

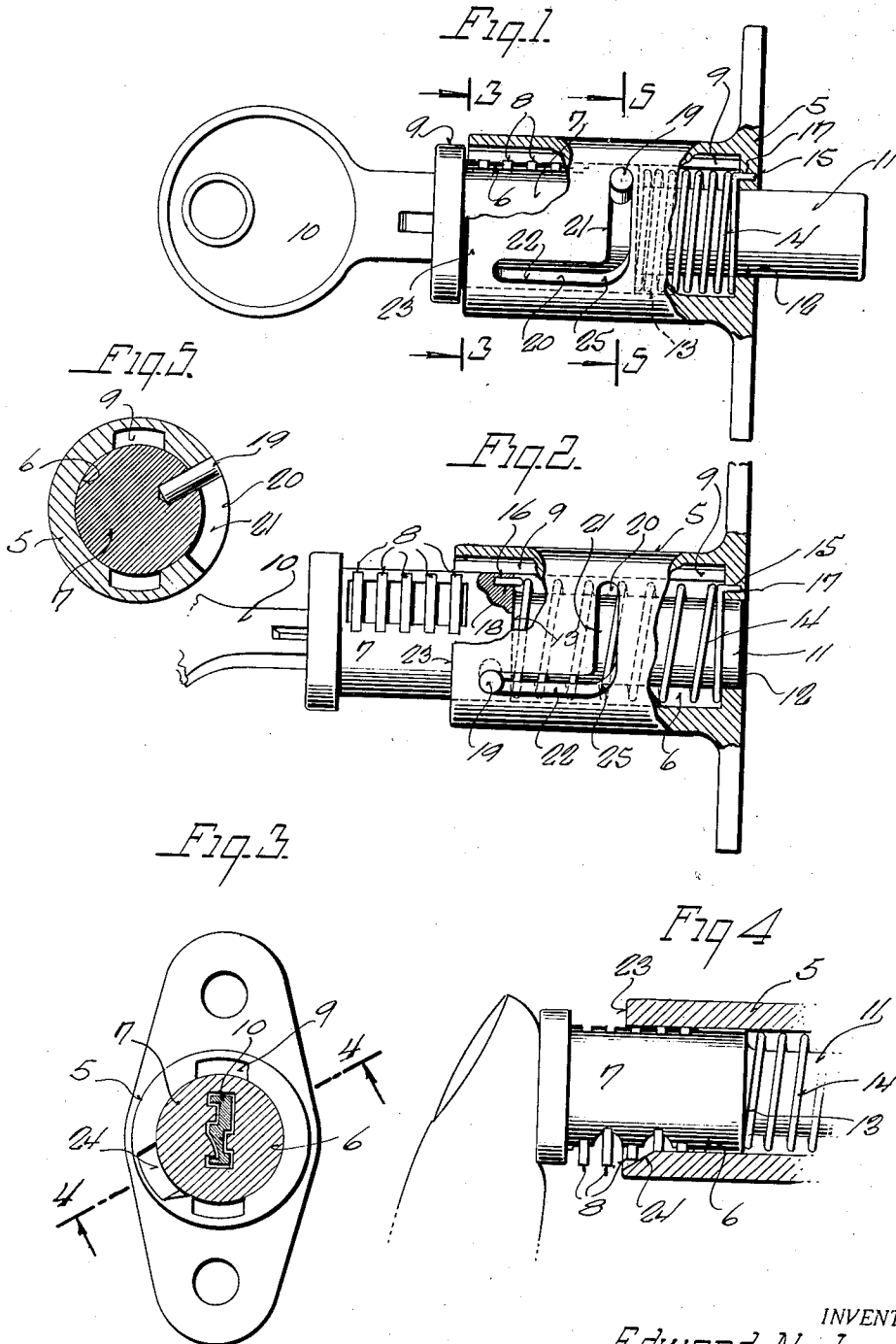
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LOCK

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LOCK

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18 Claims. (Cl. 70—46)

This invention relates to certain new and useful improvements in locks and refers more particularly to key actuated tumbler locks.

It is an object of this invention to provide a lock of the character described, in which the lock cylinder has both axial and rotational movement with respect to its mounting member.

Another object of this invention is to provide means whereby, at the completion of the projection of the lock cylinder axially into the mounting member, the lock cylinder is automatically turned to its locked position.

Another object of this invention resides in the provision of common means for projecting the cylinder from the mounting member upon rotation thereof out of locked position and for turning the cylinder to locked position at the completion of its projection into the mounting member.

A further object of this invention is to simplify the construction of a lock in which the lock cylinder has both longitudinal movement and rotation and to reduce the number of its parts.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

In the accompanying drawing, one complete example of the physical embodiment of this invention is illustrated constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a side elevation with parts broken away and in section of a lock embodying this invention;

Figure 2 is a view similar to Figure 1, but illustrating the lock cylinder in its unlocked projected position;

Figure 3 is a cross section view taken through Figure 1 on the plane of the line 3—3;

Figure 4 is a detail section view illustrating the manner in which the tumblers of the cylinder are retracted upon forced projection of the cylinder into the mounting member; and

Figure 5 is a detail section view taken through Figure 1 on the plane of the line 5—5.

Referring now more particularly to the accompanying drawing in which like numerals indicate like parts throughout the several views, the numeral 5 represents a mounting member of any

desired design, having bore 6 to receive a lock cylinder 7. The lock cylinder 7 is of conventional construction and has a plurality of locking tumblers 8 yieldably urged by springs, not shown, to project one end outwardly beyond the cylinder and into a longitudinal groove 9 formed in the mounting member in communication with the bore 6, to normally secure the lock cylinder against rotation. The locking tumblers 8 are retractable out of the groove 9 to release the cylinder for rotation by the insertion of a proper key 10. At the innermost end of the lock cylinder is an extension or stem 11 which projects through an opening 12 in the closed end of the mounting member bore to provide a locking bolt or to afford a connection with mechanism, not shown, to be locked.

Surrounding this stem or projection 11 between a shoulder 13 formed by the inner end of the lock cylinder proper and the closed end of the bore 6, is a coil spring 14 which has both an expansive and torsional component. When the cylinder is in its normal locked position illustrated in Figure 1, the spring 14 is compressed, storing up energy which tends to project the cylinder outwardly of the mounting member bore.

The ends 15 and 16 of the spring are directed laterally to engage in apertures 17 and 18 formed in the closed end wall of the bore 6 and the lock cylinder shoulder 13 respectively, and the cylinder is at all times in such position of rotation with respect to the end 15 of the spring, as to place the spring in tension tending to turn the cylinder in a counterclockwise direction when viewed from its front end.

The movement of the lock cylinder within the mounting member bore is guided and limited by the engagement of a pin or lug 19 fixed to the cylinder inner end portion and projecting through an L shaped slot 20 formed in the mounting member. Obviously, this slot may be of but sufficient depth as to accommodate the height of the pin 19 or as in the present instance, it may extend entirely through the wall of the mounting member.

With the lock cylinder in its normally locked position depicted in Figure 1, the pin 19 engages the end of the transverse leg 21 of the slot and limits the rotation of the cylinder by the action of the spring 14. At this position the tumblers are aligned with the longitudinal locking groove 9 and upon withdrawal of the key 10 from the cylinder their springs project the tumbler ends into the locking groove and secure the cylinder in its locked position. Longitudinal movement

of the lock cylinder is obviously impossible at this position of rotation as the transverse leg 21 of the slot 20 cooperating with the pin 19, prevents such movement.

- 5 To effect complete unlocking of the lock, and which necessitates the projection of the cylinder outwardly of the mounting member to its position illustrated in Figure 2, it is necessary to insert the key 10 and turn the cylinder in a clockwise direction against the action of the spring 14 until the pin 19 aligns with the longitudinal leg 22 of the slot 20. Immediately upon the alignment of the pin 19 with the leg 22 of the slot 20, the spring 14 projects the cylinder axially from the mounting member until the pin engages the outer end of the leg 22.

The longitudinal motion of the cylinder during its outward projection is sufficient to position the innermost tumbler 8 at or slightly beyond the outer end 23 of the mounting member, and as best shown in Figure 4, the mounting member end 23 has its inner edge portion cut away as at 24 in alignment with the tumblers 8. It is observed that the cut away portion 24 has an inclined bottom and thus it is possible to move the lock cylinder into the mounting member bore against the action of its spring without the use of the key, inasmuch as the inclined bottom of the slot 24 cams the projecting tumbler ends into the body of the cylinder.

Hence, to return the lock cylinder to its retracted position, it is only necessary to force the same inwardly against the action of its spring as shown in Figure 4, and immediately upon the alignment of the pin 19 with the leg 21 of the slot, the torsional force of the spring 14 snaps the tumbler around to its fully locked position.

From the foregoing description taken in connection with the accompanying drawing, it will be readily apparent to those skilled in the art to which an invention of the character described appertains, that this invention provides an exceptionally simple means for obtaining both longitudinal and rotational movement on the part of a lock cylinder and that the simplicity of the design enables the lock to be built with comparatively few parts.

What I claim as my invention is:

1. In a lock of the character described, including a bored mounting member and a key operable lock cylinder mounted therein and having both longitudinal and rotary movements with respect to the mounting member, a single yieldable means for moving the lock cylinder longitudinally in one direction and rotatably in one direction, means to constrain the movement of the lock cylinder in the mounting member bore so that the rotary and longitudinal movements follow successively.
2. A lock, comprising a bored mounting member, a key operable lock cylinder mounted for rotation and longitudinal movement in the mounting member bore, a single means yieldably tending to move the lock cylinder longitudinally and rotatably, and guide means for guiding the movement of the lock cylinder, whereby a predetermined movement in one direction is necessitated before movement in the other direction by said urging means is possible.
3. A lock, comprising a bored mounting member, a key operable lock cylinder mounted for rotation and longitudinal movement in the mounting member bore, spring means yieldably urging the lock cylinder in one direction of longitudinal movement and in one direction of rotation, and

guide means for guiding the movement of the lock cylinder and limiting its movement by the spring means in either of said directions.

4. A lock, comprising a bored mounting member, a lock cylinder mounted for rotation and longitudinal movement and terminating short of one end of the bore, spring means received in the mounting member bore between said end of the bore and the inner end of the lock cylinder for yieldably urging the lock cylinder in one direction of rotation and in one direction of longitudinal movement, and means for guiding and limiting the movement of the lock cylinder by said spring means.

5. A lock, comprising a bored mounting member, a lock cylinder mounted for rotation and longitudinal movement in the mounting member bore with the inner end of the lock cylinder terminating short of one end of the mounting member bore, an extension on the inner end of the lock cylinder and projected through said end of the mounting member bore, a coil spring encircling said extension and engaging the lock cylinder to yieldably move the same in one direction of rotation and one direction of longitudinal movement, and means for limiting and guiding the coil spring actuated movement of the lock cylinder.

6. A lock comprising a bored mounting member, a lock cylinder in the mounting member bore, key operable means for securing the lock cylinder in a predetermined position of rotation with respect to the mounting member, a spring normally in compression and in torsion connected with the lock cylinder to yieldably urge the same in one direction of axial movement and one direction of rotation, and cooperating means carried by the mounting member and lock cylinder for guiding and limiting the spring actuated movement of the lock cylinder, said means limiting rotation of the lock cylinder and holding the same against axial movement at the position in which the key operable means secures the lock cylinder against rotation.

7. A lock comprising a bored mounting member, a lock cylinder in the mounting member bore and longitudinally movable toward unlocking position, means to constrain movement of the lock cylinder so that a degree of rotation on the part of the lock cylinder with respect to the mounting member is necessary to free the lock cylinder for longitudinal movement, key operable means to releasably secure the lock cylinder against said required degree of rotation, and a single yieldable means to move the lock cylinder longitudinally toward unlocking position and rotatably toward the position at which it is secured by the key operable means.

8. A lock, comprising a bored mounting member, a lock cylinder movable in the mounting member bore, means for guiding the movement of the lock cylinder in the bore of the mounting member and necessitating both longitudinal movement and rotation on the part of the lock cylinder with respect to the mounting member in the performance of its normal locking functions, and means operable to automatically turn the lock cylinder in the mounting member bore upon longitudinal movement to a predetermined position.

9. A lock, comprising a bored mounting member, a lock cylinder movable longitudinally and rotatably in the mounting member bore, key operable tumblers for normally securing the lock cylinder in a predetermined position of rotation,

a spring engaging the lock cylinder and mounting member and yieldably urging the lock cylinder in one direction of longitudinal movement and in one direction of rotation, and inter-engaging abutments carried by the mounting member and the lock cylinder for limiting and guiding the movement of the lock cylinder, one of said abutments forming a substantially right-angular guide-way so that movement of the lock cylinder in the mounting member bore in one direction is necessary before movement thereof in the other direction is possible.

10. In a lock including a bored mounting member and a lock cylinder longitudinally and rotatably movable in the mounting member bore, yieldable means for projecting the lock cylinder from the mounting member bore, cooperating means carried by the mounting member and the lock cylinder and restraining longitudinal movement of the lock cylinder until a predetermined degree of rotation on the part of the lock cylinder with respect to the mounting member has been completed, key actuated tumblers carried by the lock cylinder and engageable with the mounting member to normally prevent rotation of the lock cylinder, said tumblers being retractable to release the lock cylinder for rotation upon insertion of a proper key, outward projection of the lock cylinder by said yieldable means being limited at a point at which the innermost locking tumbler is adjacent the outer end of the mounting member bore, and means at the outer end of the mounting member bore for retracting the locking tumblers upon the movement of the lock cylinder into the mounting member bore in the event the key is removed from the lock cylinder.

11. A cylinder lock comprising a bored mounting member, a lock cylinder, key controlled spring actuated tumblers adapted to lock the lock cylinder against rotation in the mounting member, single means to both project the lock cylinder in an axial direction toward the unlocked position and to rotate it toward the locked position, and means to guide the axial and rotational movements of the lock cylinder.

12. A cylinder lock having a lock cylinder, spring actuated key controlled tumblers, a bored mounting member for the cylinder, an abutment on the mounting member adapted to engage the tumblers to lock the lock cylinder against rotation, single means to project the lock cylinder in an axial direction toward the unlocked position and to rotate it toward the locked position, and means to constrain the rotary movement of the cylinder so as to be succeeded by the locking movement of the tumblers.

13. A cylinder lock having a bored mounting member, a lock cylinder movable to and from locked and unlocked positions in the mounting member, guiding means to constrain the movements of the lock cylinder to successive axial and rotary movements from unlocked to locked position, yieldable means to urge the lock cylinder axially toward unlocked position and rotatably toward locked position, and key controlled spring pressed tumblers adapted to secure the lock cylinder against rotary movement in the mounting member.

14. In a lock of the character described, a bored mounting member, a lock cylinder rotatably and longitudinally movable in the mounting member bore and yieldably urged to one position of longitudinal movement, means to con-

strain the movement of the lock cylinder in the mounting member bore whereby a predetermined longitudinal movement of the lock cylinder from its position to which it is yieldably urged is necessary before rotation thereof is possible, spring means to automatically turn the lock cylinder a predetermined degree upon the completion of said longitudinal movement away from its normal position to which it is yieldably urged, and key operable tumblers automatically operable to secure the lock cylinder in the position of rotation to which it is automatically turned.

15. In a lock of the character described, a bored mounting member a lock cylinder movable rotatably and longitudinally in the mounting member bore, yieldable means tending at all times to turn the lock cylinder in one direction and to move the lock cylinder longitudinally in one direction to project the same from the bore, means to constrain the movement of the lock cylinder to successive rotational and longitudinal movements and vice versa, and key operable tumblers to secure the lock cylinder in a locked retracted position to which the lock cylinder is movable by successive longitudinal movement against the action of the yieldable means and rotational movement imparted by the action of the yieldable means.

16. In a lock of the character described, a bored mounting member, a lock cylinder movable rotatably and longitudinally in the mounting member bore, yieldable means tending at all times to turn the lock cylinder in one direction and to move the lock cylinder longitudinally in one direction to project the same from the bore, means to constrain the movement of the lock cylinder to successive rotational and longitudinal movements and vice versa, key operable tumblers to secure the lock cylinder in a locked retracted position to which the lock cylinder is movable by successive longitudinal movement against the action of the yieldable means and rotational movement imparted by the action of the yieldable means, said key operable tumblers being normally yieldably projected radially from the lock cylinder, and means to automatically retract the locking tumblers upon longitudinal movement of the lock cylinder into the mounting member bore toward its retracted locked position.

17. In a lock of the character described, a bored mounting member, a lock cylinder movable rotatably and longitudinally in the mounting member bore, means to constrain the movement of the lock cylinder to successive longitudinal and rotational movements and vice versa and to hold the lock cylinder against longitudinal shifting in an operative position, an extension carried by the inner end of the lock cylinder to project from the mounting member as a locking bolt when the lock cylinder is in its operative position, a coil spring normally in compression and under torsion encircling the extension within the inner end of the mounting member bore and having a connection with the mounting member and lock cylinder to yieldably urge the lock cylinder longitudinally out of its operative position and rotatably to its position holding the lock cylinder in operative position, whereby upon movement of the lock cylinder into the mounting member bore against the compression force of the spring, the torsional force thereof automatically turns the cylinder to its position at which the constraining means holds the cylinder in operative position, and key oper-

able tumblers for releasably securing the lock cylinder in said operative position.

18. A lock comprising a bored mounting member, a key operable lock cylinder rotatably and longitudinally movably mounted in the mounting member bore, and a single coiled spring having one end anchored to the mounting member

and its other end attached to the lock cylinder, said spring being maintained in compression and under torsion to move the lock cylinder longitudinally in one direction and rotatably in one direction.

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10	85
15	90
20	95
25	100
30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150