

No. 691,273.

Patented Jan. 14, 1902.

C. F. KELLER.
KEYLESS LOCK.

(Application filed Mar. 2, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

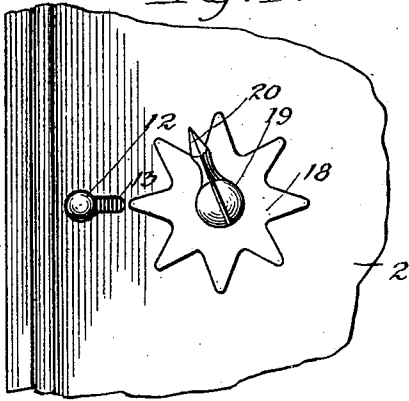


Fig. 2.

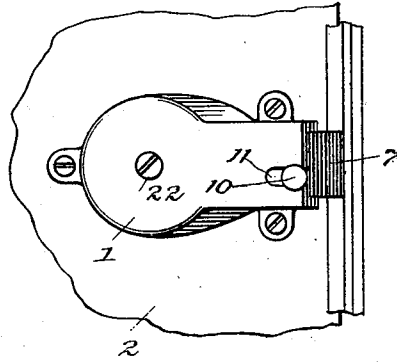


Fig. 3.

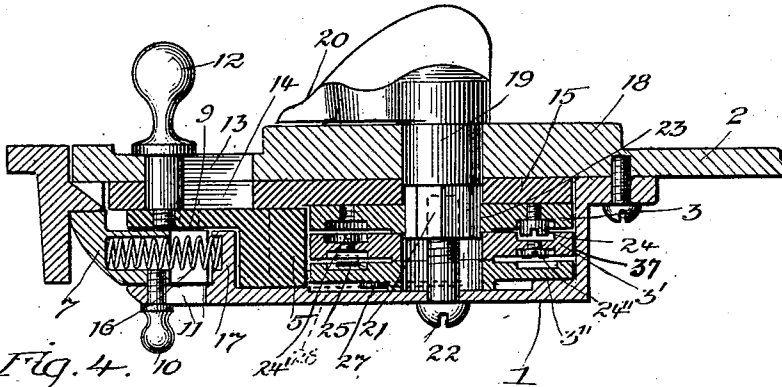


Fig. 4.

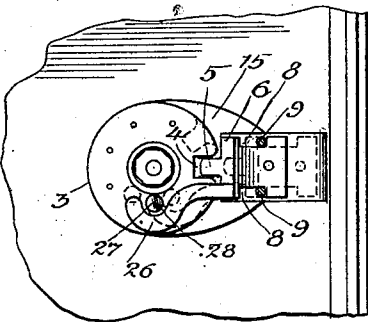


Fig. 5.

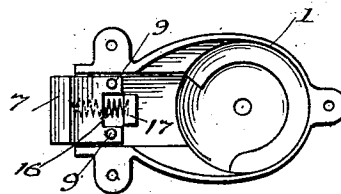
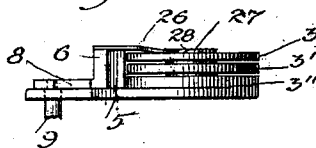


Fig. 6.



Witnesses
Frank Blanchard
Wm. Geiger

Inventor:
Charles F. Keller

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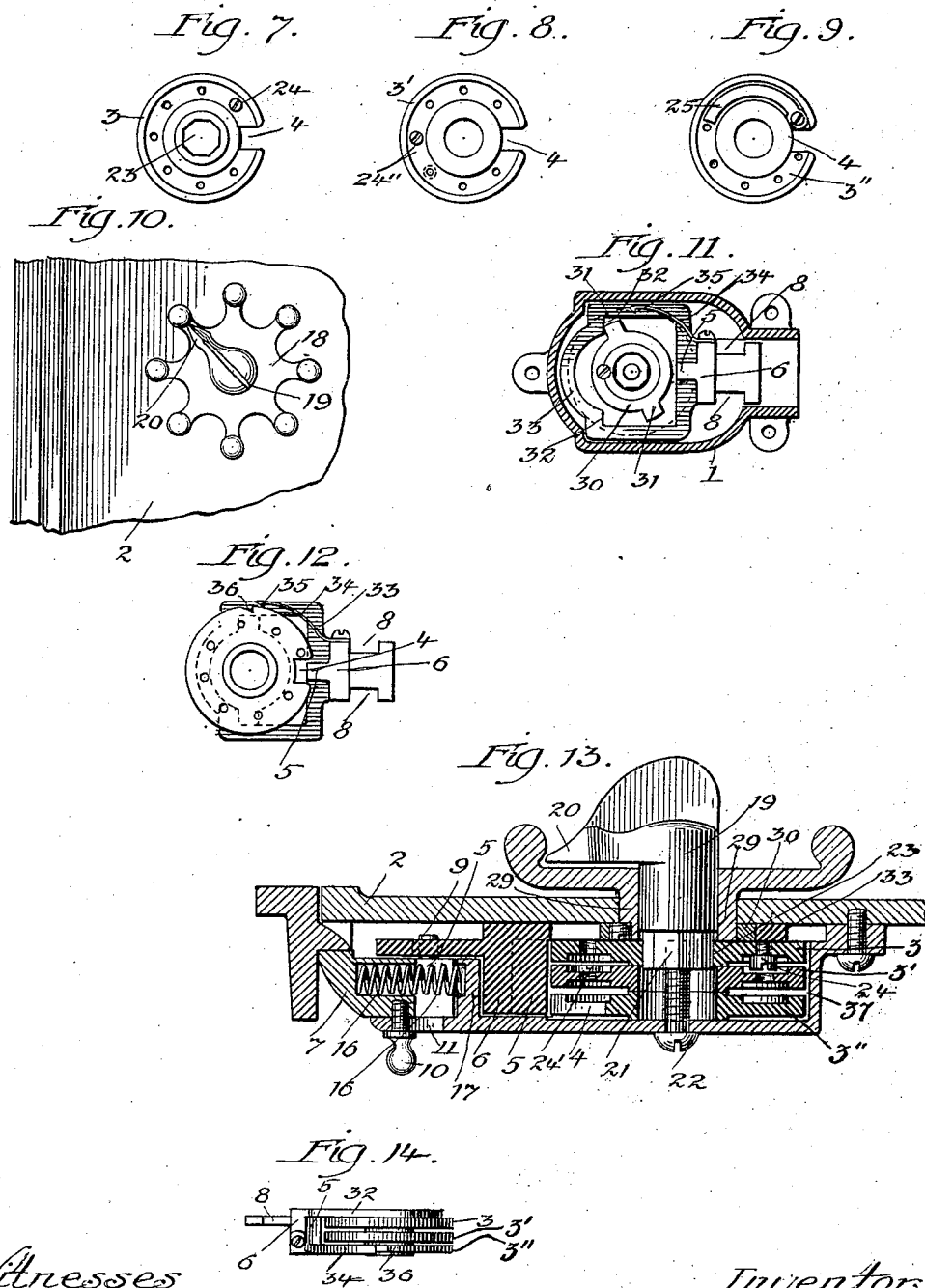
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2 Sheets—Sheet 2.



Witnesses
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Wm. Geiger

Inventor:
Charles F. Keller.

UNITED STATES PATENT OFFICE.

CHARLES F. KELLER, OF CHICAGO, ILLINOIS.

KEYLESS LOCK.

SPECIFICATION forming part of Letters Patent No. 691,273, dated January 14, 1902.

Application filed March 2, 1901. Serial No. 49,632. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. KELLER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Keyless Locks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in keyless locks; and it consists in the novel devices and combination and arrangement of parts, that will be hereinafter more particularly described and claimed.

In the drawings, Figure 1 is a plan view of the dial and pointer forming a part of the lock as applied to a door. Fig. 2 is a rear plan view of the lock. Fig. 3 is a longitudinal section of my complete invention as applied to a door, showing the parts in their normal position. Fig. 4 is a detail plan view showing the parts of the lock with the casing removed. Fig. 5 is a plan view of the casing and a portion of the bolt carried thereby. Fig. 6 is an edge view of the tumblers and parts cooperating with the same. Fig. 7 is a plan view of the first tumbler or disk, operated directly by the spindle forming a part of the pointer. Fig. 8 is a similar view showing the second tumbler. Fig. 9 is a plan view of the third tumbler or the last one made use of in carrying out my invention. Fig. 10 is a plan view of a dial and pointer, showing a modification of my invention. Fig. 11 is a sectional view of the casing of the lock with the tumblers removed, showing the mechanism for operating the bolt in one direction in the said modification. Fig. 12 is a detail plan view of the tumblers and mechanism cooperating therewith in the said modification. Fig. 13 is a longitudinal section showing my complete invention, including the said modification; and Fig. 14 is an edge view of the tumblers and parts cooperating therewith.

The invention, to be hereinafter described in detail, consists particularly in mechanism for automatically turning or displacing one or more of the tumblers when the bolt is operated, whereby the latter is locked against movement from the outside of the door or

drawer without the necessity of turning the pointer or device that operates the tumblers when the door is closed.

My invention further consists in the employment of a movable index-plate with which the pointer registers and adapted to be grasped by the hand of the operator for withdrawing the bolt from its locked position after the tumblers have been turned into their proper position to allow the release of the said bolt, thereby dispensing with an additional device or parts for withdrawing the bolt.

Referring to the drawings, 1 represents the casing for the lock, which is attached to the door 2 in any suitable mechanical manner, and movably located within said casing and bearing upon the inner periphery of the latter are three tumblers 3, 3', and 3'', each having a cut-away portion 4 for receiving the reduced inner end or fence 5 of the bolt. The bolt may be a single integral part, but is preferably composed of two sections—a movable fence-section 6 and a spring locking latch-section 7, having reduced portions which overlap one another, the fence-section 6 having cut-away portions 8, which are adapted to receive pins 9, carried by the latch-section 7, whereby the latter section is capable of being operated independently of the fence-section 6 for releasing the bolt from the inside of the door, a knob 10 being employed for the latter purpose and passed through a slot 11 and screwed into the said latch-section 7. After the tumblers have been turned in their proper position by the mechanism hereinafter to be described, to bring the cut-away portions of each of said tumblers in a line with one another to receive the reduced inner end 5 of the fence-section 6 of the bolt the said fence-section may be moved inwardly or toward the tumblers by grasping the knob 12, which passes through a slot 13, formed in the door, and a similar slot 14, formed in the plate 15, received by the casing 1 and screwed into the fence-section 6. In order to hold the sections 6 and 7 of the bolt in their proper position in respect to one another, and, further, to normally hold the bolt in a locked position, a coiled spring 16 is located in an opening formed in the

latch-section 7 and is interposed between the wall forming the base of said opening and a lug 17, forming a part of the casing 1.

In the construction above described the dial 18 is made integral with the door, and the spindle 19, forming a part of the pointer 20, passes loosely through the dial and door, which provides a bearing for it, the inner end of said spindle, as shown at 21, being octagon-shaped or of other polygonal form, and passing loosely through an opening formed in the rear wall of the casing is a screw 22, which is screwed into a screw-threaded hole in the inner end of the said spindle 19, the octagon-shaped end of the spindle being received by a similar-shaped opening 23, formed in the first disk or tumbler 3, thus causing the latter to be directly operated or turned by the pointer 20. As is common in all locks of this character, the tumblers are each provided with screws or pins adapted to enable the tumblers to cooperate with one another; but in the present instance a spring 25 is made use of, which cooperates with the pin or screw 24 of the intermediate tumbler, whereby the third tumbler, or the one to which the spring is attached, can only be operated in one direction, whereby the lock can only be opened by one combination.

By the employment of the screw 22 and its cooperation with the spindle 19 of the pointer the combination of the lock may be conveniently and readily changed by loosening said screw sufficiently to allow the octagon-shaped end of the spindle to be removed from the correspondingly-shaped opening formed in the first tumbler 3, whereby the spindle and tumbler referred to may be changed in position in respect to one another. Projecting from and forming a part of the said fence-section 6 of the bolt is a spring hook-shaped arm 26, which cooperates with a pin 27, forming a part of or rigidly secured to the third tumbler 3, said pin having an inclined face 28, which allows the arm 26 to freely pass over the same without turning or displacing the said tumbler and move in the position as shown in the full lines in Fig. 4 when the tumblers have been turned in a position to allow the bolt to be withdrawn or moved in an unlocked position by grasping the knob 12, secured to the fence-section 6 of the bolt. After the bolt has been withdrawn for releasing the locked position of the door the spring 16 will cause the bolt to be forced outward when the knob 12 is released, and in such action the hook-shaped arm 26 will cooperate with the pin 27 and cause the third tumbler, or the one carrying the said pin, to be automatically turned as the fence 5 moves out of the cut-away portion of the disks or tumblers, as shown in dotted lines, Fig. 4, whereby the periphery of the third tumbler will be brought in a position to contact with the fence 5 should an attempt be made to open the door from the outside, the latch-section of the bolt, however, being conveniently operated or withdrawn

from the inside of the door, should it be found necessary, without operating the fence-section 6 of the bolt. In other words, when the fence-section 6 is operated the latch-section 7 is likewise operated; but the latter section may be operated independently from the inside of the door.

In the modification shown particularly in Fig. 13 the operating-knob 12, previously made use of for withdrawing the bolt, is dispensed with and the dial 18 provided with a tubular extension 29, which freely moves in an opening formed in the door, whereby said dial may be turned in either direction, and secured to the inner projecting portion of said tubular extension is a collar 30, having lugs or extensions 31 projecting diametrically opposite one another, which cooperate with the vertical surfaces 32 of a frame 33, which forms an extension of the section 6 of the bolt, and loosely passed through the dial is the spindle 19 of the pointer 20, as in the preceding illustrations. From the foregoing description it will be seen that after the pointer has been turned in the proper direction for bringing all of the cut-away portions of the tumblers in a line with one another for allowing the bolt to be withdrawn from its locked position the bolt is withdrawn to its full extent or movement by turning the dial in either direction, said dial also operating as a knob for the door in opening the latter after the bolt has been released from its locked position. In the modification last referred to the device for automatically turning the third tumbler is also somewhat modified, a spring 34 being employed, one end of which is attached to the section 6 of the bolt and having a lug or hook 35 formed on the free end of the same, which is adapted to cooperate or be received by a correspondingly-shaped recess formed in the edge or periphery of said tumbler for turning the latter in a similar manner or that described in the preceding illustrations, it being observed, however, that the reduced inner end of the bolt must slightly enter the cut-away portions of the tumblers before the free end of the spring 34 contacts with the periphery of the tumbler; otherwise the same would be turned out of position, and thus prevent the bolt from being withdrawn.

The spring hook-shaped arm 26, it will be noticed, is secured to the fence-section 6 of the bolt, and hence is moved into engagement with the pin 27 only when the fence-section is operated. The movement of the latch-section 7 does not therefore effect engagement between the arm 26 and pin 27, such engagement and the subsequent disconcerting of the tumblers only occurring after the tumblers have been set preparatory to the operation of the fence-section 6.

It will be observed by reference to the drawings, particularly Figs. 3 and 13 thereof, that the spindle 19, through its rigid engagement with a disk or tumbler 3, holds such disk ra-

dially immovable in a concentric position relative to the casing. The other disks or tumblers 3' and 3'', however, loosely surround the spindle and screw 22 owing to their central apertures being larger than the octagonal inner end of the spindle and also larger than the screw 22. These disks 3' and 3'' fall by gravity to and rest upon the inner periphery of the casing, the interior diameter of the casing being slightly greater than the diameter of the disks. This construction is important, as it prevents the combination being detected by sensitizing the lock—that is, holding the inner end of the bolt against the peripheries of the disks or tumblers while they are turned, and thereby locating the cut-out portions in the disks as they pass the end of the bolt. When disks or tumblers of the same size are all held radially immovable relative to the spindle and casing, a combination may be discovered in the manner described; but in my lock this is impossible, as the inner end of the bolt when forced against the tumblers as the pointer is turned will be partially received by the cut-away portion 4 of the disk 3, which will prevent further rotation of the spindle. In this action the end of the bolt will engage the peripheries of the other tumblers 3' and 3'' and will force them out of their normal position toward the side of the casing opposite the bolt, this movement of the tumblers 3' and 3'' being permitted by the radial play of such tumblers around the spindle owing to their loose engagement therewith above described. It is therefore impossible to locate the cut-away portions in the tumblers 3' and 3'', and consequently impossible to bring the cut-away portions of all the tumblers into register with each other in this manner. While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts, and a substitution of equivalents, as circumstances may suggest or render expedient, without departing from the spirit of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a rotary tumbler-lock, the combination with a bolt, of a rotary spindle, a disk fixed to said spindle, and radially-movable tumblers surrounding said spindle and rotated thereby, substantially as described.

2. In a rotary tumbler-lock, the combination with a spindle thereof, of a rotatable disk rigidly fixed to the spindle, radially-movable tumblers adapted to be rotated by said spindle, and a casing surrounding said disk and tumblers and supporting the lower peripheries of the latter, substantially as described.

3. In a lock, the combination with a spindle, tumblers rotated thereby, a bolt, a spring for operating the latter in one direction, a rotatable index-plate, a pointer on said spindle

registering with said index-plate, and means connecting the said index-plate with said bolt whereby the latter may be actuated by the former or independently thereof in a direction to compress the spring, substantially as described.

4. In a lock, the combination with a spindle, tumblers moved thereby, a movable index-plate, and a bolt actuated by or independently of said index-plate, substantially as described.

5. In a keyless lock, the combination with a bolt having a fence-section, tumblers, and a flexible device secured to said fence-section and operating laterally to the face of a tumbler to engage therewith for automatically disconcerting said tumblers, substantially as described.

6. In a keyless lock, the combination with a bolt having a fence-section, tumblers with which the fence-section coöperates, a suitable device operating laterally to the face of the tumblers for automatically disconcerting said tumblers, substantially as described.

7. In a lock, a suitable bolt, tumblers with which the same coöperates, a movable index-plate for operating the bolt, and a pointer passing through said index-plate for operating said tumblers, as and for the purpose described.

8. In a lock, a suitable bolt, tumblers with which the same coöperates, a rotatable index-plate for operating the bolt in one direction, a spring for actuating the bolt in the opposite direction, and a pointer passing through said index-plate for operating the tumblers, as and for the purpose described.

9. In a lock, a suitable index-plate, a pointer passing through the same and coöperating with suitable tumblers, a bolt composed of two sections coöperating with one another, a spring interposed between the casing of the lock and the free section of the bolt, a knob carried by the free section whereby the same may be operated independently of the inner section, and suitable means for actuating the latter section, as and for the purpose described.

10. In a keyless lock, the combination with a bolt, of a casing, a plurality of tumblers, a rotatable spindle the end of which passes through and rigidly engages one of said tumblers, the other of said tumblers being supported by said casing, and means for adjusting the relation between the spindle and the tumbler with which it rigidly engages to change the combination of the lock, substantially as set forth.

11. In a lock, the combination with a bolt, of a suitable casing, tumblers located therein, one of which is provided with a polygonal central opening, a suitable index-plate, a pointer adapted to register with the latter, a spindle forming a part of said pointer and having a polygonal-shaped portion that is adapted to be received by the correspondingly-shaped opening in one of the tumblers, a screw loosely

passing through the casing and the other tumblers, which are supported by the casing, and into a screw-threaded hole in the inner end of the spindle, whereby said spindle may be
5 adjusted in its relation to the tumbler with which it rigidly engages to change the combination of the lock, substantially as described.

12. In a keyless lock, the combination with
10 suitable tumblers, of a bolt comprising a fence-section and a latch-section and a hook-shaped spring-arm fixed at one end to said fence-section and operating laterally to the face of the tumblers to engage with and displace one or
15 more of said tumblers, substantially as described.

13. In a keyless lock, the combination with a bolt, of tumblers, a device for setting the tumblers, and a single movable member adapt-

ed to retract the bolt and to register with the
20 device for setting the tumblers, substantially as described.

14. In a keyless lock, the combination with suitable tumblers, of a bolt comprising a fence-section and a latch-section, a hook-shaped
25 spring-arm rigidly fixed to said fence-section, and adapted to engage a notch formed in the periphery of one of said tumblers, whereby the tumblers may be relatively moved and the combination disconcerted, substantially
30 as described.

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

CHARLES F. KELLER.

Witnesses:

GEO. L. LAVERY,
R. S. NORMAN.