July 2, 1940. E. N. JACOBI 2,206,462

LOCK

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Fig. 1.

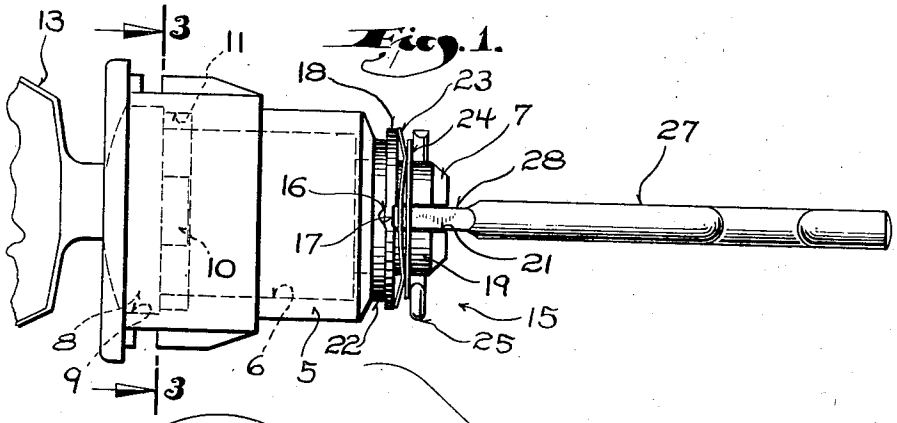


Fig. 2.

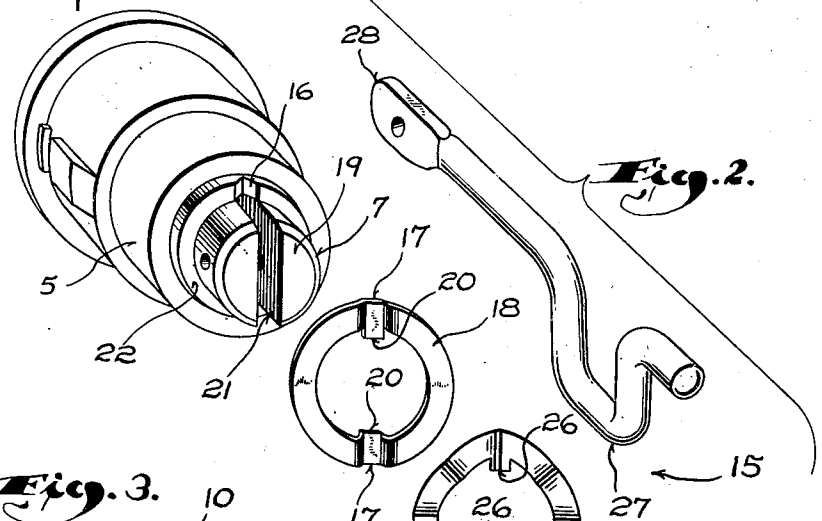
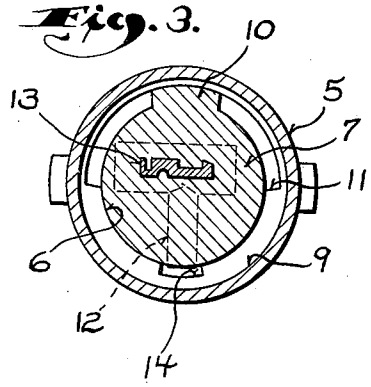


Fig. 3.



Inventor

Edward N. Jacobi

By Dallas Miller Jones

Attorney

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LOCK

Edward N. Jacobi, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Milwaukee, Wis., a corporation of Delaware

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5 Claims. (Cl. 70—362)

This invention relates to locks, and refers particularly to key operable tumbler locks of the type now generally used on automotive equipment.

Locks of this type, particularly those designed for use in automobile doors, generally comprise a casing adapted to be set into the pillar of the door, and a lock cylinder rotatable in the casing to transmit a latch actuating motion to the door latch through a suitable driver connected with the inner end of the cylinder. Such locks are generally known as door pillar locks.

It has been found expedient to construct locks of this character in such a manner that the key is insertable and removable only when the cylinder is in an intermediate position of rotation, and with the mechanism arranged to be locked by turning the cylinder in one direction from its key inserting position, and unlocked by turning the cylinder in the opposite direction from its key inserting position. Thus, the key is always inserted in the same position whether the mechanism is locked or unlocked, which makes it desirable to provide some means for readily indicating the position of the cylinder as it is turned.

The present invention therefore contemplates as one of its objects to provide a simple detent mechanism for indicating the position of rotation of the cylinder at which the key can be removed and inserted.

Another object of this invention is to provide a detent mechanism for the purpose stated, the spring of which holds the cylinder against rattling in the casing bore.

Still another object of this invention is to provide a lock construction of the character described wherein the detent mechanism is assembled with the lock and retained in position by the pin which secures the driver to the inner end of the cylinder.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawing illustrates one complete example of the physical embodiment of the invention constructed in accordance with the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a view in side elevation of a lock embodying this invention;

Figure 2 is a perspective view of the various parts of the lock disassembled; and

Figure 3 is a cross sectional view taken through Figure 1 on the plane of the line 3—3.

Referring now particularly to the accompanying drawing in which like numerals indicate like parts, the numeral 5 designates the casing of the lock bored as at 6 for the reception of the lock cylinder 7. The lock cylinder is inserted into the casing bore from its outer front end and is restrained against inward endwise motion by the engagement of a head 8 on the front end of the cylinder with the bottom of a counterbore 9 in the front of the casing.

Rotation of the cylinder in the casing bore is limited by the engagement of a lug 10 extending from the undersurface of the head 8 on the cylinder, with the ends of a semi-circular groove 11 formed in the casing and opening to the bore 6 and the counterbore 9.

The cylinder is equipped with the customary locking means 12, shown in dotted lines in Figure 3. This locking means is controlled by a key 13 and has a part adapted to be projected into a longitudinal groove 14 in the casing in communication with the bore 6. Insertion of the key 13 effects retraction of this part of the locking device from the groove 14 to free the cylinder for rotation.

Attention is particularly directed to the fact that the locked position of rotation of the cylinder lies medially of the limits of its permitted rotation. Insertion of the key thus enables the cylinder to be turned in either direction.

The locking mechanism is of conventional construction, and therefore, insertion and removal of the key cannot be effected unless the cylinder is turned to its predetermined locked position, which, as stated, lies medially of the limits of its permitted rotation.

Ready indication of this predetermined position of rotation is provided by a detent mechanism, indicated generally by the numeral 15. This detent mechanism comprises a notch or pair of notches 16 formed in the inner end of the casing at diametrically opposite points with which detents 17 on a washer 18 nonrotatably mounted on the projecting inner end portion 19 of the cylinder engage.

The washer 18 is held against rotation with respect to the cylinder by the engagement of

tangs 20 in a slot or bifurcation 21 in the inner end portion 19 of the cylinder. It is to be observed that the washer 18 overlies the inner or rear end 22 of the casing in which the notches 16 are formed. It is held in this position by a spring washer 23.

The spring washer 23 is of wave-like formation and is confined between the outer face of the washer 18 and a retaining washer 24 also fitted onto the end portion 19 of the cylinder where it is held by a cotter pin 25 passed through the inner end portion of the cylinder across the slot or bifurcation 21.

Preferably, the formed spring washer 23 is also provided with tangs 26 to engage in the slot or bifurcation 21 and hold the same against rotation with respect to the cylinder. Being confined in the manner described, the spring washer 23 provides the desired spring pressure for the detent action and also acts to yieldingly draw the cylinder into the casing bore and secure these parts against rattling.

The cotter pin 25, in addition to providing a retainer for the assembled detent mechanism also serves to hold a driver 27 assembled with the inner end of the cylinder. This driver, as is customary, transmits rotation of the cylinder to the latch mechanism (not shown). The actual turning force is applied to the driver through the interengagement of a flattened end 28 on the driver with the walls of the slot or bifurcation 21.

From the foregoing description taken in connection with the accompanying drawing, it will be readily apparent to those skilled in the art that this invention provides an exceedingly simple manner of indicating the intermediate position of rotation of a lock at which insertion and removal of a key is possible, and that the detent mechanism employed for this purpose also has the added function of holding the cylinder against rattling in its casing bore.

What I claim as my invention is:

1. In a lock: a bored casing having a longitudinal groove opening to its bore; a lock cylinder rotatable in the bore; key controlled locking means carried by the cylinder engageable in said longitudinal groove for securing the cylinder against rotation in a predetermined position from which the cylinder may be turned in either direction, said locking means through cooperation with the wall of the casing bore precluding insertion and removal of a key except when the cylinder is in said predetermined position of rotation; detent means for indicating said predetermined position of rotation; and a spring for said detent means confined between longitudinally spaced casing and cylinder carried parts so that said spring in addition to providing spring tension for the detent means also yieldingly urges the lock cylinder longitudinally in one direction to take up play between the cylinder and the casing.

2. In a lock of the character described: a casing having a bore; a lock cylinder rotatable therein; the inner end of said casing having a notch; a part nonrotatably connected with the cylinder and adapted to engage in said notch with a detent action to indicate a predetermined position of rotation of the cylinder; a driving member adapted for nonrotatable connection with the inner end of the cylinder; a spring for yieldingly urging said part with the detent toward the inner end of the casing; and a pin passed through the inner end of the cylinder and said driving member to connect the same, said pin also receiving the thrust of the spring so that the spring applies a longitudinal force on the cylinder to take up play between the parts and provides the necessary spring pressure for the detent action.

3. In a lock of the character described: a casing having a bore and having a notch adjacent to the inner end of the bore; a cylinder rotatable in the bore with its inner end projecting from the inner end of the casing; a washer encircling the inner end portion of the cylinder and nonrotatably connected therewith; a detent on said washer adapted to enter the notch on the casing to indicate a predetermined position of rotation of the cylinder; a part engageable with the inner end of the cylinder after assembly thereof with the casing; and a spring interposed between said part and said washer for yieldingly urging the washer toward the inner end of the casing and yieldingly drawing the cylinder into the casing bore to take up play between said parts.

4. In a lock of the character described: a casing having a bore and having a notch adjacent to the inner end of the bore; a cylinder rotatable in the bore with its inner end projecting from the inner end of the casing; a washer encircling the inner end portion of the cylinder and nonrotatably connected therewith; a detent on said washer adapted to enter the notch on the casing to indicate a predetermined position of rotation of the cylinder; a part engageable with the inner end of the cylinder after assembly thereof with the casing; a spring interposed between said part and said washer for yieldingly urging the washer toward the inner end of the casing and yieldingly drawing the cylinder into the casing bore to take up play between said parts; and a driver joined to the inner end of the cylinder by said part.

5. In a lock of the character described: a casing having a bore and a notch near the inner end of its bore; a lock cylinder inserted into said bore from the front outer end thereof and having its inner end portion projecting beyond the inner end of the bore, said inner end portion of the cylinder being bifurcated; a washer encircling the inner end portion of the cylinder and nonrotatably connected therewith; a detent on said washer engageable in the notch for indicating a predetermined position of rotation of the cylinder; a driver having a part inserted into the bifurcation at the inner end of the cylinder; a crosspin passing through the inner end of the cylinder and said part to join the driver nonrotatably to the inner end of the cylinder; and a spring washer interposed between said pin and said first designated washer to provide spring pressure for the detent action and to also draw the cylinder into the casing bore and take up play.

EDWARD N. JACOBI.