

N. W. GRANDALL.
LOCK AND LATCH MECHANISM.
APPLICATION FILED JUNE 10, 1904.

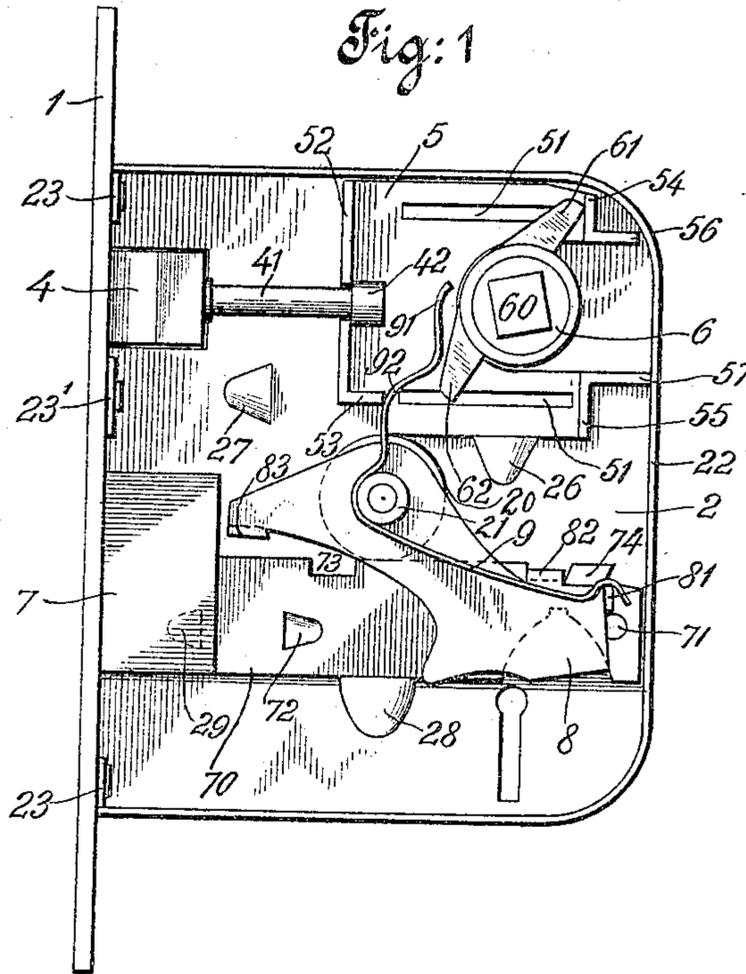
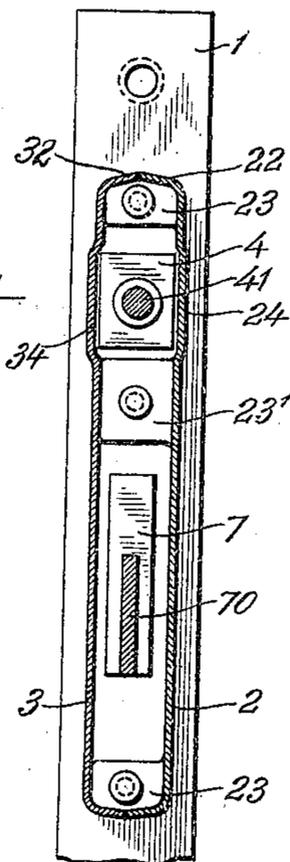
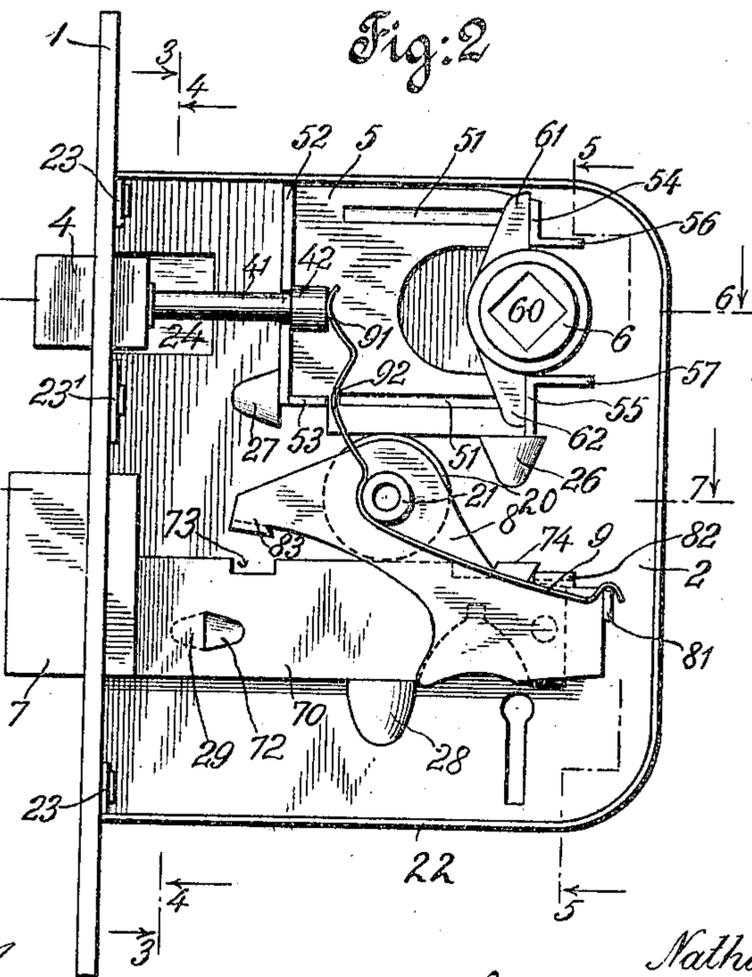
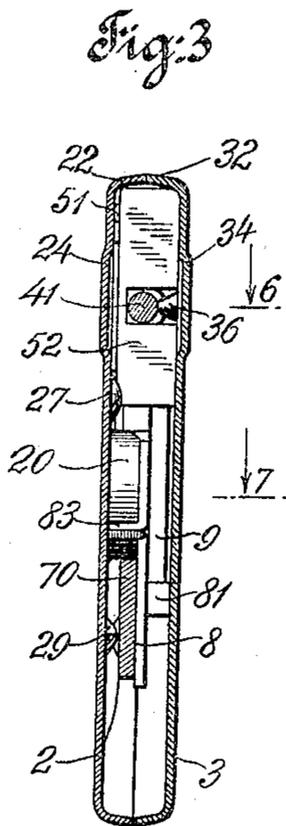


Fig:4



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Fig: 5

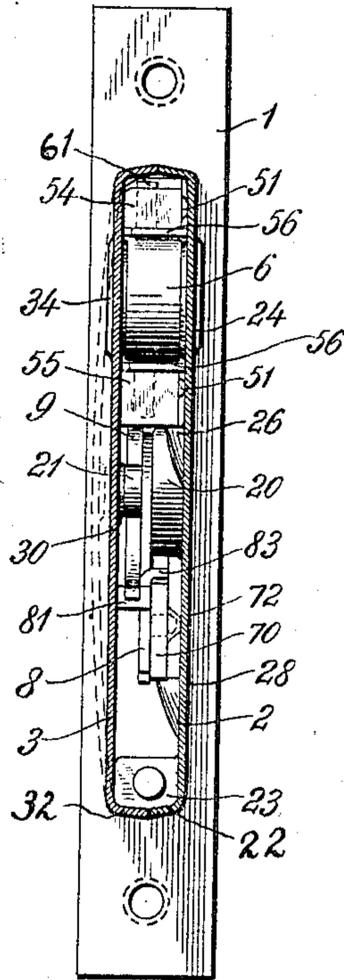


Fig: 6

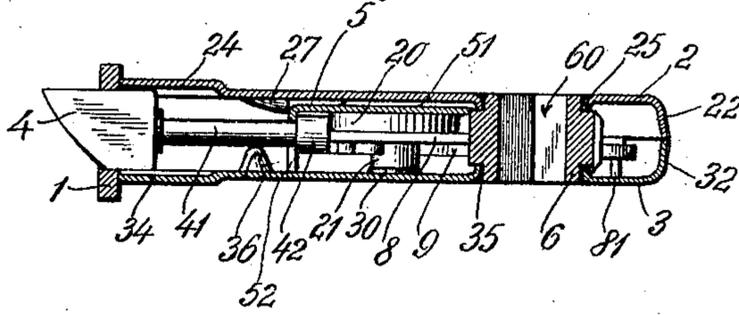


Fig: 7

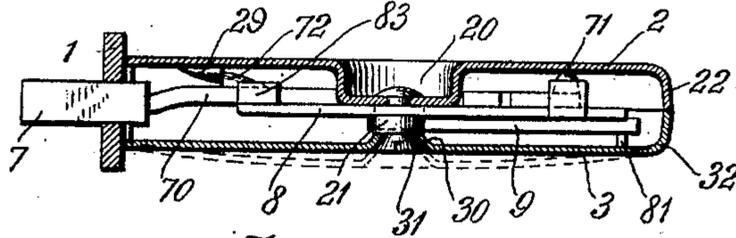
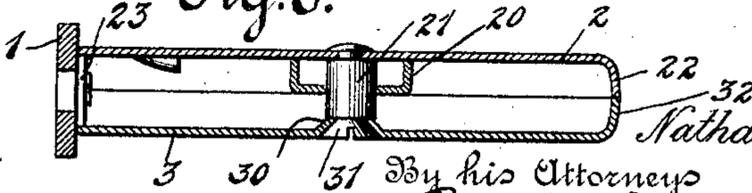


Fig: 8.



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LOCK AND LATCH MECHANISM.

No. 812,828.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed June 10, 1904. Serial No. 211,890.

To all whom it may concern:

Be it known that I, NATHAN W. CRANDALL, a citizen of the United States, residing at New Britain, Hartford county, and State of Connecticut, have invented certain new and useful Improvements in Lock and Latch Mechanism, of which the following is a full, clear, and exact description.

My invention relates to improvements in locks and latches, and particularly for doors and the like.

The object of my invention is to construct a lock economically, increase its strength and durability, make it easier to operate, and increase its general efficiency.

The construction consists in a case and the associated parts which are constructed principally of wrought or sheet metal. The number of parts has been reduced to a minimum without decreasing the safety of the lock or its efficiency. The details will be more clearly understood from an inspection of the accompanying two sheets of drawings.

Figure 1 is a side elevation of a lock embodying the improvements of my invention, the latch slide and bolt being retracted and the cap or cover plate being removed. Fig. 2 is a view of the same parts with the latch and the bolt extended. Fig. 3 is a section on the plane looking in the direction of the arrows 3 3 of Fig. 2. Fig. 4 is a section on the same plane, but looking in the direction of the arrows 4 4 in Fig. 2. Fig. 5 is a section on the line 5 5, Fig. 2. Fig. 6 is a horizontal section on the plane of the line 6 6, Fig. 2. Fig. 7 is a horizontal cross-section on the plane of the line 7 7, Fig. 2. Fig. 8 is a similar section, but modified construction, and omitting the moving parts.

The main parts of the lock, as herein shown, are as follows:

1 is the front plate, which is adapted to be secured to a door and which has passages for the latch and bolt.

2 is the main side plate.

3 is the removable cap or cover plate.

4 is the latch.

5 is the latch-slide.

6 is the roll-back hub.

7 is the locking-bolt.

8 is the tumbler.

9 is a spring which performs the triple function of operating the tumbler, the latch-slide, and the latch-bolt.

The main side plate 2 carries a raised boss portion 20 and supports a screw-seat 21. The top, back, and bottom of the side plate are bent up to form a continuous flange 22 around these three parts.

23 23 are lugs formed integrally with the side plate and with its flange. Both of these lugs are secured to the back of the face-plate 1 and hold the parts securely together to prevent lateral bending or separation.

23' is a third lug intermediate the two ends which is also integral with the side plate 2 and secured to the rear of the face-plate. These lugs all form supports for the cap-plate 3, so as to guide it to its proper seat.

24 is a recessed portion which forms a guide for the bolt 4 and a stop to prevent its being accidentally knocked inward and unseated when in the position shown in Fig. 1, at which time the spring will be disengaged therefrom.

25 is an annular seat bent inwardly for the roll-back hub, forming a bearing against the end of the fiber of the metal.

26 is a lug formed by stamping in a triangular portion of the casing to form a lower guide and support for the latch-slide 5. The latch-slide is also guided by the top flange of the case and by the boss 20.

27 is a stop formed by stamping in the metal of the case to limit the outward excursion of the latch-slide. The rearward excursion of the latch-slide is limited by the rear wall of the case.

28 is a support formed by stamping in a portion of the case to guide the locking-bolt. The locking-bolt is guided between this lug 28 and the lower part of the boss 20. The front end of the bolt is of course guided in the face-plate.

29 is a lug stamped from the metal of the case to afford a limit for the outward excursion of the bolt. The inward movement of the bolt is limited by the rear end striking against the case, as shown in Fig. 1.

The cap or removable cover 3 is preferably convexed in form, as indicated by the dotted lines in Figs. 5 and 7.

30 is an inwardly-stamped seat for the screw 31. The parts are drawn down into the proper position by means of the screw 31, which holds them securely in place, the flange 32 cooperating with the flange 22 of the main plate.

34 is a recessed portion corresponding with the recessed portion 24 for guiding and limiting the movement of the latch-bolt 4.

35 is an inwardly-turned annular shoulder 5 affording a bearing for the roll-back hub.

36 is a guide portion formed by stamping in the cap-plate, so as to assist in guiding the latch-bolt.

41 is the shank of the latch-bolt, and 42 is 10 an enlarged head. The construction of the latch-bolt is described in detail in my Patent No. 733,163. This patent also covers, broadly, the guiding of the latch-slide and the latch-bolt by means of integral lugs. The latch- 15 slide 5 is formed of sheet metal and has tracks 51 51, formed by indenting the metal. This affords a smooth bearing which decreases the friction and makes the slide easier to operate.

52 is a flange bent upward at the front edge 20 of the slide and slotted to afford a passage for the shank of the latch-bolt. The head 42 rests against the rear of the flange.

53 is a side flange bent upward to afford a 25 bearing for the latch-spring and also to reinforce the flange 52.

54 and 55 are flanges bent upward at the rear of the latch-slide with which the roll-back cooperates.

56 and 57 are reinforcing-shoulders formed 30 integrally with the slide and at the rear of the flanges 54 and 55 to reinforce the same and to afford additional support for the slide.

The roll-back hub 6 has a passage 60 through it for a suitable knob-spindle.

61 and 62 are the arms of the roll-back, 35 which are adapted to coact with the flanges 54 and 55, respectively, of the latch-slide.

The bolt 7 is formed, preferably of sheet 40 metal, having the shank 70, which is guided between the lug 28 and the boss 20. The front end of the bolt is guided in a passage through the face-plate 1.

71 is a projection from the rear of the bolt- 45 shank, which is formed by indenting the metal, and affords a guide which slides on the inner surface of the side plate 2.

72 is a lug formed by indenting the bolt- 50 shank and which acts as a stop in conjunction with the lug 29 of the side plate to prevent outward excursion of the bolt beyond the position shown in Fig. 2. The rear flange 22 acts as a stop on the incursion of the bolt, as shown in Fig. 1.

73 is a notch in the upper edge of the latch- 55 slide.

74 is a projecting lug at the rear.

The tumbler 8 is pivotally mounted on the stump 21.

81 is a projection from the tumbler formed 60 integrally therewith against which the spring 9 rests. This also acts as a guide to cooperate with the side plate 3 and hold the tumbler in its operative position.

82 is an integral lug extending from the 65 tumbler for cooperating with the two oppo-

site edges of the lug 74 of the latch-bolt shank to lock the bolt in its extended position and to prevent it from jarring out when in its retracted position.

83 is a lug which is integral with the tum- 70 bler for cooperating with the notch 73 in the latch-bolt shank. This lug comes into operation when an attempt is made to raise the tumbler above its proper position—for in- 75 stance, for the purpose of picking the lock. The tumbler must be shifted to exactly the right height in order to unlock and retract the bolt. If it is not lifted high enough, of 80 course the projection 82 holds the lug 74. On the other hand, if the rear of the tumbler is lifted too high then the lug 83 will engage in the notch or recess 73 and still hold the bolt locked.

The spring 9 is preferably formed of sheet 85 metal tempered properly. It rests near its central portion against the stump 21 and engages the tumbler on the lug 81. The upper end has two points of contact—one, 91, to engage the head 42 of the latch-bolt and act 90 as an easy spring when the door is closed without operating the knob, and the other, 92, to act as a spring for the latch-slide when the bolt is operated by the knob and to en- 95 gage with the projection 53. In the latter case a strong spring is required, since the friction of the knob, spindle, and slide must be overcome in returning the parts to the posi- 100 tion shown in Fig. 2. The advantages of this construction are particularly a decrease in cost of construction, ease of operation, the prevention of "picking," strength and du- 105 rability of parts, ease of assembling, the reduction in number of parts, and general efficiency. These will be understood readily by one skilled in the art.

What I claim is—

1. In a lock and latch mechanism the com- 110 bination of a case having two side plates of sheet metal with flanges, a boss and a seat carried by one of said side plates, a screw for cooperating with said seat and connecting 115 said plates, an integral lug stamped from one of said side plates, a latch-slide guided between one of said flanges at one edge and said boss and said lug at the other edge.

2. In a lock and latch mechanism the com- 120 bination of a casing formed of sheet metal, an integral lug stamped from the metal of one of the side plates, a latch-slide guided in said case, said lug acting as a stop to limit the out- 125 ward movement of said slide and being reinforced by its connection with said plate opposite the engaging edge.

3. In a lock and latch mechanism the com- 130 bination of the casing having a front plate and side plates, a latch-slide and separate latch-bolt adapted to be retracted by said slide, said bolt being also movable independ- 135 ently of said slide, a spring for normally holding said latch-bolt in its extended position,

said casing having a recess in one of its side plates affording a guide for said latch-bolt, the rear end of said recess forming a shoulder limiting the inward movement of said latch-bolt.

4. In a lock and latch mechanism the combination of a casing having one side formed of sheet metal, a latch-bolt, a slide, means for operating the same, an integral lug stamped from the metal of one side plate and forming a lateral guide for the shank of said latch-bolt.

5. In a lock and latch mechanism the combination of a casing, a latch-bolt, a slide, guiding means for said slide, and integral tracks stamped from the metal of said slide to cooperate with one of the said plates of said case.

6. In a lock and latch mechanism the combination of a casing, a latch-bolt and slide, a roll-back, flanges integral with said slide with which said roll-back cooperates and integral reinforcing-lugs for said flanges which also cooperate with said case.

7. In a lock and latch mechanism, the combination of a face-plate and side plates having flanges, one of said side plates being formed of sheet metal and having reinforcing and stiffening lugs at two corners uniting the side plate and the adjacent flange and secured to said face-plate.

8. In a lock and latch mechanism, the combination of a face-plate and side plates having cooperating flanges, one of the said side plates being formed of sheet metal and having lugs secured to the back of said face-plate and integral with said side plate and at right angles to its flange for the purpose specified, the other side plate also being formed of sheet metal, said lugs cooperating with and inclosing its flanges to seat the same and means for securing the side plates together.

9. In a lock and latch mechanism, the combination of a case, a locking-bolt having a shank formed of sheet metal, guides therefor, an integral lug stamped from the metal of said shank and sliding on one of said side plates and stops to limit the movement of said bolt.

10. In a lock and latch mechanism the combination of a casing having one side formed of sheet metal, a locking-bolt, guides therefor, and integral lugs formed by stamping up the metal of said side plate and a corresponding lug formed by indenting the metal of said bolt-shank to operate as a stop.

11. In a lock and latch mechanism the combination of a casing formed with two side plates, a boss and seat carried by one of said side plates, a screw for cooperating with said seat and holding said side plates together, a locking-bolt, a lug formed by stamping up the metal of one of said side plates, said bolt being guided between said boss and said lug.

12. In a lock and latch mechanism the combination of a casing formed with two side plates, a boss carried by one of said plates, a locking-bolt, a tumbler mounted on said boss, a spring therefor and a lug integral with said tumbler and cooperating with one of said side plates, said spring cooperating with said lug.

13. In a lock and latch mechanism the combination of the casing having a front plate and side plates, a boss and a post carried by one of said plates, a tumbler pivotally mounted on said post and positioned by said boss, a locking-bolt, shoulders formed in the shank of said locking-bolt in front of and to the rear of said post, lugs projecting from said tumbler, adapted to coact with said shoulders, and a spring for normally holding said tumbler with one of its lugs engaging the rear shoulder of said bolt when the same is extended, said casing having a keyhole opening beneath said tumbler and beneath said bolt, all for the purpose specified.

14. In a lock and latch mechanism the combination of a case, a latch-bolt, a slide separate therefrom, a locking-bolt, a tumbler therefor and a single spring cooperating with said latch-bolt and said tumbler to hold them in their proper positions and adapted to cooperate with said latch-slide when the same is retracted and to throw the same outward independent of said latch-bolt.

15. In a lock and latch mechanism the combination of a case, a latch-slide, means for retracting the same, a latch-bolt adapted to be retracted by said latch-slide but having an independent movement with relation thereto and a single spring having a long arm adapted to engage said latch-bolt and a shorter arm adapted to engage said latch-slide whereby the same spring affords less resistance to the retraction of said latch-bolt than to the retraction of said latch-slide.

16. In a lock and latch mechanism the combination of a case, a latch-bolt, a slide having an upturned flange engaged by the shank of said latch-bolt, and a lug integral with said latch-slide reinforcing said flange and a spring for cooperating with said lug to operate said latch-slide.

17. In a lock mechanism the combination of a case formed in two parts, a raised boss, a seat projecting beyond said boss but secured to one part of said case, a screw for taking into said seat and securing the parts of said case together, a locking-bolt, and a tumbler pivoted on said seat and positioned by said boss.

Signed at New Britain, Connecticut, this 7th day of June, 1904.

NATHAN W. CRANDALL.

Witnesses:

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F. E. SUNBURN.