

1,059,483.

J. B. MILLER.
COMBINATION LOCK.
APPLICATION FILED JAN. 2, 1912.

Patented Apr. 22, 1913.

2 SHEETS—SHEET 1.

FIG. 1.

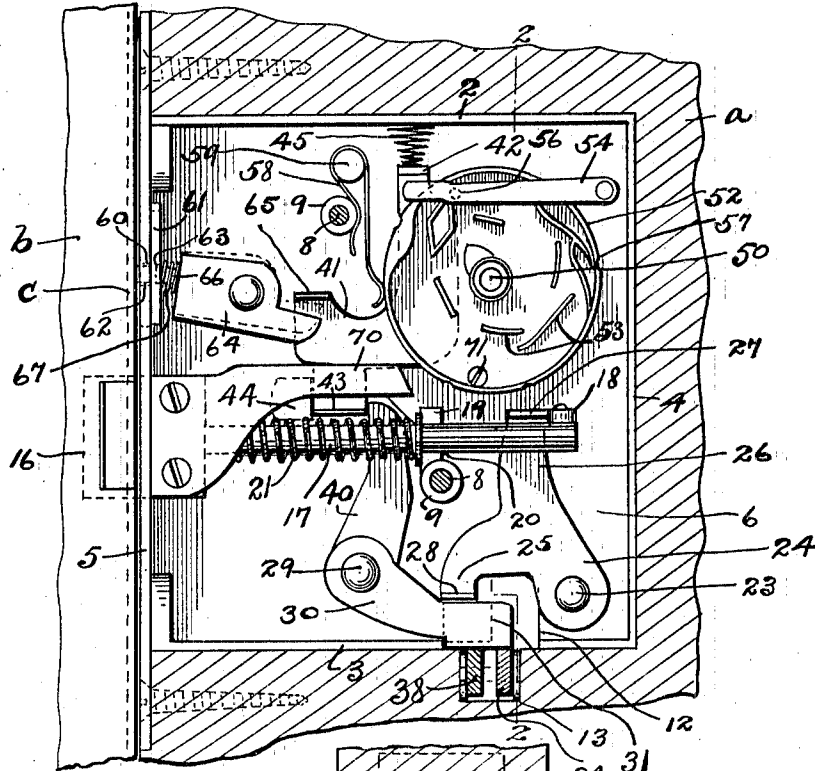
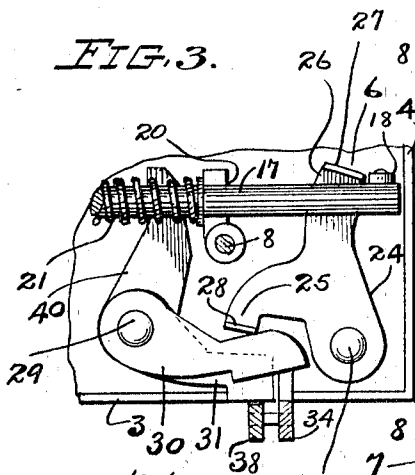
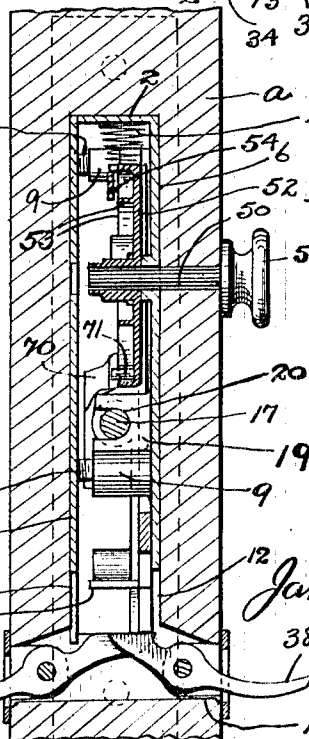


FIG. 3.



Witnesses.
H. J. Gittins
N. R. McDonnell

FIG. 2.

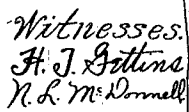


Inventor.
James B. Miller
by
Lynch & Over
his Attorneys.

APPLICATION FILED JAN. 2, 1912.

2 SHEETS—SHEET 2.

Fig. 4.



Inventor.
James B. Miller
by
Lynch & Dore
his Attorneys.

UNITED STATES PATENT OFFICE.

JAMES B. MILLER, OF KENT, OHIO, ASSIGNOR TO THE J. B. MILLER KEYLESS LOCK COMPANY, OF KENT, OHIO, A CORPORATION OF OHIO.

COMBINATION-LOCK.

1,059,483.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed January 2, 1912. Serial No. 668,996.

To all whom it may concern:

Be it known that I, JAMES B. MILLER, a citizen of the United States of America, residing at Kent, in the county of Portage and State of Ohio, have invented certain new and useful Improvements in Combination-Locks; and I hereby 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 pertains to make and use the same.

This invention relates to new and useful improvements in locks and particularly to the class of locks known as keyless locks or combination locks.

One object of the invention is to provide a lock having a latch operated bolt which will be very simple in construction, positive in operation and cheap to manufacture.

A further object of the invention is to provide a lock wherein the lock bolt will also serve as the door latch when the locking mechanism is thrown out of operation.

Another object of my invention is to provide a lock wherein the means for actuating the lock bolt operating mechanism from the outside of the door is separate and independent from the means for operating the mechanism from the inside of the door.

With these objects in view and to the end of securing other advantages hereinafter appearing this invention consists in certain features of construction and combination of parts, the preferred form of which is illustrated in the accompanying drawings, pointed out in the claims and described in the specification.

In the accompanying drawings Figure 1 is a view of the lock with one of the faces of the casing removed showing the lock bolt in its outer position and the other mechanism in position for holding it against movement. Fig. 2 is a section on line 2—2, Fig. 1. Fig. 3 is a detail view showing the position of the bolt operating mechanism when moved by the inside latch to open the door from the inside. Fig. 4 is a view similar to Fig. 1 showing the position of the mechanism when the combination has been operated to lift the tumbler so that the bolt can be operated from the outside of the door. Fig. 5 is a similar view to Fig. 3 showing the position of the bolt operating mechanism when moved

by the outside latch to open the door from the outside.

Again referring to the drawings *a* represents a door which is mortised in the usual manner to receive a lock casing and *b* represents the jamb of the door casing which is mortised to receive the end of the bolt and is provided with a lock strike *c*. The lock casing is similar to the usual lock casing and has a top and a bottom 2 and 3, respectively, an inner and outer side 4 and 5, respectively, a back face 6 formed integral with the sides and a front face 7 which is formed separately and is removably secured to the rest of the casing by means of screws 8 which screw into lugs 9 formed on the inner surface of the back face 6. In the faces 6 and 7 of the casing near the bottom thereof are formed openings 11 and 12, respectively, and in the door below said openings is formed an opening 13, the object of which will appear later. Within and near the center of the casing is arranged the lock bolt 16 which serves also as the latch, but the sides of the bolt are parallel and at a right angle to the edge, the bolt having no beveled face as is customary with latches, and the lock strike *c* is arranged to project at the proper angle to engage the bolt and shove it back when the bolt is being used as a latch. The bolt 16 is provided with a long shank 17 and at the free end of the shank 17 is arranged a lug 18. On the inner surface of the face 6 of the casing is arranged a lug 19 in which is formed a groove 20 adapted to receive the shank 17 so that said lug forms a guide and support for the said shank 17. A coil spring 21 is arranged on the shank 17 and one end thereof abuts against the bolt and the other end abuts against the lug 19, the arrangement being such that the tension of the spring will force the bolt to its outer position so that the bolt can serve as a latch when the locking mechanism is thrown off. On a pin 23 is fulcrumed the bolt operating lever 24. This lever has two divergent arms 25 and 26. The arm 26 extends up above the shank 17 and is provided with a small flange 27 which engages with the lug 18 on the end of the shank 17. The other arm 25 extends downwardly and is provided with a flange 28.

It will be readily seen that when the arm

25 is moved up the arm 26 is moved back into engagement with the lug 18 on the end of the shank 17 and thereby the lock bolt is drawn back to its unlocked or inoperative position against the tension of the spring 21. A lever 30 is pivotally supported at one end on a pin 29 and the free end of said lever extends under the flange 28 on the arm 25 and across the openings 11 and 12 in the faces of the casing and above the opening 13 in the door. A lever 31 is also mounted on the pin 29 and said lever extends along-side of the lever 30 and the end thereof also extends under the flange 28 of the arm 25 and this lever 31 is not quite as long as the lever 30, the end of the said lever 31 terminating a short distance back of the end of the lever 30. In the opening 13 of the door, at the inner side of the door, is pivotally mounted a thumb lever 34 and the inner end of said thumb lever extends under the end of the lever 30 where it extends beyond the end of the lever 31 and in the same opening 13 at the outer side of the door is pivotally mounted a thumb lever 38 and the inner end thereof extends under both the lever 30 and the lever 31. It will therefore be understood that when the thumb lever 34 on the inner side of the door is pressed down it will raise the lever 30 bringing it into contact with the flange 28 on the end of the arm 25 of the bolt operating lever which will cause said arm 25 to swing up and the arm 26 to swing back which draws back the bolt 16. Now when the thumb lever 38 at the outside of the door is pressed down it will raise both of the levers 30 and 31 bringing them into contact with the flange 28 on the arm 25, which again causes the arm 25 to swing up and the arm 26 to swing back drawing back the bolt 16. The bolt 16 can therefore be drawn back by operating the thumb lever on the inside of the door or the thumb lever on the outside of the door and each lever operates independently of the other lever. The lever 34 at the inside of the door is always left free to operate the bolt but means is provided to prevent the operation of the lever 38 on the outside of the door when it is desired to lock the door which is arranged as follows:—On the lever 31 is arranged a rigid arm 40 which extends up beyond the shank 17 of the bolt 16. An L-shaped tumbler 41 having a flange 42 at its upper end and flange 43 at its lower end is arranged to slide vertically and is held against displacement by a lug 44. When said tumbler is in its lower position the flange 43 at the end of said tumbler is arranged to lie in the path of the upper end of the arm 40 of the lever 31, preventing any movement of the arm 40 and consequently any movement of the lever 31 and therefore any operation of the thumb lever 38. A spring 45 is arranged

between the flange 42 at the upper end of the tumbler and the top of the casing and the tension thereof normally holds the tumbler in its lower position.

The means for lifting the tumbler 41 is arranged as follows: A spindle 50 is mounted in the casing and extends outwardly to the outside of the door and on the outer end thereof is secured a knob 51. On the spindle within the casing is secured a combination disk 52 so as to turn when the said knob is turned. On the face of said combination disk 52 are arranged a series of cams or ridges 53. A lever 54 is pivotally mounted at one end at the side of said combination disk and extends across the face of said disk and the free end thereof extends under the flange 42 at the upper end of the tumbler 41. A peg 56 is secured on the lever 54 and extends in toward the face of the disk 52 so as to come in contact with the ridges 53 thereon. The ridges are so arranged that when the combination disk 52 is turned back and forth through a whole or part of a revolution a number of times, according to a predetermined plan, the peg 56 travels from ridge to ridge constantly moving farther from the center of the disk, which of course causes the lever 54 to move upward and the free end of said lever 54 comes in contact with the flange 42 on the tumbler 41 and raises the said tumbler so that the lower end thereof is removed from the path of the arm 40 freeing said arm. The lever 31 is then free to move which permits the operation of the latch from the outside of the door. Around the perimeter of the disk 52 are formed a series of notches 57 and at the side of said disk 52 is arranged a spring 58 which is supported by lugs 9 and 59. One end of the spring 58 is held in contact with the perimeter of the disk 52 and when the said disk 52 is turned the end of the spring 58 passes over the notches 57 and indicates both to the sense of hearing and to the touch through what part of a revolution the said disk 52 has been turned. To destroy the combination after it has been worked, the following arrangement is provided:—On the bolt 16 is secured a finger 70 and on the combination disk 52 is mounted a stud 71 which is so located on the disk 52 that when the combination has been worked the said stud 71 will be opposite the end of the finger 70 and when the said bolt is drawn back the finger 70 will come in contact with said stud and turn the said disk 52 destroying the combination.

In order that the lock can be used as a latch and operated from the outside of the door without working the combination, the following arrangement is provided:—In the front side of the casing above the bolt 16 is formed a small opening 60 and over said opening on the inside of the casing is ar-

ranged a small plate 61 which is provided
 with a small lug 62 which extends outwardly
 through said opening 60 and on the inner
 face of said plate is formed a socket 63. A
 dog 64 is pivotally mounted in proximity
 to the plate 61 and one end of said dog ex-
 tends under a flange 65 formed on the tum-
 bler 41 and at its other end said dog is pro-
 vided with a stud 66 which extends into the
 socket 63 in the plate 61. A coil spring 67
 is arranged on the stud 66 between the plate
 61 and said dog to hold the plate in position.
 Now when it is desired to use the lock simply
 as a latch the plate 61 is engaged by the lug
 62 and is moved down, which by its engage-
 ment with the dog 64 causes the opposite
 end of the dog to swing up lifting up the
 tumbler 41 and holding the flange 43 at the
 end thereof out of the path of the arm 40 on
 the lever 31 so that the thumb lever on the
 outside of the door is free to operate.

What I claim is,—

1. A combination lock comprising a cas-
 ing, a bolt arranged in said casing, means
 for resiliently holding said bolt in its outer
 position, a thumb lever, a bolt operating le-
 ver provided with two divergent arms, one
 arm being arranged to engage with said
 bolt and the other arm extending down-
 wardly toward said thumb lever, a lever
 pivoted at one end and having its other
 end extending between said thumb lever and
 said downwardly extending arm of said bolt
 operating lever, an arm arranged on said
 last-mentioned lever, a tumbler arranged to
 project in the path of said arm and means
 for moving said tumbler out of the path of
 said arm.

2. A combination lock comprising a cas-
 ing, a bolt arranged in said casing, means
 for resiliently holding said bolt in its outer
 position, a thumb lever, a bolt operating le-
 ver provided with two divergent arms, one
 arm being arranged to engage the said bolt
 and the other arm extending downwardly
 toward said thumb lever, a lever pivoted
 at one end and having its other end ex-
 tending between said thumb lever and said
 downwardly extending arm of said bolt op-
 erating lever, an arm arranged on said last-
 mentioned lever, a tumbler arranged to pro-
 ject in the path of said arm, means for
 resiliently holding said tumbler in the path
 of said arm, a lever arranged to engage said
 tumbler, a combination disk, means for ro-
 tating said disk and a stud mounted on said
 tumbler operating lever and adapted to en-
 gage the face of said combination disk so
 that the operation of said disk will actuate
 said lever.

3. A combination disk comprising a cas-
 ing, a bolt arranged in said casing, means
 for resiliently holding said bolt in its outer
 position, a thumb lever, a bolt operating
 lever provided with two divergent arms, one

arm being arranged to engage the said bolt
 and the other arm extending downwardly
 toward said thumb lever, a lever pivoted at
 one end and having its other end extending
 between said thumb lever and said down-
 wardly extending arm of said bolt operating
 lever, an arm arranged on said last-men-
 tioned lever, a tumbler arranged to project
 in the path of said arm, means for resiliently
 holding said tumbler in the path of said arm,
 a lever arranged to engage said tumbler, a
 combination disk, means for rotating said
 disk, a stud mounted on said tumbler op-
 erating lever and adapted to engage the face
 of the said combination disk so that the op-
 eration of said disk will actuate said lever,
 a dog mounted in proximity to said tumbler
 and adapted to hold said tumbler out of the
 path of said arm, and means for operating
 said dog from the outside of said casing.

4. A combination lock comprising a cas-
 ing, a bolt arranged in said casing, means
 for resiliently holding said bolt in its outer
 position, a pair of thumb levers, a bolt op-
 erating lever provided with two divergent
 arms, one arm being arranged to engage
 with said bolt and the other arm extending
 downwardly toward said thumb levers, a
 lever pivoted at one end and having its other
 end extending between one thumb lever and
 said downwardly extending arm of said bolt
 operating lever, an arm arranged on said
 last-mentioned lever, a tumbler arranged to
 project in the path of said arm, means for
 moving said tumbler out of the path of said
 arm and a lever pivotally supported in said
 casing and having its free end extending be-
 tween both of said thumb levers and said
 downwardly extending arm of said bolt op-
 erating lever.

5. A combination lock comprising a cas-
 ing, a bolt arranged in said casing, means
 for resiliently holding said bolt in its outer
 position, a pair of thumb levers, one thumb
 lever being mounted on the outer side of the
 door and the other thumb lever being mount-
 ed on the inner side of the door, a bolt op-
 erating lever provided with two divergent
 arms, one arm being arranged to engage
 with said bolt and the other arm extending
 downwardly toward said thumb levers, a
 lever pivoted at one end and having its other
 end extending between the thumb lever on
 the outer side of the door and said down-
 wardly extending arm of said bolt operating
 lever, an arm arranged on said last-men-
 tioned lever, a tumbler arranged to project
 in the path of said arm, means for resiliently
 holding said tumbler in the path of said
 arm, a lever arranged to engage said tumbler,
 a combination disk, means for rotating said
 disk, a stud mounted on said tumbler op-
 erating lever and adapted to engage the face
 of said combination disk so that the opera-
 tion of said disk will actuate said lever and

a lever pivotally supported in said casing at one end and having its other end extending between both of said thumb levers and the downwardly extending arm of said bolt
5 operating lever.

In testimony whereof, I sign the foregoing

specification, in the presence of two witnesses.

JAMES B. MILLER.

Witnesses:

VICTOR C. LYNCH,
N. L. McDONNELL.

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