

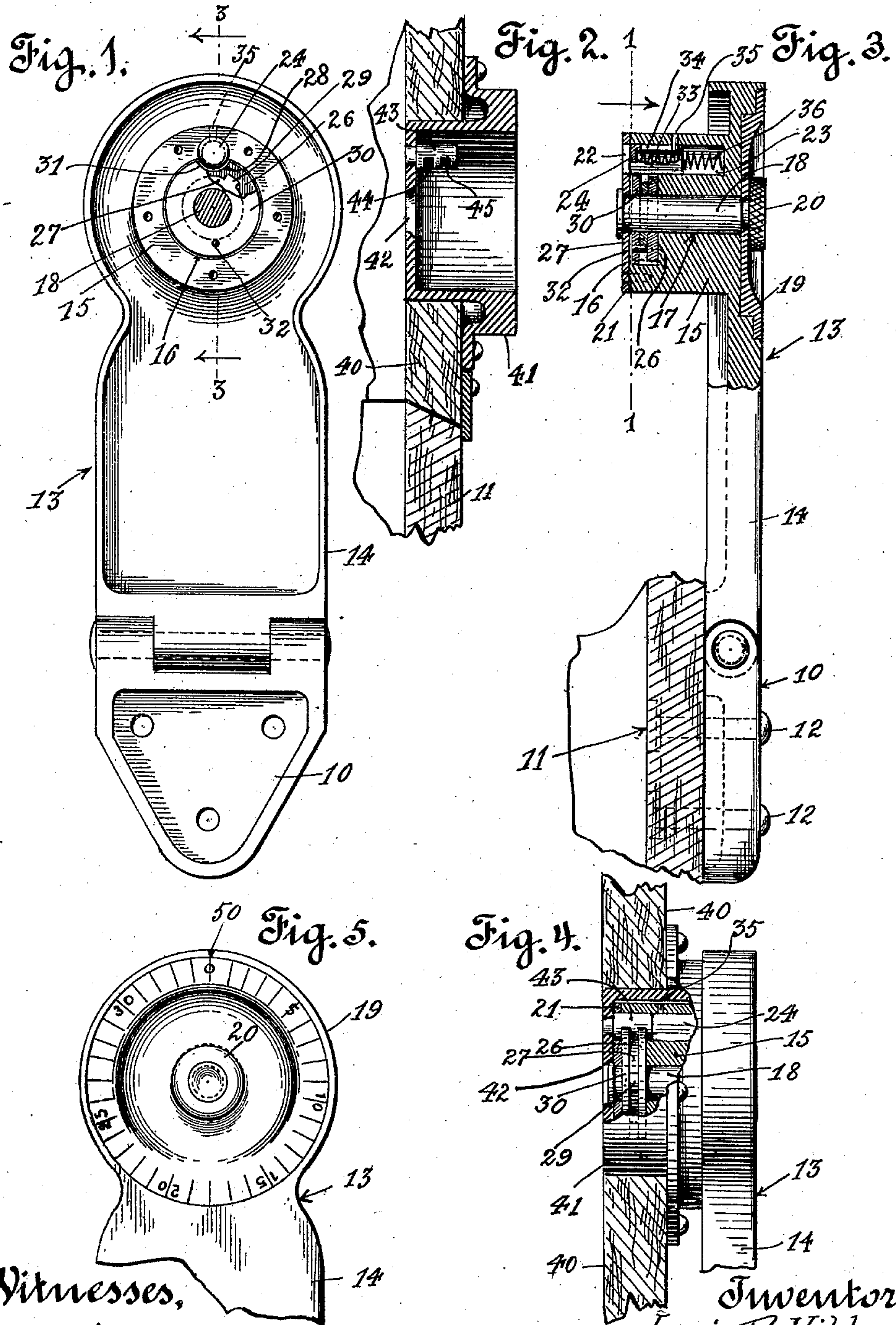
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LOCK.

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To all whom it may concern:

Be it known that I, LOUIS R. HIBBARD, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Locks, of which the following is a specification.

This invention relates more specifically to a combination lock of the tumbler disk type, and more especially to that class of locks wherein one member is pivotally mounted on an immovable structure, and adapted to coöperate with a stationary member mounted on a movable structure when in a locked condition, and a main object thereof is to provide a combination lock of the swinging type that may be effectively employed in a variety of situations where keylocks have heretofore been employed, thus dispensing with the use of keys.

Another and important object is to provide a novel form of lock of the two part swinging type in which the locking mechanism secured to the movable member will be maintained in an operative position during its disengagement from the lock engaging, or stationary member, thus permitting an instant engagement of the two members without necessitating the manipulation of the combination of the locking mechanism.

Another object is to provide a locking mechanism in which a change of an existing combination can be effected without the use of tools or dismantling the locking mechanism.

A further object is to provide a lock which is simple in construction, reliable in operation, which is composed of few parts, and which will fulfil in a satisfactory and efficient manner the conditions imposed upon it.

I accomplish the above objects by means of the device described herein and illustrated in the accompanying drawings in which:—

Figure 1— is a rear elevation of the movable member of the lock. Fig. 2— is a cross section through the stationary member of the lock. Fig. 3— is a longitudinal section through the movable member, taken on line 3—3 of Fig. 1. Fig. 4— is a side elevation of the two locking members in a locked relation to each other, parts being in section for clearness of illustration. Fig. 5— is a front elevation of the upper portion of the movable member, showing the indicating dial.

In a practical embodiment of my invention I have illustrated it as adapted for use as a trunk lock, but it may be employed in various other situations, such as maintaining a rotary member in a locked relation to a stationary member, and when used in this situation the locking mechanism is held in a stationary position and the stationary member in a removable position, in both situations the operation of the locking mechanism is essentially the same.

Referring more particularly to the drawings 10 designates a bearing which is rigidly secured to a support 11, in this case the body of a traveling trunk, by rivets 12. Pivotally mounted in bearing 10 is a movable lock member 13, which preferably consists of an elongated metallic hasp or shank 14 carrying on its inner face and at the top thereof a cylindrical head 15 in which is mounted a locking mechanism. The inner face of this cylinder is provided with a circular recess 16, and a centrally disposed bore 17 that opens therethrough for the reception of a spindle 18, that carries a portion of the tumbler mechanism on its inner end, and an indicating dial 19 on its outer end, the dial being rigidly secured thereto and rotating therewith. The outer end of the spindle is provided with a knurled operating head 20 and the inner end is headed, the inner face of the head bearing against a face plate 21, which is secured by rivets or other securing means to the face of the cylindrical head 15. Plate 21 is provided near its periphery with an aperture 22, that registers with a cylindrical recess 23 formed in head 15, and whose diameter is the same as the aperture in the face plate. Mounted in this recess is a spring controlled bolt 24 the operation of which will be more particularly described farther on.

That portion of the tumbler mechanism which is carried by the spindle 18, and which has been referred to hereinbefore, consists of an apertured tumbler disk, 26, and an operating collar 27, held in frictional engagement therewith. Disk 26 is provided in its outer edge with a notch 28 of a segmental configuration, and it bears against the bottom of the cylindrical recess, its periphery being out of contact with the walls of the recess 23. Operating collar 27 is of smaller diameter than disk 26 and carries on its periphery an engaging lug 29. Interposed between collar 27 and the face plate 21, and

loosely mounted on the spindle 18 is a tumbler disk 30, the periphery of which frictionally engages the perimeter of the cylindrical recess, and is provided on its outer edge with notch 31 similar in configuration to notch 28 in disk 26. This tumbler is further provided with a pin 32 on its inner face that is engaged by the lug 29 on disk 27 so that when the spindle is rotated it will carry the disk 30 with it, as will be more particularly explained hereinafter.

Special attention is called to the fact that the tumbler 26 and the collar 27 are friction tight on the spindle 18, that is, they are, for all intents and purposes, rigid with the spindle, so that the spindle can be rotated with respect to them if they are held stationary and a sufficient force is applied such as a force applied by means of a wrench secured to the knurled head 20. These parts are sufficiently tight on the spindle, however, to insure that they will not be displaced by the relatively small rotating force which could be exerted by one's fingers applied to the head 20. This arrangement enables the combination to be changed very readily as will appear hereinafter.

Bolt 24, which is mounted in recess 23, is provided with a recess 33 closed on its outer end, and is provided with a longitudinal slot 34 that is engaged by a pin 35 rigidly secured to the wall of the recess, the purpose being to prevent the rotation of the bolt in the recess. Interposed between the bottom of the bolt recess and the bottom of recess 23 is a coiled compression spring 36 that normally forces the bolt forwardly, the pin 35 limiting its movement.

Rigidly secured to the lid 40 of the trunk 11 by rivets or other securing means is a cylindrical socket lock member 41, the cylindrical bore being of slightly greater diameter than the cylindrical head 15 formed on member 13 to allow for the swinging movement of the member 13 when swung into its locked position. This socket is provided with a centrally disposed aperture 42 to accommodate the head of spindle 18, when the head 15 is forced thereinto, and rigidly secured to the bottom of the socket bore is a keeper stud 43 provided with transversely disposed slots 44, 45, that are engaged by the tumbler disks 26, 30, when the head 15 is seated in the socket 41 and the spindle is rotated. This stud is disposed so that it will enter the recess 23 formed in the cylindrical head 15 when the two members are brought together, the notches in the tumbler disks 26, 30, permitting the entrance of stud 43 into the recess, bolt 24 being forced rearwardly into the cylindrical recess 23 so that the tumbler disks 26, 30, may be rotated in the slots 44, 45, and the two members locked together, the notches in the tumbler disks permitting the entrance of the stud 43 into the recess.

When it is desired to disengage member 13 of the lock from its socket, the knurled head 20 is rotated until the lug 29 on collar 27 contacts with the pin 32 on disk 30. The spindle is further rotated, collar 27 carrying disk 30 with it, until the opening number of the combination has been reached, which for an illustration may be 30. When the number 30 has reached the indicating point 50 the notch in disk 30 will register with the slot 44 in keeper 43, thereby permitting a disengagement of the disk from the stud. In order to bring the notch in disk 26 so that it will register with the slot 44 in the stud, the spindle is rotated in the opposite direction from the first rotation to bring the dial to its opening number, which may for illustration be 10. When the second number 10 reaches the indicating point 50, its notch will register with the slot 45 in the stud 42. The member 13 can now be disengaged from its socket. As the cylindrical head 15 leaves the socket the recessed bolt 33 is forced forwardly by spring 26 entering the notches 28, 31, so as to maintain the tumbler disks in an unlocked position.

It will be apparent from the above description that by providing a spring actuated bolt, it follows that when the member 13 is disengaged from its socket, it will be impossible to change the combination of the lock, except by unusual means, this feature being extremely desirable so as to enable a person to quickly lock the receptacle when desired without first having to manipulate the combination. In other words, the bolt 24 maintains the alinement of the tumblers when the lock is open.

Oftentimes it may be found desirable to change the combination of the lock, that is when the combination has become known to others. In order to change the combination the member 13 is first disengaged from its socket, the bolt 33 being forced into the notches of the tumbler disks by the action of spring 36 and preventing their rotation. The spindle is then rotated until the lug 29 on the collar 27 contacts with the pin 32 on disk 30. The pin then prevents rotation of the collar. The spindle can then be rotated farther in the same direction until the new number of the combination is reached, which for the purposes of illustration may be "25" on the indicating dial. In this way I change the angular relation of the collar and tumblers, that is, their position measured in degrees of the arc of rotation. The number now being reset, the lug 29 will contact with the pin on the disk and the further rotation thereof to number 25 will bring the notch 31 in the disk to its proper registering position with respect to the keeper or stud 43, when it is desired to disengage the locking member 13 from its socket. The opening number for the second

tumbler disk is then changed, the change being effected in substantially the same manner as the first disk 30, with the exception that instead of rotating a collar to operate the disk, the spindle only is operated being rotated in a direction the reverse of its first rotation, the disk being held stationary by the bolt 34. When the new number, which has been selected is reached, for illustration 10, on the dial, it will be obvious that when unlocking member 13 from its socket, that when the number 10 reaches the indicating point 50, that the notch 28 on this disk will be brought into a proper registering position with the stud 43 and permit a disengagement therefrom.

If more than a two number combination is desired the number of tumbler disks may be increased, the operation of unlocking and resetting a combination being essentially the same in every particular, as for the above described construction.

From the foregoing description it will be apparent that I have provided a simple and efficient combination lock that will admirably subserve the conditions for which it is designed.

What I claim is:—

1. A combination lock comprising a movable case, a plurality of tumblers mounted in said case, means for setting said tumblers according to a combination to lock and unlock, a spring pressed member coöperating with said tumblers and movably mounted in said case normally locking said tumblers against rotation when said lock is open and a fixed member removed from said case adapted to displace said first member when the lock is being closed to release said tumblers.

2. A combination lock comprising a case, a plurality of tumblers mounted therein adapted to be set to a combination, a keeper coöperating with said tumblers when the lock is locked and a movable bolt normally engaging said tumblers when the lock is

unlocked and normally holding said tumblers in alinement, said keeper affording means for displacing said bolt when said lock is closed, whereby said tumblers are released.

3. A combination lock comprising a case, a plurality of tumblers movably mounted therein and adapted to be set to a combination, said case having a bore, a spring pressed bolt movably mounted in said bore and normally engaging said tumblers to lock the same against rotation when said lock is open, and a keeper adapted to engage said bolt and displace the same when the lock is closed thereby releasing said tumblers, said keeper being adapted to coöperate with said tumblers to hold the lock in a locked condition.

4. A combination lock, comprising a casing, a tumbler mechanism mounted therein including tumblers and means to operate the same from the exterior, in combination with a keeper coöperating with said tumblers to lock the lock and a member movably mounted in said casing and movable with respect to said keeper engaging both of said tumblers to prevent a movement of the tumbler mechanism when disengaged from said keeper.

5. A combination lock comprising a stationary lock engaging member provided with a keeper, a movable lock member, tumblers mounted thereon, means for alining said tumblers to disengage the same from said keeper, and a spring pressed member adapted to be displaced by said keeper and normally engaging said tumblers when the lock is open to maintain the alinement of said tumblers.

In witness that I claim the foregoing I have hereunto subscribed my name this 28th day of August, 1909.

L. R. HIBBARD.

Witnesses:

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