

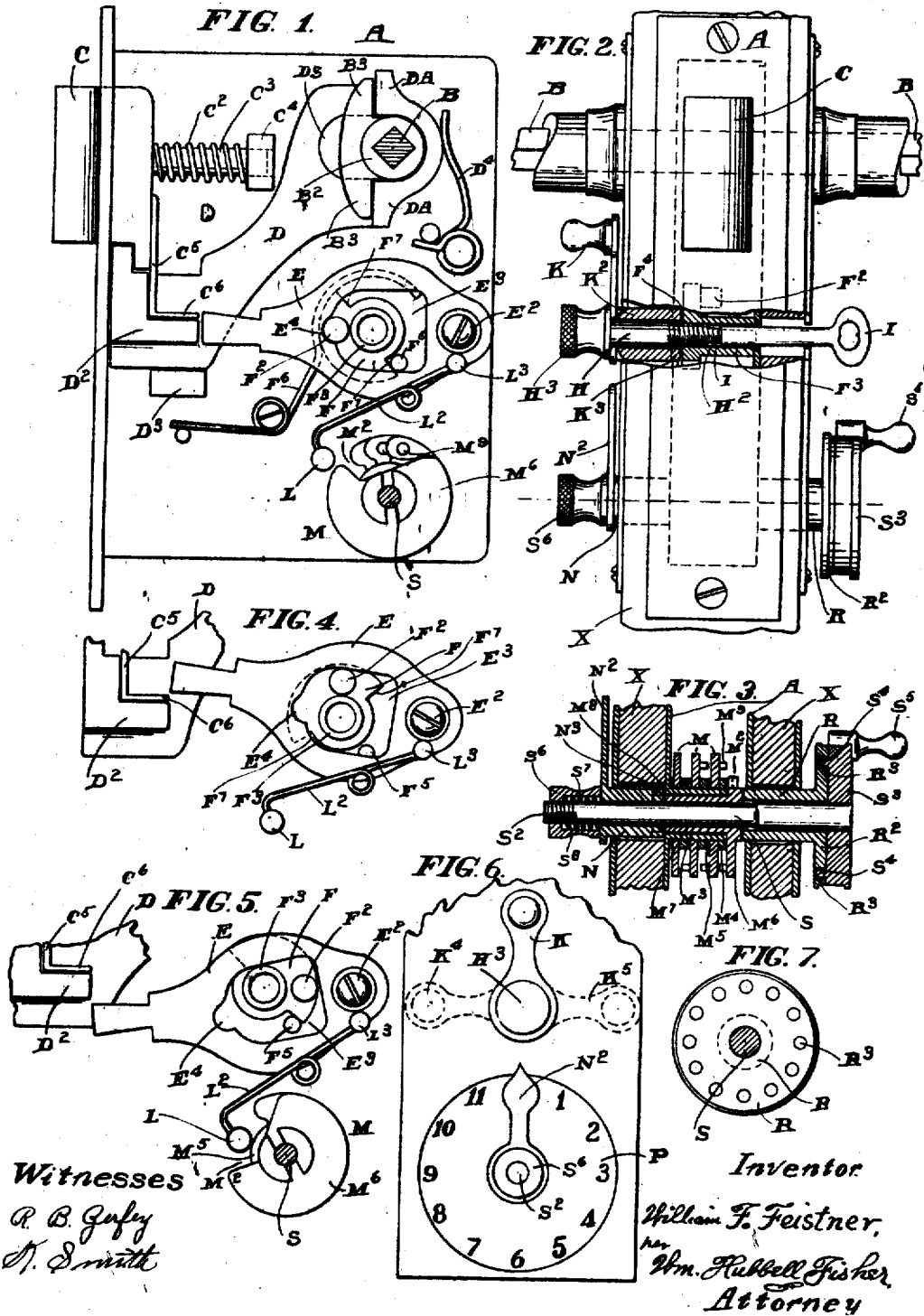
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LOCK.

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To all whom it may concern:

Be it known that I, WILLIAM F. FEISTNER, a citizen of the United States, and a resident of the city of Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Locks, of which the following is a specification.

The several features of my invention and the various advantages resulting from their use conjointly or otherwise will be apparent from the following description and claims.

In the accompanying drawing, making a part of this specification, and in which similar characters of reference indicate corresponding parts,—Figure 1 is a side elevation of the operative parts of the lock, the switch being set to make the lock serve as a night latch. Fig. 2 is a front elevation of the lock in the door, the handle spindles being broken away, and also a portion of the face of the lock being broken away, showing a cross section of the parts wherein the key fits. Fig. 3 is an axial cross section of the tumbler mechanism detached from the lock case. Fig. 4 is a detail view showing how the bolt is liberated by its locking mechanism to act as a simple spring bolt. Fig. 5 is a detail view showing a portion of the bolt, wherein the switch is set to permit the retraction of the locking mechanism as soon as the proper combination of the tumblers is restored. Fig. 6 is a face view of the dial and switch which are on that side of the lock which faces the inside of the room. Fig. 7 is a face view of the outside disk for changing the combination of the tumblers.

I will now describe my invention in detail. The lock-case A is traversed by a spindle B to the ends of which ordinary knobs or handles are secured, in order that the only bolt C of the lock may be operated either from the outside or inside in the usual way, the bolt being shot by the spring C². The spring C² is compressed between the back of the bolt C and the guide post C⁴. From the back of bolt C, a stem C³ projects. The rear end portion of this stem C³ is in an opening in the guide post C⁴, and is slidable through the post. The spring C² embraces this stem C³ and is compressed between this stem and the back of said bolt C. This stem C³

guides the bolt C. The bolt C is operated from the handle spindle B, by the arm D. This arm D has at one end the raised portion D² which engages with the arm C⁵ fastened to the bolt C. The arm D is kept in alignment and is guided by the guide post D³ and is shot by the spring D⁴. The spindle B operates directly the hub B² carrying the arms B³, B³, which respectively engage adjacent arms D⁴, D⁴ of the arm D. This hub B² is located in a slot D⁵ of the bolt arm D.

Located below the bolt arm D and pivoted within the case at E², is a lever E having a rectangular opening E³ and a semicircular opening E⁴ communicating with opening E³. These openings E³ and E⁴ are of such proportions as to permit the free turning of pin F², projecting horizontally from the semicircular disk F, in a radius from the center of pivot F³ of disk F. The disk F is journaled in case A on its hollow pivot F³. This pivot F³ is threaded on the inside to receive the headed pin H. This pin H may have the inserted end shaped as H², being cut off flat on two sides, or any other desired shape in cross section. A key I is adapted to fit and engage such shape of the end H². But the end may, when desired, be perfectly smooth, in which case, nobody from the outside can turn the pin H with a key.

A switch K on its collar K² is interlocked in the disk F, by means of a groove F⁴ cut into disk F, and a projection K³ on K² to fit the groove F⁴. This switch is held in place tightly by the headed pin H being screwed down tightly. A thumb piece H³ of the pin enables the pin H to be screwed to place or unscrewed by the spring F⁵. The disk F being semicircular, the shoulders F⁷, F⁷, thus formed come in contact with the pin F⁶, which latter projects horizontally from the case A, and is so situated as to allow the disk F to be turned not quite half way around.

To lever E is fastened a post L at L³, by means of the spring rod L². This post L is adapted at the proper moment to drop and engage with the coincident gates M² of the disk tumblers M, mounted upon the sleeve M³, fastened securely in case A. These disks are free to move around the sleeve M³, but are kept in place by collars M⁴ which em-

brace and fit tightly upon the sleeve. Thin washers M^6 are placed between the disks and collars to make the movement of the disks free. The top disk tumbler M is not mounted on the sleeve M^3 , but is made with a cylinder M^7 which passes through the sleeve M^3 and is free to revolve therein. This disk M^6 is the driving disk tumbler. With the cylinder M^7 another cylinder N is interlocked by some suitable means. One kind of such means consists as follows: A ridge N^3 of cylinder N locks in the groove M^8 of cylinder M^7 . To the cylinder N a pointer N^2 is attached. This pointer is on the inside of the door X and points to the numerals on the dial P . To the outer end of cylinder M^7 is interlocked, by means before described, a cylinder R , whose outer end is provided with a flange R^2 . This flange R^2 is perforated near its circumference by holes R^3 . Passing through the cylinders R , M^7 and N is a rod S threaded on its inner end at S^2 . To the outer end of rod S a disk S^3 is fastened, which has on its inner face, pins S^4 which engage in the perforations R^3 in flange R^2 . To the peripheral edge of disk S^3 handle S^5 is fastened. By this handle S^5 , the disk is rotated. This handle S^5 also serves as a pointer. On the inner end of rod S , at S^2 , a nut S^6 is screwed, this nut having a chamber S^7 in which a spring S^8 is placed, and fitting loosely over S^2 . This nut S^6 being screwed against the end of the cylinder N tightly brings this cylinder N and the cylinder M^7 and the cylinder R and the disk S^3 tightly together. When the disk S^3 is revolved, it revolves the cylinder R by means of the pins S^4 holding in holes R^3 , and the cylinder R being locked in cylinder M^7 revolves the tumbler M^6 which has a projecting pin M^9 on its under side, which latter engages with the pins M^9 inserted in the faces of tumblers M . The combination of the lock is determined by these pins M^9 when they are first inserted in the disk tumblers. The user of the lock can never change the position of these pins, but must be informed of the exact combinations by the manufacturer. Let it be supposed that the tumblers M are "set up" on the numbers 9, 3, 10 and 4, or in other words,—nine, three, ten and four distinct movements must be made before all the gates M^2 can be brought in line with each other and the post L be permitted to engage with them. The cylinder N being interlocked with the cylinder M^7 , turns arm N^2 , pointing to the numerals on the dial.

The combination can never be changed, but by unscrewing nut S^6 a little distance, the stem S can be pulled out, which throws the pins S^4 out of holes R^3 , then by turning disk S^3 by handle S^5 , the pins S^4 engage in a different set of holes R^3 . Meanwhile the spring S^8 keeps all parts interlocked while

this is being done by pressing against cylinder N . This action throws handle S^5 out of line with pointer N^2 , thereby changing the combination to be read on the outside dial. The memorandum of the combination to be worked by reference to the dial is carried by persons using the door. This outside dial may be changed as many times as there are perforations in the flange R^2 .

The switch K is so fastened on the collar K^2 (which is interlocked in disk F and held tight by the bead pin H^3 , H , which is screwed into pivot F^5) as to be in line with the pin F^2 on the semicircular disk F , in order that said pin F^2 may be vertically above the axis of disks F , as seen in Fig. 4, when switch K is perpendicular as represented in Figs. 2 and 6. In this position of pin F^2 , the lever E , as shown in Fig. 4, is lifted clear of the raised portion D^2 of bolt arm D and also of the wing C^6 of arm C^5 which is a part of bolt C . In this position, as shown in Fig. 4, the lock is used as an ordinary spring bolt, which allows the bolt to be drawn back by the handle, or if the door is open and goes shut, the bolt C operates alone by its spring C^2 . When the pin F^2 is in the position shown in Fig. 5, the switch takes the position as shown by the dotted lines K^4 , as shown in Fig. 6. The lock is now used as a combination lock. The pin F^2 being free in the opening E^3 , the lever E can drop and free portions D^2 and C^6 as soon as the combination is restored, letting the post L fall into the gates M^2 of the tumblers. The lever E is raised and locks the bolt by the tumbler M^6 , through the agency of the post L and the pivoted rod lever L^2 , connected at L^3 to the lever E , as soon as the tumblers are "scattered" by turning disk S^3 . In this position of pin F^2 , if the combination is not known, the disk F may be turned to the position as shown in Fig. 4 by a key, as in Fig. 2. Further movement of the disk F is prevented by the pin F^5 which is located in the lock-case A .

When the disk is so turned by the switch K , as shown by the dotted lines K^5 in Fig. 6, the pin F^2 rests in the opening E^4 in lever E , as shown in Fig. 1, and the shoulder of said disk F is against pin F^5 , which stops further movement in that direction. The lever E is now locked by the pin E^4 and cannot drop, therefore the combination is made useless, and the door cannot be opened from the outside unless the disk is turned by a key to either of the other two positions, Figs. 4 and 5.

Attention is called to the fact that the screw shaft H can, by rotating it, be readily withdrawn and a new and differently formed end for the engagement of the removable key can be made. When such change is made, the old key cannot operate the bolt. In this way, the lock may be easily

made safe against being opened by one who has possession of the former key, and who should not have entrance to the room, etc.

What I claim as new and of my invention and desire to secure by Letters Patent, is:—

1. The combination, in a lock of a bolt, a spring for projecting it; a rotatory gated tumbler; an external device that operates said tumbler; a fence adapted to engage said gate; shiftable mechanism intermediate of said bolt and fence; internal means for setting by a removable key such mechanism, whereby said bolt may serve as a spring latch bolt only, or be used in conjunction with said tumbler, or be locked independently of it, substantially as herein specified.

2. The combination, in a lock, of a bolt, and a spring for advancing it, a series of reciprocatory rotary gated tumblers; an external device that operates the said tumblers; a fence adapted to engage with alined gates of said tumblers; shiftable mechanism intermediate of said bolt and fence; and internal means operatable by a removable key, whereby said bolt may be used in conjunction with said tumblers, or be locked independently of them, or serve as a spring latch bolt.

3. The combination, in a lock, of a bolt, and a spring for advancing it, a series of reciprocatory rotary gated tumblers; an external device that operates the said tumblers; a fence adapted to engage with alined gates of said tumblers; shiftable mechanism intermediate of said bolt and fence; and internal means operatable by a removable key, whereby said bolt may be used in conjunction with said tumblers, or be locked independently of them, or serve as a spring latch bolt, and means external to the lock for enabling the combination of the tumblers to be changed as desired.

4. The combination, in a lock, of the spring protruded bolt C having a lateral arm C⁵, a spindle movable arm D, in connection with said arm C⁵, a swinging lever E, having openings E³, E⁴, a rotatable disk F having a movable pin F² located within said opening, means for moving said pin F² within said opening, means for rotating said disk F, a lever L² fixed at one end to the lever E and at its free end provided with post L, a series of revolving gated tumblers with which the said post L engages and means for operating said tumblers.

5. The combination, in a lock, of a spring protruded bolt, carrying an arm, the spindle, a reciprocatory arm actuated by said spindle, and having an abutment D², the oscillatory lever E, whose end is adapted to abut against said abutment D² and prevent retraction of the latter, and having opening E³, E⁴, a rotatory disk F provided with pin F², the latter being within said opening and mounted on a hollow pivot, containing

an arbor or end H², the latter adapted to engage a removable turn key I, and the shaft H, carrying at one end the said arbor or end H², and at the other end and outside of the lock an arm K, adapted to rotate the said disk F from the inner or room side of the lock, as the said removable latch key is adapted to rotate the said disk F at the outer side of the lock.

6. The combination, in a lock, of a spring protruded bolt, carrying an arm, the spindle, a reciprocatory arm actuated by said spindle, and having an abutment D², the oscillatory lever E, whose end is adapted to abut against said abutment D² and prevent retraction of the latter, and having opening E³, E⁴, a rotatory disk F provided with pin F², the latter being within said opening and mounted on a hollow pivot, containing an arbor or end H², the latter adapted to engage a removable turn key I, and the shaft H, carrying at one end the said arbor or end H², and at the other end and outside of the lock an arm K, adapted to rotate the said disk F from the inner or room side of the lock, as the said removable latch key is adapted to rotate the said disk F at the outer side of the lock, and gated tumblers, and a post upheld by an arm L² fixed to the said lever E, the tumblers when in alinement adapted to receive the said post, and mechanism for operating the said tumblers.

7. The combination, in a lock, of a spring protruded bolt carrying an arm, the spindle, a reciprocatory arm actuated by said spindle, and having an abutment D², the oscillatory lever E, whose end is adapted to abut against the said abutment D², and prevent movement of the latter, and also having opening E³, E⁴, a rotatory disk provided with pin F², the latter located within the said opening and mounted on a shaft, one end of which extends beyond the lock on the room side, an arm K, adapted to rotate the said disk at the room side of the lock, and gated tumblers and a post upheld by an arm L² fixed to the said lever E, the tumblers when in alinement adapted to receive the said post, and mechanism for setting and scattering the tumblers.

8. The combination, in a lock, of a spring protruded bolt, carrying an arm, the spindle, a reciprocatory arm actuated by said spindle, and having an abutment D², the oscillatory lever E, whose end is adapted to abut against said abutment D² and prevent retraction of the latter, and having opening E³, E⁴, a rotatory disk F provided with pin F², the latter being within said opening and mounted on a hollow pivot, containing an arbor or end H², the latter adapted to engage a removable turn key I, and the shaft H, carrying at one end the said arbor or end H², and at the other end and outside of the lock an arm K, adapted to rotate the

said disk F from the inner or room side of the lock, as the said removable latch key is adapted to rotate the said disk F at the outer side of the lock, the said shaft H provided with a screw thread engaging the said disk, and adapted to be removed, at will, at the room side face of the lock.

9. The combination, in a lock, of a bolt, means for operating it, said means provided with an abutment, the oscillatory lever E, whose end is adapted to abut against said abutment and prevent the retraction of the bolt, this lever E having an opening, a rotatory disk F, provided with pin F², the latter being within said opening, said disk

provided with a hollow pivot, a pin for said pivot, the pin containing an arbor or end H², the latter adapted to engage a removable turn key I, and the shaft H carrying at one end the said arbor or end H², and at the other end and beyond the lock carrying an arm, this shaft H adapted to rotate the said disk and removable from the lock and readjustable therein, for enabling the arbor H² to be changed.

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Attest:

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K. SMITH.