June 16, 1959 E. M. NAVARRO 2,890,582

LOCK MECHANISM

Filed Oct. 28, 1954

FIG. 1

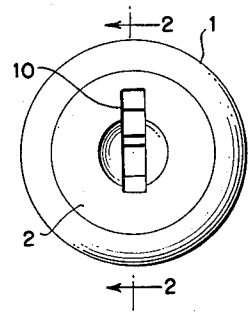


FIG. 2

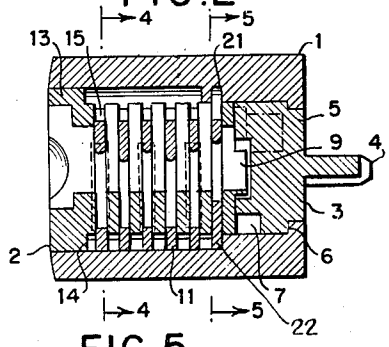


FIG. 3

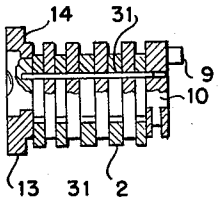


FIG. 4

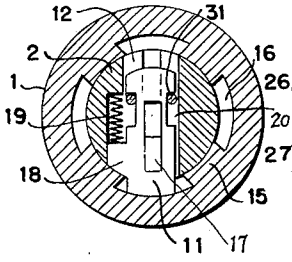


FIG. 5

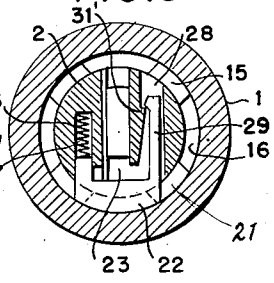


FIG. 10

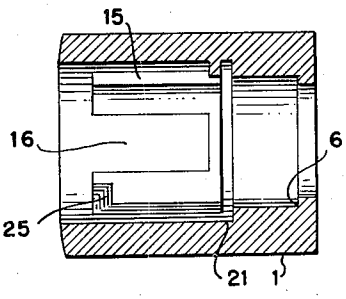


FIG. 8

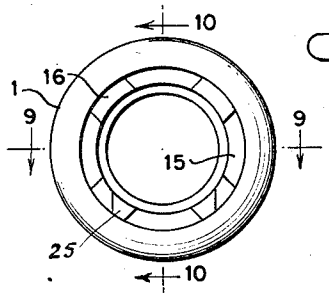


FIG. 13

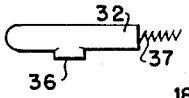


FIG. 6

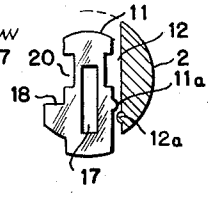


FIG. 12

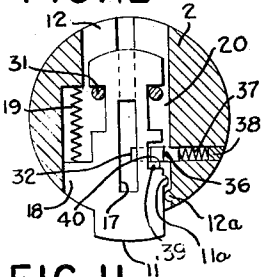


FIG. 14

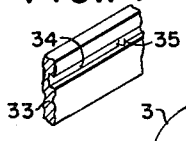


FIG. 11

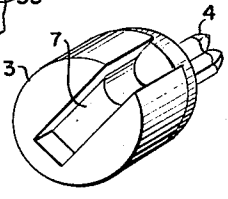


FIG. 9

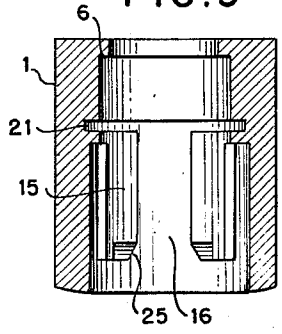


FIG. 7

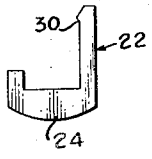
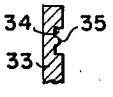


FIG. 15



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LOCK MECHANISM

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Application October 28, 1954, Serial No. 465,338

1 Claim. (Cl. 70—421)

This invention is an improved lock mechanism; especially a lock mechanism with a casing enclosing 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 turned on its long axis.

It is an important object of the invention to provide lock mechanism comprising a casing with a barrel carrying tumblers therein to be mounted in a closure member, and be engaged by the tumblers to hold the barrel fast; the barrel as usual controlling a bolt and the lock having an additional tumbler to retain the barrel in the casing but allow it to rotate as required.

A further object is to provide lock mechanism in which the barrel is adapted to retain the tumblers against displacement after they are mounted therein.

An additional object is to provide a lock that can be opened only with the proper key and is therefore proof against "picking."

Other objects and the advantages of my improvement are clearly set forth in the ensuing description and the novel features are defined in the appended claim. The invention however, is not restricted to the exact structure disclosed herein, but changes in details of shape, size and arrangement of parts may be made without changing or omitting any of the essential characteristics which the invention contains.

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 longitudinal section on a smaller scale of the barrel carrying the tumblers of the lock mechanism.

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

Figures 6 and 7 are plan views of different tumblers for the lock mechanism.

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 perspective view of a member rotatably mounted at the inner end of the casing and connected to the tumbler barrel of the lock to project and withdraw a locking bolt.

Figure 12 is a section similar to Figure 4 showing a modified construction.

Figures 13, 14 and 15 show details of said modification.

The numeral 1 indicates the casing of the lock mechanism. It 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 a rotatable plug 3, with an outside projection 4. This projection is adapted to engage and move a bolt in the usual manner when the barrel turns the plug 3. This plug has a shouldered end 5 that fits against an internal shoulder 6 in the adjacent

end of the casing 1; and a transverse recess 7, in the end presented to the barrel 2. The inner end of the barrel has a stud or pin 9 that fits into the recess 7 when the parts are assembled. The barrel is rotated when a key is inserted into the slot 10, and the plug also rotated, and the stud or projection 4 actuates the bolt, which is not shown.

Several tumblers 11 are mounted in transverse recesses 12 of the barrel 2, which has a flange 13 at its outer end presenting an inside shoulder 14 that abuts the ends of several longitudinal ribs 15 of equal depth and width in the casing 1. The body of the barrel is of reduced diameter adjacent these ribs, and the latter are 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 10 retracts the tumblers 11 from a groove 16 to clear the ribs 15, the barrel 2 can be turned.

The tumblers 11 each have an elongated longitudinally extending opening 17 in line with the key slot 10. When no key is inserted in the slot the springs 19 will project the tumblers out of the barrel 2 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.

As shown on Figure 4 the tumblers 11 have the central slot or opening 17 for the key and the lateral projection 18 for the spring 19, and in addition, wide recesses 20 in one or both sides. When these tumblers are inserted into the recesses 12 of the barrel 2, a rod or rods 31 is passed through a longitudinal opening in the barrel, so located that each rod passes between the sides of the recesses 20 and serves to retain the tumblers 11 in place; so that they cannot be expelled by the springs 19 from the barrel when the tumblers are put into the recesses 12 before the barrel is pushed into the casing 1. The construction of the tumblers and of the barrel 2 is thus made easy and cheap. The springs 19 seat against shoulders in the recesses 12.

In the casing 1 is a circular groove 21 near the shoulder 6, and in addition to the tumblers 11 which secure the barrel against turning, the barrel 2 carries a tumbler 22 in a recess 23. See Figures 5 and 7. This tumbler has the approximate form of an L with a wide base 24 which projects into the circular slot 21.

This tumbler 22 is not controlled by the key which operates the other tumblers 11 to withdraw them so that their outer ends are flush with the outer surface of the key barrel 2 and permit the barrel to be pushed into the casing and turned therein.

The base 24 is wider than the slots 16, one of which is to receive the projecting ends of the tumblers 11. The ribs 15 beside this particular groove 16 will have inclined shoulders 25 at the ends adjacent the front of the casing 1. When the barrel is inserted into the casing the shoulders 25 push the tumbler 22 inward to clear the adjacent ribs 15 and when the tumbler 22 reaches the groove 21, the base 24 enters this groove.

In the barrel 2 the transverse recess 23 is open to the key slot 10; and this recess has at one side of the key slot a cavity 26 in which seats a spring 27 to engage the end of the base 24 and impel the tumbler 22 outward into the slot 21. On the other side of the key slot is a hole 28, to receive the leg 29 of the L-shaped tumbler 22. This leg has a lateral projection 30 to engage a shoulder 31′ in the hole 28, so that the spring 26 cannot force the tumbler 22 out of the barrel when the tumbler is mounted therein. The hole 28 is wide enough to permit easy insertion of the leg 29, so that its projection 30 will slip past the shoulder 31′, and the projection 30 will hook itself over the shoulder 31′ and retain the tumbler 22 in the barrel 2.

The casing 1 will usually be mounted in the door or the like in such position that when the tumblers 11 are held fast between two of the ribs 15, the key slot 10 will be vertical and the tumblers 11 will project, when not retracted by the key, into the groove 16 which is lowermost. In this position two ribs 15 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 4, for example. When the key is inserted into the lock, the tumblers 11 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 19 into the lowermost groove 16. After the barrel 2 has been moved far enough to retract the bolt, the tumblers 11 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, but can again be released by the key when the barrel is to be turned to retract the bolt.

A lock of the above description is very useful and can be employed on doors, closets, lids of chests and strong boxes, or in any other construction for which a lock is required.

The barrel 2 is permanently secured in the casing 1 when the tumbler 22 engages the slot 21, but if desired one of the grooves 16, say at the right on Figure 4 can be wide enough to pass the tumbler end 29, if the barrel 2 is to be removable. Preferably the barrel 2 should be held permanently in the casing 1 by the tumbler 22.

The lock mechanism of Figure 12 has tumblers 11′ of the type illustrated in Figure 6, with projections 11*a* to cooperate with projections 12*a* in the barrel 2; and the barrel has a sliding latch 32 to hold each tumbler 11′, till it is engaged and pushed back by a key 33. The end of the latch 32 forms a projection at one edge of the open space in the tumbler which receives the key. In the side of the key is a groove 34 with a projection 35. Each latch is at the side of a tumbler opposite the side having the shoulder 18, and has a lateral projection 36. It is mounted in a bore 37, in one end of which is a spring 38 that pushes the latch out till the projection 36 is received in a recess 39 in the tumbler 11′. Projections 36

are adapted to engage the shoulders 40 of recesses 39 when the tumblers 11′ are moved without first retracting the latches; thereby preventing the withdrawal of said tumblers from the groove 16. The projection 35 in the slot 34 of the key of Figure 14 will engage the inner end of the latch, which projects past the tumbler along one face, to push back the latch. The latches 32 will be arranged so as to be in different places, and the groove 34 will be so shaped and the projections 35 so located that the latches can all be retracted by said projections to release the tumblers 11′ when the proper key is used. The edge of the key can be straight, or recessed, to engage the tumblers at one end of the slots 17 to withdraw the tumblers, and thus operate in the usual way when the latches are released as if the latches 32 were omitted; thus cooperating with the latches; or the edge of the key can be straight and the projections 35 and latches 32 relied upon solely to release the tumblers 11′. In either instance the presence of the latches 32 will make picking impossible.

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

A lock comprising a casing, a barrel therein having recesses with tumblers therein to project from the barrel and engage the casing and prevent rotation of the barrel till said tumblers are retracted, the barrel having a key slot, the tumblers having recesses at their sides, the barrel having latches with lateral projections engaging the recesses in said tumblers, said latches projecting into said slot and securing said tumblers in position, and a key having a slot with a portion therein to engage the latches and release the tumblers therefrom.

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