

O. W. BEDELL.

LOCK.

APPLICATION FILED FEB. 19, 1908.

Patented Sept. 10, 1912.

3 SHEETS—SHEET 1.

1,038,268.

Fig. 1,

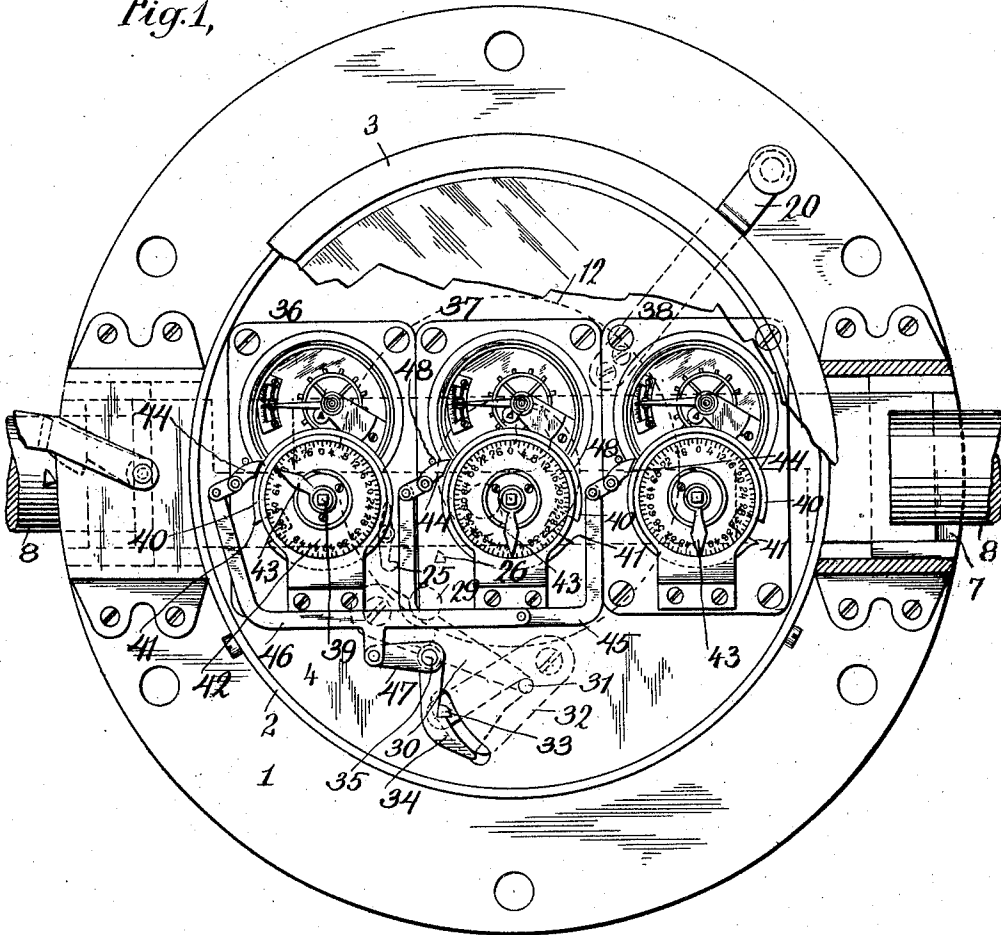
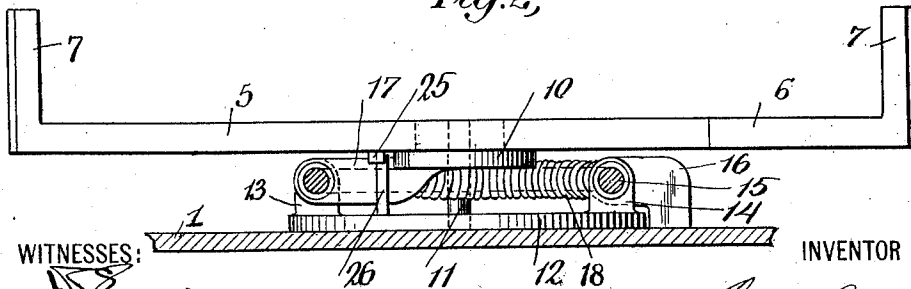


Fig. 2,



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3 SHEETS—SHEET 3.

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Fig. 5,

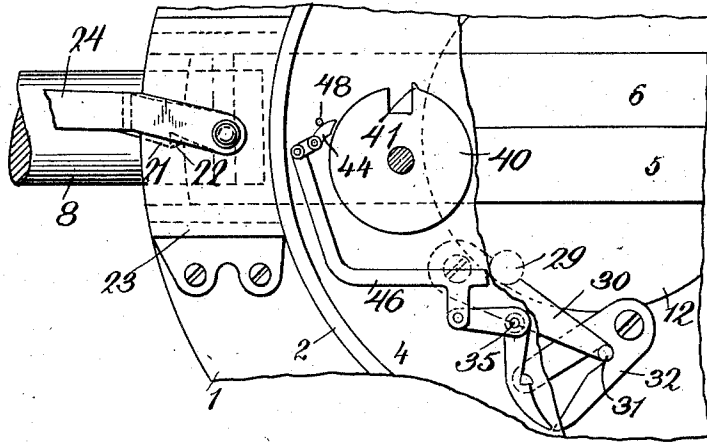
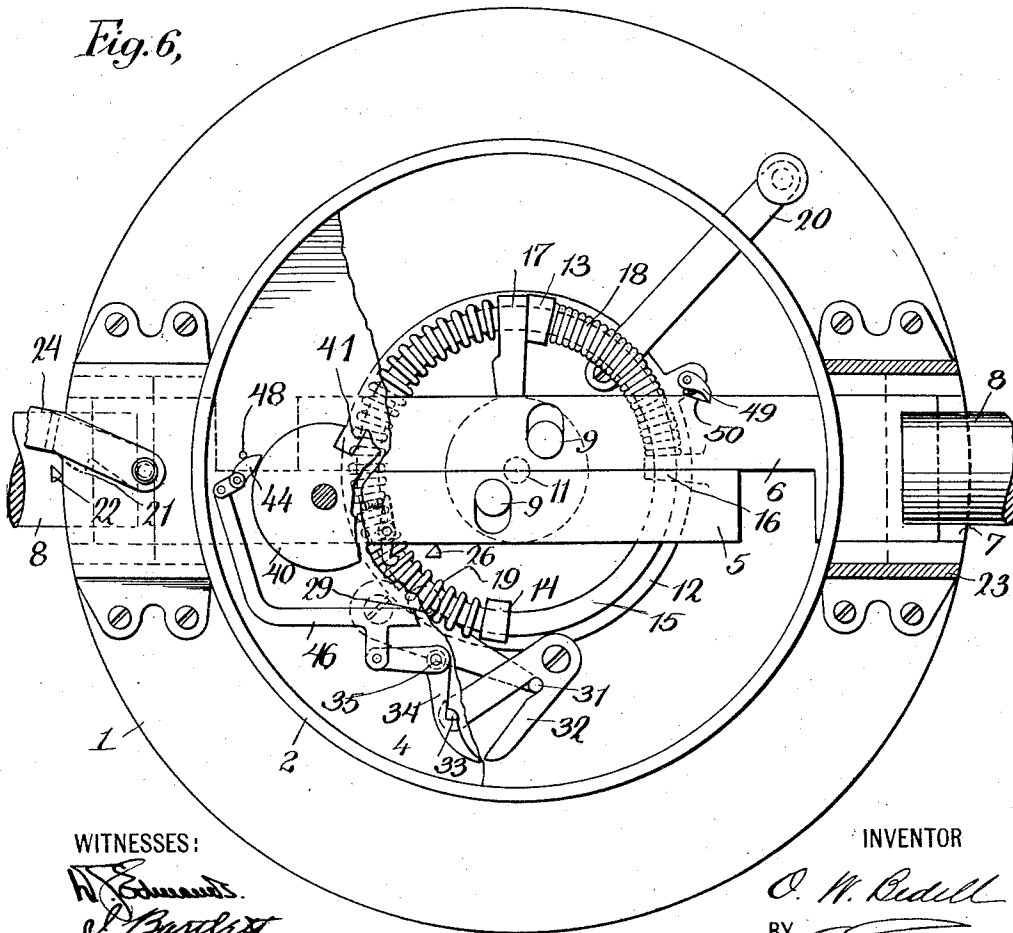


Fig. 6,



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LOCK.

1,038,268.

Specification of Letters Patent.

Patented Sept. 10, 1912.

Application filed February 19, 1908. Serial No. 416,654.

To all whom it may concern:

Be it known that I, ORLANDO W. BEDELL, a citizen of the United States, residing in the city of New York, county of Richmond, and State of New York, have invented certain new and useful Improvements in Locks, of which the following is a specification.

This invention relates to locks and has reference more particularly to time-locks adapted for locking the doors of safes, vaults and the like.

The invention is directed to the provision of a time-lock of an improved construction having, in the preferred embodiment, a plurality of time-mechanisms any one of which may operate to unlock the door.

One object of the invention is to so construct the lock as to secure greater convenience in positioning the parts in the operative relation, and to this end my improved lock is so arranged that certain of the parts may be moved to the positions in which they are held by the time mechanisms and will be held mechanically in those positions so that the operator is relieved of the duty of holding them manually while setting the time mechanisms; thus, certain of the parts may be moved into positions for exerting a tension on the locking bolts to actuate them in which positions they are to be held by the time mechanisms until the predetermined time and while the time mechanisms are being set so as to place the movements of these parts under their control, the parts will be temporarily held mechanically by means independent of the time mechanisms which means is subsequently released.

Another object of the invention is to so improve the construction as to obtain greater reliability of operation, and one way by which this is accomplished is by precluding the setting of the time-mechanisms except when the locking devices have been moved to the positions in which they are to be held by the time-mechanisms and the parts connected thereto; thus the setting of the time-mechanisms must always result in making the operation of the locking devices subject to the control of the time-mechanisms in the desired manner.

A further object of the invention is to

provide connecting devices between the time-mechanisms and the locking devices of an improved construction, these connecting devices being such that they are held against movement except when the corresponding time-mechanism is in a definite position so that a connection, known as a "dead-lock," is provided which eliminates the danger of the lock operating to release the door when the safe is subjected to a blow as with a heavy hammer or an explosive.

One embodiment of my invention is illustrated in the accompanying drawings in which—

Figure 1 is a front view of the lock, Fig. 2 is a detail view partly in section of a portion of the operating mechanism, and Figs. 3, 4, 5 and 6 are diagrammatic face views of the lock, illustrating different positions of the parts.

Referring to these drawings, 1 indicates a base-plate on which is mounted a cylindrical casing 2 provided with a hinged cover 3 and within casing 2 is mounted a plate 4 parallel to and spaced apart from the plate 1. Two locking members 5 and 6 lie side by side and are adapted to be moved toward and away from each other to effect the locking and unlocking of the door; these members extend between the plates 1 and 4. The movement of members 5 and 6 may be arranged to lock and unlock the door in any suitable manner; in the drawings I have shown each member as provided with an up-turned end 7 which is received in a recess in a bolt 8 movable in suitable guides on the door to cause its end to enter or be withdrawn from an opening in the door-jamb. The movement of members 5 and 6 toward and away from each other is effected by studs 9 each entering a slot in one of the members and extending upward from a disk 10 which directly underlies the members 5 and 6 and which is adapted to be turned back and forth through an angle of about ninety degrees on a central stub-shaft 11. Adjacent to disk 10 and also mounted on stub-shaft 11 is a larger disk 12, this being here shown as resting on plate 1. On this disk are two standards 13 and 14 which support a ring 15. Rising from

the base 1 is a standard 16 having an opening therethrough through which ring 15 passes loosely. On disk 10 is a projecting arm 17 having an opening through its end through which ring 15 passes loosely. A spring 18 is coiled on ring 15 between standards 13 and 16, and a spring 19 is coiled on ring 15 between standard 14 and arm 17. A handle 20 is fixed to disk 12 and projects through a slot in casing 2. In the positions of the parts shown in Figs. 2 and 3, springs 18 and 19 are extended and disks 10 and 12 are in such positions that standard 14 is in engagement with standard 16 and standard 13 is in engagement with arm 17; but by turning disk 12 by means of handle 20, springs 18 and 19 may be compressed, the former between standards 13 and 16 and the latter between standard 14 and arm 17, as shown in Fig. 4.

When the parts are in the positions in which they are shown in Fig. 4, movement of arm 17, disk 10, studs 9 and members 5 and 6 under the influence of spring 19 is precluded by a latch 21 coacting with a stud 22 on one of the bolts 8. This latch is pivotally mounted on a casing 23 which guides member 5 and its bolt 8 in their movement. Fixed to the stub-shaft which passes through casing 23 and which carries latch 21 is an arm 24 adapted to coact with a fixed part on the door-jamb to release the latch. When disk 12, standards 13 and 14, ring 15 and springs 18 and 19 are moved as above described from the Fig. 3 to the Fig. 4 position, they are held mechanically in that position against retraction to their former positions shown in Fig. 3 under the influence of springs 18 and 19 by a latch 25 pivotally mounted on the under side of member 5 and coacting with a stud 26 on disk 12; a spring 27 acts on latch 25 to turn it on its pivot to operative position where it is stopped by a stud 28. When arm 24 is operated to cause latch 21 to release stud 22, spring 19 turns disk 10 on stub-shaft 11, causing studs 9 to move the locking members 5 and 6 away from each other to carry the bolts 8 to locking position, this position of the parts being shown in Fig. 6, and the movement of member 5 causes latch 25 to release and move away from stud 26.

On disk 12 is a pin 29 adapted to be received in a depression in the edge of a lever 30 pivoted on base 1 and carrying a pin 31 at its free end. This pin 31 enters the notch in a bifurcated lever 32 also pivotally mounted on plate 1 and carrying a pin or stud 33 at its free end. Stud 33 extends upwardly through a slot in plate 4 and is engaged by a latch 34 secured to a sleeve pivotally mounted on a post 35.

Mounted on plate 4 are a plurality of

time-mechanisms of any suitable construction, three being shown in the present instance at 36, 37 and 38. Each of these mechanisms is arranged to drive a shaft 39 on which is mounted a disk 40 having a notch cut in its periphery and a lip 41 at the rear edge of the notch. Overlying the disk 40 is a dial 42 mounted on the face-plate of the mechanism and suitably marked to indicate hours of time. Above the dial 42, shaft 39 carries an index 43 and the end of the shaft is squared to permit turning it and the index 43 and disk 40 in a clockwise direction independently of the mechanism, such independent movement being permitted by a ratchet and pawl mechanism of the usual construction. Pivotally mounted on the face-plate of each time-mechanism adjacent to the disk 40 thereof is a lever 44 the end of which is adapted to be engaged by the lip 41 to turn the lever on its pivot, the end of the lever entering the notch in disk 40. The outer ends of the levers 44 of the time-mechanisms 37 and 38 are pivotally connected to the ends of a link 45. The outer end of the lever 55 of the time-mechanism 36 is pivotally connected to one end of a link 46, the other end of which is pivotally connected to the link 45 at about the middle of the latter. On link 46 is an offset which is pivotally connected to the free end of a crank 47 secured on the sleeve which carries the latch 34. Excessive movement of the levers 44 and links 45 and 46 is prevented by studs 48 mounted behind the levers 44 on the face-plates of the time-mechanisms. The shape of the latch 34 is preferably that shown in the drawings, that is, beyond the shoulder which engages stud 33 to hold the latter, the latch is extended and its edge curved to correspond to the path of movement of the stud for a purpose hereinafter pointed out.

Pivotally mounted on disk 12 is a detent 49 which when the parts are in the Fig. 3 position is inoperative but which in the movement of the disk to the Fig. 4 position is carried around till it bears on the edge of member 6. In the edge of this member is a notch 50 and when the member is moved outwardly the detent 49 drops by gravity into this notch as shown in Fig. 6 to preclude backward movement of the member by compressing spring 19 in other than the intended manner. Excessive turning movement of detent 49 is prevented by a stop 51 on disk 12.

The lock is adapted to be secured to the inner side of a circular door of a safe, the door being arranged to be swung on pivots to the closed position and then turned on its axis to lock it. Fig. 3 shows the parts in the unlocked or inoperative position ready to be set for locking the door. The bolts 8 have

been drawn in by the members 5 and 6, the latch 21 extends over the stud 22, the springs 18 and 19 are extended and the stud 33 has been released by latch 34; also, the time-mechanisms are all at the zero positions, the ends of the levers 44 entering the notches in the disks 40. To set the lock, the handle 20 is first turned to turn disk 12 until the stud 26 is caught by the spring-positioned latch 25, whereupon the handle 20 may be released and the disk will be held by the latch. As the disk 12 turns, the standards 13 and 14 thereon are turned and the springs 18 and 19 thereby compressed; also, pin 29 on disk 12 is turned until it enters the depression in the edge of lever 30 and acts on the lever to turn it on its pivot, carry the pin 31 thereon to the crotch of the bifurcation in lever 32 and turn lever 32 slightly until the pin 33 thereon is opposite the shoulder on the latch 34. The parts are then in the positions shown in Fig. 4. The time-mechanisms are then set by applying a key to the squared ends of the shafts 39 and turning those shafts until the indices 43 are in the desired positions relatively to their dials. In turning shafts 39 thus, disks 40 are turned with them and the levers 44 are turned on their pivots until their inner ends are out of the notches in the disks 40. As the last one of the time-mechanisms is positioned thus, the crank 47 will be moved downwardly enough to turn latch 34 to the position in which the shoulder thereon takes under the stud 33. This relation of the parts is shown in Fig. 5. The door is then moved to the closed position and turned on its axis to lock it. This turning movement carries arm 24 into engagement with a fixed abutment on the door-jamb (not shown) and causes relative movement of latch 21 fixed to arm 24 and stud 22 on bolt 8. At this time spring 19 is under compression between the parts on the disks 12 and 10, disk 12 is held against movement by latch 25 and disk 10 is held against movement by stud 9, member 5 and latch 21; but as soon as latch 21 releases stud 33, disk 10 is released and spring 19 turns arm 17, disk 10 and studs 9 about shaft 11 and the studs move the locking members 5 and 6 and the bolts 8 connected thereto outwardly until they coact with the door-jamb to lock the door. This position of the parts is shown in Fig. 6. When member 6 is moved outwardly thus, detent 49 drops into notch 50 so that the members 5 and 6 and the bolts 8 are positively held against backward movement in other than the intended manner; also, when member 5 moves outwardly, the latch 25 mounted thereon is carried out of engagement with stud 26 on disk 12 so that the disk is held in position solely by the latch 34 and the time-mechanisms.

When any one of the time-mechanisms approaches the zero position, the lip 41 on the disk 40 thereof will engage the end of the lever 44 corresponding thereto, rock that lever and, through the links 45 and 46 and crank 47, operate latch 34 to release stud 33. This will occur regardless of which one of the time-mechanisms reaches the zero position first as the lever of time mechanism 36 will raise one end of link 46 and the lever of either of the time mechanisms 37 and 38, operating through link 45, will raise the other end of lever 46. When pin 33 is thus released, spring 18 acts on standard 13 to turn disk 12 back to its original position and standard 13 carries with it the arm 17, disk 10 and studs 9, the parts then moving from the Fig. 6 to the Fig. 3 position; the movement of disk 12 withdraws detent 49 from notch 50 and the movement of studs 9 draws members 5 and 6 and bolts 8 inwardly until the bolts disengage the door-jamb and the door is unlocked. The parts are then in the Fig. 3 position again except that latch 21 remains out of engagement with stud 22 until the door is turned on its axis to permit opening it, whereupon the arm 24 falls by gravity until latch 21 is in coaction with stud 22.

The latch 25 on the member 5 is of considerable utility since it constitutes a mechanical means for holding the springs under compression to furnish the power for operating the members 5 and 6 and the bolts 8 in both directions while the operator is setting the time-mechanisms. This setting of the time-mechanisms requires the exercise of considerable care and improper setting is much more apt to occur if the operator must hold the disk 12 in the position to which he has moved it to compress springs 18 and 19 and move pin 33 to position to be engaged by latch 34, while setting the time-mechanisms.

The locking of disk 12 by latch 25 is effected automatically, as is also the releasing of the disk by the latch after the time-mechanisms have been set and the locking members 5 and 6 moved outwardly to locking position. The shape of latch 34 is such that the time-mechanisms can only be set when pin 33 is in position to be engaged by the latch; for if it were attempted to set the time-mechanisms when pin 33 is in the position shown in Fig. 3, the turning of shaft 39 would be obstructed, since the lever 44 could not turn enough to carry its end out of the notch in the disk 40 owing to the fact that pin 33 precludes turning movement of latch 34. If latch 34 were not extended below its latching shoulder as shown, the time-mechanisms could be set with pin 33 in the Fig. 3 position, the end of the latch moving

in above the pin instead of below it, and imperfect operation would result. The notched disks 40, the pivoted levers 44 co-acting therewith and the links 45 and 46 constitute a positive connection between the time-mechanisms and the latch 34 which is quite simple in construction and reliable in operation, this connection being such that each lever 44, and hence the latch 34, is held against movement except when the time-mechanism corresponding to that lever is in a definite position, that is, the position for permitting opening of the safe.

Having now described my invention, what I claim as new therein and desire to secure by Letters Patent is as follows:—

1. In a lock, a movable locking member, operating means connected thereto for moving the member to unlocking position, a time mechanism for controlling the movement of said member to unlocking position, a holding device for holding said operating means while setting said time mechanism, and releasing mechanism acting independently of the time mechanism for causing the holding device to release said operating means, substantially as set forth.

2. In a lock, a movable locking member, operating means connected thereto for moving the locking member to unlocking position, a plurality of time mechanisms controlling the movement of said member to unlocking position one independently of another, a holding device for holding said operating means while setting said time mechanisms, and releasing mechanism acting independently of the time mechanisms for causing the holding device to release said operating means, substantially as set forth.

3. In a lock, a movable locking member, operating means connected thereto for moving the member to unlocking position, a plurality of time mechanisms independently controlling the movement of said member to unlocking position, a holding device for holding said operating means while setting said time mechanisms, and releasing mechanism actuated automatically and independently of the time mechanisms when said member is moved to locking position for causing the holding device to release said operating means, substantially as set forth.

4. In a lock, a movable locking member, operating means connected thereto for moving the member to locking and unlocking positions, a movable device for holding the member against movement to locking position, a time mechanism for controlling the movement of said member to unlocking position, and a movable holding device for holding said operating means while setting said time mechanism, said holding device being

operable to release said operating means and permit it to be held by the time mechanism, substantially as set forth.

5. In a lock, a movable locking member, operating means connected thereto for moving the member to locking and unlocking positions, a movable device for holding the member against movement to locking position, a plurality of time mechanisms independently controlling the movement of said member to unlocking position, and a movable holding device for holding said operating means while setting said time mechanisms, said movable holding device being operable to release said operating means and permit it to be held by the time mechanisms, substantially as set forth.

6. In a lock, a locking-member movable between locking and unlocking positions, means for moving the same, a time-mechanism controlling the movement of said member from locking to unlocking position by holding the member against movement actuated by said means, and a releasable holding device independent of and additional to said time-mechanism for holding said moving means against movement, substantially as set forth.

7. In a lock, a locking member adapted to be moved to locking and unlocking positions, a spring for moving said member from locking to unlocking position, and two releasable holding devices for holding said spring under tension, one of said devices being a time-mechanism adapted to release said spring at a predetermined time and the other of said devices having its operation independent of that of said time-mechanism, substantially as set forth.

8. In a lock, a locking member adapted to be moved from locking to unlocking position, a spring for moving said member to unlocking position, and two releasable holding devices for holding said spring under tension, one of said devices consisting of a plurality of time-mechanisms any one of which is adapted to release said spring at a predetermined time to permit it to move said member to unlocking position and the other of said devices having its operation independent of that of said time-mechanisms, substantially as set forth.

9. In a lock, a movable locking member, a spring for moving the member in one direction, a second spring for moving the member in the opposite direction, a time-mechanism for holding one of said springs under tension, a releasable holding device independent of said mechanism for holding said last mentioned spring under tension, and a movable device for holding the other of said springs under tension, substantially as set forth.

10. In a lock, a movable locking member, a spring for moving the member in one direction, a second spring for moving the member in the opposite direction, a plurality
5 of time-mechanisms for holding one of said springs under tension, any one of said mechanisms being adapted to release said spring, a releasable holding device independent of said mechanisms for holding said last mentioned spring under tension, and a movable
10 device for holding the other of said springs under tension, substantially as set forth.

11. In a lock, a movable locking member, a spring for moving the member in one
15 direction, a second spring for moving the member in the opposite direction, a releasable holder for holding said first spring under tension, and a movable device for holding said member against movement caused
20 by said second spring, the movement of said member caused by said second spring when released by said movable device rendering said holder inoperative, substantially as set forth.

25 12. In a lock, a movable locking member, a spring for moving the member in one direction, a second spring for moving the member in the opposite direction, a plurality of time-mechanisms for holding said mem-
30 ber against movement caused by said first spring, any one of said mechanisms being adapted to release the member, a releasable holder independent of said mechanisms for holding said first spring under tension, and
35 a movable device for holding said member against movement caused by said second spring, the movement of said member caused by said second spring when released by said movable device rendering said independent
40 holder inoperative, substantially as set forth.

13. In a lock, a movable locking member, a spring for moving the member in one direction, a second spring for moving the member in the opposite direction, a time-
45 mechanism for holding said member against movement caused by said first spring and releasing the member at a predetermined time, a holder independent of said time mechanism
50 for holding said first spring under tension while setting the time-mechanism, and a movable device for holding said member against movement caused by said second spring, said holder for said first spring being
55 rendered inoperative by the movement of said locking member caused by said first spring, substantially as set forth.

14. In a lock, a movable locking member, operating means connected thereto for moving the member to unlocking position, a
60 time-mechanism, a detent device for holding the member against movement to unlocking position including a latch controlled by said

mechanism and a part coacting therewith, a holder independent of said time mecha- 65
nism for holding said operating means and part in position while setting said time-mechanism to carry said latch into coaction with said part, and means for rendering
70 said holding means inoperative, substantially as set forth.

15. In a lock, a movable locking device, means for moving the same, a time mechanism, a member moved by said time mechanism when setting the same to place the
75 time mechanism in control of the movement of said locking device, and a stop device which precludes setting of the time mechanism except when such setting will place
80 said moving means under the control of the time mechanism, substantially as set forth.

16. In a lock, a movable locking member, a spring for moving the same to unlocking position, means for holding said spring under
85 tension, a time mechanism for holding said member against movement to unlocking position and releasing the member at a predetermined time, and a stop device for preventing the setting of said mechanism except when such setting will result in hold-
90 ing said member against movement to unlocking position, substantially as set forth.

17. In a lock, a movable locking member, a time-mechanism for holding said member in one position and releasing it at a prede- 95
termined time, and connections between said mechanism and member including a latch and a part coacting therewith, said latch being shaped to prevent setting said time-mechanism except when said member is in
100 the position in which it is to be held by said mechanism, substantially as set forth.

18. In a lock, a movable locking member, three time mechanisms for holding the same in locking position and releasing it at a pre- 105
determined time, and connections between said member and mechanisms including a lever pivotally mounted adjacent to each of said mechanisms, a part operated by each mechanism adapted to engage the lever cor- 110
responding thereto and rock the same, a link connecting two of said levers, a second link connected to said link and to said third lever, a latch, and a connection between said
115 second link and said latch, substantially as set forth.

19. In a lock, a movable locking member, a time-mechanism for holding the member and releasing it at a predetermined time, connections between said mechanism and 120
member including a latch and a part adapted to be held thereby, and a movement-limiting device for positively preventing the setting of said mechanism except when said part is in position to be held by said latch, 125
substantially as set forth.

20. In a lock, a movable locking member, means for moving the same, a plurality of time-mechanisms for controlling the movement of said member, any one of said mechanisms being adapted to release the member at a predetermined time and permit movement thereof, a stop device for positively preventing the setting of said time-mechanisms except when such setting will place

said moving means under the control of said mechanisms, substantially as set forth. 10

This specification signed and witnessed this 17th day of February, 1908.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."