Dec. 6, 1960 R. W. AHLQUIST 2,962,888

LOCK

Filed Oct. 27, 1958

Fig. 1.

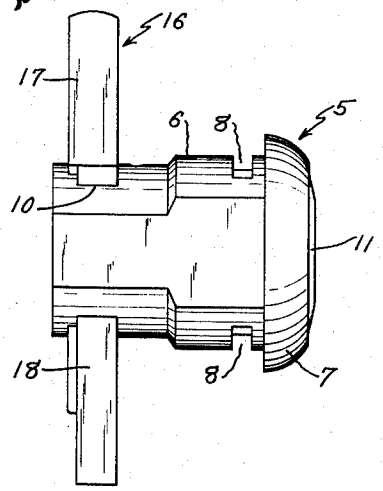


Fig. 2.

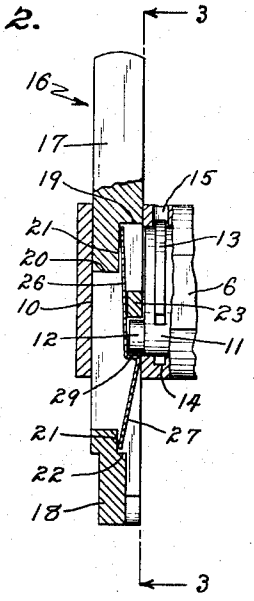


Fig. 3.

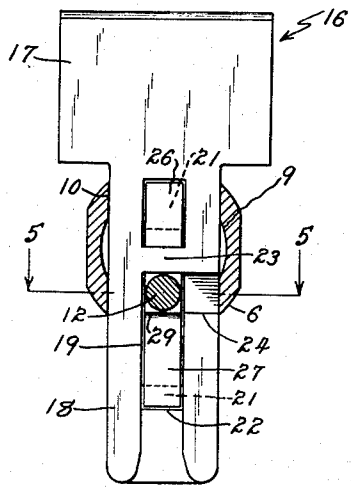


Fig. 4.

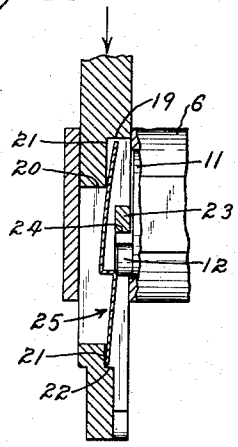


Fig. 6.

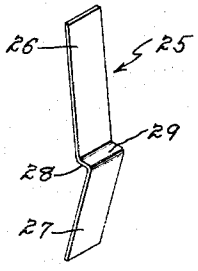
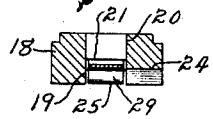


Fig. 5.



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LOCK

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6 Claims. (Cl. 70—86)

This invention relates to a lock and more particularly to a key operated cylinder lock of the type commonly used on desk drawers and other closures for locking them in closed position.

The primary object of the invention is to provide a lock having a bolt which may be readily assembled to the cylinder of the lock without the use of tools and without removing the key plug therefrom.

Another object of the invention is to provide a lock having a bolt equipped with a spring member which permits the bolt to be easily assembled to the lock cylinder and which also establishes an operative connection between the bolt and the key plug of the lock.

A further object of the invention is to provide novel means for fastening the spring member to the bolt which eliminates the need for separate fastening elements such as rivets or the like.

Other objects and advantages of the invention will be more clearly understood from the following description and the accompanying drawing in which:

Fig. 1 is an elevational view illustrating a lock embodying the present invention.

Fig. 2 is a fragmentary elevational view, partly in central vertical section, illustrating the construction of the lock.

Fig. 3 is an end view of the lock taken on line 3—3 of Fig. 2 and illustrating the construction of the bolt.

Fig. 4 is a view similar to Fig. 2, but showing how the bolt is assembled to the lock cylinder.

Fig. 5 is a sectional plan view of the bolt taken on line 5—5 of Fig. 3.

Fig. 6 is an isometric view of the spring member carried by the bolt.

The lock shown in the drawing is of a well known type especially adapted for use in metal desk drawers and is conventional in all respects except for the construction of the bolt as provided by the present invention.

Said lock, indicated generally at 5, includes a cylinder 6 which is adapted for insertion into a hole in a metal drawer front, not shown. A flange 7 is provided at the outer end of the cylinder for engagement with the outer surface of the drawer front, and notches 8—8 are formed in the periphery of the cylinder inwardly of the flange for the reception of a spring clip which engages the inner surface of the drawer front and secures the lock in position thereon as fully disclosed in the copending application of Carl A. Vahlstrom, Serial No. 662,849, filed May 31, 1957, and now U.S. Patent No. 2,948,141, issued August 9, 1960. The cylinder has an axial bore 9 and at its inner end contains a transversely extending guideway 10 which intersects said bore.

A key plug 11 is rotatably mounted in the bore 9 and carries a plurality of disc tumblers, not shown, which cooperate with slots in the wall of the bore to maintain the key plug locked in either of two rotated positions 180° apart; the position shown in the drawing corresponding to the retracted or unlocked position of the bolt. The tumblers are released from the cylinder by a properly bitted key to permit turning of the key plug, and, in the lock illustrated, rotation of the key plug for 180° in a counterclockwise direction moves the bolt to fully projected position. The key plug has an eccentrically located cam pin 12 on the inner end thereof which projects into the transverse guideway 10 in the lock cylinder and when the key plug is in either of its locked positions said pin is located centrally of said guideway. The key plug is retained in the cylinder and is prevented from moving axially therein by a retainer 13 which is carried by the key plug and is spring pressed into an annular groove 14 in the wall of the bore 9. A hole 15 is formed in the cylinder in alignment with the groove 14 to provide access to the retainer 13 so that it may be released with a suitable tool when it is desired to remove the key plug from the cylinder, all as is well known in the art.

The bolt 16 of the lock is, in the present instance, of conventional T shape, including a head 17 and a shank 18 which extends through and is slidable in the guideway 10 in the lock cylinder.

In accordance with the present invention, the shank 18 of the bolt is provided with a longitudinally extending, centrally located slot 19 in its front face which opens to the free end of the shank and terminates adjacent the head 17 as shown in Figs. 2, 3 and 4. A clearance opening 20 extends from the bottom of the slot 19 to the rear face of the shank and divides said bottom into upper and lower seats 21—21 which face the cam pin 12. Both the slot 19 and the clearance opening 20 are of the same width, being slightly wider than said cam pin 12. A step 22 is formed in the bottom of the slot 19 adjacent the lower seat 21 and provides an abutment which is opposed to the upper end of said slot. The depth of the slot below the step 22 is sufficient to accommodate the cam pin 12 as the shank is inserted through the guideway 10 in the lock cylinder.

A retaining bar 23, which is an integral part of the shank 18, extends across the slot 19 at a point intermediate the seats 21—21, and the rear face of said bar is spaced forwardly of said seats as shown in Figs. 2 and 4. Directly below the bar 23, a laterally extending recess 24 is formed in the front face of the shank as best shown in Figs. 3 and 5. Said recess extends from the right-hand edge of the slot 19 to the adjacent edge of the shank and is adapted to receive the cam pin 12 during rotation of the key plug.

In order to establish an operative connection between the cam pin 12 and the bolt 16 and yet permit the bolt to be assembled to the lock cylinder without removing the key plug, I provide a spring member 25 which is shown, in its relaxed state, in Fig. 6. Said spring member is formed from flat spring stock that is slightly narrower than the width of the slot 19 and includes an upper leg 26 and a lower leg 27 which are joined by an integral, forwardly extending portion 28 forming an upwardly facing stop shoulder 29 on the spring.

Referring now to Figs. 2 and 3 in particular, it will be seen that the spring member 25 is adapted to fit in the slot 19 between the seats 21—21 and the bar 23 and between the upper end of said slot and the step 22. When the spring member is mounted in the shank, it is under tension and therefore presses against the seats 21—21 and the bar 23 so that it cannot rattle or move about. The stop shoulder 29 on the spring member is spaced from the lower edge of the bar 23 and forms a recess therebetween which is adapted to receive the cam pin 12, said recess being a continuation of the recess 24 as shown in Fig. 3.

The bolt 16 may be assembled to the lock cylinder

without removing the key plug by simply inserting the shank **18** of the bolt into the top of the guideway **10** and pressing it downwardly therein as shown by the arrow in Fig. 4. When the lower inclined leg **27** of the spring member **25** engages the cam pin **12**, said spring will flex rearwardly into the clearance opening **20**, as shown in Fig. 4, and permit continued downward movement of the bolt. As soon as the stop shoulder **29** on the spring member passes by the pin **12**, the spring will snap back to its normal position shown in Fig. 2. Further downward movement of the bolt is then prevented by engagement of the bar **23** with said pin. Once the bolt has been properly installed, it is obvious that it cannot be removed without removing the key plug since the shoulder **29** provides a stop engageable with the cam pin which prevents withdrawal of the bolt from the cylinder.

When the bolt is properly engaged with the cam pin **12**, as shown in Figs. 2 and 3, it may be moved between retracted and projected positions by simply rotating the key plug in the required direction with the proper key as will be well understood by those skilled in the art.

I claim:

1. In a lock including a cylinder having a bore extending inwardly therein and a guideway extending transversely of and intersecting said bore, a key plug rotatable in said bore, and a cam pin extending inwardly from said key plug into said guideway; a bolt including a shank slidable in said guideway and having a longitudinal slot therein extending from the free end of said shank and terminaing in an end wall, said slot being adapted to receive said cam pin and having a clearance opening in the bottom thereof dividing said bottom into spaced outwardly facing seats opposed to said cam pin, a step in the bottom of said slot located between the end of said clearance opening and the free end of said shank, a flat spring member disposed in said slot between said end wall thereof and said step and supported on said seats, a retaining bar extending across said slot intermediate said seats and retaining said spring member therein and against said seats, a portion on said spring member providing a shoulder spaced from and opposed to said retaining bar and defining a recess therebetween adapt to receive said cam pin, said spring member being yieldable into said clearance opening upon engagement of said portion thereof with said cam pin as said shank is inserted into said guideway to permit movement of said shoulder past said cam pin and assembly of said bolt to said cylinder without removing said key plug therefrom.

2. In a lock including a cylinder having a bore extending inwardly therein and a guideway extending transversely thereof and intersecting said bore, a key plug rotatable in said bore, and a cam pin extending inwardly from said key plug into said guideway; a bolt having a shank insertable downwardly into said guideway for sliding movement therein, outwardly facing seat portions formed on said shank and opposed to said cam pin, an elongated spring member seated on said seat portions and extending longitudinally of said shank, a retaining abutment on said shank having an inwardly facing abutment surface opposed to said seat portions and engageable by said spring to retain said spring against said seat portions, an upwardly facing stop shoulder extending outwardly from said spring intermediate its ends and engageable with said cam pin to prevent withdrawal of said shank from said guideway, the portion of said spring extending downwardly from said stop shoulder being inclined inwardly to provide a cam surface on said spring, said spring being yieldable inwardly upon engagement of said cam surface with said cam pin as the shank is moved downwardly into said guideway to allow said shoulder to pass said cam pin and thereby permit assembly of said bolt to said cylinder without removing the key plug therefrom.

3. In a lock including a cylinder having a bore extending inwardly therein and a guideway extending transversely thereof and intersecting said bore, a key plug rotatable in said bore, and a cam pin extending inwardly from said key plug into said guideway; a bolt having an elongated shank insertable downwardly into said guideway for sliding movement therein, longitudinally spaced, outwardly facing seat portions formed on said shank opposed to said cam pin, an elongated spring member extending longitudinally of said shank and having its opposite ends seated on said seat portions, the intermediate portion of said spring being biased outwardly toward said cam pin, a retaining abutment on said shank disposed intermediate said seat portions and having an inwardly facing abutment surface opposed to said seat portions and engageable by said spring to retain said spring against said seat portions, an upwardly facing stop shoulder extending outwardly from the intermediate portion of said spring for engagement with said cam pin to prevent withdrawal of said shank from said guideway, the portion of said spring extending downwardly from said stop shoulder being inclined inwardly to thereby provide a cam surface on said spring engageable with said cam pin as the shank is moved downwardly into said guideway to cause said spring to yield inwardly and thereby permit said stop shoulder to pass said cam pin whereby said bolt may be assembled to said cylinder without removing the key plug therefrom.

4. In a lock including a cylinder having a bore extending inwardly therein and a guideway extending transversely thereof and intersecting said bore, a key plug rotatable in said bore, and a cam pin extending inwardly from said key plug into said guideway; a bolt having an elongated shank insertable downwardly into said guideway for sliding movement therein, said shank having a longitudinal slot therein opening to the free end of said shank and adapted to receive said cam pin, the bottom of said slot having longitudinally spaced, outwardly facing seat portions thereon opposed to said cam pin, an elongated flat spring member disposed in said slot having its opposite ends seated on said seat portions and its intermediate portion biased outwardly toward said cam pin, a retaining bar extending across said slot intermediate the ends of said spring and having an inwardly facing abutment surface opposed to said seat portions and engageable by said spring to retain said spring in said slot and against said seat portions, abutment means in said slot engageable by said spring to prevent longitudinal movement thereof relatively to said shank and an upwardly facing stop shoulder extending outwardly from the intermediate portion of said spring for engagement with said cam pin to prevent withdrawal of said shank from said guideway.

5. In a lock including a cylinder having a bore extending inwardly therein and a guideway extending transversely thereof and intersecting said bore, a key plug rotatable in said bore, and a cam pin extending inwardly from said key plug into said guideway; a bolt including an elongated shank insertable downwardly into said guideway for sliding movement therein, said shank having a longitudinal slot therein extending upwardly from the free end of said shank and terminating in an end wall intermediate the ends of said bolt, said slot being adapted to receive said cam pin when said shank is inserted into said guideway, an upper seat portion formed on the bottom of said slot adjacent said end wall, a lower seat portion formed on the bottom of said slot and spaced longitudinally from said upper seat portion, said seat portions facing outwardly from said shank in opposed relation to said cam pin, an upwardly facing step extending outwardly from the bottom of said slot adjacent said lower seat portion and providing an abutment surface opposed to said end wall, an elongated flat spring member disposed in said slot between said end wall and said step and having its opposite end portions seated on said seat portions, the intermediate portion of said spring

being biased outwardly toward said cam pin, a retaining bar on said shank extending across said slot intermediate said seat portions and having an inwardly facing abutment surface opposed to said seat portions and engageable by said spring to retain said spring in said slot, an upwardly facing stop shoulder extending outwardly from the intermediate portion of said spring for engagement with said cam pin to prevent withdrawal of said shank from said guideway, the portion of said spring extending downwardly from said stop shoulder being inclined inwardly toward said lower seat portion to thereby provide a cam surface on said spring engageable with said cam pin as said shank is inserted into said guideway to cause

said spring to yield and thereby permit said stop shoulder to pass said cam pin whereby said bolt may be assembled to said cylinder without removing the key plug therefrom.

6. The subject matter set forth in claim 5 wherein said stop shoulder is spaced from said retaining bar to provide a recess therebetween adapted to receive said cam pin.

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