E. S. PHELPS.

TUMBLER LOCK.

APPLICATION FILED JULY 12, 1915.

1,263,104.

Patented Apr. 16, 1918.

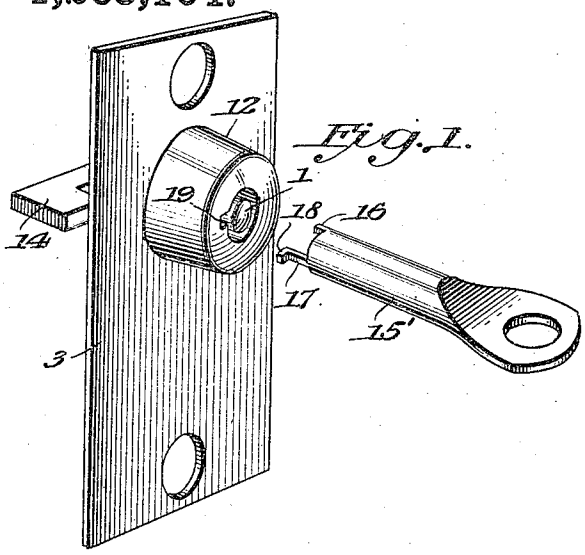


Fig. 1.

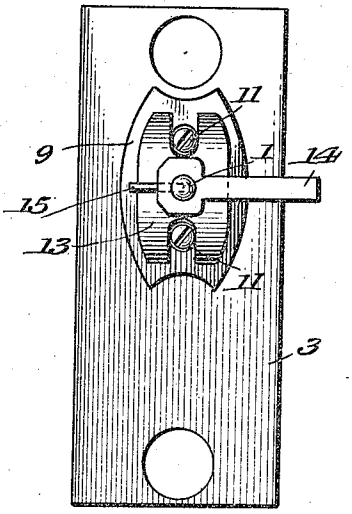


Fig. 2.

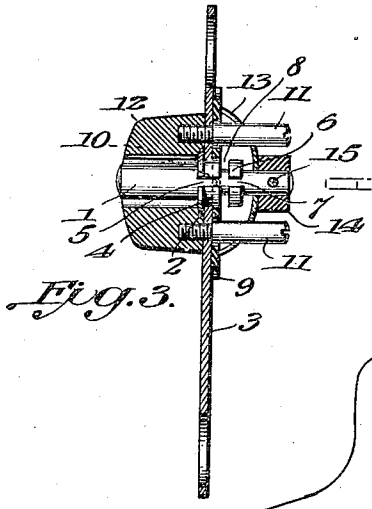


Fig. 3.

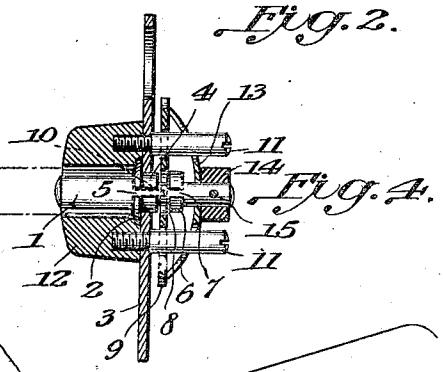


Fig. 4.

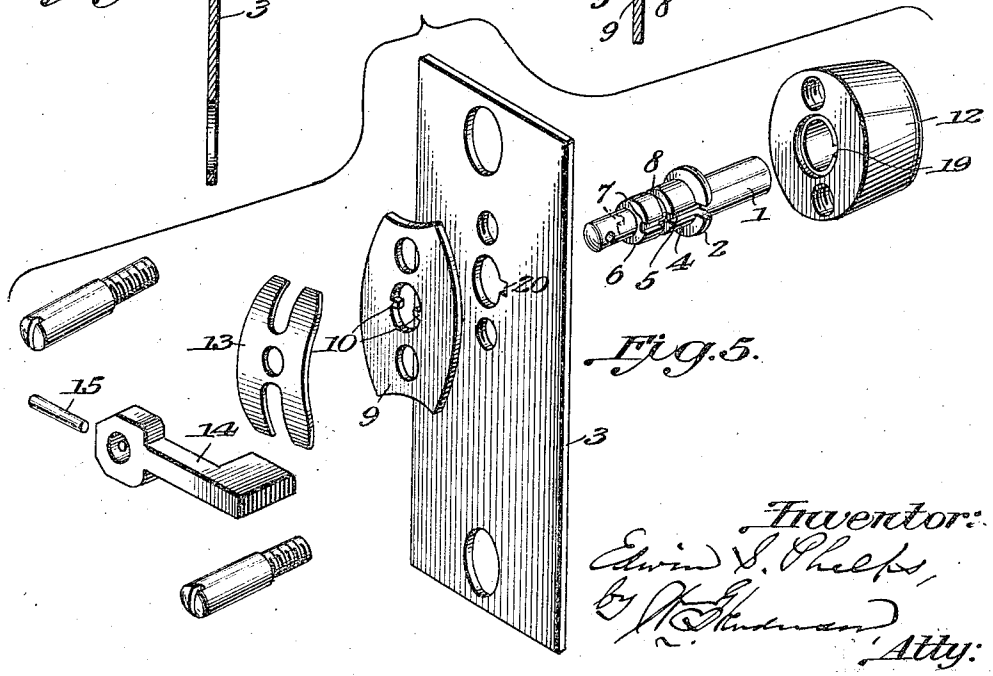


Fig. 5.

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UNITED STATES PATENT OFFICE.

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TUMBLER-LOCK.

1,263,104. Specification of Letters Patent. Patented Apr. 16, 1918.

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To all whom it may concern:

Be it known that I, EDWIN S. PHELPS, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Tumbler-Locks; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to locks, and is particularly well adapted for use as a "cabinet-lock," and also adapted for use on suit-cases, and hand-bags, and also on doors as well as on receptacles having a lid or cover to be locked.

It has for its object to form such a lock which will be composed of a minimum number of parts and act upon the principle of a tumbler-lock requiring a key formed to coact with the particular formation of tumblers employed, and admitting of a wide range of tumbler combinations in the different locks made.

To the accomplishment of the foregoing and such other objects as may hereinafter appear the invention consists in the features hereinafter described and then sought to be clearly defined by the claims, reference being had to the accompanying drawing forming part hereof, and in which:

Figure 1 is a perspective of the lock, with key withdrawn;

Fig. 2 a rear face view of the lock;

Fig. 3 a vertical central section, with parts in locking position;

Fig. 4 a vertical central section, with parts in unlocking position, and key in dotted lines;

Fig. 5 a perspective view with the parts unassembled.

In the drawing the numeral 1 designates a spindle provided with a collar 2 to limit its movement in one longitudinal direction in an escutcheon or face-plate 3. It is also provided with an enlargement or collar 4 formed with transverse grooves or slots 5 spaced apart to receive prongs of an operating key by which the spindle may be turned, and also provided with another enlargement or collar 6 formed with transverse grooves or slots 7 preferably in alinement with the slots 5 of the enlargement 4. Between the two enlargements 4 and 6 is a reduced portion 8 which for convenience will be referred to as a race-way because it will receive portions of what will be designated a tumbler so as to permit the spindle to turn when the portions of the tumbler are brought into the race by manipulation of the operating key. The tumbler 9 in its preferred form consists of a plate 9 loosely mounted on the spindle 1 and having teats or lugs 10 adapted to fit into the grooves or slots 5 of the enlargement 4 so as to prevent the spindle from turning when the parts are so engaged, and leaving the spindle free to be turned when the tumbler is moved so as to bring its teats or lugs into the race-way 8. While the tumbler is capable of movement longitudinally of the spindle it is held against rotary movement thereon when its teats or lugs are in the race-way by suitable means, for instance by posts or pins 11 which pass through openings made therefor in the tumbler, and which posts may also be utilized for securing the key-guide 12 to the opposite face of the escutcheon, the posts passing through the escutcheon or face-plate and being screwed into or otherwise connected to the key-guide. The tumbler is normally held in place with its teats or lugs in the slots 5 of the enlargement 4 by means of a suitable spring, for instance by an arched spring 13, of the leaf-type which has an opening for the passage of the spindle 1 and whose ends may be forked as illustrated to straddle the posts 11 so as to prevent the spring from turning on the spindle. This spring may be held on the spindle by the hub of the locking bolt or dog 14 which is attached to the spindle 1 by a set-screw or pin 15 passed through its hub and engaging the spindle so that the bolt or dog will be swung or rocked to and fro into locking or unlocking position as the spindle is turned for that purpose, the free end or nose of the dog being adapted to engage a suitable plate or keeper (not shown) when thrown into locking position as will be obvious to the skilled in the art. The throw of the dog or bolt in its locking and in its unlocking positions may be restricted or limited by the posts 11 against which it will abut when thrown into either position.

The operating key is indicated by the

numeral 15 and is of the barrel-type. It has at its inner end prongs 16 and 17 adapted to enter the slots 5 of the enlargement 4 of the spindle so as to turn the spindle when the key is rotated. When the key is inserted its inner end will contact with the tumbler 9 and by pressing the key inwardly it will slide the tumbler against the tension of spring 13 and so as to move its teats or lugs 10 out of the slots 5 of the enlargement 4 into the race-way 8 and then by rotating the key the spindle 1 will be turned and its bolt or dog 14 swung or rocked to its unlocking position, the several parts retaining the position thus given to them until the key is rotated back to its first position, whereupon the spring 13 will throw the tumbler 9 back to its normal position with its teats or lugs carried into the slots 5 of the enlargement 4, in which relation the bolt or dog is in its locking position.

One of the prongs of the key, for instance the prong 17 is formed with a laterally bent end, or lug, 18, and the key-guide 12 is formed with a slot or way 19 for the passage of this lateral projection in inserting the key into the lock, and the escutcheon or face-plate is also formed with a slot or recess 20 for the passage of such lug or projection. When the key is in position and the tumbler moved from locking engagement with the spindle 1, this projection or lug will lie between the escutcheon and tumbler and prevent the key from being withdrawn from the lock. In order to withdraw it, the key must be turned to bring the bolt or dog into locking position, when the key can be withdrawn as then its lug or lateral projection will be in alinement with the registering slots. This therefore insures the bolt being in its locked position before the key can be withdrawn.

It is apparent from the foregoing that the lock cannot be operated except by the key made specially for it as the prongs of the key must fit to the slots or grooves formed in the enlargement of the spindle for turning the spindle; and the tumbler must be moved on the spindle so as to carry its teats or studs into the race-way of the spindle so as to permit the spindle to turn; and the stud or lateral projection on the key prong must pass beyond the inner face of the escutcheon to turn the key. If the key prongs do not register with the slots in the parts of the spindle the tumbler cannot be moved to release its hold on the spindle; if the prongs are longer than they should be they will press the tumbler so that its teats will be moved beyond the race-way and into the slots of the enlargement 6 and thus prevent the spindle from turning; if the key is a small fractional part of an inch too long or too short it will not move the tumbler so as to permit the spindle to turn; if the prong of the key having the lug or projection is not of the proper length to permit the lug to pass between the tumbler and face of the escutcheon the spindle cannot be turned. It is thus apparent that the parts must be proportioned for the proper adjustment of the parts to enable the lock to be operated. It is also apparent that by changing the proportion of the race-way; or the position of the slots in the spindle enlargement; or by making changes in other parts and having the several parts appropriately proportioned there may be worked out a large number of variations in a large number of locks all however embodying the same essential features of the invention and yet the keys for one set or group of locks not capable of operating another group having a different tumbler combination. With all, the lock is of comparatively few parts, and comparatively inexpensive to make, and capable of a wide range of application.

I have illustrated and described the preferred construction and relative arrangement of the several parts but it is obvious that changes and variations may be made and essential features of the invention retained.

Having described my invention and set forth its merits what I claim is:

1. A lock comprising a rotatable spindle, a bolt coactively related to the spindle to be actuated from the spindle, a non-rotatable tumbler mounted externally of and slidable on the spindle and normally holding the spindle against rotation, and means for releasing the holding engagement between the spindle and tumbler to permit rotation of the spindle and movement of the bolt.

2. A lock comprising a rotatable spindle, a bolt coactively related to the spindle to be actuated from the spindle, a non-rotatable tumbler mounted externally of and slidable on the spindle and normally holding the spindle against rotation, a spring for holding the tumbler in holding relation to the spindle, and means for releasing the tumbler against the tension of the spring from holding engagement with the spindle.

3. A lock comprising a rotatable spindle, a bolt coactively related to the spindle, a tumbler slidable on the spindle and formed with lugs for inter-locking engagement with the spindle, the spindle being formed with a race-way to receive the lugs of the tumbler, and means for shifting the tumbler to bring its lugs into the race-way of the spindle to permit rotation of the spindle.

4. A lock comprising a rotatable spindle, a bolt coactively related to the spindle, a non-rotatable tumbler mounted on the spindle to slide longitudinally thereof and having an interlocking engagement with the spindle, a spring for positioning the tumbler for normal interlocking engagement with

the spindle, and means for releasing the tumbler from interlocking engagement with the spindle when the latter is to be rotated.

5. A lock comprising a rotatable spindle, a bolt coactively related to the spindle, a tumbler mounted externally of and slidable on the spindle and having an interlocking engagement with the spindle to prevent rotation of the latter, and a key for effecting a release of the interlocking engagement between the spindle and tumbler to permit rotation of the spindle, said key having a member to hold the tumbler released from interlocking engagement with the spindle until the key is restored to withdrawing position.

6. A lock comprising a rotatable spindle having portions formed with alining slots and a race-way between the alined slotted portions, a bolt coactively related to the spindle, a tumbler slidable on the spindle and formed with lugs for interlocking engagment with the slotted portions of the spindle, and means for moving the tumbler to bring its lugs into the race-way to effect a release of the interlocking engagement between the spindle and tumbler to permit rotation of the spindle.

7. A lock comprising a rotatable spindle, a bolt coactively related to the spindle, a tumbler slidable on the spindle, and having interlocking engagement therewith to prevent rotation of the spindle, a plate upon which said parts are mounted, and a key for moving the tumbler to release the interlocking engagement between the spindle and tumbler, said key having a prong formed with a lateral projection to pass between the tumbler and the plate to hold the tumbler in its released relation until the tumbler is to be restored to its interlocking relation to the spindle.

8. A lock comprising a rotatable spindle, a bolt coactively related to the spindle, the spindle having slotted portions and a race-way, a tumbler slidable on the spindle and having parts to enter the slotted portions of the spindle for interlocking the tumbler with the spindle to prevent rotation of the spindle, a spring for holding the tumbler in its interlocking engagement with the spindle, and means for shifting the tumbler in relation to the race-way to release its interlocking engagement with the spindle to permit rotation of the spindle.

9. A lock comprising a rotatable spindle, a bolt coactively related to the spindle, a tumbler slidable on the spindle and having interlocking engagement with the spindle to prevent rotation of the spindle, a spring for holding the tumbler normally in interlocking engagement with the spindle, means for releasing the tumbler from interlocking position to permit rotation of the spindle, and posts for guiding the tumbler in its sliding movements and limiting the throw of the bolt.

In testimony whereof I affix my signature in presence of two witnesses.

EDWIN SANFORD PHELPS.

Witnesses:

CLARA A. RYLEY,

BELLA SCHMEELK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."