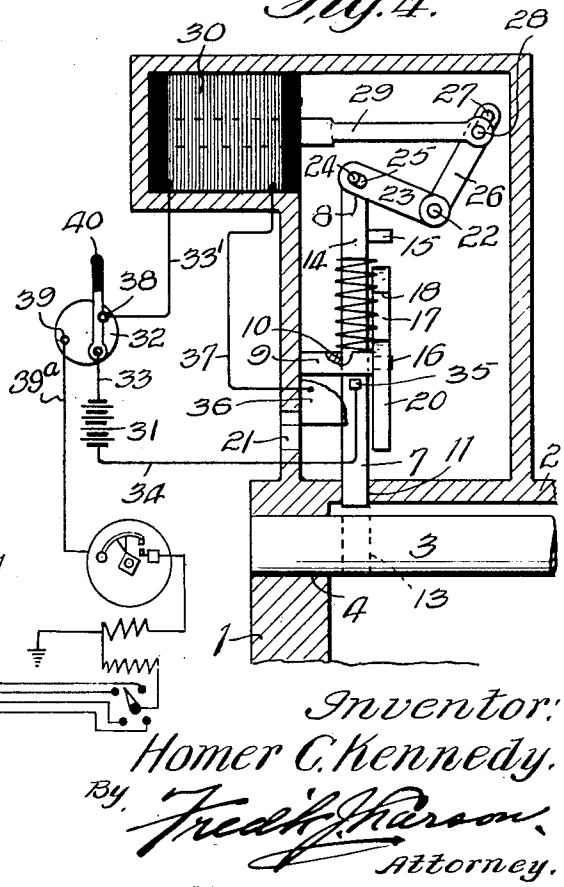


Fig. 4.



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Patented Oct. 14, 1930

1,778,294

UNITED STATES PATENT OFFICE

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LOCK

Application filed January 22, 1926, Serial No. 83,093. Renewed July 9, 1930.

This invention relates in general to improvements in locks, particularly adapted, though not necessarily limited in its use for locking the transmission of a motor vehicle, and one of the objects of the invention is to provide an improved locking means for locking any of the parts of a motor vehicle to prevent unauthorized use of the vehicle or the removal of any of the parts that are to be locked thereby.

A further object is to provide an improved lock which will be associated with a control device (such as a switch) that controls some of the operating parts of a machine or apparatus in connection with which the lock is associated, whereby when the control device is actuated to stop the operation of the part controlled thereby, the lock will automatically become active and certain of the parts of the machine or apparatus will be locked against operation or movement with respect to the machine or apparatus or by securing certain parts against removal, the lock being rendered inactive through the medium of other instrumentalities, such as a key or the like.

With the above and other objects in view, the invention consists in the novel features of construction, arrangement and combination of parts hereinafter more fully described and finally pointed out in the claims hereto appended.

Referring to the accompanying drawings forming a part of this specification, wherein like characters of reference denote similar parts throughout the several views:

Fig. 1, is a top plan view of my invention diagrammatically showing the same applied to a transmission case.

Fig. 2, is a top plan view in section of a device constructed in accordance with and embodying the features of my invention.

Fig. 3, is a view partly in section and showing a front elevation of the locking means.

Fig. 4, is a view partly in section of a side elevation of the locking means.

Referring to the drawings, the reference character 1 represents a portion of one of the end walls of a transmission gear case. The numeral 2 represents the cover for the case 1 and numeral 3 designates a pair of longitudinally movable shifting rods which pass through openings 4 in the end walls 1 of the transmission case, while numeral 5 represents the usual type of gear shifting lever through the movements of which the gear shifting rods 3 are longitudinally movable, as is manifest.

In carrying out the aim of my present invention, I employ a suitable housing, or case 6 which preferably forms a part of the cover 2. Within the case 6 is mounted the locking mechanism constituting my invention here shown as adapted for locking transmission shifting rods against movement through the medium of the gear shifting lever 5.

The mechanism embodying the features of my particular invention involves a plunger preferably consisting of two arms 7 which arms are suitably spaced apart preferably in parallel relation and are connected at their upper ends by means of a suitable cross-head 8. A suitable bearing member is provided and each rod 7 passes through an opening 10 therein and also through openings 11 in the transmission case cover 2 and are guided thereby. A suitable coiled spring 12 preferably encircles each plunger rod 7 and the springs are disposed between the head of the plunger and the bearing member 9, for normally holding the plunger rods 7 in their retracted position and out of locking engagement with lock grooves 13 in the gear shifting rods 3, as shown in full lines in Fig. 3.

The cross-head 8 is provided with a body portion 14 and carries a pin or lug 15 and the bearing member 9 is provided with a pin 16 upon which is pivotally mounted a catch member 17 having a lip 18 for engagement with the pin or lug 15 on the cross-head body portion 14, when the arms of the plunger are in their projected or locking position, that is, when in engagement with the lock grooves 13 of the shifting rods 3, as shown in dotted lines in Fig. 3. This will lock the rods 3 against longitudinal movement. A suitable spring 19 bears against the catch member 17 for holding the lip 18 thereof in locked engagement with the lug 15. An arm 20 ex-

tends from the catch member 17 and is disposed adjacent a key hole 21 in the case 6, so that the lip 18 of the catch member 17 may be released from engagement with the lug 15 whenever it is desired, by placing a key in the key hole 21 and causing it to engage and move the arm 20. This will cause the catch member to pivotally move upon the pin 16 and permit the coiled springs 12 to retract the plunger to its unlocked position, which thereby releases the shifting rods 3 and permits longitudinal shifting movements thereof through the shifting movements of the gear-shifting lever 5.

The means for projecting the plunger preferably consists of a suitably supported rocker shaft 22. Arms 23 are fixed to the rocker shaft 22 and have engagement at their opposite ends with pins 24 fixed to the ends of the cross-head 8 which pins pass through slotted openings 25 in the arms 23, as shown in Fig. 4. A suitable arm 26 is also fixed to the rocker shaft 22 and is provided at its outer end with a slot 27 for receiving a pin 28 carried by an armature 29, the inner end of which armature is receivable in a suitable solenoid coil 30, which armature when energized attracts and draws or pulls the armature shaft further into the solenoid coil, thereby imparting a rocking movement to the arms 26 and 23, to project the plunger rods until the catch member 17 engages the lug 15 on the cross-head 8 for locking the plunger rods in their projected or active position to prevent shifting of the rod 3 within the gear transmission case 1.

The electrical current is preferably provided from a battery 31, for energizing the solenoid coil and is controlled preferably by means of a suitable two way switch 32, the latter being connected to a conductor 33 leading from the battery 31 to the coil 30. A second conductor 34 leads from the opposite side of the battery 31 to a terminal 35 which is carried by the plunger rod 7 and is adapted to contact with a terminal 36 when the plunger is in its retracted position and from which terminal 36 a conductor 37 leads to the solenoid coil 30, the other end of the coil being connected with the conductor 33′ for completing an electric circuit. The conductor 33′ is connected to the terminal 38 and when the switch member 40 is moved into contact with the terminal 38 and the plunger is retracted, at which time the terminals 35 and 36 will be in contact, the coil 30 will be instantly energized and the plunger will be projected. Just before the plunger reaches its projected or locking position, the terminal 35 disengages the terminal 36 and breaks the circuit through the solenoid 30 after which the catch member 17 will engage the lug 15 for holding the plunger in its locked position. Whenever the switch member 40 is moved into contact with the terminal 39, electrical source is directed to an electrical system such as the ignition system diagrammatically illustrated at 39ª so that the motor may be run even though the shifting rods 3 are locked against movement. The plunger rods 7 can be retracted only after the catch member 17 is unlocked or shifted. The plunger rods 7 will then be moved out of locking engagement with the shifting rods 3. Whenever the plunger is retracted, the terminals 35 and 36 will be again brought into contact for closing the circuit through the solenoid 30 should the switch 40 be again moved from the ignition terminal 39 to contact with terminal 38. Since the engagement of the moving terminal 35 with the fixed terminal 36 will obtain for practically the full distance of travel of the plunger rods, the circuit of the solenoid, will be active during this time and the solenoid circuit being broken only after the contact 35 leaves the contact 36 which is just prior to the engagement of the catch member 17 with the lug 15. At the time of disengagement of the contacts 35 and 36, the plunger rods, while freed from the direct pulling force of the solenoid, have reached such a point that the momentum carries them and their attendant parts the further minute distance necessary to permit engagement of the catch member 17 with the lug 5. Various systems of electrical control are adaptable to this locking device and the system illustrated was selected merely to show one of such systems.

From the foregoing description, it is evident that there is provided a locking device that is simple, durable, positive, easily and readily locked and unlocked and which will prove highly efficient for the purpose intended.

The many advantages of the herein described invention will readily suggest themselves to those skilled in the art to which it appertains.

I do not wish to be understood as having limited myself to the details of construction shown and described, but desire to have it understood that the invention I have shown in the drawings is merely illustrative, as it is manifest that various changes may be made in the details of construction and particular arrangement of parts without departing from the spirit of my invention, hence I reserve the right to make any such changes, or modifications as may fairly fall within the scope of the appended claims when fairly construed.

What I claim is:

1. In a gear transmission lock structure, a gear casing, shiftable rods mounted in said casing, means for locking said shiftable rods against movement carried by said casing and comprising a casing, a vertically disposed reciprocable plunger mounted within said last mentioned casing, electrically controlled means for moving said plunger into engagement with said shiftable rods, means for

locking said plunger in engagement with said shiftable rods to prevent unauthorized longitudinal movement of said shiftable rods, means engageable with a key for unlocking the plunger and resilient means for automatically raising the plunger out of engagement with the shiftable rods to permit movement of the shiftable rods by actuating a gear transmission shifting lever.

2. In a gear transmission lock structure, a gear casing, shiftable rods mounted in said casing, means for locking said shiftable rods against movement carried by said casing and comprising a casing, a vertically disposed reciprocable plunger mounted within said last mentioned casing, electrically actuated means for moving said plunger in a downward path, a spring controlled catch automatically operating to lock the plunger in its lowermost position in engagement with said shiftable rods and means for releasing the said catch to release the plunger from locked engagement with the shiftable rods.

3. In a gear shift locking mechanism, the combination with a casing and a plurality of shiftable rods, of a plunger engageable with the shiftable rods when in its lowermost position, electrically controlled means for moving said plunger from a normal neutral position to said lowermost position, a spring controlled catch automatically operating to lock the plunger in its lowermost position, means for unlocking said plunger and resilient means for raising the plunger to neutral position after having been unlocked.

4. In a gear transmission lock structure, a gear casing, shiftable rods mounted in said casing, means for locking said shiftable rods against movement carried by said casing and comprising a casing, a vertically disposed reciprocable plunger mounted within said last mentioned casing, a rocker arm connected with said plunger, a solenoid coil, an armature shaft for said solenoid coil, a connection between said rocker arm and said armature for imparting downward movement to the plunger for engagement thereof with the shiftable rods when the solenoid coil is electrically energized, means for controlling the energizing of said coil, locking means for retaining the plunger in engagement with the shiftable rods, means engageable with a key for unlocking said plunger and resilient means for raising said plunger out of engagement with said shiftable rod to permit longitudinal shifting movements thereof.

In testimony whereof, I have hereunto signed my name to the specification.

HOMER C. KENNEDY.