Oct. 30, 1951 F. E. RAYMOND 2,573,061

COMPARTMENT LOCK

Filed Jan. 22, 1947 2 SHEETS—SHEET 1

Fig. 1.

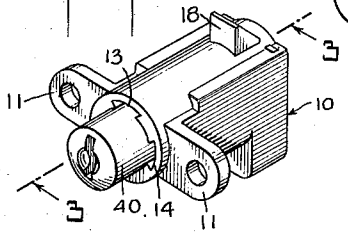


Fig. 2.

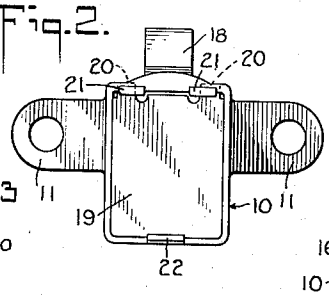


Fig. 4.

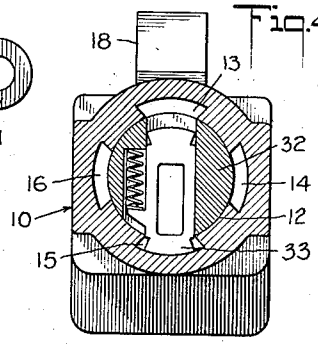


Fig. 3.

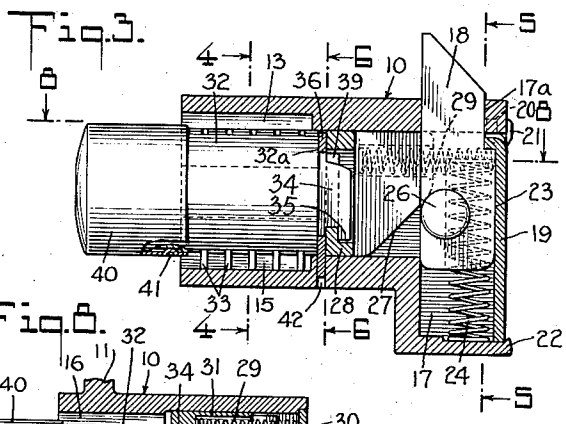


Fig. 5.

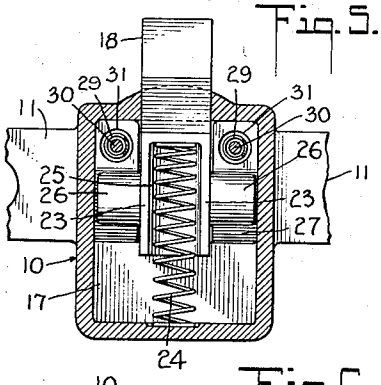


Fig. 6.

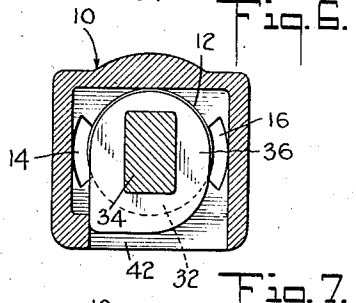


Fig. 8.

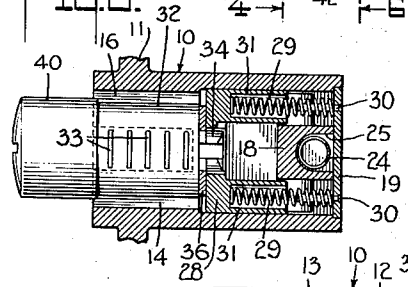


Fig. 5A.

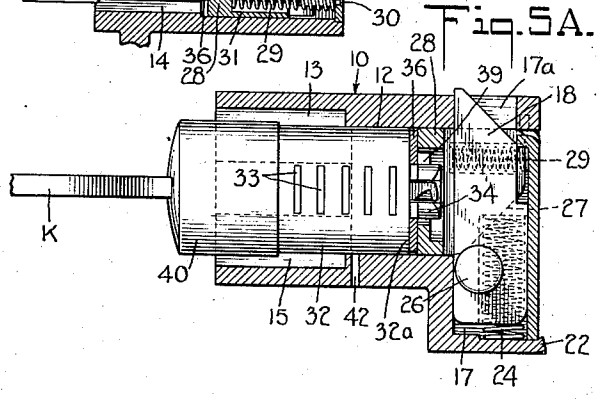
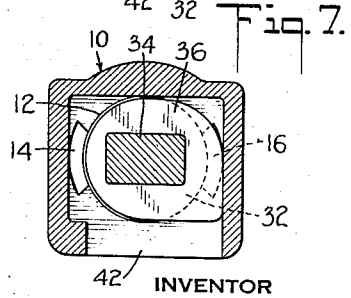


Fig. 7.



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Fig. 9.

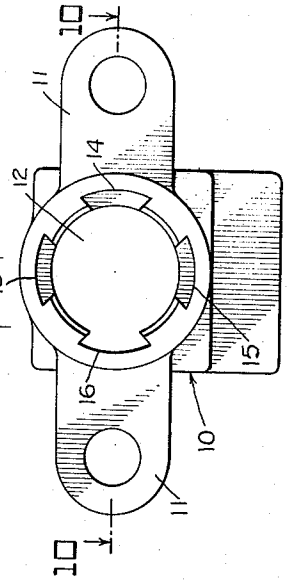


Fig. 10.

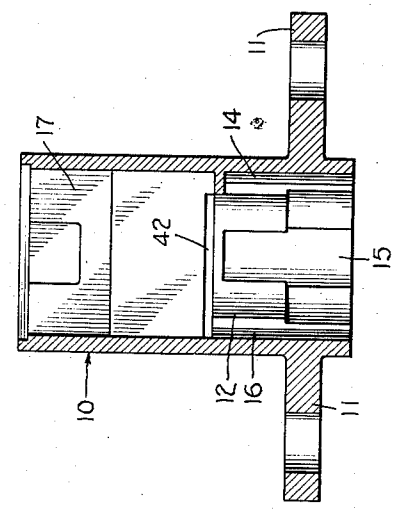
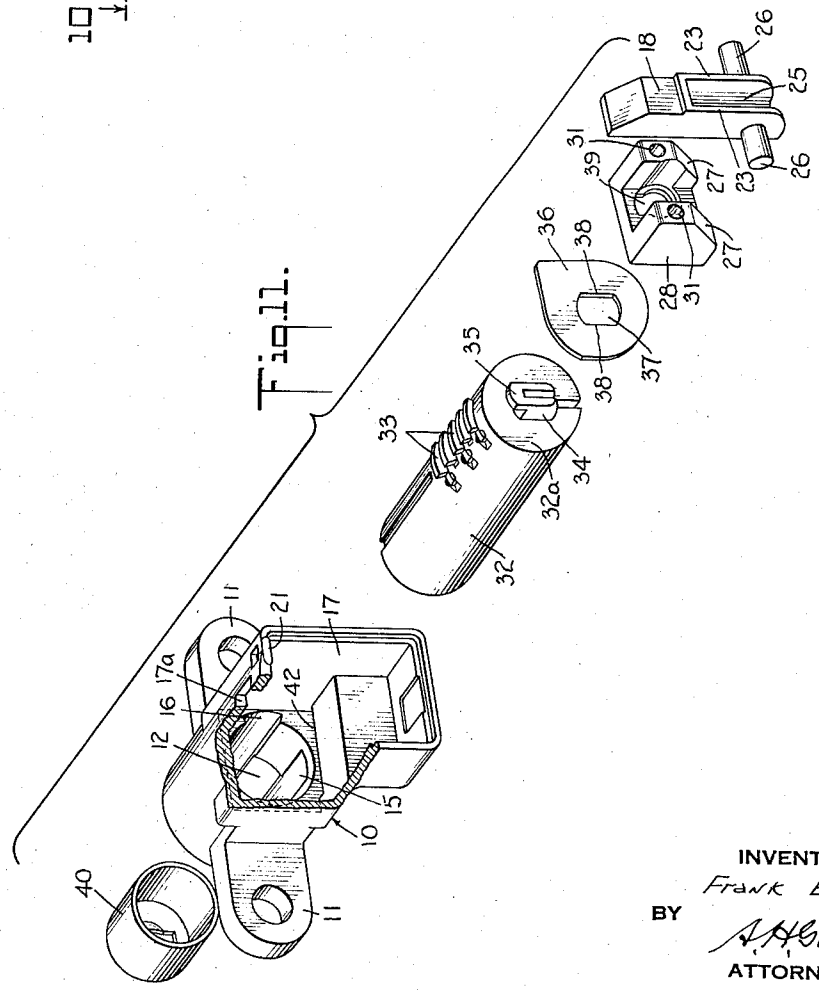


Fig. 11.



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UNITED STATES PATENT OFFICE

2,573,061

COMPARTMENT LOCK

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Application January 22, 1947, Serial No. 723,496

18 Claims. (Cl. 70—81)

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This invention relates to a lock, and more particularly to that type of lock used for locking a box, chest, or compartment. Even more particularly, my lock is intended for use on the glove box compartment of an automobile and to meet the structural and operating requirements of locks of the particular class.

In my lock there is utilized a bolt and a tumbler controlled key plug, together with means whereby movement of the key plug retracts the bolt. It is a feature of my invention that the key plug and the bolt actuator means are retained within the casing of the lock once they are assembled within the casing, no bolts or other retaining means being utilized for the particular purpose. As a more particular feature of this part of the invention, the key plug and the bolt actuator means are mutually retaining upon assembly to one another.

As a further feature of my invention, I utilize a rotating and sliding key plug, while a sliding bolt actuator functions as the bolt actuator means. Preferably, the bolt actuator is maintained against rotation so as to coact efficiently at all times with the bolt, it being a feature of the invention that the rotating and sliding key plug is adapted to move the actuator in one direction while the actuator moves the key plug in a reverse direction through spring means acting always upon the bolt actuator.

As a still further feature of my invention, the key plug is adapted for positive locking preferably through means operating against a substantial surface of the key plug so that the lock will resist attack. Still a further feature of the invention resides in the utilization of simple spring mechanism operating against the bolt and operating also against the bolt actuator, the springs being arranged in such a manner as to function without in any way obstructing the action of one another.

I have thus outlined the general nature of my invention and its relation to the prior art in order that the description thereof that follows may be better understood, and in order that my contribution to the art may be better appreciated. There are, of course, additional features of my invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which my disclosure is based may readily be utilized as the basis for the designing of other structures for carrying out the several purposes of my invention and that my claims should not be limited to the actual structure herein shown and described.

Referring now to the drawings, Fig. 1 is a perspective view of my new lock while Fig. 2 is an elevation of the right hand end thereof as

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seen in Fig. 1. Fig. 3 is a section taken along lines 3—3 of Fig. 1. Figs. 4, 5 and 6 are sections taken respectively along lines 4—4, 5—5, and 6—6 of Fig. 3. Fig. 5A is a view similar to Fig. 3, but showing the parts as they would appear when the bolt is retracted. Fig. 7 is a view similar to Fig. 6, but showing the parts in a different rotated position. Fig. 8 is a section taken along lines 8—8 of Fig. 3. Fig. 9 is an enlarged front end view of the casing of my lock, while Fig. 10 is a section taken along lines 10—10 of Fig. 9. Fig. 11 is an exploded view of the parts of the lock.

Referring now more particularly to the drawings, reference numeral 10 indicates generally the casing of my lock, having a pair of integral mounting ears 11 whereby the lock may be secured to the door of the compartment to be locked, all as is quite conventional. The casing 10 is formed with a key plug bore 12 having four tumbler slots designated by reference numerals 13, 14, 15, and 16 as best appears in Fig. 4.

The casing 10 has also a bolt compartment 17 formed with an opening 17a in which moves a bolt 18 best illustrated in Fig. 11. The end of the casing is closed by a plate 19 having lugs 20 underlying ears 21 of the casing as best shown in Fig. 2. Plate 19 is retained in the position of Fig. 2 by a staked portion 22 integral with the casing, the staking of the staked portion 22 taking place after the plate 19 is applied with its lugs 20 under the ears 21. Bolt 18, as probably best shown in Fig. 3, slides with the surfaces 23 thereof against the inside surface of the plate 19, a spring 24 lying within the groove 25 of the bolt 18 and projecting it upwardly through opening 17a and into the extreme position of Fig. 3.

Bolt 18 is formed with a pair of opposed posts 26, and coacting with these posts 26 are the cam surfaces 27 of a bolt actuator 28, best illustrated in Fig. 11. Bolt actuator 28 is adapted for axial sliding movement between the bolt compartment 17 and the key plug bore 12 as best shown in Figs. 3 and 5A, and due to its shape, is held against any rotary movement relatively to the casing 10. A pair of springs 29 are mounted about pins 30 riveted to the plate 19, the springs then extending into bores 31 of bolt actuator 28 for pressing the actuator to the left in Fig. 3. Actually, the bolt spring 24, through the posts 26 of the bolt 18, cooperates with the springs 29 in urging the bolt actuator to its position of Fig. 3.

The key plug of my lock is designated by reference numeral 32 and carries a series of conventional tumblers 33 retractable by a suitable key in a conventional manner, all as those skilled in the art will fully understand and appreciate. The tumblers 33 are adapted for coaction with opposed grooves 13, 15 of the key plug bore 12, or with opposed grooves 14, 16 depending upon the

rotated position of the key plug 32 within the bore 12. Obviously, it is only when the tumblers are retracted into a release position by the key K that the key plug may be rotated from its locked position of Fig. 4 into a position 90° therefrom.

The right hand end of the key plug 32 is formed with a rather novel extension 34 having an upwardly extending lug 35 as best seen in Fig. 11. Adapted to be applied over the extension 34 is a detent plate 36 having a hole 37 the sides 38 of which coact with the sides of the extension 34 of the key plug so as to lock the detent plate for rotation integrally with the key plug.

The bolt actuator 28 is formed with a bayonet type opening 39 adapted for coaction with the extension 34 of the key plug and its upwardly extending lug 35. Thus, with the bolt actuator 28 aligned with the key plug 32 as shown in Fig. 11, the actuator may be slipped over the extension 34, and with the detent plate 36 against the end surface 32*a* of the key plug and between the key plug and the bolt actuator. Thereafter, a simple rotation of 90° will lock the key plug to the actuator so as to prevent endwise separation of the two, all as is best seen in Fig. 3.

The relationship of the key plug to the bolt actuator thus described is used to assemble the key plug and the bolt actuator and to prevent endwise separation thereof relatively to one another and consequent movement of the key plug outwardly of the casing 10. Thus, with the parts in the position of Fig. 3, it is obvious that the key plug 32 cannot be removed from the casing. Moreover, the detent plate 36 rotatable with the key plug 32 prevents rotation of the key plug except within the limits indicated in Figs. 6 and 7. In this way, the key plug 32 is prevented from rotating into that alignment with the bolt actuator illustrated in Fig. 11, so that separation of the two is impossible. As a matter of fact, the key plug 32 and the bolt actuator 28 are assembled to one another and the detent plate 36 outwardly of the casing 10. Thereafter, the three parts are inserted endwise into the casing as can be best understood from Fig. 11. Then, the bolt 18 may be inserted in place, and thereafter the plate 19 assembled to the casing 10.

The front end of the key plug is preferably covered by a scalp 40 made of sheet metal and appropriately plated. The scalp is assembled to the key plug after the key plug is within the casing, being then staked to the key plug as illustrated at 41 in Fig. 3.

For coaction with the detent plate 36, the casing is formed with a slot 42, and when the key plug is in its locked position of rotation, the detent plate 36 is within the slot 42 as best shown in Fig. 6 as well as Fig. 3. With the parts in this position, it is obvious that the key plug is prevented from movement to the right from its position of Fig. 3. If a key is now inserted to set the several tumblers 33, it will be possible to rotate the key plug 90° from its position of Figs. 4 and 6 and into the position of Fig. 7. At this time, the detent plate 36 is removed from the slot 42. Then, the key plug may be depressed into its position of Fig. 5A, and through the cam surfaces 27 coacting with the posts 26 will retract the bolt 18.

If desired, the key may be removed when the key plug is in its position of Fig. 5A, and since the tumblers are then in alignment with slots 14 and 16, they will be projected into one of the said slots for locking the key plug against rotation. Thereafter, mere manual depression of the key plug into its position of Fig. 5A will at all times retract the bolt 18.

It will be reiterated that it is the function of the detent plate 36 not only to lock the key plug against sliding, but also to limit rotation of the key plug relatively to the bolt actuator 28 so as to prevent release alignment of the key plug and actuator, as has been emphasized earlier. Reference is also made again to the rather simple functioning of the several springs and their cooperation to maintain the key plug in an initial position and the bolt projected. At this time emphasis is also made once again to the particular feature whereby the bolt actuator is at all times maintained in a predetermined effective relation to the bolt, so that the key plug in each of its rotated positions will operate the bolt actuator in an effective manner.

I now claim:

1. In a lock of the class described, a casing, a latchbolt movable in said casing, a retractor for said latchbolt movable in an opening of said casing, a key plug slidable in a bore of said casing, and a bayonet joint connection between said retractor and key plug made by relative movement between said key plug and retractor.

2. In a lock of the class described, a casing, a latchbolt movable in said casing, a retractor for said latchbolt movable in an opening of said casing, a key plug slidable in a bore of said casing, and a bayonet joint connection between said retractor and key plug made by relative movement between said key plug and retractor, said connection securing said retractor and key plug for sliding motion together relatively to said casing.

3. In a lock of the class described, a casing, a latchbolt movable in said casing, a retractor for said latchbolt movable in an opening of said casing, a key plug slidable in a bore of said casing, a bayonet joint connection between said retractor and key plug made by relative movement between said key plug and retractor, and means for preventing movement of said key plug relatively to said retractor sufficient to release said bayonet joint when said key plug and retractor are within said casing.

4. In a lock of the class described, a casing, a latchbolt movable in said casing, a retractor for said latchbolt movable in an opening of said casing, a key plug slidable in a bore of said casing, a bayonet joint connection between said retractor and key plug made by relative movement between said key plug and retractor when said key plug and retractor are outside said casing, said connection securing said retractor and key plug for sliding motion together relatively to said casing, and said casing coacting with said key plug and retractor to prevent relative movement therebetween sufficient to release said connection when said key plug and retractor are in said casing.

5. In a lock of the class described, a casing, a latchbolt movable in said casing, a retractor for said latchbolt movable in an opening of said casing, a key plug slidable in a bore of said casing, a bayonet joint connection between said retractor and key plug made by relative movement between said key plug and retractor when said key plug and retractor are outside said casing, said connection securing said retractor and key plug for sliding motion together relatively to said casing, said casing coacting with said key plug and retractor to prevent relative movement thereof sufficient to release the connection therebetween when said key plug and retractor are in said casing, and parts of said key plug and retractor co-

acting with parts of said casing to limit the sliding movement of said key plug in said casing.

6. In a lock of the class described, a casing, a latchbolt movable relatively to said casing, a retractor for said latchbolt movable in an opening of said casing, a key plug rotatable and slidable in a bore of said casing, a connection between said retractor and key plug made by relative movement between said key plug and retractor securing said retractor and key plug for sliding motion together relatively to said casing while leaving said key plug free for rotation in said casing bore relatively to said retractor between predetermined positions, tumblers for preventing rotation of said key plug relatively to said casing except when said tumblers are properly key positioned, and means whereby said key plug is locked against endwise movement with said retractor to retract said latchbolt when said key plug is locked by said tumblers in one of said predetermined positions.

7. In a lock of the class described, a casing, a latchbolt movable in said casing, a retractor for said latchbolt movable in an opening of said casing, a key plug slidable in a bore of said casing, a bayonet joint connection between said retractor and key plug made by relative movement between said key plug and retractor, said key plug being rotatable in said casing bore between predetermined positions, tumblers for preventing rotation of said key plug relatively to said casing except when said tumblers are properly key positioned, and means whereby said key plug is locked against endwise movement with said retractor to retract said latchbolt when said key plug is locked by said tumblers in one of said predetermined positions, the rotation of said key plug to another predetermined position releasing said key plug from said means locking it against endwise movement.

8. In a lock of the class described, a casing, a latchbolt movable in said casing, a retractor for said latchbolt slidably mounted in an opening of said casing, a key plug slidable and rotatable in a bore of said casing, a connection between said retractor and key plug securing said retractor and plug for sliding movement together in said casing made by relative movement between said key plug and retractor prior to insertion in said casing, said key plug rotating in said casing bore and relatively to said retractor between predetermined positions without disturbing said connection, tumblers for preventing rotation of said key plug relatively to said casing except when said tumblers are properly key positioned, and means whereby said key plug is locked against endwise movement with said retractor to retract said latchbolt when said key plug is locked by said tumblers in one of said predetermined positions, the rotation of said key plug to another predetermined position releasing said key plug from said means locking it against endwise movement.

9. In a lock of the class described, a casing, a latchbolt mounted for movement in said casing, a retractor for said latchbolt, said casing having an opening at its rear in which said retractor is mounted for sliding movement and held against rotation, a key plug mounted in a bore of said casing communicating with said opening, said bore being open at its front end to allow access by a key to the forward end of the key plug, a bayonet joint connection made by relative movement of said retractor and key plug when said retractor and key plug are outside the casing, said

connection securing said retractor and key plug for sliding motion together in said casing when said retractor and key plug are inserted endwise into said casing through said opening to bring the key plug into the bore of said casing.

10. In a lock of the class described, a casing, a latchbolt mounted for movement in said casing, a retractor for said latchbolt, said casing having an opening at its rear in which said retractor is mounted for sliding movement and held against rotation, a key plug mounted in a bore of said casing communicating with said opening and open at its front end to allow access by key to the forward end of the key plug, a bayonet joint connection made by relative movement of said retractor and key plug when said retractor and key plug are outside the casing, said connection securing said retractor and key plug for sliding motion together in said casing when said retractor and key plug are inserted endwise into said casing through said opening to bring the key plug into the bore of said casing, said connection leaving said key plug free for rotation relatively to said retractor between predetermined positions, and means locking said key plug against endwise sliding movement with said retractor in a latchbolt retracting direction when said key plug is in one of said predetermined positions.

11. In a lock of the class described, a casing, a latchbolt mounted for movement in said casing, a retractor for said latchbolt, said casing having an opening in which said retractor is mounted for sliding movement and held against rotation, a key plug mounted in a bore of said casing communicating with said opening and open at its front end to allow access by key to the forward end of the key plug, a bayonet joint connection made by relative movement of said retractor and key plug when said retractor and key plug are outside the casing, said connection securing said retractor and key plug for sliding motion together in said casing when said retractor and key plug are inserted endwise into said casing to bring the key plug into the bore of said casing, said connection leaving said key plug free for rotation relatively to said retractor between predetermined positions, means locking said key plug against endwise sliding movement with said retractor in a latchbolt retracting direction when said key plug is in one of said predetermined positions, and key set tumblers for locking said key plug against rotation between said predetermined positions.

12. In a lock of the class described, a casing, a latchbolt mounted for movement in said casing, a retractor for said latchbolt, said casing having an opening at its rear in which said retractor is mounted for sliding movement and held against rotation, a key plug mounted in a bore of said casing communicating with said opening and open at its front end to allow access by key to the forward end of the key plug, a bayonet joint connection made by relative movement of said retractor and key plug when said retractor and key plug are outside the casing, said connection securing said retractor and key plug for sliding motion together in said casing when said retractor and key plug are inserted endwise into said casing through said opening to bring the key plug into the bore of said casing, said connection leaving said key plug free for rotation relatively to said retractor between predetermined positions, and means locking said key plug against endwise sliding movement with said retractor in a latchbolt retracting direction when said key plug is in

one of said predetermined positions, said key plug being free of said means and adapted for sliding movement when in another of said predetermined positions, and key set tumblers for locking said key plug against rotation between said predetermined positions.

13. In a lock of the class described, a casing, a latchbolt mounted for movement in said casing, a retractor for said latchbolt, said casing having an opening in which said retractor is mounted for sliding movement and held against rotation, a key plug mounted in a bore of said casing communicating with said opening and open at its front end to allow access by key to the forward end of the key plug, means of connection between said retractor and key plug securing said retractor and key plug for sliding motion together in said casing, said connection leaving said key plug free for rotation relatively to said retractor between predetermined positions, and means locking said key plug against endwise sliding movement with said retractor in a latchbolt retracting direction when said key plug is in one of said predetermined positions.

14. In a lock of the class described, a casing, a latchbolt mounted for movement in said casing, a retractor for said latchbolt, said casing having an opening in which said retractor is mounted for sliding movement and held against rotation, a key plug mounted in a bore of said casing communicating with said opening, a bayonet joint connection between said retractor and key plug securing said retractor and key plug for sliding motion together in said casing, and a detent carried by said key plug and cooperable with said casing to lock said key plug against sliding movement when said key plug is rotated in said bore to a predetermined position.

15. In a lock of the class described, a casing, a latchbolt mounted for movement in said casing, a retractor for said latchbolt, said casing having an opening in which said retractor is mounted for sliding movement and held against rotation, a key plug mounted in a bore of said casing communicating with said opening and open at its front end to allow access by key to the forward end of the key plug, means of connection between said retractor and key plug securing said retractor and key plug for sliding motion together in said casing, and a detent inserted over a part of said key plug and positioned between the key plug and the retractor, said detent coacting with a part of said casing to lock said key plug against sliding movement when said key plug is rotated in said bore to a predetermined position.

16. In a lock of the class described, a casing, a latchbolt mounted for movement in said casing, a retractor for said latchbolt, said casing having an opening at its rear in which said retractor is mounted for sliding movement and held against rotation, a key plug mounted for rotation and sliding in a bore of said casing communicating with said opening and open at its front end to allow access by key to the forward end of the key plug, a connection made by relative movement of said retractor and key plug when said retractor and key plug are outside the casing, said connection securing said retractor and key plug for sliding motion together in said casing when said retractor and key plug are inserted endwise into said casing through said opening to bring the key plug into the bore of said casing while leaving said key plug free for rotation relatively to said retractor, a detent inserted over a part of said key plug and positioned between the key plug and the retractor, said detent coacting with a part of said casing to lock said key plug against sliding movement when said key plug is rotated in said bore to a predetermined position, and key set tumblers for locking said key plug against rotation to said predetermined position.

17. In a lock of the class described, a casing, a latchbolt mounted for movement in said casing, a retractor for said latchbolt, said casing having an opening at its rear in which said retractor is mounted for sliding movement and held against rotation, a key plug mounted in a bore of said casing communicating with said opening and open at its front end to allow access by key to the forward end of the key plug, a connection securing said retractor and key plug for sliding motion together in said casing when said retractor and key plug are inserted endwise into said casing through said opening to bring the key plug into the bore of said casing, spring means pressing against said retractor and thereby adapted to urge the forward end of the key plug outwardly of the front end of said bore, and a spring pressing against said bolt to press the bolt against the retractor for further urging the forward end of the key plug outwardly of the front end of said bore.

18. In a lock of the class described, a casing, a latchbolt mounted for movement in said casing, a retractor for said latchbolt, said casing having an opening at its rear in which said retractor is mounted for sliding movement and held against rotation, a key plug mounted for sliding and rotation in a bore of said casing communicating with said opening and open at its front end to allow access by key to the forward end of the key plug, a connection made by relative movement of said retractor and key plug when said retractor and key plug are outside the casing, said connection securing said retractor and key plug for sliding motion together in said casing when said retractor and key plug are inserted endwise into said casing through said opening to bring the key plug into the bore of said casing while leaving said key plug free to rotate in said bore, spring means pressing against said retractor and thereby adapted to urge the forward end of the key plug outwardly of the front end of said bore, a part of the retractor limiting the movement of the key plug and retractor relatively to the casing by said spring means, and means locking said key plug against endwise sliding movement with said retractor in a latchbolt retracting direction when said key plug is in one predetermined position of rotation in said bore, said key plug being free of said means and adapted for sliding movement when in another predetermined position of rotation in said bore, and key set tumblers for locking said key plug against rotation between said predetermined positions.

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The following references are of record in the file of this patent:

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