Feb. 1, 1949. E. M. NAVARRO 2,460,709

LOCK MECHANISM

Filed Feb. 25, 1947

Fig. 1.

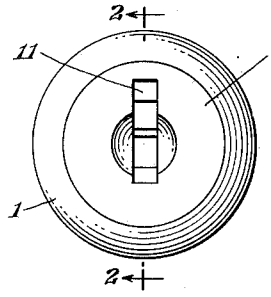


Fig. 2.

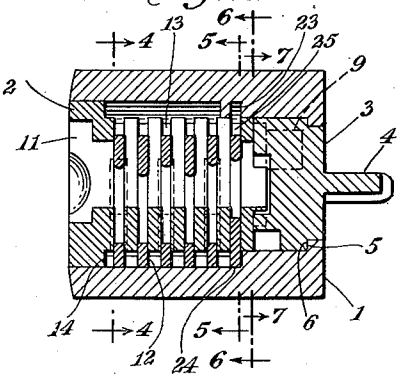


Fig. 3.

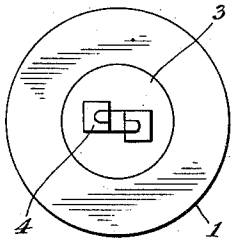


Fig. 4.

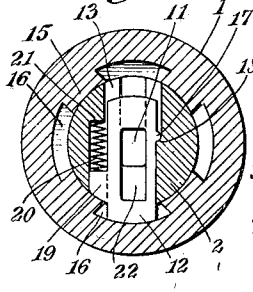


Fig. 5.

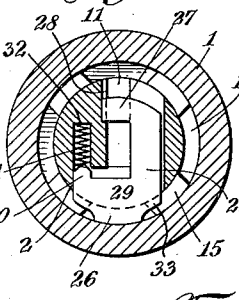


Fig. 6.

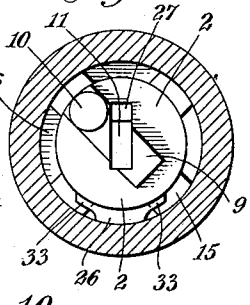


Fig. 7.

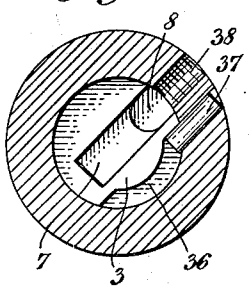


Fig. 8.

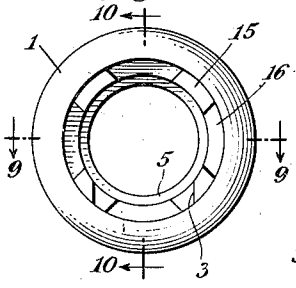


Fig. 10.

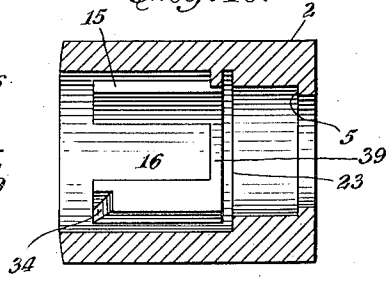


Fig. 11.

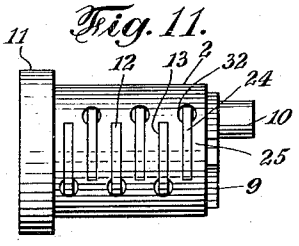


Fig. 9.

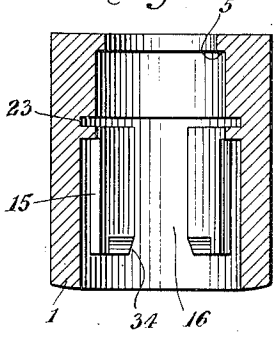


Fig. 12.

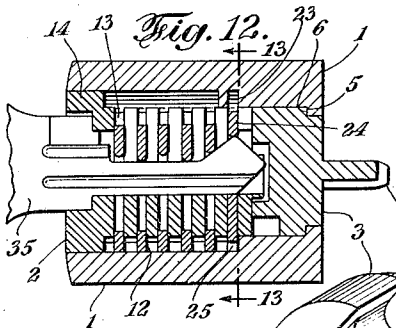


Fig. 13.

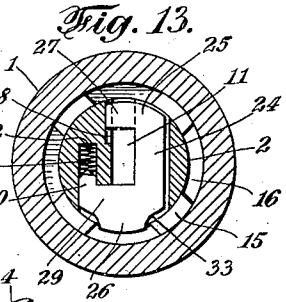
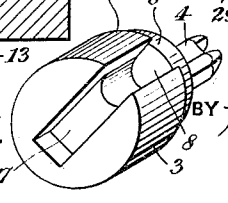


Fig. 14.



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LOCK MECHANISM

Eugene M. Navarro, New York, N. Y.

Application February 25, 1947, Serial No. 730,765

2 Claims. (Cl. 70—369)

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My invention is an improvement in locks; particularly a lock with a rotatable barrel carrying tumblers, and having a slot for the insertion of a key to engage and retract the tumblers when the barrel is to be rotated.

An important object of the invention is to provide a tumbler lock casing which is to be mounted in a door or other closure member equipped with the lock, and be engaged by the tumblers to hold the barrel fast; the lock having an additional tumbler, and the interior of the casing being so shaped that said additional tumbler will retain the barrel in the casing but allow it to rotate as required; said additional tumbler also being so mounted that it can be moved to release the barrel; thus enabling the latter to be mounted in the casing and extracted at will.

The nature and advantages of the improvement are made plain in the following description and the novel features are defined in the appended claims. I do not wish, however, to be restricted to the exact structure disclosed herein, but reserve the right to make changes in details of shape, size and arrangement of parts without deviating from the principle of the invention or omitting any of the features in which the invention resides.

In the drawings:

Figure 1 is a front view of a lock comprising a tumbler barrel and casing according to this invention.

Figure 2 is a longitudinal section on line 2—2 of Figure 1.

Figure 3 is a rear view.

Figures 4, 5, 6 and 7 are cross sections on lines 4—4, 5—5, 6—6, and 7—7 respectively of Figure 2.

Figure 8 is a front elevation of the casing of the lock, without the tumbler barrel therein.

Figures 9 and 10 are sections on lines 9—9 and 10—10 respectively of Figure 8.

Figure 11 is a side view of the tumbler barrel of the lock.

Figure 12 is a section similar to Figure 2 showing the complete lock with a key inserted into it.

Figure 13 is a cross section on line 13—13 of Figure 12; and

Figure 14 is a perspective view of the bolt-turning plug rotatably mounted at the inner end of the casing and connected to the key or tumbler barrel of the lock.

The casing 1 of the lock has the shape of a hollow cylinder open in front for the insertion of the rotatable tumbler barrel 2, and having at the opposite end, which is the inner end with respect to the door or the like carrying it, a rotatable plug 3, with an outside projection 4. This projection is coupled to the bolt, not shown, to move the latter in the usual manner when the barrel is operated to turn the plug 3. This plug has a reduced shouldered end 5 that fits against an

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internal shoulder 6 in the adjacent end of the casing 1. The plug has a transverse recess 7, terminating in deeper cavity 8 at one extremity, in the face presented to the barrel 2. The inner end of the barrel has a transverse projection 9 and stud 10 that fit into the recess 7 and cavity 8 respectively, when the parts are assembled. The barrel and plug are thus connected and when the barrel is rotated by a key inserted into the slot 11, the plug is actuated.

The barrel carries several tumblers 12, mounted in transverse recesses 13. The barrel has a flange at its outer end presenting an inside shoulder 14 which abuts the ends of several longitudinal ribs 15 of equal depth and width in the casing 1; the body of the barrel being of reduced diameter adjacent these ribs, and the latter being separated by longitudinal grooves 16 into one of which the tumblers project to hold the barrel 2 against movement. When a key in the slot 11 retracts the tumblers from one of the grooves to clear the ribs, the barrel 2 can be turned. The tumblers 12 for preventing rotation of the barrel each have a projection 17 at one side to engage a shoulder 18 in the recess 13 and limit the outward movement of the tumbler into the groove 16. See Figure 4. On the opposite side each tumbler has a shoulder 19 engaged by a spring 20 in a bore 21, open along the side to the tumbler recess 13. The tumblers are flat and can usually be inserted into the recesses or slots 13, after the springs 19 are in place, by bending or springing them a little along the middle line to make the projections 17 clear the shoulders 18; and they can be made resilient enough to return to a flat shape when in proper position.

Each of the tumblers 12 has an elongated longitudinally extending opening 22 in line with the key slot 11. When no key is inserted in the slot the springs 20 will project the tumblers out of the barrel 2 as far as the projections 17 and shoulders 18 will permit, into the groove 16 which receives the tumblers. In this position the barrel cannot be turned because of the ribs 15 at either side of this groove.

The casing 12 has an inside circular groove 23 near the shoulder 5, and in addition to the tumblers 12 which secure the barrel against turning, the barrel 2 carries a tumbler 24 in a transverse slot 25. See Figures 5, 9 and 13. This tumbler has a reduced outer extremity 26 which projects into the circular slot 23. Said tumbler 24 has the form of a hook with approximately the outline of a C, one end 27 of which extends across the key slot 11 in the barrel and projects into a slot 28 at one side of the recess 25 in the barrel 2. The opposite portion 29 from which the reduced extremity 26 projects is larger and also extends across the key slot 11 and terminates in a point 30 which is engaged by a spring 31 in a socket 32

at the side of the recess 25 in the key barrel 2. This tumbler 24 is not controlled by the key which operates the other tumblers and as long as the end 26 remains in the groove 23 the barrel can be turned when a key operates and pushes back the tumblers 12 to clear the ribs 15, but this barrel cannot be pulled out. The shoulders 33 at each side of the reduced end 26 are provided so that when the barrel 2 is inserted into the casing 1 these shoulders will slide upon the inclined portions 34 at the ends of two of the ribs 15. The tumbler 24 will thus be forced back into the key barrel until the latter is inserted into the casing 1 far enough for the tumbler 24 to lie in the same transverse plane as the groove 23. The spring 31 then projects the tumbler 24 so that the end 26 enters the groove 23 and holds the key barrel inside of the casing 1 but permits it to be rotated whenever the bolt united to the projection 4 is to be operated.

The casing 1 will usually be mounted in the door or the like in such position that when the tumblers 12 are held fast between two of the ribs 15, the key slot 11 will be vertical and the tumblers 12 will project, when not retracted by the key, into the groove 16 which is lowermost. In this position the two ribs 15 which have the inclined ends 34 will be in the lower half of the casing and the other two will be in the upper half; and the plug 3 will be as indicated in Figure 7 and the stud 10 will be in line with one of the ribs 15 in the upper half of the casing 1, as shown in Figure 6. When the key 35 is inserted into the lock, the tumblers 12 are retracted from the groove 16 to clear the two lowermost ribs 15, and then the barrel 2 can be turned through a short arc, say to the left with reference to Figures 4 and 5. The bolt connected to the projection 4 is thus pulled back, and when the bolt is to be projected the key is turned in the opposite direction and then pulled out to allow the tumblers 12 to be forced once more by their springs 20 into the lowermost groove 16. After the barrel 2 has been moved far enough to retract the bolt, the tumblers 12 will, if the key is pulled out, project into the groove 16 at the left side of the casing 1, as presented in Figure 4. When the barrel 2 has its proper position in the casing 1, the stud 10 enters the cavity 8 and the projection 9 fits in the transverse recess 7 of the plug 3. The latter has a slot 36 which is engaged by a stud 37 in the casing 1 to limit the degree of rotation through which the plug can be turned by the barrel 2, and the casing 1 may have a sight opening 38 in line with the recess 7 when the plug 3 is at one end of its movement. When the casing is in place, the aperture 38 is at the point shown in Figure 1, and the unlocking rotation of the barrel proceeds till the lower end of the slot 36 strikes against the stop 37. The key slot 11 has moved through a quarter of a turn and is horizontal in the casing 1.

The barrel 2 can be withdrawn from the casing any time by first getting the barrel 2 in position to have the slot 11 vertical, using the key 35 if necessary; and the lower end of the slot 36 of the plug 3 abuts the stop 37. All of the tumblers 12 are now in line with the lowermost groove 16 in the casing. The key 35 is now pulled out and another key is inserted to keep the tumblers 12 retracted and to retract the tumbler 24 and free it from the circular slot 23. Then the barrel can be withdrawn from the casing 1. This removal is allowed because the shoulders 33 now clear the

adjacent inner corners of the two lower ribs 15, the lowermost groove 16 between them communicating freely at its inner end with the groove 23. See Figure 9. The three other grooves 16 are closed at their inner ends by ridges 39 between the ribs 15, these ridges helping to form the front wall of the groove 23. To reinsert the barrel 2, the said other key is again inserted into the slot and the barrel is put back into the casing with the latter in such position that the shoulders 33 at each side of the end 26 of the tumbler 24 are about in line with the bevelled ends 34 of the two lower ribs 15. The barrel can then be easily replaced in the casing 1 because the inclined ends 34 give enough clearance for the tumbler 24 to be pushed in far enough to slide back along these ribs until the slot 23 is reached. The plug is first turned so as to make the recess 7 and the cavity 8 in the plug 3 register with the projection 9 and stud 10 respectively of the barrel 2. Hence when the barrel is fully in and the key pulled out, the tumbler 24 snaps into the grooved slot 23, the barrel 2 and the plug 3 will again be in connected relation.

A lock of the above description is very useful for holders in which full bottles of milk are designed to be placed and secured on the exterior of a dwelling or the like between the time of delivery and the hour when the occupant needs the milk and takes possession of the bottle. But obviously the lock can be employed on doors, closets, lids of chests and strong boxes, or in any other construction for which a lock is required.

Having described my invention, what I believe to be new is:

1. A lock comprising a casing having separated longitudinal ribs therein, a barrel therein having tumbers to project between some of said ribs and engage the casing and prevent rotation of the barrel till said tumblers are retracted, the casing having a circular slot on its interior adjacent the inner ends of said ribs, and an additional tumbler to engage the slot to permit the barrel to be turned in the casing while holding it against withdrawal therefrom, all of said ribs being united at their inner ends to provide one wall of said slot, the latter having an entrance opening between two of said ribs, which are bevelled at their forward ends, and a rotatable plug in said casing on the other side of said slot, said plug having a cavity and a transverse recess and the inner end of said barrel a stud and a projection to enter same respectively, the plug also having a circular groove and the casing a stop entering the groove to allow limited rotation of the plug.

2. The lock according to claim 1 in which the additional tumbler is wider than the spaces between said ribs and has shoulders to engage the beveled forward ends of said ribs when the barrel is inserted in the casing, said additional tumbler then being retracted by the ribs until it reaches said circular slot.

EUGENE M. NAVARRO.

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