Aug. 24, 1937. S. R. FRAIM 2,091,199

LOCK

Filed Feb. 26, 1936

Fig. 3.

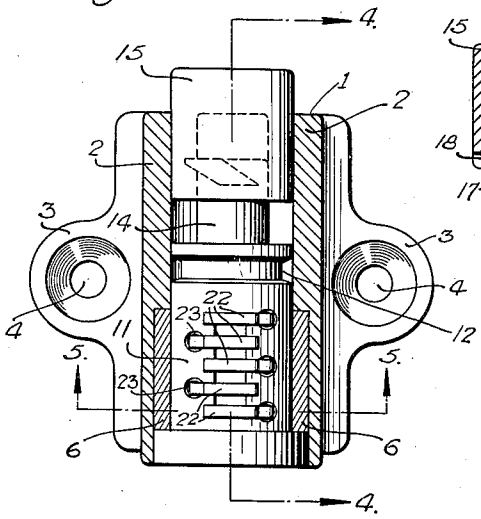


Fig. 4.

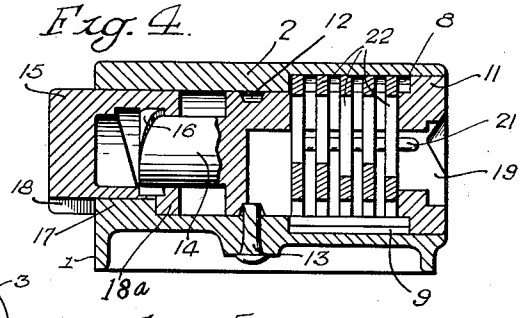


Fig. 5.

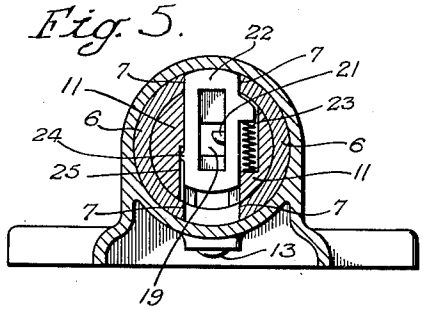


Fig. 2.

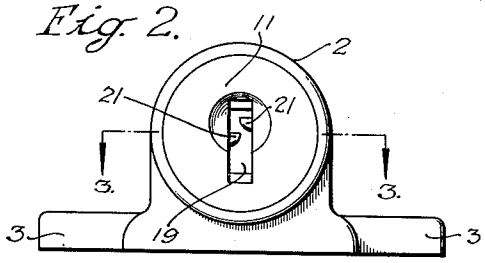


Fig. 6.

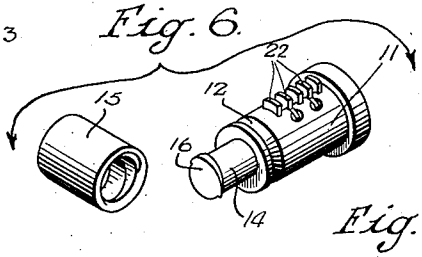


Fig. 1.

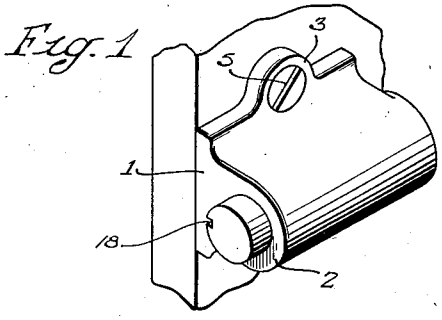


Fig. 7.

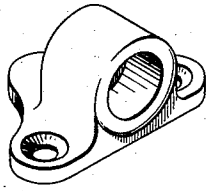


Fig. 8.

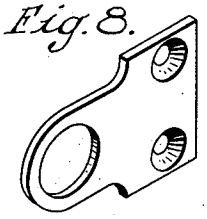
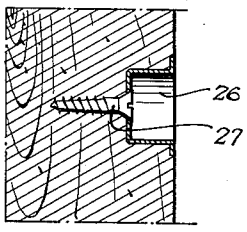


Fig. 9.



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UNITED STATES PATENT OFFICE

2,091,199

LOCK

Samuel R. Fraim, Lancaster, Pa.

Application February 26, 1936, Serial No. 65,880

2 Claims. (Cl. 70—90)

The object of this invention is to provide a novel form of cylinder lock that shall be characterized by extreme compactness and simplicity of form, that shall be capable of production at low cost, and that shall be adapted for a variety of uses as hereinafter set forth.

In the attached drawing:

Figure 1 is a view in perspective of a lock made in accordance with my invention;

Fig. 2 is an enlarged front elevation of the lock;

Fig. 3 is a section on the line 3—3, Fig. 2;

Figs. 4 and 5 are, respectively, longitudinal and transverse sections on the lines 4—4 and 5—5, Fig. 3;

Fig. 6 is a detached view in perspective showing the cylinder and bolt elements of the lock;

Figs. 7 and 8 are views in perspective of two different forms of keepers, and

Fig. 9 is a sectional view showing still another type of keeper adapted for a special purpose hereinafter described.

With reference to the drawing, the lock comprises a body member 1 having a barrel portion 2 and flanges 3, 3 extending transversely from opposite sides thereof and provided with countersunk openings 4 for reception of screws 5, by means of which the lock is secured to a supporting structure. The cylindrical chamber of the barrel 2 is countersunk at one end for reception of a pair of segmental sleeve elements 6, 6, the edges 7, 7 of which are spaced apart from each other to form in effect slotted recesses 8 and 9 extending longitudinally of the barrel bore and at top and bottom thereof respectively. The sleeve elements 6, 6 are rigidly secured by any suitable means in their respective positions in the barrel.

The lock further comprises a cylinder 11 which in assembly is mounted rotatably within the barrel and between the sleeve elements 6, 6, this cylinder having a circumferential recess 12 which receives the inner end of a pin 13, see Fig. 4, which is passed through the wall of the barrel at the bottom and which functions to retain the cylinder against axial displacement from the barrel. The pin 13 may be in the form of a drive screw which when driven will retain its position in the barrel. The cylinder 11 also has at its inner end an axial extension 14 of reduced diameter, which in assembly receives a hollow bolt element 15, the interior of this latter element being provided with a screw thread which meshes with a suitably formed tooth element 16 on the extension 14. The bolt 15, as shown in Fig. 4, is slidably mounted in the bore of the barrel 2, but is prevented from rotating in the barrel by a fin 17 on the latter which projects into a longitudinal slot 18 in the outer surface of the bolt. The slot 18 terminates short of the inner end of the bolt and the fin 17 by abutment with the inner wall 18a of the slot also functions as a stop limiting the outward movement of the bolt from the end of the cylinder 2, as shown in Fig. 4. The arrangement is such that rotation of the cylinder 11 in the barrel will cause by the action of the tooth element 16 on the threaded interior of the bolt an axial movement of the latter element in the barrel. The bolt 15 is shown in Figs. 1, 3 and 4 in the fully extended or projected position, and when fully retracted, the outer end of the bolt will lie flush with or inside of the end plane of the barrel.

The barrel 11 is provided with the usual key slot 19, from the opposite sides of which project the conventional key-aligning lugs 21. The cylinder also carries a series of tumblers 22 mounted in radial slots in the cylinder body, these tumblers being adapted to project beyond the cylindrical surface of the cylinder and into the slots 8 and 9 to thereby lock the cylinder against rotation in the barrel 2. Springs 23 operatively associated with the respective tumblers 22 resiliently hold the tumblers in the extended position, as shown in Fig. 5, and each of the tumblers is provided at one edge with a teat 24 which slides in a slot 25 in the cylinder, and which by engagement with the inner end of this slot limits the outward movement of the tumbler under the action of the spring 23, and prevents the tumblers from being completely displaced from the cylinder by the action of the springs prior to assembly with the barrel. The tumblers 22 are adapted for retraction from their normal extended positions shown in Fig. 5 by action of the key inserted in the slot 19, and when so retracted and cleared from the slot 8, in engagement with which they are shown in Figs. 4 and 5, the cylinder 11 is free to rotate in the barrel. This rotation, effected through the medium of the key, will cause, as previously described, an axial movement of the bolt 15 toward or from the extended position, and the construction is such in the present instance that a rotation of the cylinder 11 through an angle of 180° is sufficient to actuate the bolt from one extreme position of adjustment to the other. When the cylinder 11 is rotated through an angle of 180° from the position in which it is shown in the drawing, the operative ends of the tumblers 22 are brought into alignment with the slot 9 in the bottom of the barrel, and when the

key is withdrawn, the said tumblers will be projected by action of the springs 23 into the slot 9, thereby again locking the cylinder against rotation. It will be apparent, therefore, that provision is made for locking the bolt 15 in both the projected and retracted positions of adjustment. Since it is essential, in order to permit retraction of the key from the cylinder 11 after insertion, that the tumblers 22 be free to move to their extended positions, it is apparent that the key can be retracted only when the cylinder has been moved to either one of the two positions in which, respectively, the tumblers 22 are aligned with the slots 8 and 9.

Assembly of the cylinder and the bolt elements in the barrel is an extremely simple operation, it being only necessary to assemble the bolt element with the cylinder so that the bolt is in the relatively retracted position, and thereafter to insert the cylinder and bolt assembly in the barrel so that the tumblers 22 engage in the slot 9 and the fin 17 of the barrel in the slot 18 of the bolt. The parts are then locked in the barrel by insertion of the retaining pin 13. The bolt is now in the retracted position, and rotation of the cylinder 11 through the medium of the key and as previously described through an angle of 180° will advance the bolt 15 to the projected position, as shown in the drawing, and will bring the tumblers 22 into position for engagement in the slot 8 when the key is withdrawn.

The lock described above is extremely compact and is, therefore, adaptable for a large variety of uses. It may, for example, be applied to the sash of a window to lock the sash either in a closed or open position. For this purpose, I may employ a keeper of the character shown in Fig. 9, this keeper consisting of a cup-shaped member 26 which may readily be fitted into a recess in the window frame and which may be secured in position by means of a screw 27 passed through an opening in the bottom of the cup. When a conventional wood bit is used to form the recess for reception of the cup 26, the leading point of the bit will form in the bottom of the recess a starting hole for the screw 27, so that the operation of mounting this keeper is an extremely simple one. For other purposes, such for example when the lock is used with doors or transoms, keepers of the character shown in Figs. 7 and 8 may be employed. Its extreme simplicity of form makes possible manufacture and marketing of the lock at an extremely low cost, so that they may be used in relatively large numbers without excessive overall cost. While simple in form and construction, the lock is extremely rugged, and has the requisite strength to withstand heavy strains.

I claim:

1. In a lock, the combination with a barrel having a cylindrical bore, said bore having toward one end a longitudinal groove and at the other end a longitudinal inwardly projecting integral rib, and said barrel having in the wall thereof an aperture entering said bore at a point intermediate the inner ends of said groove and rib, a cylinder mounted for rotation in the grooved end of the barrel and carrying spring-actuated key-retractible tumblers adapted when extended to project into said groove to hold the cylinder against rotation in the barrel, said cylinder having an external circumferential groove, a pin secured in said aperture and projecting into the said cylinder groove and preventing axial movement of the cylinder in the barrel, a bolt mounted for axial movement in the ribbed end of said bore and having a groove extending longitudinally from the outer end thereof to a point short of the inner end for reception of said rib, said rib thereby preventing rotation of the bolt in the barrel and constituting also a stop limiting the extent to which the bolt may be projected from the barrel, and interacting means on said cylinder and bolt operative by rotation of the former to project and retract the latter.

2. In a lock, the combination with a barrel having a cylindrical bore, said bore being countersunk at one end and having at the other end a longitudinal inwardly projecting integral rib, and said barrel having in the wall thereof an aperture entering said bore at a point intermediate the inner ends of said countersink and rib, a pair of segmental elements inserted in said countersink and forming between the ends thereof a pair of longitudinal grooves in the countersunk end of said bore, a cylinder mounted for rotation in the last-named end of the barrel and carrying spring-actuated key-retractible tumblers adapted when extended to project into one or other of said grooves to hold the cylinder against rotation in the barrel, said cylinder having an external circumferential groove, a pin secured in said aperture and projecting into the said cylinder groove and preventing axial movement of the cylinder in the barrel, a bolt mounted for axial movement in the ribbed end of said bore and having a groove extending longitudinally from the outer end thereof to a point short of the inner end for reception of said rib, said rib thereby preventing rotation of the bolt in the barrel and constituting also a stop limiting the extent to which the bolt may be projected from the barrel, and interacting means on said cylinder and bolt operative by rotary movement of the former to project and retract the latter.

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