Dec. 22, 1942. J. S. LACH 2,306,022

LOCK

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Fig. 1.

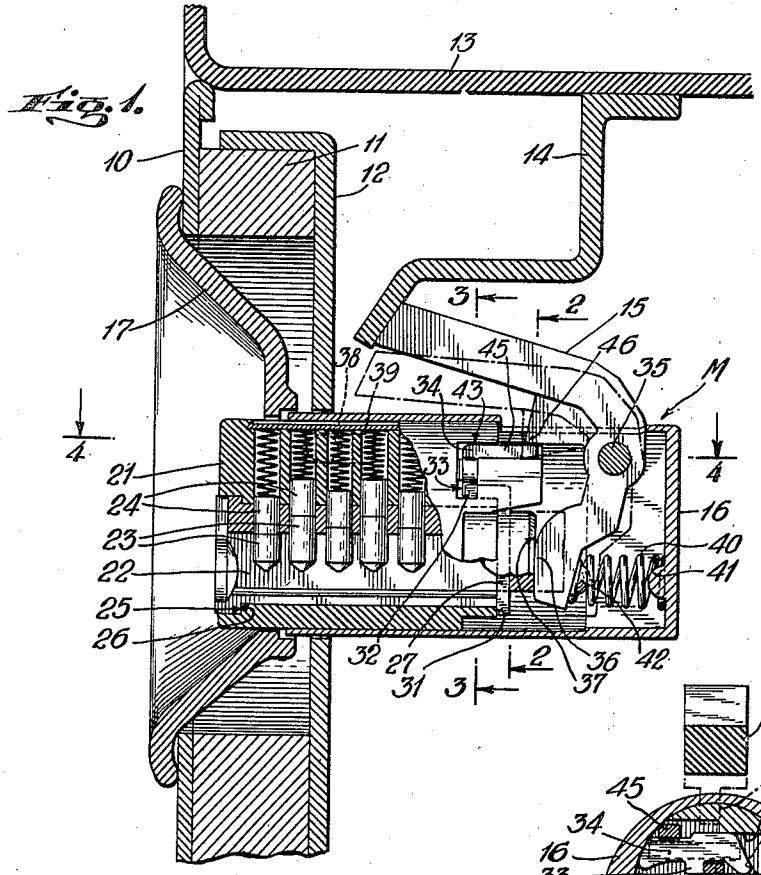


Fig. 3.

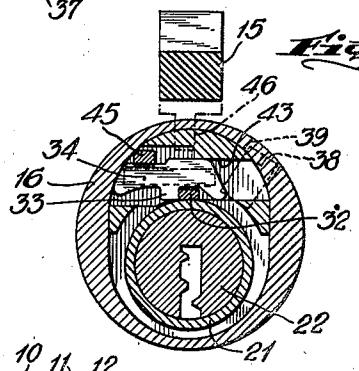


Fig. 2.

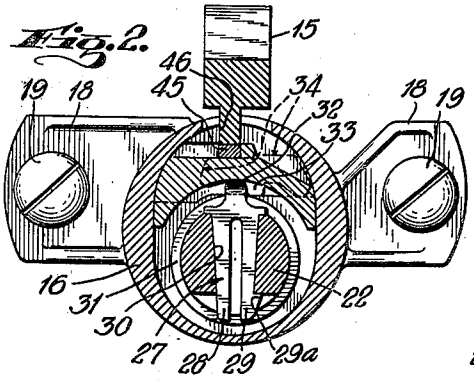


Fig. 4.

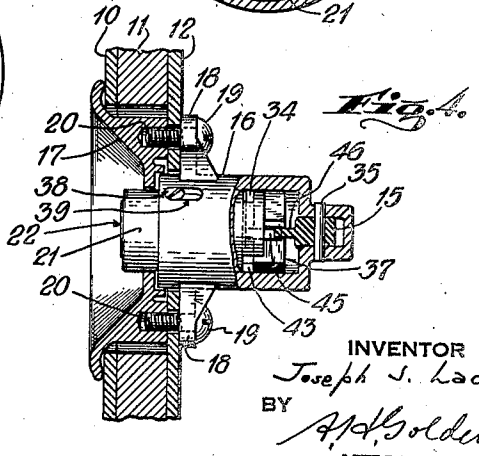
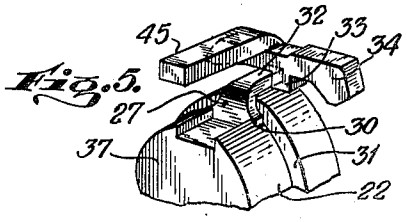


Fig. 5.



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Fig. 6.

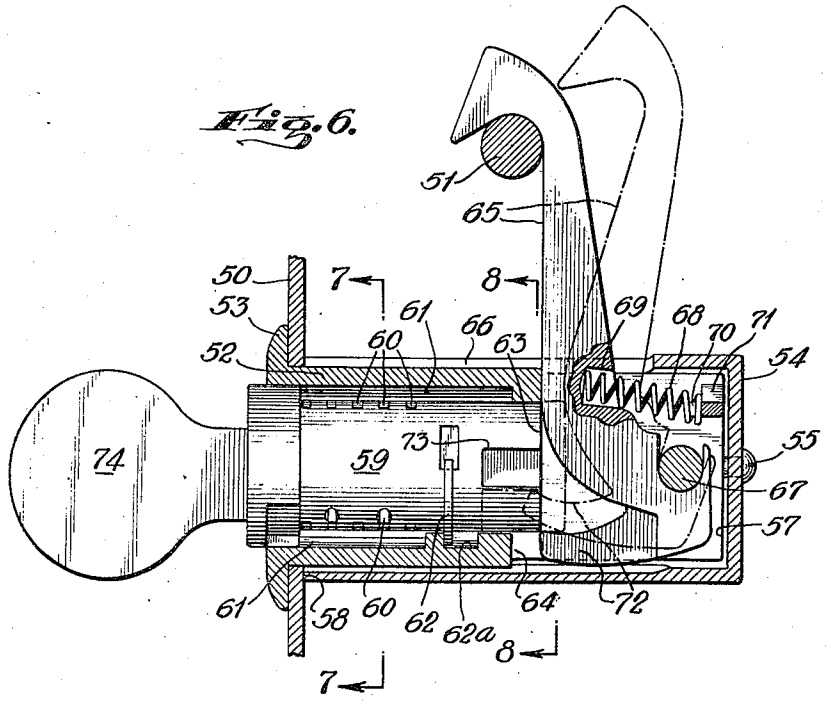


Fig. 7.

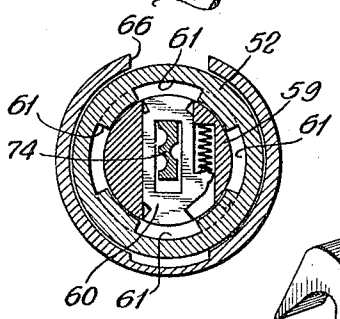


Fig. 8.

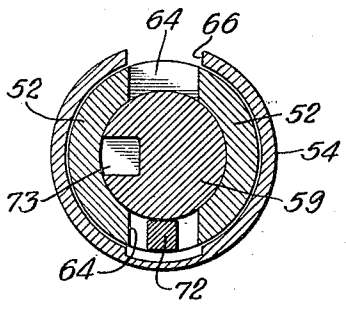
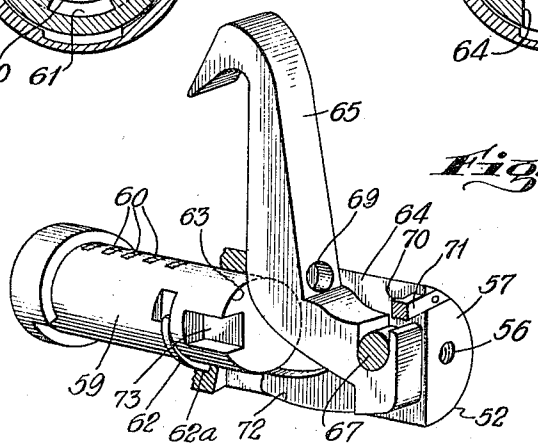


Fig. 9.



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UNITED STATES PATENT OFFICE

2,306,022

LOCK

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Application November 23, 1940, Serial No. 366,865

7 Claims. (Cl. 70—81)

This invention relates to a lock which I shall describe as especially adapted for locking glove compartments of automobiles, but which is readily usable for other installations, as will readily be understood by those skilled in the lock art.

As a feature of my invention, I utilize a lock of the type in which the bolt is retracted from a locking position by the sliding movement of a key plug, the particularly novelty residing in the manner in which the rotation of the key plug is utilized to lock the latch bolt against retraction. Thus, in my invention, the key plug effects the obstruction of the bolt whereby to deadlock the said bolt, simultaneously blocking the key plug itself against sliding movement. In one modification of my invention, the deadlocking of the bolt is accomplished by the movement of a detent member by the key plug incidental to the rotation of the key plug, the detent member being moved into obstructing relation to a part of the bolt so as to prevent the movement of the bolt by the key plug. As a preferred feature of this construction, the key plug is itself locked against sliding movement when the bolt is deadlocked. As a further feature of this modification, I utilize a lock cylinder in which the key plug and cylinder are slidable together.

In a second modification of my invention, the key plug has a portion thereof adapted to impinge against a surface of the bolt for moving the bolt into release position as the plug slides inwardly, with the feature that in so moving, a dogging projection of the bolt moves into a notch or other opening in the key plug. Rotation of the key plug to bring the notch out of alignment with the said projection of the bolt, effects the locking of the bolt against movement by the key plug. It simultaneously, of course, locks the key plug against sliding movement. As a feature of this modification, I use a cylinder in which the key plug is slidable relatively to the cylinder in retracting the bolt.

While I have thus set forth the more important contributions of my invention, and have described generally two modifications whereby the said contributions of my invention are obtained, it should be understood that there are additional novel mechanisms in the locks which I shall show and describe, that form an important part of my invention, and will be claimed hereinafter. Furthermore, those skilled in the art will readily perceive that my basic contribution may be utilized in mechanical forms other than shown and described in this application, and that the patent to be granted me should not be limited to the constructions I shall herein show and describe.

Referring now to the drawings, Fig. 1 is a vertical section through the lock of my invention showing it applied to the door of a compartment, as, for instance, the glove compartment of an automobile. Figs. 2, 3 and 4 are views taken along lines 2—2, 3—3, and 4—4 of Fig. 1. Fig. 5 is an end view of the key plug of Fig. 1, showing the means for operating the sliding detent used in this particular modification for dogging the bolt. Fig. 6 is a view similar to Fig. 1 but illustrating a modification of my invention. Figs. 7 and 8 are sectional views taken along lines 7—7 and 8—8 of Fig. 6. Fig. 9 is a perspective view illustrating the operation of the invention in Figs. 6, 7 and 8.

Referring now more particularly to the drawings, the front plate of the glove compartment door to which my invention is applied in Fig. 1, is designated by reference numeral 10. Forming part of the door is a spacer 11, and a rear plate 12. The upper inner surface of the compartment is designated by reference numeral 13, and depending therefrom is a locking bracket 14 with which is adapted to cooperate the locking bolt 15 of the lock of my invention.

This lock comprises a mounting member, designated generally by reference letter M, and comprising a tube portion 16 and an escutcheon 17. As is best shown in Fig. 4, the tube 16 is equipped with ears 18 through which pass bolts 19 adapted to enter threaded bores 20 in the escutcheon 17 so as to draw the tube 16 and the escutcheon 17 together, with the rear plate 12 of the compartment door therebetween, thus securing the mounting member M to the door, as will be quite apparent to those skilled in the art, and as is well shown in Figs. 1 and 4.

For controlling the bolt 15, there is mounted in the tube 16 of the mounting member M a pin tumbler cylinder 21 in which is rotatable a key plug 22, whose rotation relatively to the cylinder is controlled by suitable pin tumblers 23 and drivers 24 in a manner well known by those skilled in the art. The key plug 22 is assembled to the cylinder by forward insertion until its shouldered portion 25 impinges against the shoulder 26 of the cylinder, and it is retained in this position by a retainer 27, best illustrated in Fig. 2.

This retainer 27 is substantially U shaped, with spaced legs 28 and 29, and is adapted to enter a slot 30 in the key plug 22 juxtaposed to an end surface 31 of the cylinder, thereby retaining the key plug against endwise removal. The leg 29 of the retainer 27, through its lug portion 29a,

as is best seen in Fig. 2, prevents removal of the retainer except when the legs 28 and 29 are drawn together, as is quite apparent. The retainer 27, as is probably best shown in Fig. 5, extends outwardly and upwardly from the slot 30 of the key plug 22, terminating in an actuating lug 32 cooperable with the lug 33 of a sliding detent 34 for a purpose which will be described hereinafter.

As was already indicated previously, the bolt 15 is maintained within the tube 16 of the mounting member M. More particularly, it is pivoted relatively to the tube 16 through the short pin 35, and has a downwardly extending portion 36 against which impinges the end 37 of the key plug 22. The cylinder 21, and therefore the key plug 22, are adapted for axial sliding movement within the tube 16, and the cylinder is guided in this movement by a screw 38 which is threaded into the cylinder 21 so as to move integrally therewith, while resting in a guide and limit slot 39 of the tube 16 (Figs. 3 and 4).

It is quite apparent that the cylinder 21 may be moved endwise in the mounting member within the limits of slot 39, thereby moving the key plug 22 so that the portion 37 of the key plug will impinge against the portion 36 of the bolt 15, moving the bolt from its solid line position of Fig. 1 to its dash and dot, or release, position in that same figure. Naturally, in its dash and dot position, it is out of the plane of the lower end of the bracket 14, and the compartment door carrying the lock may move into open position. This unlocking movement of the bolt 15 is in opposition to a compression spring 40 mounted at one end about a lug 41 on the tube 16, and at its other end about a lug 42 on the bolt 15, and urging the portion 36 of the bolt against the end 37 of the key plug.

It is naturally necessary, in order to carry out the locking function of the cylinder lock 21, to incorporate mechanism so that authorized key operation of the key plug 22 will prevent the opening of the compartment door as has just been described. For this purpose, I utilize the detent 34 which I have already described generally. This detent is slidable within a guide slot 43 which is formed in the cylinder 21, as is probably best shown in Fig. 3, in which position, incidentally, the detent is shown in release position. The detent 34 is moved to the position of Fig. 3 by rotation of the key plug 22, and its retainer 27, the actuator lug 32 on the retainer cooperating with the lug 33 on the detent, as when the key plug is rotated in a counterclockwise direction, to bring the detent into the release position shown in Fig. 3. It will be noted that the tube 16 of the mounting member actually prevents further movement to the left of the detent 34 and actuator lug 32 in Fig. 3, and that with the retainer 27 in the position of Fig. 3, the key plug 22 is in a position in which its pin tumblers 23 are aligned with the drivers 24 to allow removal of the key.

In the release position of the detent 34 in Fig. 3, a horizontally extending dog 45 formed thereon and best shown in Fig. 5, is positioned to the left of a downwardly extending lug portion 46 of the bolt 15. There is therefore nothing to obstruct the movement of the bolt from the full line position of Fig. 1 to the dash and dot position of Fig. 1 through the inward movement of the cylinder 21 and key plug 22. It will be appreciated, of course, that there is nothing present to obstruct said inward movement of the cylinder 21 and plug 22, and that this inward movement is resisted only by the spring 40.

If it now be desired to lock the compartment door against opening, the key is inserted into the key plug 22, setting the tumblers 23 and the drivers 24, whereupon the key plug may be rotated clockwise from its position of Fig. 3 a full 360° to its position of Fig. 2. In the position of the key plug in Fig. 2, the pin tumblers 23 therein are once more in alignment with the drivers 24, and the key may be removed. The detent 34, whose outline in Fig. 2 may readily be discerned, is now completely to the right relatively to the mounting member M, and with its lug portion 33 to the right of the actuator lug 32 of the retainer 27. The horizontally extending dog 45 of the detent 34 is now positioned directly under the lug 46 of the bolt 15. It is quite readily seen that this positioning of the dog 45 under the lug 46 prevents pivotal movement of the bolt 15 from its full line position of Fig. 1 to its dot and dash line position. In other words, the bolt 15 is actually dogged, or deadlocked, against any movement whatsoever, so that should anyone try to pry the bolt out of position, it would be impossible to do so except through the destruction of the bolt or of the other parts maintaining it in position.

Moreover, since the bolt itself is not movable, the key plug 22, whose end portion 37 is maintained against the portion 36 of the bolt, is also locked against any axial sliding movement. The cylinder 21, moving integrally with the plug 22, is therefore also held against any axial inward movement relatively to the mounting member. There therefore occurs a simultaneous and mutual deadlocking of the bolt 15 and a locking of the key plug and cylinder against endwise movement, all as will now be fully appreciated. It may be well to point out, before proceeding further, that the modification of Fig. 1 will function with locks other than those of the pin tumbler type, and that the detent may be moved into deadlocking position by a shorter rotation of the key plug, if that is desired, and if the lock construction is adapted therefor.

I shall now refer to the modification shown in Figs. 6–9, inclusive, wherein I utilize what is termed in the industry a sliding plate tumbler lock, adapted to operate a bolt which is of a construction somewhat different from the bolt 15 shown in Fig. 1. Referring now to Figs. 6–9, the plate to which my lock is secured is designated by the reference numeral 50, and the locking portion with which the bolt of my lock cooperates is in the form of a round rod or lug 51. Those skilled in the art will appreciate that the form of bolt or locking device is of no real importance here. Instead of utilizing a mounting member, such as that of Fig. 1, my second modification employs a cylinder 52, the front head 53 of which fits against the front of the plate 50. A tube 54 has screws 55 which are adapted to enter screw threaded openings 56 formed in the end surface 57 of the cylinder 52, whereby the tube 54 may be assembled to the cylinder 52 with the front end 58 of the tube against the rear of the plate 50, and with the head 53 of the cylinder 52 pressing against the front of the plate 50, all as is clearly shown in Fig. 6.

Mounted within the cylinder 52 is a key plug 59 which has a series of plate tumblers 60 cooperable with a series of four locking slots 61 formed in the cylinder. It is obvious to those skilled in the art that the key plug 59 may be

locked to the cylinder 52 in any one of several rotated positions. Actually, through the use of the usual locking shoulders formed on my key plug, I limit the rotation of my key plug to 90°, and therefore utilize the slots 61 for locking the key plug in either one of two rotated positions spaced 90°, all as is standard in this art.

The key plug is retained against outward movement from the cylinder by a retainer disk 62, resting in a retainer groove 62a. The retainer groove allows inward sliding of the key plug in the cylinder, but prevents outward sliding beyond the position of Fig. 6. The cylinder 52, as it extends beyond the end 63 of the key plug, is slotted as at 64 for the entry of a bolt 65, the bolt projecting outwardly of the tube 54 through a slot 66 formed in the said tube. The bolt is pivotally mounted on a pin 67 extending between the two halves formed in the cylinder by the slotting thereof at 64, as is best seen in Fig. 9, and through a spring 68, best shown in Fig. 6, is maintained pressed against the end surface 63 of the key plug. The spring, as will be noted, rests at one end in a shallow bore 69 in the bolt 65, and at its other end on a lug 70 extending from a bar 71 secured to the end of the cylinder 52. The bolt 65 has formed integrally therewith a dogging arm 72 through which the bolt 65 is locked, as will be indicated presently. The key plug is slotted as at 73 for particular cooperation with the dogging arm 72 when the key plug is in a rotated unlocking position.

In the position of the parts in Figs. 6, 8 and 9, the slot 73 of the key plug is displaced 90° from the dog 72 of the bolt 65. Therefore, when the key plug is pressed inwardly relatively to the cylinder 52 in an attempt to move the bolt 65 from its full line position of Fig. 6 to its dotted line position of the said figure, the solid contour of the key plug will not allow movement of the arm 72 of the bolt 65. Therefore, there can be no inward movement of the key plug in Fig. 6 or Fig. 9, and no movement of the bolt to its dash and dot line position of Fig. 6. Moreover, the bolt is dogged or deadlocked against any movement whatsoever in an unlocking direction in Figs. 6 and 9, just as is the bolt 15 in the first modification.

If it be desired to move the bolt into its unlocking position, it is necessary to insert a key 74 into the key plug 59 to set the tumblers 60, as best illustrated in Fig. 7. The key plug 59 may now be rotated counterclockwise from its positions of Figs. 8 and 9 to bring the slot 73 thereof opposite the dogging arm 72 of the bolt 65. Now, if the key plug is pressed inwardly, the bolt will pivot to its dash and dotted line position of Fig. 6, with the dog 72 entering the slot 73, all as is quite apparent.

It will thus be noted that in a very simple manner, I am able not only to deadlock my bolt, but I am able to lock my plug against inward movement. Those skilled in the art will readily appreciate the advance made therein by the elimination of a considerable number of parts now required, and the simultaneous accomplishment of results not heretofore obtainable in similar lock constructions; as, for example, the dogging or deadlocking of the bolt.

I now claim:

1. In a lock of the class described, a mounting member, a bolt pivoted relatively to said mounting member, a cylinder lock slidable axially in said mounting member, means whereby said sliding movement of said cylinder lock moves said bolt on its pivot and out of locking position, a rotatable key plug in said cylinder lock, and a detent on said cylinder lock movable by the rotation of said key plug into blocking relation between said cylinder lock and bolt to prevent simultaneously the pivoting of said bolt and the sliding axial movement of said cylinder lock.

2. In a lock of the class described, a bolt, a cylinder lock having a key plug rotatable therein, means mounting said key plug for axial sliding movement, means whereby said axial sliding movement of the key plug retracts said bolt, a blocking detent on said cylinder, means whereby said detent is moved into blocking relation to said bolt and key plug incidental to the rotation of said key plug relatively to said cylinder whereby to prevent retraction of said bolt and sliding of said key plug, said blocking detent moving out of blocking relation to said bolt and key plug incidental to the rotation of said key plug whereby to allow retraction of said bolt by sliding of said key plug.

3. In a lock of the class described, a bolt, a cylinder lock, means mounting said cylinder lock for sliding axial movement, a key plug mounted in said cylinder lock and rotatable therein, means whereby said axial sliding movement of the cylinder lock retracts said bolt, a blocking surface movable into blocking relation to said bolt and cylinder lock incidental to the rotation of said key plug relatively to said cylinder lock whereby to prevent retraction of said bolt by said sliding axial movement of the cylinder lock, and said blocking surface moving out of blocking relation to said bolt and cylinder lock incidental to the rotation of said key plug whereby axial movement of said cylinder lock retracts said bolt.

4. In a lock of the class described, a bolt, a cylinder lock, means mounting said cylinder lock for sliding axial movement, a key plug in said cylinder lock rotatable therein, means whereby said axial sliding movement of the cylinder lock retracts said bolt, a detent on said cylinder lock movable by rotation of said key plug into blocking relation to said bolt and cylinder lock whereby to prevent retraction of said bolt by said sliding axial movement of the cylinder lock, said detent being movable by said key plug out of blocking relation to said bolt and cylinder lock whereby axial movement of said cylinder lock retracts said bolt.

5. In a lock of the class described, a mounting member, a bolt pivoted relatively to said mounting member, a tumbler cylinder lock slidable axially in said mounting member, a key plug in said cylinder lock rotatable relatively thereto by the key setting of the tumblers and slidable together with said cylinder lock, the end of said key plug abutting the said bolt for moving it on its pivot, a detent mounted on said cylinder lock, means whereby said detent is movable relatively to said cylinder lock by rotation of said key plug and into blocking relation to said bolt whereby to block simultaneously the pivoting of said bolt and the axial sliding of said cylinder lock.

6. In a lock of the class described, a mounting member, a bolt pivoted relatively to said mounting member, a tumbler cylinder lock slidable axially in said mounting member, a key plug in said cylinder lock rotatable relatively thereto by the key setting of the tumblers, means whereby axial sliding of said cylinder lock moves said bolt on its pivot, a detent mounted on said cylinder lock, an operator on said key plug for moving said detent relatively to said cylinder lock as said key

plug rotates a complete revolution in one or the other direction relatively to said cylinder lock, whereby rotation of said key plug in one direction moves said detent into blocking relation to said bolt whereby to block the pivoting of said bolt and the axial sliding of said cylinder lock, the rotation of said key plug in a reverse direction thereafter moving said detent out of said blocking relation.

7. In a lock of the class described, a mounting member, a bolt pivoted relatively to said mounting member, a tumbler cylinder lock slidable axially in said mounting member, a key plug in said cylinder lock rotatable relatively thereto by the key setting of the tumblers, a retainer secured to said key plug and fitting against an end surface of said cylinder lock to retain said key plug against movement outwardly of said cylinder lock whereby said cylinder lock and key plug are slidable together, the end of said key plug abutting the said bolt for moving it on its pivot, a detent mounted on said cylinder lock, a portion of said retainer moving said detent relatively to said cylinder lock as said key plug rotates in one or the other direction relatively to said cylinder lock, whereby rotation of said key plug in one direction moves said detent into blocking relation between a portion of said bolt and said key plug whereby to block simultaneously the pivoting of said bolt and the axial sliding of said cylinder lock, the rotation of said key plug in a reverse direction thereafter moving said detent out of said blocking relation.

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