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VEHICLE DOOR BOLT LOCK

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This invention relates generally to the lock art, and more particularly to a new and useful vehicle door lock of the bolt type for use in addition to the usual door latching mechanism.

The customary vehicle door latch serves its intended purpose under normal conditions, but has the disadvantage that usually it can be released all too quickly by children from the inside of the vehicle, which is particularly dangerous when the vehicle is in motion. Further, such latches are apt to spring open in the event of an accident, which can result in an occupant of the vehicle being thrown and suffering injury.

It is a primary object of my invention to provide a vehicle door lock, utilizing a lock bolt, which provides an additional and positive lock against undesired opening of the vehicle door from either interiorly or exteriorly of the vehicle.

Another object of my invention is to provide the foregoing in a door lock which is readily controlled by the vehicle operator to alternately lock and unlock the door, as desired.

In addition, it is an object of my invention to provide the foregoing in a vehicle door lock which is relatively inexpensive and simple in construction, which is readily assembled and installed, and which is extremely durable and dependable in operation.

In one aspect thereof, a vehicle door lock constructed in accord with my invention comprises a reciprocative cam, a lock bolt movable at generally a right angle to the direction of movement of the cam between retracted and extended positions, first spring means holding the lock bolt engaged with the cam for movement by the cam to extended position, to lock an associated door, as the cam moves out of a position of rest, return movement of the cam to its position of rest enabling movement of the lock bolt under the influence of its spring to a retracted position, unlocking an associated door, together with spring means normally urging the cam into its position of rest, and actuating means selectively operable to move the cam out of its position of rest against the urge of its spring.

The foregoing and other objects, advantages and characterizing features of a vehicle door lock constructed in accord with my invention will become clearly apparent from the ensuing detailed description of two presently preferred embodiments thereof, taken in conjunction with the accompanying drawing illustrating the same wherein like reference numerals denote like parts throughout the several views and wherein:

Fig. 1 is a generally schematic, side elevational view of a double bolt door lock of my invention operatively installed on a vehicle, showing the lock bolts extended for locking a pair of associated doors;

Fig. 2 is a longitudinal, sectional view of the door lock of Fig. 1;

Fig. 3 is a transverse sectional view thereof, taken about on line 3—3 of Fig. 2;

Fig. 4 is a view corresponding to that of Fig. 2, but showing a single lock bolt embodiment; and

Fig. 5 is a transverse sectional view thereof, taken about on line 5—5 of Fig. 4.

Referring now in detail to the embodiment of Figs. 1—3, the door lock of my invention is adapted to be installed on a vehicle 1 having, for example, front and rear doors 2 and 3 separated by the usual pillar or post 4. The lock device includes a housing 5 adapted to be mounted in pillar 4 by any suitable means, the same being so apparent to those skilled in the art that detailed description thereof is believed to be unnecessary.

Housing 5 contains a beveled member in the form of a double faced cam 6, which can comprise a hollow member having tapering sides 7 providing opposed cam surfaces and joined at their front and rear edges. A rod 8 is fastened to member 6 at its rear edge and extends through housing 5 for engagement with a spring 9 (Fig. 1) which is attached at its opposite end to the vehicle. Spring 9 urges cam 6 to a retracted position of rest, comprising its normal position, as illustrated in full lines in Fig. 2. A second rod 10 is secured to cam 6 adjacent its other end, and extends through a bushing 11 in housing 5, terminating in a yoke or clevis 12 to which there is secured the wire 13 of a Bowden cable arrangement, the wire 13 extending through a sheath 14 (Fig. 1) and terminating in a control member 15 mounted on the vehicle dash 16. The cable 13, 14 can be carried through pillar 4 and the usual rocker panel below door 2, beneath the vehicle, or can be carried on the underside of the roof.

Spring 9 is strong enough to carry the weight of cam 6 and to urge it into its position of rest, but is not sufficiently strong to overcome the friction of wire 13 in sheath 14. Therefore, when desired the vehicle operator can manipulate the control 15, by pulling the same outwardly to the position shown in Fig. 1, which will pull cam 6 downwardly out of its position of rest and into the position illustrated in phantom in Fig. 2. The friction of wire 13 in sheath 14 will hold the cam in this position, against the urging of spring 9, until the vehicle operator pushes inwardly upon the control 15 which, with the help of spring 9, will return cam 6 to its position of rest.

In the embodiment of Figs. 1—3 the lock is provided with a pair of lock bolts 17 which are carried by leaf springs 18, attached to housing 5, which springs urge lock bolts 17 into engagement with cam 6 so that normally the lock bolts are retracted, as illustrated in full lines in Fig. 2, to unlock the doors for opening and closing under the control of the usual latch mechanisms (not illustrated).

Leaf springs 18 are bifurcated, at their outer ends, to engage in grooves on opposite sides of lock bolts 17 whereby the lock bolts are carried by the springs 18. In addition each lock bolt has a slot in its inner end, between the spring bifurcations, which slots receive rollers 19 having axial pins 20 projecting from opposite sides thereof, the bifurcated ends of springs 18 bearing against the pins 20 to retain the rollers in the slots.

The springs 18 resiliently urge rollers 19 against the cam surfaces 7, whereby the rollers act as cam followers, reducing friction and thereby facilitating operation of the lock device. If desired, a tube 22 can be provided for the entry of lubricating oil into the housing 5.

It will be seen that, with my lock as thus described, upon manipulating control 15 to move cam 6 out of its position of rest and into the position illustrated in phantom in Fig. 2, lock bolts 17 are cammed outwardly of housing 5, through bushings 21, into an extended, door locking position as illustrated in full lines in Fig. 1, and in phantom in Fig. 2. When in this position the doors cannot be opened, even upon releasing the usual door

latches. Upon manipulating control 15 to return cam 6 to its position of rest, lock bolts 17 move under the urging of their springs 18 to a retracted, door unlocking position as illustrated in full lines in Fig. 2.

In addition to acting as connecting rods, the members 8 and 10 also function as guide rods, guiding cam 6 for rectilinear motion. In addition, the opposite side walls 23 of housing 5 and the opposite sides of cam 6 have a close fit, although working clearance is of course provided, and being flat, or noncircular, they substantially preclude rotation of cam 6 about the axis of rods 8 and 10. In this way, cam 6 is constrained against movement other than the desired rectilinear movement.

The embodiment of Figs. 4 and 5 is essentially the same in construction and operation as that illustrated in Figs. 1-3, except that it is provided with only one lock bolt 17, for locking a single door. Accordingly, the cam 6' has only one cam surface 7, the opposite surface of the cam being flat and coacting with the adjacent wall 24 of housing 5' to guide the cam in the desired movement.

The fastening members 25, which secure leaf springs 18 to the housing 5, also could be utilized in securing the housing 5, or 5', to an appropriate mounting bracket (not illustrated) or other mounting member within the door pillar 4. Of course, the various parts can be made of any material suitable for the purpose.

If desired, a separate lock device as illustrated in Figs. 4, 5 could be used for each door, even in a four-door vehicle. However, I believe it would be preferable to use a double bolt lock, where possible, for doors on the same side of the vehicle. In either case, locks will be provided on opposite sides of the vehicle, as required, and will have control cables 13, 14 leading either to control member 15, or to one or more common cables under the control of member 15.

Accordingly, it is seen that my invention fully accomplishes its intended objects, with the cam or beveled member 6, 6' normally spring urged into a position of rest, whereby the lock bolts 17 are normally urged into a retracted, unlocking position. However, by simply manipulating the member 15, which is so positioned as to be under control of the vehicle operator, the cam is moved to wedge the lock bolts 17 into an extended, door locking position. Of course, the actuating knob 15 can be positioned wherever desired, and need not take the particular form illustrated.

While only two, presently preferred embodiments have been disclosed and described in detail, I do not thereby intend that my invention be limited to such details. In-

stead, such disclosure is intended to be by way of illustration only.

Having fully disclosed and completely described my invention, and its mode of operation, what I claim as new is:

1. A vehicle door lock comprising, a reciprocative cam normally occupying a predetermined position of rest, lock bolt means, leaf spring means mounting said lock bolt means for movement between retracted and extended positions at generally a right angle to the direction of movement of said cam, said leaf spring means holding said lock bolt means engaged with said cam for movement thereby to said extended position upon movement of said cam out of said position of rest and for movement to said retracted position upon return of said cam to said position of rest, second spring means normally urging said cam into said position of rest, and means for selectively moving and holding said cam out of said position of rest against the urge of said second spring means, wherein said lock bolt means comprise a lock bolt formed with a slot containing a cam following roller having axially projecting pins on opposite sides thereof, said leaf spring means engaging said lock bolt on opposite sides of said roller and constraining said roller pins against movement out of said slot.

2. A vehicle door lock comprising a housing, a cam movable within said housing into and out of a position of rest, means restraining said cam against other than substantially rectilinear movement into and out of said position of rest, a lock bolt, a leaf spring secured to said housing and carrying said lock bolt for movement thereof at generally a right angle to said cam movement between retracted and extended positions relative to said housing, said leaf spring urging said lock bolt into engagement with said cam for movement thereby into said extended position upon movement of said cam out of said position of rest and into said retracted position upon return of said cam to said position of rest, and means for selectively moving said cam into and out of said position of rest.

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