

No. 755,909.

PATENTED MAR. 29, 1904.

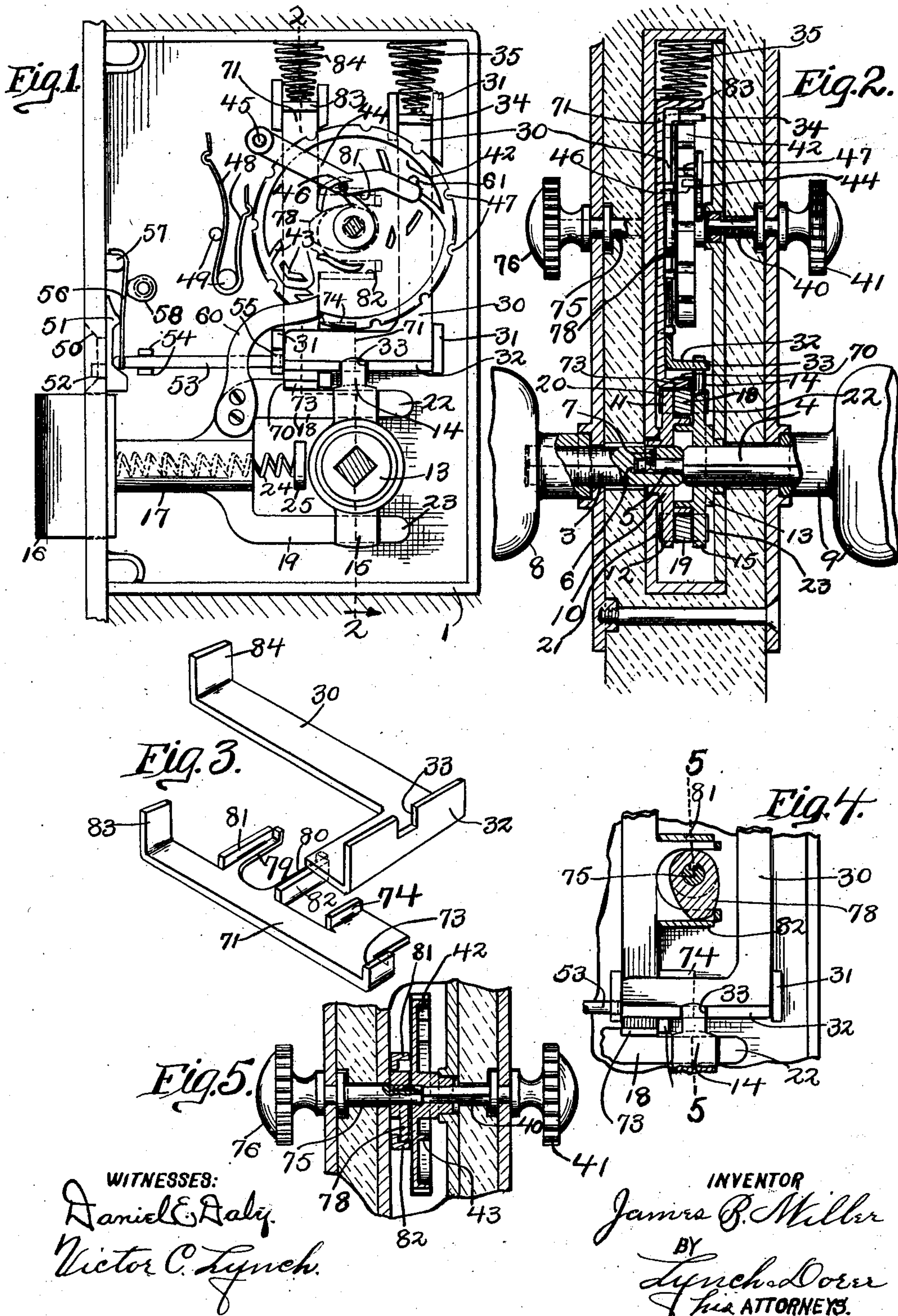
J. B. MILLER.

LOCK.

APPLICATION FILED DEC. 4, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

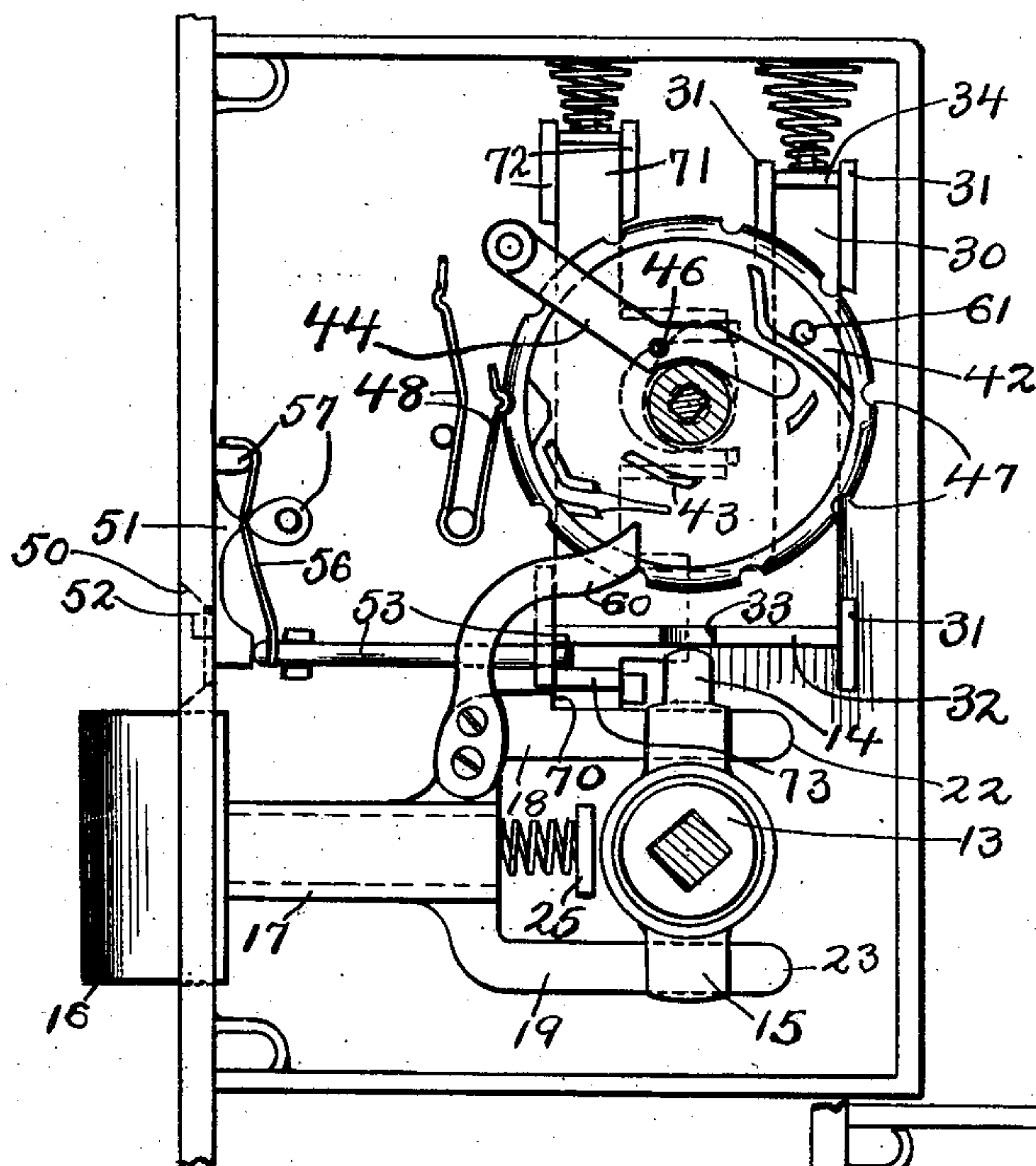
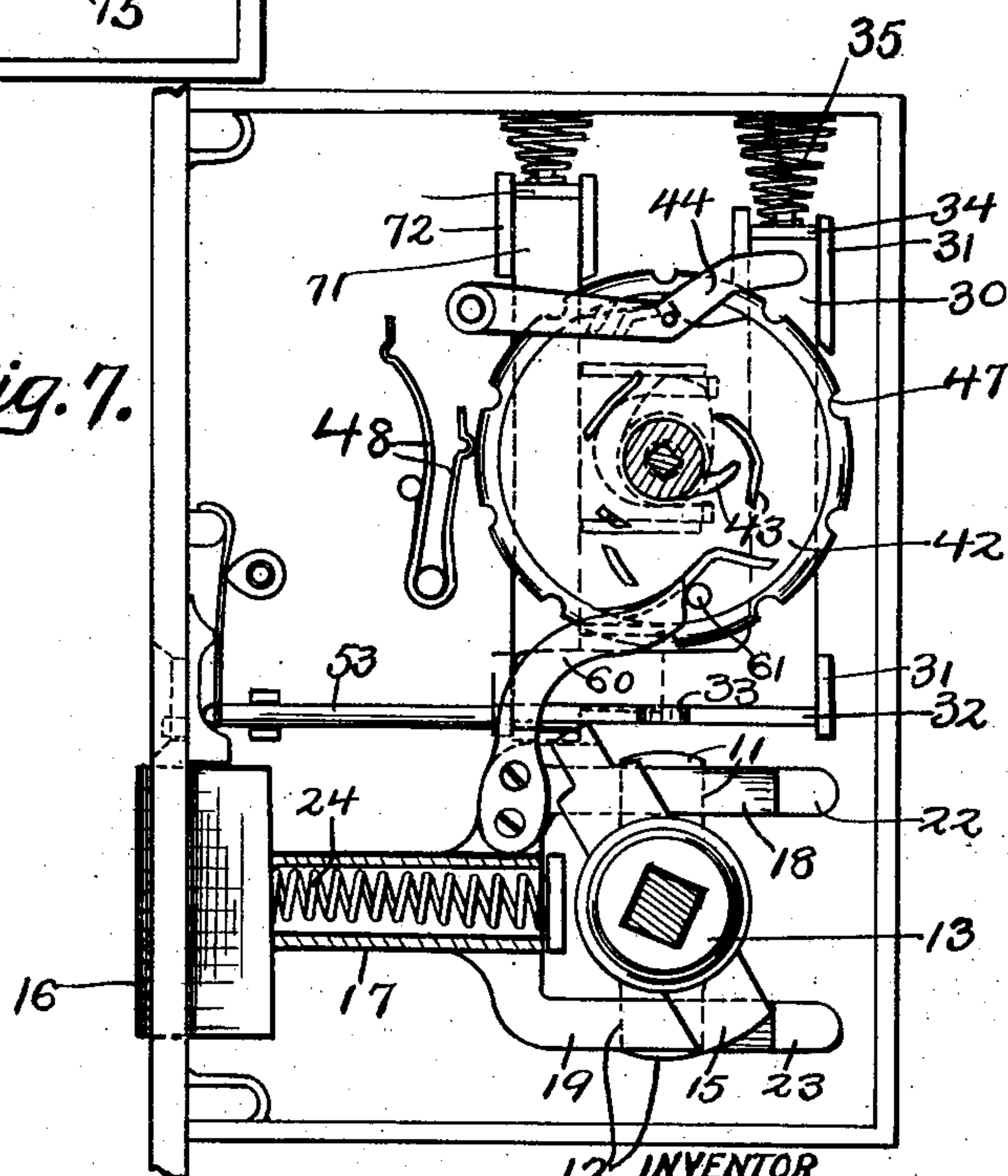


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

JAMES B. MILLER, OF KENT, OHIO.

LOCK.

SPECIFICATION forming part of Letters Patent No. 755,909, dated March 29, 1904.

Application filed December 4, 1903. Serial No. 183,817. (No model.)

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 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 improvements in locks, and especially to the class of locks termed "keyless" or "combination" locks.

An object of this invention is to provide a lock of this character which will be strong, simple in construction, and comprise a small number of parts.

Another object of this invention is to provide a spring-bolt latch-lock and dead-bolt all in one.

A further object of this invention is to provide a single combination which will operate both the latch-lock and the dead-bolt from the outside of the door, while both bolts can be operated from the inside of the door without working the combination.

With these objects in view my invention consists in providing two tumblers, one of which is arranged to lock the bolt-spindle which operates the bolt from the outside of the door, and the other is arranged to engage directly with the bolt, combination mechanism arranged to operate both tumblers from the outside of the door, and means independent of the combination mechanism for operating both tumblers from the inside of the door.

My invention further consists in the features of construction and combination of parts as described in the specification, pointed out in the claims, and illustrated in the drawings.

In the accompanying drawings, Figure 1 is a view of the lock mechanism with the cover removed, showing the arrangement of mechanism when both the latch-lock and the dead-bolt are in their operative position. Fig. 2 is a section on line 2 2, Fig. 1. Fig. 3 is a detail view of the tumblers detached. Fig. 4 is a detail view showing the tumblers locked, so that they cannot be operated by the combination mechanism. Fig. 5 is a section on line

5 5, Fig. 4. Fig. 6 shows the arrangement of mechanism when the lock is serving simply as a latch. Fig. 7 shows the arrangement of mechanism when the lock is serving as a latch-lock with the dead-bolt held in its inoperative position.

Again referring to the drawings, 1 represents the casing which holds the lock mechanism. The spindles 3 and 4, which operate the bolt, are secured together by means of a neck portion 5, which is formed integral with the spindle 4 and enters a socket 6, formed in the spindle 3, and is held in the socket by means of a screw 7, so that it is free to turn. This arrangement allows one spindle to be turned while the other spindle remains stationary. The respective spindles are provided with the usual knobs 8 and 9. On the spindle 3, which carries the inner door-knob, is arranged a hub 10, which is provided with a square bore, so that it will turn with the said spindle 3. The hub 10 is provided with two arms 11 and 12, preferably of the same length. On the section 4, which carries the outer door-knob, is mounted a hub 13, which is likewise provided with two arms 14 and 15, and the arm 14 is formed longer than the arm 11 on the hub 10.

The bolt 16 has a hollow shank portion 17, which is provided with arms 18 and 19, arranged to straddle the spindle. At the end of said arms 18 and 19, at each side thereof, are formed lugs 20, 21, 22, and 23, respectively. One end of a coil-spring 24 is arranged in the hollow shank 17, and the other end abuts against a lug 25, formed on the casing, so as to normally hold it in its outer position.

When the knob 8 on the inside of the door is turned, the arm 11 on the hub 10 will engage with the lug 20, or the arm 12 will engage with the lug 21, according to the direction in which the knob is turned, and the bolt will be pulled back in the casing against the action of the spring 24. Also when the knob 9 on the outside of the door is turned the arm 14 on the hub 13 will come in contact with the lug 22, or the arm 15 will come in contact with the lug 23, thus drawing the bolt back in the casing against the action of the spring 24.

Above the bolt is arranged a tumbler 30, 100

which slides vertically in a guideway formed by the lugs 31, formed integral with the casing. The tumbler 30 is provided with a flange 32, in which is formed a notch 33, arranged to receive the end of the arm 14 when the tumbler is in its lowest position, preventing any movement of the said arm 14, and thereby preventing the outer door-knob from being turned. On the upper end of the tumbler 30 is formed a flange 34, and between the flange 34 and the side of the casing is arranged a coil-spring 35, so as to normally hold the tumbler in its lowest position.

Above the lock-spindle is journaled the combination-spindle 40, which is provided on the outside of the door with a knob 41. On the combination-spindle is mounted the combination-disk 42, so as to turn therewith. On the face of the disk 42 are arranged a series of cams or ridges 43. A lever 44 for lifting the tumbler is pivoted at one end on a lug 45 in the upper part of the casing, and the other end is arranged to come into contact with the flange 34 of the tumbler. A peg 46 is secured on the lever and extends in toward the face of the disk 42, so as to come into contact with the ridges 43. The ridges are so arranged that when the combination-disk is turned back and forth through a whole or part of a revolution a number of times, according to a predetermined plan, the peg 46 will travel from ridge to ridge, constantly moving farther from the center of the disk, and the free end of the lever 44 is raised, which in turn lifts the tumbler 30 against the spring 35 and away from the arm 14, so that the bolt can be operated from the outer side of the door. Around the perimeter of the combination-disk are formed notches 47, and at the side of the combination-disk is arranged a spring 48, which is supported by lugs 49, formed integral with the casing. One end of the spring 48 is held in contact with the perimeter of the combination-disk, and when the combination-disk is turned the end of the spring passing over the notches 47 indicates both to the sense of hearing and touch what portion of a revolution the combination-disk has been turned through.

In the side of the casing above the bolt 16 is formed an opening 50, and within the casing a cam-faced block 51 is arranged to travel across the said opening. A lug 52 is formed on the block 51, and it extends into the opening 50, by means of which the block 51 can be moved up or down. A bar 53 is slidably supported in lugs 54 and 55, formed integral with the casing. A flat spring 56 is supported at one end by lugs 57 and 58, and at its other end it engages with the bar 53. This spring 56 serves both to hold the block 51 in position and to hold the end of the bar 53 against the cam-face of the block 51. The object of this arrangement is to hold the tumbler 30 out of engagement with the arm 14, so that the lock

can be used simply as a latch, and to effect this result the combination is first worked, lifting the tumbler 30, and before the bolt 16 is moved the lug 52 is shoved up in the opening 50, which carries up the block 51, and the block in turn moves in the bar 53 until the end thereof comes under the tumbler 30, locking it in its upper position.

On the arm 18 of the bolt is rigidly secured a curved plate 60, which is arranged so that the free end thereof will travel across the face of the combination-disk 42 when the bolt is drawn back in the lock. In the face of the combination-disk is secured a peg 61, which is so arranged that when the combination-disk 42 has been turned so as to lift the tumbler 30 then the peg 61 will be close to and in the path of the plate 60, and when the bolt is drawn back the plate 60 will come into contact with the peg 61 and cause a partial revolution of the combination-disk, thereby throwing off the combination, the same as if the combination-spindle had been twirled by hand, and when the bolt is released the tumbler 30 will again engage the arm 14, locking the outer bolt-spindle.

On the arm 18 of the bolt 16 is formed a lug or projection 70. Above the bolt 16 is arranged a tumbler 71 in a guideway formed by lugs 72, and the lower end of this tumbler extends down between the casing and the tumbler 30 and is provided with a flange 73, arranged to engage with the lug 70, and a flange 74, arranged to be engaged by the tumbler 30 when the said tumbler 30 is raised by the operation of the combination mechanism. A spindle 75 is arranged in line with the combination-spindle 40 and is provided on one end with a knob 76. On the inner end of the spindle 75 is rigidly secured an arm or cam 78. On the tumbler 71 above and below the spindle 75 are formed arms 79 and 80, respectively, which are provided with flanges 81 and 82, respectively. The flange 81 is so arranged that when the arm or cam 78 is turned up the said cam will come in contact with the said flange and lift the tumbler out of engagement with the lug 70 on the bolt, and when the cam 78 is turned down it will come in contact with the flange 82 and lock the tumbler 71 in engagement with the said lug 70.

When both the dead-bolt and the latch-lock are in their operative position—that is, the tumbler 71 engaging with the lug 70 and the tumbler 30 engaging with the arm 14—and it is desired to open the door from the outside, the combination is worked so as to lift the lever 44, thereby drawing up the tumbler 30, which in turn comes in contact with the flange 74 on the tumbler 71 and lifts the tumbler 71 out of engagement with the lug 70, and the bolt can then be operated by turning the knob 9. If it is desired to open the door from the inside when both the latch-lock and dead-bolt are in their operative position, all that is

necessary to do is to turn the knob 76, so as to lift the cam 78 and bring it into contact with the flange 81, thereby drawing the tumbler 71 out of engagement with the lug 70, and then the bolt can be operated by turning the knob 8. If it is desired to fix the door so that it cannot be opened at all from the outside, the knob 76 is turned so as to swing down the cam 78 into contact with the flange 82, as shown in Fig. 4, and thus lock the tumbler 71 in engagement with the lug 70 and also the tumbler 30 in engagement with the arm 11, as the flange 74 on the tumbler 70 will prevent the upward movement of the said said tumbler 30.

What I claim is—

1. A combination-lock comprising, a casing, a bolt, inner and outer bolt-operating spindles, means for preventing the outer spindle from being turned, means for preventing the movement of said bolt, combination mechanism arranged to operate both said means from the outer side of the lock and means independent of said combination mechanism for operating both of said first-mentioned means from the inner side of the lock.

2. A combination-lock comprising, a casing, a bolt, inner and outer bolt-operating spindles, means for preventing the outer spindle from being turned, means for preventing movement of said bolt, combination mechanism arranged to operate both said means from the outer side of the lock, means independent of said combination mechanism for operating both of said first-mentioned means and means for locking both said first-mentioned means so that they cannot be operated by the combination mechanism.

3. A combination-lock comprising, a casing, a bolt, inner and outer bolt-operating spindles, a tumbler arranged to prevent movement of said bolt, a tumbler arranged to prevent movement of said outer spindle, a combination-disk arranged to lift the last-mentioned tumbler and means for operatively connecting said tumblers so that the upward movement of the last-mentioned tumbler will lift the first-mentioned tumbler.

4. A combination-lock comprising, a casing, a bolt having a lug formed thereon, inner and outer bolt-operating spindles, a tumbler arranged to prevent the operation of said outer bolt-spindle, a tumbler arranged to engage with the lug on said bolt and provided with a flange arranged to engage with the first-men-

tioned tumbler, a lever arranged to lift said first-mentioned tumbler and combination mechanism for operating said lever.

5. A combination-lock comprising, a casing, a bolt, having a lug formed thereon, inner and outer bolt-operating spindles, a tumbler arranged to prevent the operating of said outer bolt-spindle, a tumbler arranged to engage with the lug on said bolt and provided with a flange arranged to engage with the first-mentioned tumbler, a lever arranged to lift said first-mentioned tumbler, combination mechanism for operating said lever and means for locking said first-mentioned tumbler in its operative position.

6. A combination-lock comprising, a casing, a bolt having a lug formed thereon, inner and outer bolt-spindles, arms arranged on the respective spindles for operating said bolt, a tumbler arranged to engage with an arm on said outer spindle, a tumbler arranged to engage with the lug on said bolt and provided with a flange arranged to engage with the first-mentioned tumbler, a lever arranged to lift the first-mentioned tumbler, a combination-disk arranged to operate said lever, means for operating said disk from the outer side of the lock, a cam arranged to lift said tumbler which engages with the lug on the said bolt and means for operating said cam from the inner side of the lock.

7. A combination-lock comprising, a casing, a bolt, inner and outer bolt-operating spindles, arms arranged on the respective spindles, a tumbler arranged to engage with the arm on the outer spindle, a tumbler arranged to engage with said bolt and provided with a flange arranged to engage with the first-mentioned tumbler, a lever arranged to lift the first-mentioned tumbler, a combination-disk arranged to operate said lever, means for operating said disk from the outer side of the lock, two arms formed on said tumbler which engages with said bolt, a cam arranged between said arms and means for operating said cam from the inner side of the lock, so as to bring the said cam in contact with the upper arm or lower arm, substantially as described and for the purpose set forth.

In testimony whereof I sign the foregoing specification in the presence of two witnesses.

JAMES B. MILLER.

Witnesses:

VICTOR C. LYNCH,
GERTRUDE HAYES.