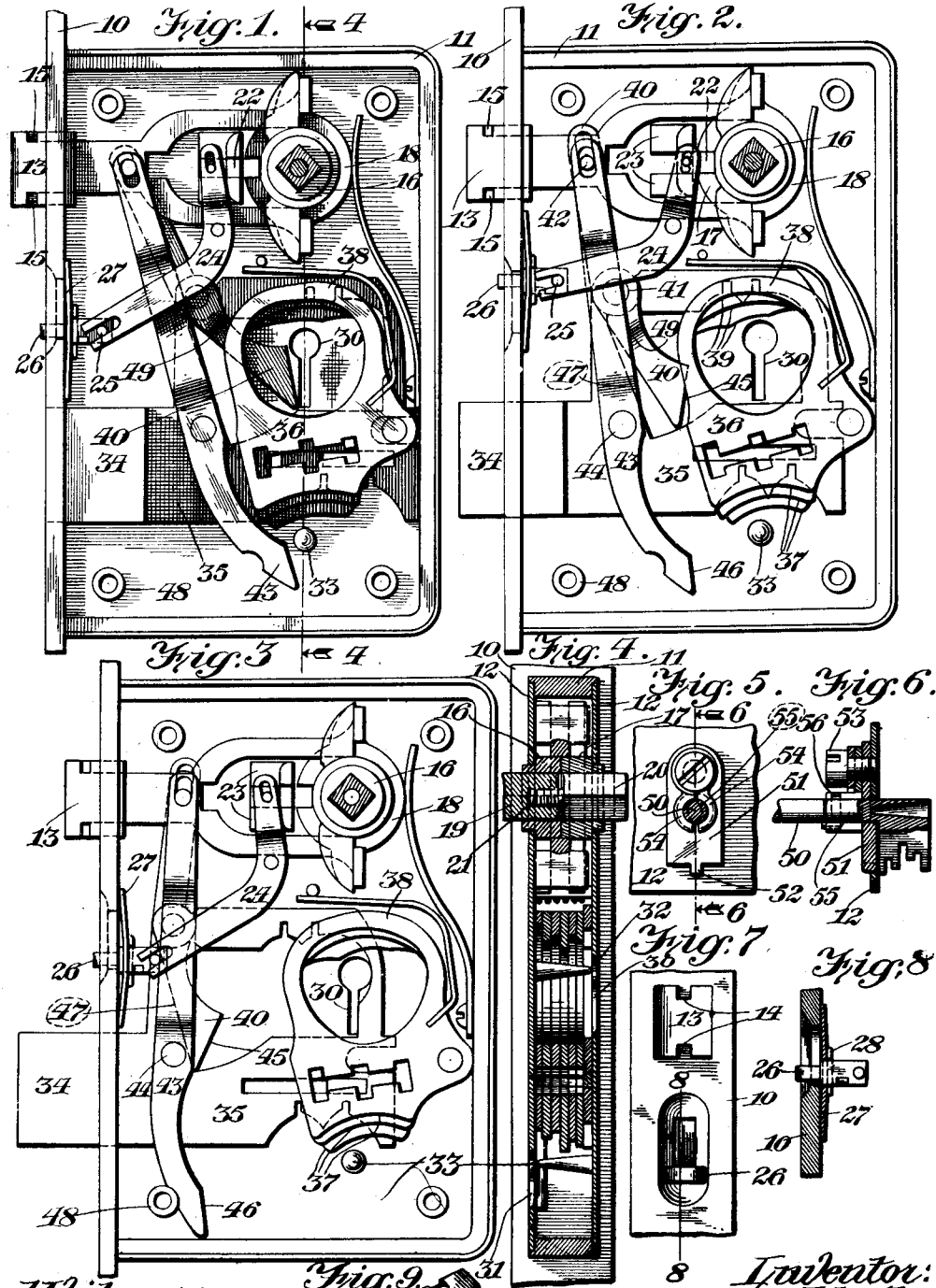


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 LOCK.
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UNITED STATES PATENT OFFICE.

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LOCK.

Special Case of Patent Form.

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10 This invention relates to locks and more particularly to door bolts of the reversible latch and key type.

15 In the latch mechanism of the reversible lock, the sides of the body, the rollers, and the roll backs are provided with grooves or notches on their sides 20 which are in the same vertical plane of the latch bolt. The grooves or notches of the rollers and the roll backs are so arranged that they are in the same vertical plane of the latch bolt and its notches are arranged symmetrically, and it is thus possible to combine the two halves of the mechanism in one half of the door, as shown. The number of combinations possible with tumblers arranged symmetrically as described is very much less than if each tumbler were 25 supplied a different position.

30 One of the objects of this invention is to provide a reversible lock capable of being both right and left handed, in which the numbers are arranged symmetrically.

35 Another object is to provide a novel form of tumbler.

40 Another object is to provide a combined mechanism in which the latch bolt and lock bolt are reversibly adjusted by a single key, in which the extension of the lock bolt 45 will be the latch bolt, and the retraction of the latch bolt will be the lock bolt.

50 Another object is to provide a novel form of key guiding means.

55 Further objects will appear from the detailed description taken in connection with the accompanying drawings in which:

60 Fig. 1 is a side elevation of a lock embodying this invention, one of the side plates being shown in Figs. 2 and 3 are similar views with the mechanism in different positions. Fig. 4 is a cross-section of the latch bolt.

65 Fig. 5 is a detail showing the key guiding means. Fig. 6 is a cross-section of the tumbler. Fig. 7 is a side elevation of the face plate, showing the key holes and the key guiding pins. Fig. 8 is a side elevation of the body, showing the latch bolt and the roll backs.

70 Fig. 9 is a side elevation of the latch bolt, showing the lugs and the wings.

75 Fig. 10 designates a face plate, 11 the body, and 12 the side plates of a lock casing. The side plates are set into the body as shown in Fig. 11.

80 A latch bolt 13 extends through the face plate, which has lugs 14 thereon engaging grooves 15 cut in the latch bolt. The roll backs 16 and 17 are mounted in the side plates 12 and are provided with wings 85 engaging lugs on the latch bolt yoke 18. The hubs of the roll backs are machined and the latch bolt yoke rests upon these hubs and between the hub wings so as to be guided 90 vertically and laterally by the roll backs and the wings thereon. The latch bolt is thus guided by the lugs 14 and the roll backs and requires no additional guide lugs. The 95 hub shaft or spindle is divided and its sections 19 and 20 are connected by a threaded lug 21 on one section engaging a tapped hole in the other. The spindle sections and roll backs are thus held in rigid alignment, at the same time permitting independent 100 movement of the roll backs. One of the roll backs, in this case 17, is provided with a recess adapted to be engaged by a bolt 22, guided by lugs 23 on the casing and operated by a lever 24. The lever 24 is engaged 105 by a pin 25 on an operating button 26 projecting through and guided by a slot in the face plate. The button is maintained in 110 different adjusted positions by means of a bowed spring plate 27 and a pin 28. The button 26 is cut as shown at 29 to permit its insertion into the slot in the face plate. The roll backs 16 and 17 are interchangeable, and the latch bolt is reversible, so as to adapt the latch to right and left doors. The bolt 22 extends across both roll backs so as to cooperate with the notched roll back in 115 either of its positions.

120 The casing walls have key holes 30 and 31 formed therein, and opposite these key holes are key guiding pins 32 and 33 respectively. These pins 32 and 33 are of tapered construction and therefore require a special key with a tapered hole in its 125 shank as shown in Fig. 6. The lock bolt 23 has a frame 35 guided in the casing as usual and provided with two pairs of key bit engaging portions, one pair positioned above each key hole. A plurality of tumblers 36 are pivoted in the casing and provided with the usual racks cooperating with a stump on the bolt frame. These tumblers are of novel construction. Each tum- 130 bler is provided with a bit engaging part 37

positioned above the key hole 31, and the tumbler is extended above its rack as shown at 38 and recessed to provide a second bit engaging part 39 positioned above the key hole 30. These bit engaging parts are so constructed and arranged that the key will lift the tumblers the same distance when inserted from either side of the lock. In view of the fact that the key will engage different parts of the tumblers when inserted from either side, it is not necessary to arrange these tumblers symmetrically, but it is possible to arrange them unsymmetrically. As shown in Fig. 4, the set of key bit engaging parts 37 are arranged reversely with respect to the set of key bit engaging parts 38, so that the set 37 will properly cooperate with the key when inserted from the left side of the lock, and so that the set comprising the parts 38 will properly cooperate with the key when inserted from the right side of the lock. It will also be noted that each tumbler is provided with a pair of reversely arranged key bit engaging parts, one of said parts being engageable by a key from one side of the lock and the other of said parts being engageable by a key from the other side of the lock. With this unsymmetrical arrangement of tumblers the protective value of the lock will be greatly increased and it is possible to obtain a very much greater number of different combinations than with the symmetrical arrangement.

It will be noted that with this lock the number of different combinations increases in a geometrical progression with the number of tumblers, while with the symmetrical arrangement the number of different combinations increases with half the number of tumblers. It will thus be seen that the present invention provides a lock having a greater protecting value, and a larger number of possible combinations. As the tumblers are stamped their expense will not be greater than those of the ordinary type. The lock bolt is arranged to be extended and retracted in steps as shown.

A lever 40 is pivoted on the frame 35 at 41 and connected by a slot with a pin 42 on the latch bolt. A second lever 43 is pivoted to the frame 35 at 44 and also has a slotted connection with the pin 42. When the lock bolt is retracted as shown in Fig. 1, the ends 45 and 46 of the levers 40 and 43 respectively will be adjacent the key holes 30 and 31 respectively. If the key is inserted in either key hole 30 or 31 and turned in a direction as to retract the lock bolt, the key will engage the end 45 or 46 and retract the latch bolt. Fig. 2 shows the lock bolt partially extended. The ends 45 and 46 are at this time out of reach of the key so that the latch bolt cannot be retracted at this time. This latch bolt is however

free to be retracted by the knob. Fig. 3 shows the lock bolt fully extended. The lever 40 now engages a shoulder 47 on the frame 35, and the lever 43 engages a lug 48 (which is one of the spacing and securing lugs between the plates 12 of the casing). The latch bolt will now be locked by the levers 40 and 43. It will be noted that the lever 40 is bent as shown at 49, Fig. 1, so that the lower end of this lever will lie in the open space in the frame 35. When a key inserted from either side is turned to retract the lock bolt, it will successively retract the lock bolt one step and unlock the latch bolt, then fully retract the lock bolt, and further revolution of the key so used will retract the latch bolt.

It is sometimes desirable to provide an unlocking means on the inside of the door which forms a permanent part of the lock. Referring to Figs. 5 and 6, 50 designates a key which may be provided with any suitable handle. A plate 51 having a lug 52 entering and closing the keyhole, is clamped to the inside side plate 12 by means of a screw 53. A pair of members 54 are pivoted on the screw 53 and engage an elliptical portion 55 of the key. A spring 56 positioned in a groove on the members 54 holds these members yieldingly against the portion 55 and tends to hold the key vertical.

It is obvious that various changes may be made in details of construction, within the scope of the claims, without departing from the spirit of this invention, and it is therefore to be understood that this invention is not to be limited to the specific construction shown and described.

Having thus described the invention what is claimed is:

1. In a lock, the combination with a bolt, of tumblers therefor having key bit engaging parts constructed and arranged to cooperate with a key having unsymmetrically arranged key bit steps, when inserted from either of the opposite sides of the lock.
2. In a lock, the combination with a lock casing having key-holes in its opposite walls, and a bolt in said casing, of tumblers in said casing having key engaging parts constructed and arranged to cooperate with a key having unsymmetrically arranged key bit steps, when inserted through either key hole.
3. In a lock, a tumbler having a plurality of key bit engaging parts positioned one above the other and constructed and arranged to be engaged by the bit of the same key at different times to move the tumbler in the same direction.
4. In a lock, a tumbler having a recess therein forming a rack, and having key bit engaging parts positioned on opposite sides of said rack.
5. In a lock, a tumbler having key bit

gaging parts constructed and arranged to be engaged by the bit of the same key, and whereby the engagement of the key with said key bit engaging parts moves the tumbler in the same direction.

6. In a lock having key holes positioned out of alinement, the combination with a latch bolt and a lock bolt, of means for retracting said latch bolt, and means positioned in the path of a key inserted in either key hole to retract said latch bolt.

7. In a lock having key holes positioned out of alinement the combination with a latch bolt and a lock bolt, of means connecting said bolts adapted to be positioned adjacent either key hole to retract said latch bolt.

8. In a lock having key holes positioned out of alinement, the combination with a latch bolt and a lock bolt, of a plurality of members connecting said bolts, said members being placed adjacent the key holes when said lock bolt is retracted.

9. In a lock, the combination with a bolt, of a plurality of tumblers therefor having unsymmetrically arranged key bit engaging parts, said tumblers being constructed and arranged to be operated from either side of the lock.

10. In a lock, the combination with a bolt, of a plurality of unsymmetrically arranged tumblers therefor, said tumblers being constructed and arranged to be operated by a key having unsymmetrically arranged key bit steps, from either side of the lock.

11. In a lock, the combination with a bolt, of a plurality of unsymmetrically arranged tumblers therefor, each tumbler having a plurality of key bit engaging parts thereon, whereby a plurality of unsymmetrically arranged key bit engaging parts are formed, one of said sets being operable by a

key from one side of the lock, and another of said sets being operable by a key from the other side of the lock.

12. In a lock, the combination with a bolt, of a plurality of tumblers therefor, each tumbler having a plurality of key bit engaging parts thereon constructed and arranged to form a plurality of sets of reversely arranged key bit engaging parts.

13. In a lock, the combination with a bolt, of a plurality of tumblers therefor, each tumbler having a plurality of key bit engaging parts thereon constructed and arranged to form a plurality of reversely arranged sets, one set cooperating with a key inserted from one side of the lock, and another set cooperating with a key inserted from the other side of the lock.

14. In a lock having key holes positioned out of alinement, the combination with a bolt, of a plurality of tumblers therefor, each tumbler having a plurality of key bit engaging parts thereon, said key bit engaging parts being arranged in sets, one set adjacent each key hole, whereby said tumblers may be operated by a key having unsymmetrically arranged key bit steps.

15. A lock having a tapering key positioning pin constructed to enter and cooperate with a like aperture in the shank of a key.

16. A lock casing having key holes positioned out of alinement in its opposite walls, and tapering key positioning pins opposite said key holes and constructed to enter and cooperate with a like aperture in the shank of a key.

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

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Witnesses:

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