June 16, 1925. 1,542,358

D. H. BELLAMORE

COMBINED KEY AND COMBINATION LOCK

Filed Nov. 3, 1923 2 Sheets-Sheet 1

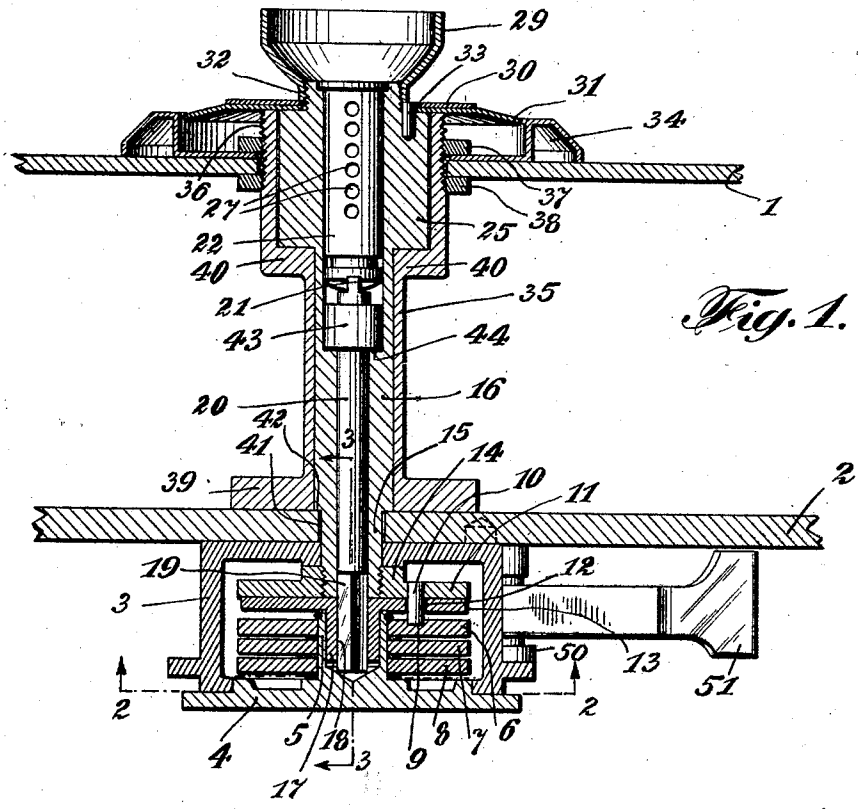

Fig. 1.

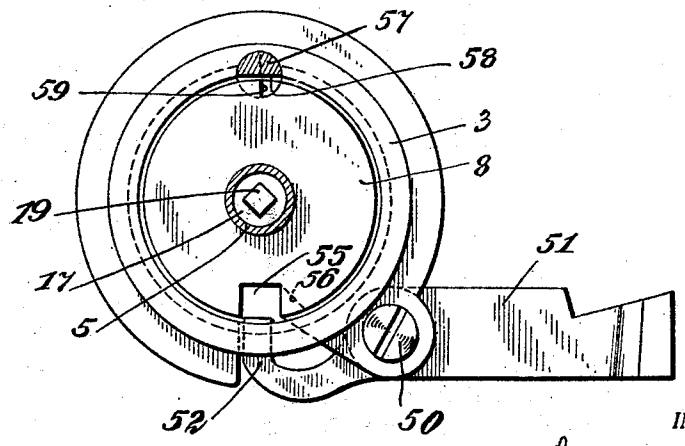

Fig. 2.

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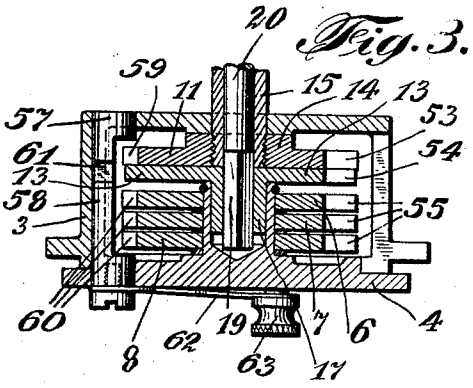

Fig. 3.

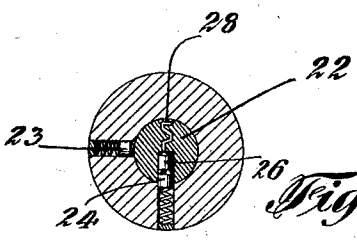

Fig. 5.

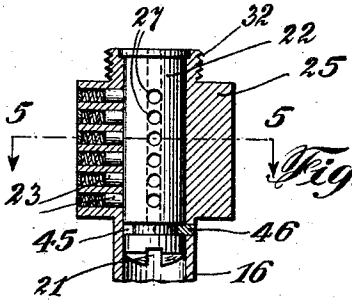

Fig. 4.

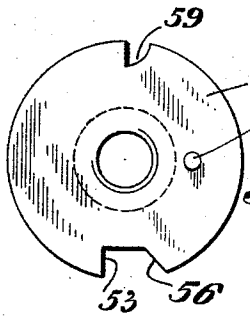

Fig. 6.

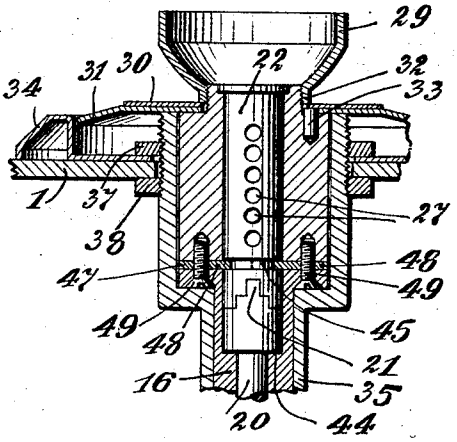

Fig. 9.

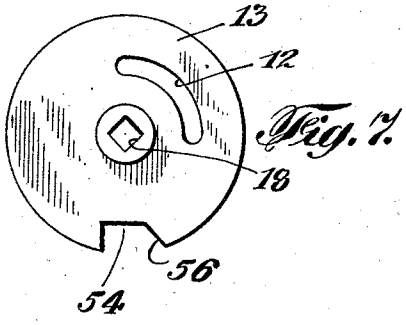

Fig. 7.

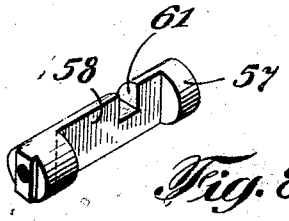

Fig. 8.

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UNITED STATES PATENT OFFICE.

DAVID H. BELLAMORE, OF NEW YORK, N. Y., ASSIGNOR TO THE MOSLER SAFE COMPANY, OF HAMILTON, OHIO, A CORPORATION OF NEW YORK.

COMBINED KEY AND COMBINATION LOCK.

Application filed November 3, 1923. Serial No. 672,464.

To all whom it may concern:

Be it known that I, DAVID H. BELLAMORE, a citizen of the United States, and residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Combined Key and Combination Locks, of which the following is a specification.

This invention relates to locks of the combined key and combination type, and it is the principal aim of this invention to provide a lock which may be used as a plain key lock, and which may also be used as a plain combination lock, and one which may be used as a combination lock, subject, however, to control by a key.

A further object of this invention is to provide a combined key and combination lock which may be adjusted readily and easily from a plain combination lock to a key lock, and vice versa, and one which may be adjusted readily and easily from a plain combination lock to a combination lock which is controlled by a key, and vice versa, and one which may be readily and easily adjusted from a plain key lock to a combination lock controlled by a key, and vice versa.

Another object of my invention is to provide a lock which is readily and easily mountable in a wall or the like in such a way that it may not be readily removed therefrom or rendered inoperative by an unauthorized person, and one which will effectively resist attempts to drive the lock inwardly from the outside of the wall.

Another object of my invention is to provide a lock of the character described which is simple and durable, and efficient in operation.

Other objects of this invention will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In accordance with my invention, the lock comprises a plurality of tumblers operable either from a combination knob and dial, or from a key tube, which is preferably arranged concentric with the combination knob and dial. Separate mechanism for actuating the tumblers from the key tube and combination knob is provided, but provision is made whereby the lock may be adjusted, so that the lock may be locked and unlocked by appropriately manipulating the combination dial and knob alone, and whereby the lock may be adjusted so that it may be locked and unlocked by means of an appropriate key operating in the key tube, and adjustable means are also provided for connecting the key lock mechanism with the combination mechanism, so that the combination dial may not be manipulated to unlock the lock unless the key lock mechanism has first been properly adjusted by means of a key operating in the key tube. The arrangement is such that the ready and easy adjustment of the lock into the various conditions above referred to may be manually accomplished, some from the inside of the wall on which the lock is mounted.

In order that a clearer understanding of my invention may be had, attention is hereby directed to the accompanying drawings, forming a part of this application and illustrating certain possible embodiments of my invention.

Referring to the drawings:

Fig. 1 is a sectional view through the lock;

Fig. 2 is a sectional view of the lock, and is taken on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view of a portion of the lock, and is taken on the line 3—3 of Fig. 1;

Fig. 4 is a sectional view of a portion of the lock, showing displaceable means for connecting a part of the key lock mechanism to a part of the combination lock mechanism;

Fig. 5 is a sectional view of a detail of the lock, and is taken on the line 5—5 of Fig. 4;

Fig. 6 is a top plan view of the combination lock drive tumbler;

Fig. 7 is a top plan view of the key lock drive tumbler;

Fig. 8 is a perspective view of an adjustable latch member for releasably maintaining certain of the tumblers in predetermined alignment; and

Fig. 9 is a sectional view of a fragment of the lock mechanism, showing the modified form of construction.

Similar reference characters refer to simi-

lar parts throughout the several views of the drawings.

Referring to the drawings, the lock is shown mounted upon a wall, such as is usually found in doors of safes, safe cabinets and the like, this wall including outer metallic wall 1 and inner metallic wall 2. A suitable tumbler casing 3 is secured to the inner side of wall 2. Casing 3 may be provided with a cover 4, providing a hollow annular arbor 5, about which a plurality of combination tumblers 6, 7 and 8 are rotatably nested, the upper tumbler 6 having a recess 9, in which is engaged a drive pin 10 extending from the combination lock drive tumbler 11 through an elongated slot 12 provided in the key lock tumbler 13, which is mounted intermediate the tumblers 6 and 11. The combination tumbler 11 has a hub 14 in engagement with the lower end 15 of combination lock spindle 16. The key lock tumbler 13 has a hub 17 seated for rotation within the hollow of the arbor 5, and has a square central aperture 18, in which engages the squared lower end 19 of the key lock spindle 20. Key lock spindle 20 extends through a central bore in the combination spindle 16. With the upper end of spindle 20, as by means of tongue and groove connections, such as 21, is connected the rotating cylinder 22 of the key lock, which is of the pin tumbler type, having two sets of pin tumblers 23 and 24 carried in appropriate recesses in the enlarged upper end 25 of spindle 16, and having another set of pin tumblers 26 mounted in suitable recesses 27 in the key cylinder 22, so that the key cylinder 22 can be rotated with respect to the combination lock cylinder 16, and may be locked in either one of two different positions with respect thereto by means of an appropriate key operating in key slot 28. Key slot 28 is exposed in the center of combination knob 29, which knob, together with name plate 30 and combination dial 31, is suitably secured to the threaded top of combination spindle 16, as by means of cooperating threads 32 and pin 33. In conjunction with dial 31, a co-acting dial 34 is secured to the outside of the wall plate 1. Preferably, a protection tube 35 is provided about the spindle 16, having its upper end threaded, as at 36, and secured by washers 37 and 38, engaging the threads at the front and rear of the wall plate 1. The inner end of cover member 35 is preferably enlarged, as at 39, and is there suitably secured to the outer surface of wall plate 2. The construction of the parts is such that the enlarged upper portion 25 of the spindle 16 is abutted by shoulders 40 provided by cover tube 35. The inner end of spindle 16 is reduced, as at 15, where it extends through the aperture 41 in the plate 2, to provide shoulders 42, which come against the outer surface of wall 2. Thus, both the shoulders 40 and the wall plate 2 prevent the spindle 16 from being driven inwardly of the walls. To prevent the spindle 20 being driven inwardly of the spindle 16, the spindle 20 is provided with an enlarged portion 43, which is abutted on the rear by shoulders 44 provided by spindle 16.

In order to prevent removal of key cylinder 22, it is provided with an annular recess 45, in which is engaged a semi-circular key 46 carried on spindle 16. Another method of accomplishing this object may include the severing of the spindle 16, as at 47 (Fig. 9), and incorporating between the two parts of the spindle two semi-circular keys 48, which extend into the key cylinder recess 45. The two parts of the spindle 16 and the keys 48 may be held in place by screws 49.

Adjacent the tumbler casing 3 is pivoted, as at 50, a trigger 51, which is adapted to be moved into and out of dogging position with respect to bolt work, or the like, in response to the operation of the lock. Trigger member 51 is provided with a finger portion 52 presented radially toward the edges of all the tumblers, and the tumblers are provided on their peripheries with suitable notches, such as 53, 54 and 55, into which finger 52 may move to assume unlocked position. Each of these notches has one side beveled or slanted, as at 56, so that, by turning one or more of the tumblers, the trigger may be cammed out into locking position. Rotatably mounted in tumbler casing 3 is a latch member 57, having a main eccentric portion 58, which is movable upon rotation of member 57 into and out of engagement with suitable notches 59 and 60 provided in tumblers 11, 6, 7 and 8. The cam portion 58 is itself notched, as at 61, so that its adjustment is not interfered with by tumbler 13, which is not provided with a notch corresponding with the notches 59 and 60. A suitable arm 62 and knob 63 may be attached to member 57, whereby latch 57 may be adjusted into and out of locking engagement with the tumblers, and suitable arrangement may be made for maintaining member 57 in adjusted position, either frictionally or otherwise, so that it cannot be jarred out of adjusted position.

As will be apparent from the above, the lock consists of a plurality of ordinary combination tumblers 6, 7 and 8, a knob and dial, a drive wheel 11 for operating the tumblers from the knob and dial through the spindle 16 (which, however, comprises the outer member of the key lock), and key lock cylinder 22 or inner member of the key lock, connected by means of spindle 20 to auxiliary drive tumbler 13, which, on account of the engagement of pin 10 in elongated slot 12,

permits rotation of key cylinder 22 and spindle 20 and tumbler 13 through 90° without interfering with the pin 10 of main drive tumbler 11. Therefore, the notch 54 of the auxiliary drive tumbler 13 may be brought into or out of alignment with the notch 53 of drive tumbler 11 by rotating key cylinder 22 within spindle 16 by means of an appropriate key inserted into key slot 28. When notch 54 is adjusted so as to be out of alignment with notch 53 of tumbler 11, the trigger 51 may not be moved into unlocked position by solely operating the combination because, even when the slots 53 and 55 of the main drive tumbler and combination tumblers are in alignment opposite finger 52, the inward movement of this finger will be prevented by auxiliary tumbler 13, whose slot is locked in a position which is out of alignment with the other slots. Therefore, when the lock is in this condition, it is first necessary to adjust key cylinder 22 with respect to spindle 16, and then to properly manipulate the combination to effect the unlocking of the trigger 51. In this adjustment, the lock is a combined combination and key lock.

If the key cylinder 22 has been so adjusted with respect to spindle 16 that the slot in tumbler 13 is in alignment with slot 53 in the main drive tumbler 11, then the lock is operable as a plain combination lock, since slots 53 and 54 will maintain their alignment for all manipulations of the knob 29.

In order to adjust the lock for operation as a plain key lock, it is necessary first to align the slot 59 in tumbler 11 and the slots 60 in the combination tumblers opposite latch 57, and then to throw the latch into engagement with these notches so as to hold tumblers 11, 6, 7 and 8 stationary, with their slots 53 and 55 in alignment and open toward finger 52 of trigger 51. This adjustment leaves tumbler 13 free to be rotated back and forth through 90° by means of an appropriate key operating in key slot 28. Thus, solely by means of the key, the tumbler 13 may be adjusted into or out of locking position, and the trigger 51 may be placed into or out of locking position.

It will also be apparent that, with latch 57 retracted, by merely turning the key while holding the knob stationary, the lock may be conditioned for or prevented from operation solely by the combination. For instance, the lock may be unlocked in the regular way by manipulating the knob alone, and then if for any reason it is desired to lock the lock without disturbing the combination, the knob may be held stationary and the key introduced, turned and removed. The lock is now unlocked as regards the combination but locked as regards the key lock. Any attempt to tamper with this condition will almost surely result in disturbing the combination, and in locking the lock in this regard also. An authorized person, however, may unlock the lock merely by means of a key without needing to bother with manipulating the combination unless the combination has been disturbed in the meantime.

As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What I claim is:—

1. In a lock of the character described, in combination, combination lock mechanism operable from a combination operating member to lock and unlock the lock, and key lock mechanism associated with said combination operating member, said key lock mechanism being operable to lock and unlock the lock and being operable also to prevent or to permit the unlocking of the lock by operation of said combination lock mechanism.

2. In a lock of the character described, in combination, combination lock mechanism, two tumblers associated therewith and movable thereby into and out of locking position, and key lock mechanism operable to adjust said tumblers relatively to each other to permit or to prevent the placing of both said tumblers in unlocking position by the combination lock mechanism, and operable to place one of said tumblers into and out of unlocking position while the other tumbler remains in unlocking position.

3. In a lock of the character described, in combination, a knob, a spindle connected to said knob for rotation therefrom, a key tube, a second spindle connected to said tube for rotation therefrom, and adjustable means for locking said spindles together in various relative positions for simultaneous rotation, whereby said lock may be adjusted for operation from either said knob or from said key tube.

4. In a lock of the character described, in combination, a knob, a spindle connected to said knob for rotation therefrom, a key tube, a second spindle connected to said tube for rotation therefrom, and adjustable means for locking said spindles together in various relative positions for simultaneous rotation, whereby said lock may be adjusted for operation from either said knob or from said key tube, said means comprising tumbler mechanism carried jointly by said two spindles.

5. In a lock of the character described, in combination, a knob, a spindle connected to said knob for rotation therefrom, a key tube,

a second spindle connected to said tube for rotation therefrom, and adjustable means for locking said spindles together in various relative positions for simultaneous rotation, whereby said lock may be adjusted for operation from either said knob or from said key tube, said means comprising a series of pin tumblers carried by one of said spindles and a plurality of cooperating series of pin tumblers carried by the other of said spindles.

6. In a lock of the character described, the combination with a trigger, a plurality of combination tumblers, a combination drive tumbler therefor, and a knob connected with said drive tumbler for working the combination to place said tumblers into and out of locking position, of an auxiliary tumbler for said trigger, and means for placing and for maintaining said auxiliary tumbler in such relative position with respect to said main drive tumbler that whenever said main drive tumbler assumes unlocking position said auxiliary tumbler is in locking position.

7. In a lock of the character described, the combination with a trigger, a plurality of combination tumblers, a combination drive tumbler therefor, and a knob connected with said drive tumbler for working the combination to place said tumblers into and out of locking position, of an auxiliary tumbler for said trigger, and means for placing and for maintaining said auxiliary tumbler in such relative position with respect to said main drive tumbler that whenever said main drive tumbler assumes unlocking position said auxiliary tumbler is in locking position, said means comprising an operable key lock mechanism.

8. In a lock of the character described, the combination with a trigger, a plurality of combination tumblers, a combination drive tumbler therefor, and a knob connected with said drive tumbler for working the combination to place said tumblers into and out of locking position, of an auxiliary tumbler for said trigger, and means for placing and for maintaining said auxiliary tumbler in such relative position with respect to said main drive tumbler that whenever said main drive tumbler assumes unlocking position said auxiliary tumbler is in locking position, said means being adjustable into condition for placing and for maintaining said auxiliary tumbler in such relative position with respect to said main drive tumbler that said two tumblers will move simultaneously into and out of locking position in response to operation of said knob.

9. In a lock of the character described, the combination with a trigger, a plurality of combination tumblers, a combination drive tumbler therefor, and a knob connected with said drive tumbler for working the combination to place said tumblers into and out of locking position, of an auxiliary tumbler for said trigger, means for placing and for maintaining said auxiliary tumbler in such relative position with respect to said main drive tumbler that whenever said main drive tumbler assumes unlocking position said auxiliary tumbler is in locking position, said means being adjustable into condition for placing and for maintaining said auxiliary tumbler in such relative position with respect to said main drive tumbler that said two tumblers will move simultaneously into and out of locking position in response to operation of said knob, and adjustable means for latching said main drive tumbler and said combination tumblers in unlocking position, leaving said auxiliary tumbler operable into and out of locking position.

10. In a lock of the character described, the combination with a trigger, a plurality of combination tumblers, a combination drive tumbler therefor, and a knob connected with said drive tumbler for working the combination to place said tumblers into and out of locking position, of an auxiliary tumbler for said trigger, means for placing and for maintaining said auxiliary tumbler in such relative position with respect to said main drive tumbler that whenever said main drive tumbler assumes unlocking position said auxiliary tumbler is in locking position, said means being adjustable into condition for placing and for maintaining said auxiliary tumbler in such relative position with respect to said main drive tumbler that said two tumblers will move simultaneously into and out of locking position in response to operation of said knob, and adjustable means for latching said main drive tumbler and said combination tumblers in unlocking position, leaving said auxiliary tumbler operable into and out of locking position, said latter adjustable means comprising a latch which is manually movable from the rear of the lock into and out of engagement with said main drive and combination tumblers.

11. In a lock of the character described, the combination with a trigger, a plurality of combination tumblers, a combination drive tumbler therefor, and a knob connected with said drive tumbler for working the combination to place said tumblers into and out of locking position, of an auxiliary tumbler for said trigger, means for placing and for maintaining said auxiliary tumbler in such relative position with respect to said main drive tumbler that whenever said main drive tumbler assumes unlocking position said auxiliary tumbler is in locking position, said means being adjustable into condition for placing and for maintaining said auxiliary tumbler in such relative position with respect to said main drive tumbler that said two tumblers will move simultaneously into and out of locking position in response to

operation of said knob, adjustable means for latching said main drive tumbler and said combination tumblers in unlocking position, leaving said auxiliary tumbler operable into and out of locking position, and a key tube accessible from the front of the lock and from which said auxiliary tumbler may be operated independently of said main drive and combination tumblers.

12. In a lock of the character described, in combination, a plurality of locking tumblers including a set of combination tumblers, an auxiliary drive tumbler having an elongated slot, and a main drive tumbler for said combination tumblers and having a pin extending through said slot in said auxiliary tumbler; a spindle secured to said main drive tumbler; a second spindle secured to said auxiliary drive tumbler; means comprising a key lock mechanism whereby said two spindles may be moved relatively to each other and locked together in various relative positions; and latch mechanism adjustable to latch said main drive and combination tumblers in unlocked position and adjustable to permit free operation of said tumblers.

13. The combination with a wall having an inner wall plate; of a lock mounted on said wall and including a protection tube abutting against the outer face of said inner wall plate and having internal shoulders; an outer spindle having shoulder portions abutting said inner wall plate and said inner shoulders of said protection tube and having a hollow center formed with internal shoulders; and a second spindle within the hollow of said spindle and having shoulders abutting its said internal shoulders; whereby said tube and spindles are prevented from being driven inwardly of said wall.

This specification signed this 29th day of October, 1923.

DAVID H. BELLAMORE.