

B. BORLAND.

LOCK.

APPLICATION FILED JUNE 14, 1905.

940,300.

Patented Nov. 16, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

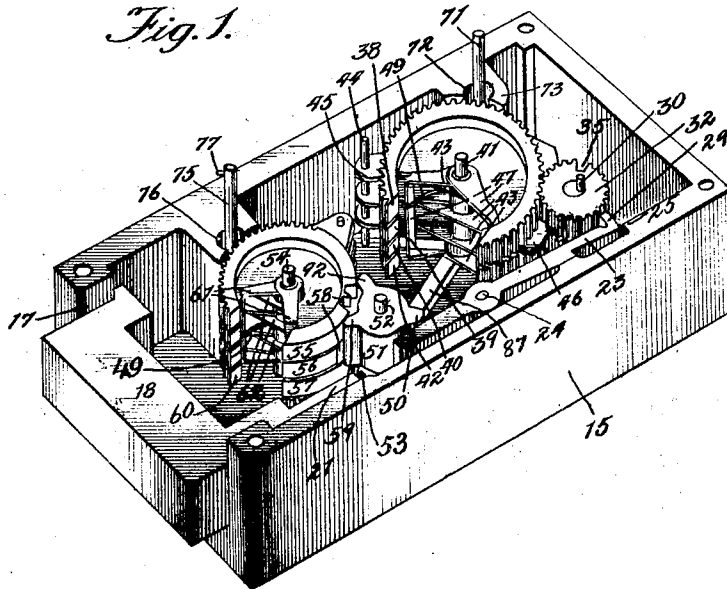
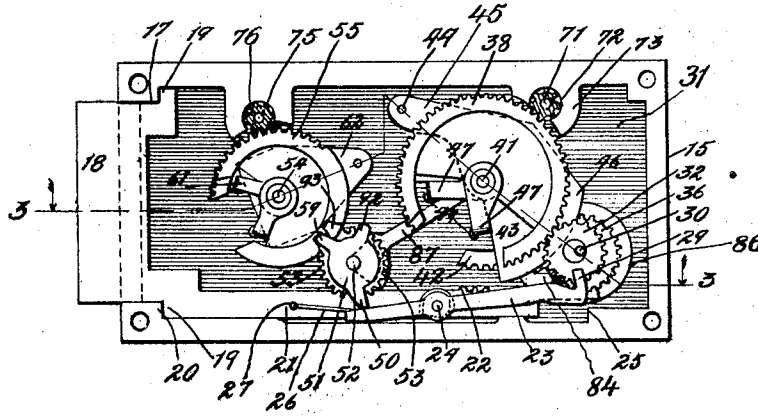


Fig. 2.



Witnesses;

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3 SHEETS—SHEET 2.

Fig. 3.

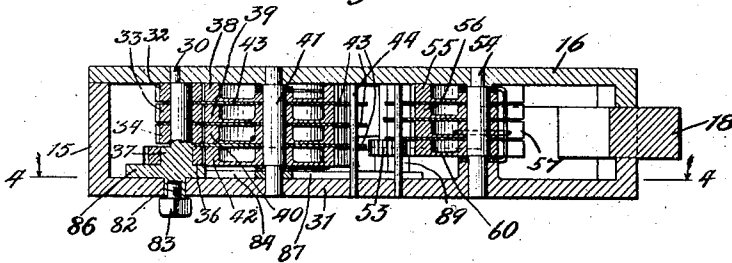


Fig. 4.

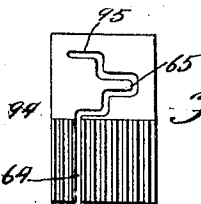
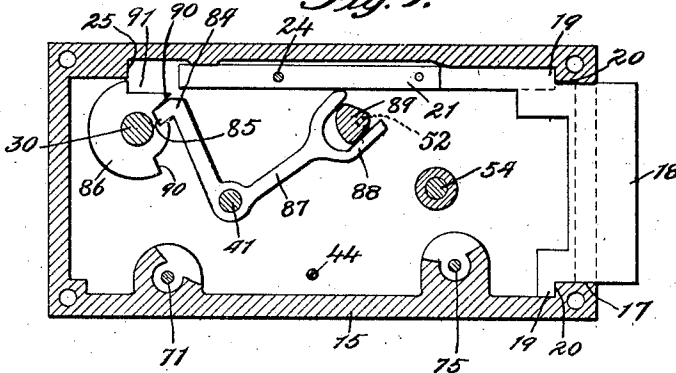


Fig. 14.

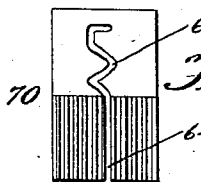


Fig. 15.

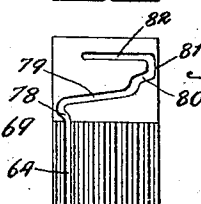


Fig. 16.

Fig. 5.

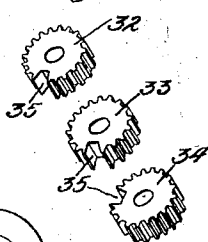


Fig. 11.

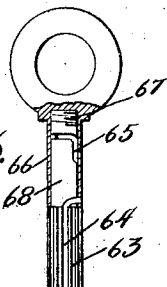
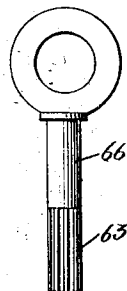


Fig. 12.

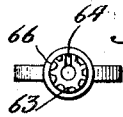


Fig. 13.

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his Att'y

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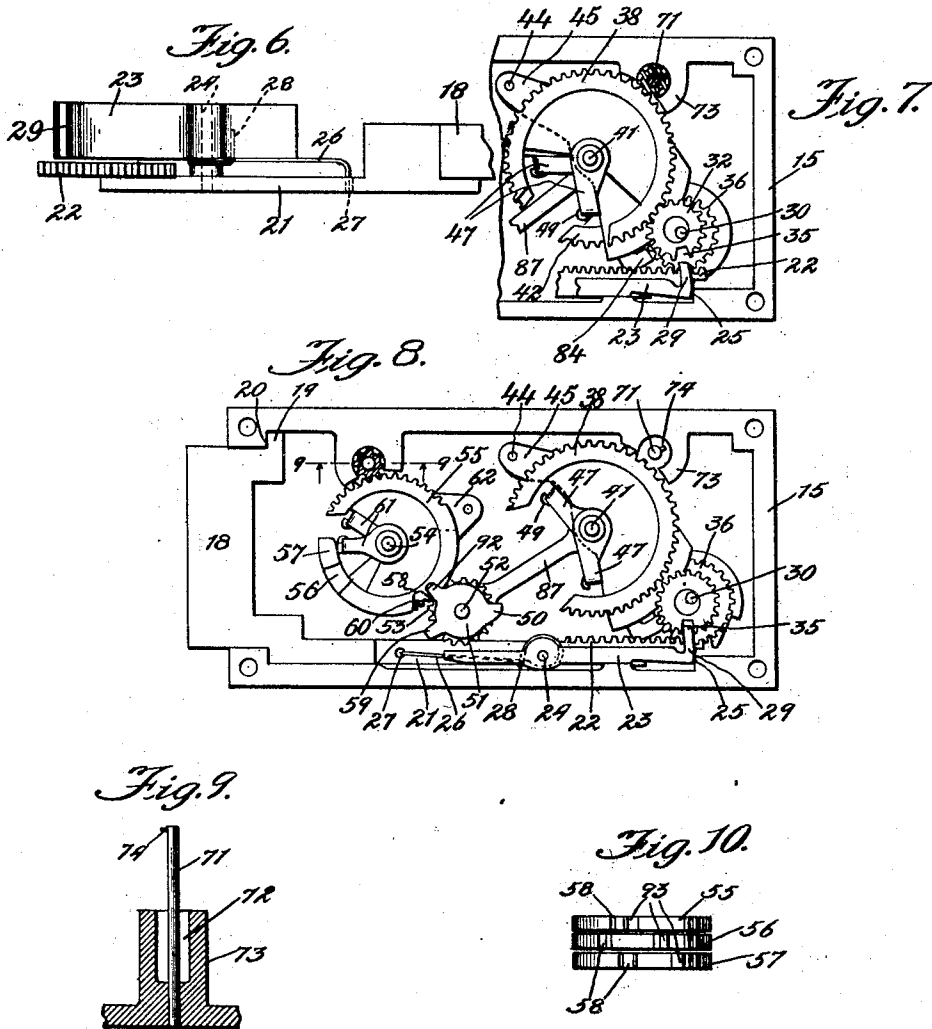
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APPLICATION FILED JUNE 14, 1905.

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3 SHEETS—SHEET 3.



Witnesses:

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Arthur Seibold.

Inventor:

Bruce Borland

By *Colum & McRoberts*
his Attys.

UNITED STATES PATENT OFFICE.

BRUCE BORLAND, OF CHICAGO, ILLINOIS.

LOCK.

940,300.

Specification of Letters Patent.

Patented Nov. 16, 1909.

Application filed June 14, 1905. Serial No. 265,206.

To all whom it may concern:

Be it known that I, BRUCE BORLAND, 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 Locks, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to locks, and particularly to multiple-key or changeable key locks designed for vaults, safe-deposit boxes, and the like. In this class of devices an inner box is usually removable from a compartment or box proper whose door is provided with a lock, the general practice being for the depositor to withdraw this inner box and carry it to a separate booth or room to examine his papers, the door of the compartment or box proper usually remaining open until the inner box is returned to place. In these locks the combination is re-settable or capable of being changed to accommodate different keys for various reasons; for example, if a depositor or box-holder loses his key the combination may be changed or reset to a different key to prevent the finder of the lost key or other unauthorized person using such key to open the box. The change in the combination can be effected only when the door upon which the lock is located is open to provide access to the box because the parts operated to change or re-set the combination are upon the rear face of the lock and so are exposed only when the door is open. But the fact that the resetting means are so exposed when the door is open makes it possible for the custodian or guard in charge of the safe-deposit boxes to change the combination in locks as heretofore constructed without the knowledge of the owner of the box, and in this way gain access to the box without the use of the key held by the owner. Thus an unscrupulous or dishonest guard might reset the lock to another key while he was in attendance upon a customer holding the key to the lock.

The special object of the present invention is to preclude the possibility of the surreptitious changing of the combination of such a lock while the box to which it is applied is open by setting its tumblers to a key which would then be kept for future use by the person who wrongfully changed the combination or by someone in league with him.

With this object in view the invention consists in the coördination with the reset-

ting means of a safety or supplemental lock actuate by a key which will prevent the surreptitious resetting of the main lock and control the changing or resetting of the combination of the main lock from its adaptation to a depositor's or change-key of one form to that of another form. The key of this safety or supplemental lock is held by the manager of the safe-deposit vault, and so it is indispensable that the manager be present and coöperate to reset the combination; his supplemental lock controls this change, and its operation and his presence are conditions precedent to resetting the combination for another depositor's or change-key.

Other objects and advantages of the invention will be apparent from the accompanying disclosure.

In the accompanying drawings, which illustrate one embodiment of the invention—Figure 1 is a perspective view of the lock, showing the bolt in its shot position; Fig. 2 is a plan view of the same with the bolt latch released; Fig. 3 is a section on the line 3—3 of Fig. 2; Fig. 4 is a section substantially on the line 4—4 of Fig. 3; Fig. 5 is a detail perspective view of the rotating bolt tumblers showing the same separated from each other for purpose of clearness; Fig. 6 is a detail side elevation of the bolt and locking latch; Fig. 7 is a fragmentary plan view of the lock showing the locking tumblers in their registered position; Fig. 8 is a plan view with the locking tumblers disengaged from the operating gears and the parts in position for changing the combination; Fig. 9 is a detail sectional view partially in elevation of the key way and pin; Fig. 10 is a detail side elevation of the master tumblers; Fig. 11 is a side elevation of a key employed with the lock; Fig. 12 is a similar view partially in section; Fig. 13 is an end elevation of the key; and Figs. 14, 15 and 16 are diagrammatic views of various forms of keys employed with the lock.

Referring to the drawings, 15 indicates the lock casing. This casing may be of any suitable shape and size and in the present instance is shown as rectangular and provided with a face plate 16 suitably secured thereto. The front end of the casing is provided with the usual opening 17 in which reciprocates the bolt 18. The movement of the bolt is limited in its shot or advanced position by suitable shoulders 19, as shown in Fig. 2,

which engage shoulders 20 on the front end of the casing. The bolt 18 is provided with a rearwardly extending tail 21 which extends from one end thereof and is located adjacent one of the side walls of the casing. The rear end of the tail 21 is provided with teeth, the toothed portion being in the form of a rack bar 22 which in the present embodiment of the invention extends beyond the end of the tail 21, and in a different plane as shown in Fig. 6. A bolt latch 23 is pivoted between its ends on a post 24 on the front face of the tail 21 and its rear end is adapted to engage a stop 25 which may be formed in the adjacent side wall of the casing. The opposite end of the latch 23 is adapted to be actuated, in the manner hereinafter explained, to disengage the latch from the stop 25 in order to permit of the retraction of the bolt. The latch 23 is held in engagement with the stop 25 by means of a spring 26 one end of which is anchored to the bolt tail 21, as at 27, while the other end is wound around the post 24 and is bent upwardly, as at 28, so as to react against the bolt latch 23. The latch 23 is provided with an inwardly extending tooth 29, the purpose of which will be hereinafter explained. While the stops 20 arrest the bolt in its shot position the bolt latch 23 by reason of its engagement with the stop 25 holds the bolt in such position and prevents retraction thereof until the latch is released. The latch is released from its position dogging the bolt and the bolt is retracted by suitable tumblers, and in the preferred embodiment of my invention I employ two sets of tumblers operated respectively by the depositor's or change-key and by the guard's or custodian's key, neither key alone being capable of unlocking the box, the locking tumblers being constructed to be set to different combinations for coaction with different depositor's keys and the guard tumblers of all the locks being operative by the same guard-key which therefore is a master-key for all the boxes. The locking tumblers in the present embodiment of my invention are two-part tumblers the respective parts whereof may be reset for coaction with different change-keys and comprise two-sets of cooperating, rotatable wheels, the sets being locked and unlocked by a resetting means comprising an adjusting-eccentric which simultaneously moves the wheels of one set with respect to the other so as to unlock the sets and then restores the parts to engaged position after the combination has been changed to a different depositor's key. The supplemental or safety lock for preventing surreptitious resetting of the tumblers controls this adjusting-eccentric.

A post 30 mounted at its ends in the rear wall 31 and face plate 16 of the casing is provided with an eccentric portion as clearly

shown in the drawings. The locking tumblers are in two parts, and the movable parts or wheels 32, 33 and 34 of the locking tumblers are pivoted on this eccentric, these wheels being designed when in certain positions to prevent the disengagement of the bolt latch 23 from the stop 25, but adapted to be suitably operated and moved to a predetermined position to permit the release of the latch from its stop to allow the bolt to be retracted. In the present instance three tumblers are employed and the number may of course be varied. The wheels are provided with suitable teeth and in the present instance are in the form of pinions. Each wheel is provided with a radial slot 35 extending inwardly from the periphery thereof of a suitable distance forming a gating. When the bolt is shot and the wheels 32, 33 and 34 are in locking position the gatings 35 are out of alinement or register so that the body of the wheels obstructs the movement of the bolt latch by presenting the solid portions thereof in the path of the tooth 29, the length of which is at least equal to the combined thickness of the wheels. A pinion 36 is pivoted on a hub 37 of the post 30 back of the wheel 34 and meshes with the rack bar 22. The wheels 32, 33 and 34 constitute the parts of the tumblers movable by the resetting means 30 to permit the tumblers to be reset for a different change-key, and may be rotated to bring their gatings 35 into registered or unlocking position through the medium of any suitable means constituting the other parts of the two-part tumblers. In the present embodiment of the invention I employ for this purpose a second set of wheels such as the series of gears 38, 39 and 40 which are pivoted on a post 41 the ends of which are mounted in the opposite walls of the casing. The gears 38, 39 and 40 mesh with the pinions 32, 33 and 34, respectively. A gear 42 is also pivoted on the post 41 between the gear 40 and the wall 31 and this gear 42 is adapted to mesh with the pinion 36. As the gears 38, 39 and 40 are designed to rotate independently of each other, in order to prevent movement by frictional engagement one with another I preferably separate these gears by plates 43. These plates are provided with suitable openings through which the post 41 passes and are held against movement on such post by means of a pin 44 which is fixed in the rear wall 31 of the casing and passes through suitable openings in ears 45 of the plates, as shown in Fig. 1. The plates 43 may be extended, as at 46, so as to project between the pinions 32, 33 and 34, in order to space them in accordance with the spacing of the gears 38, 39 and 40. The gears 38, 39 and 40 are provided with peripheral slots, as clearly shown in Fig. 1, and pivoted on the post 41 is a pair of yokes

47 the arms of which are pivoted on the said post above and below the group of gears 38, 39, 40 and 42. These yokes 47 act in opposition to each other against the edges of the recesses in the gears and are held under spring pressure by means of a spring 48 which passes around the post 41 and has its ends bent over, as at 49, to engage the yokes and press them away from each other. The purpose of these spring pressed yokes will be explained hereinafter. The pinions 32, 33, 34 and gears 38, 39, 40 constitute two-part locking tumblers, and it is to be understood that in the specific form of main or changeable-key lock here shown to illustrate a coordination of main-lock and supplemental lock embodying my invention even when the locking tumblers are in their registered and unlocking position it is necessary to disengage the bolt latch or dog 23 from stop 25 against the tension of its spring 26 so that the bolt may be retracted.

Any suitable means may be employed for releasing the latch, and preferably such means under control of a master or guard-key is employed. In the present embodiment of the invention I employ a cam 50 which is maintained in its operative position by means of a series of master or guard tumblers. This cam 50, in the construction illustrated, is formed on a hub 51 provided with trunnions 52 pivoted in the opposite walls of the casing. A pinion 53 is rigid with the hub 51 and is located between the latter and the wall 31 of the casing. A post 54 is mounted at its ends in the opposite walls of the casing and is provided with a plurality of master or guard tumblers 55, 56 and 57. Three such tumblers are shown although the number thereof is not material and may be varied. These tumblers may be of any suitable construction but in the present instance are in the form of mutilated gears and are provided with notches in the periphery thereof forming gatings 58. The hub is provided with a tooth 59 the length of which is at least equal to the combined thickness of the tumblers 55, 56 and 57. A gear 60 is pivoted on the post 54 and meshes with the pinion 53. When the bolt is shot and the master tumblers are in their locking position the gatings 58 are out of alinement and the cam 50 is held against movement by reason of the engagement of the tooth 59 with the body portions of such tumblers. When, however, these tumblers are moved into unlocking or registered position, that is to say when their gatings 58 are in alinement, and when the gear 60 is turned backward or contra-clockwise, the tooth 59 will enter the alined gatings 58 thereby turning the pinion 53 and consequently moving the cam 50 into engagement with the end of the latch or dog 23, and the gatings 35 of the locking tumblers being in alinement, the

tooth 29 of the latch will enter the alined gatings 35 clearing the stop 25 so that when the pinion 36 is rotated the bolt will be withdrawn or retracted. The master tumblers 55, 56 and 57 are cut out or recessed and provided with spring pressed yokes 61 similar to the yokes 47 of the gears 38, 39, etc., and plates 62, similar to and serving the same function as the plates 43, are interposed between the master tumblers 55, 56 and 57 as well as between the latter tumbler and the gear 60.

For rotating the two sets of tumblers and setting them to unlocking position to permit of the retraction of the bolt I employ suitable keys which are adapted while being inserted in the lock to successively act upon the associated tumblers and rotate them to registered or unlocking position. The keys for this purpose may be of the same general construction and because of the interdependence of the two sets of tumblers the co-operation of both keys is necessary in order to unlock the lock in the form shown. The keys employed may be of any suitable construction adapted to the attainment of the desired end. One of such keys, that is to say the key for operating the locking tumblers, may be designated for convenience the depositor's or change-key, while the other key, which supervises the locking key may be termed the "master" or guard-key. In the present embodiment of the invention these keys are generally the same but differ in the detail hereinafter explained. As shown in Figs. 11, 12 and 13, the key is substantially circular in cross section and is provided with longitudinal teeth which extend from the end thereof a distance at least equal to the combined thickness of the gears with which it is designed to cooperate. In the present instance the toothed portion of the key is in the form of an elongated pinion 63 the teeth of which are so proportioned as to properly cooperate with the teeth of the gears. Each of these keys is provided with a sinuous slot or way, the conformation of which depends upon the relative positions of the tumblers when in their locking position. As shown in Fig. 13, the key is cylindrical and extending along the outer portion of the length of the pinion 63 is a longitudinal slot 64 which terminates at its inner end in a sinuous groove 65. For convenience in making the key the finger piece of the key may be formed with a tubular socket 66 the bottom of which is threaded, as at 67, as shown in Fig. 12, while the key pinion 63 is provided with a cylindrical extension 68 having its end threaded so as to screw into the socket. With this arrangement the extension may be conveniently formed with the slot 65 which is a continuation of the straight portion 64 and is concealed within the socket 66. After the

pinion portion of the key is screwed into the socket the parts may be brazed or otherwise secured together to prevent separation. Fig. 16 illustrates diagrammatically the depositor's unlocking key 69, while Fig. 15 is a similar view of the master or guard-key 70. It will be understood, however, that the character of the slot in each instance depends altogether upon the relative positions of the slots or notches of tumblers when such tumblers are in their locked position, and that any variation in such relative positions will necessitate the employment of a key having its slot varied accordingly.

To guide the depositor's unlocking key into the lock, a pin 71 is fixed in the wall 31 of the lock casing and extends through a key way 72 formed in the present instance in a boss 73 at the side of the casing opposite the bolt latch 23. This boss is cut away adjacent the gears 38, 39, 40 and 42 so that when the key is inserted in the lock the pinion thereof will engage such gears. The pin projects beyond the front wall of the lock and is provided with a radial lug 74. A second pin 75 is located in a key way 76 adjacent to the gears 55, 56, 57 and 60 and is provided with a lug 77, such construction being similar to the key way 72 and pin 71 associated with the gears 38, etc. The face plate 16 is of course provided with suitable key holes through which the pins 71 and 75 project and through which the keys may be passed while sliding and turning on the pins 71 and 75. As the key 69 is engaged with the depositor's or change key hole and pushed into the lock the longitudinal portion 64 of the slot permits the key to slide on the pin in a straight line until its pinion comes into engagement with the first gear 38. Then as the key is pushed in farther owing to the engagement with the lug 74 on the pin with the sinuous slot in the key the latter is turned so as to rotate the tumblers and finally bring them into registered position.

In unlocking the lock the depositor's key 69 is inserted on its associated pin 71 and pushed inwardly. The straight portion of the slot 64 moves along the lug 74 until the said lug enters the short spiral portion 78 of the key slot slightly before which time the pinion end of the key comes into engagement with the gear 38. A slight axial movement of the key will move the spiral portion 78 of the key slot past the lug 74 and during this movement the gear 38 is rotated and consequently the tumbler 32 bringing the gating 35 of the latter into alinement with the gating of the tumbler 33. As the key is pushed in farther the lug 74 enters the reverse spiral portion 79 of the gating and the gears 38 and 39 being coupled by the key pinion the tumblers 32 and 33 are rotated until their alined gat-

ings 35 are brought into alinement with the gating of the tumbler 34. The three gears 38, 39 and 40 are now coupled and the gatings 35 of the tumblers are in alinement. The gears may be so arranged that this last movement will bring the alined gatings of the tumblers in the path of the tooth 29 of the locking bar 23. Preferably, however, a further rotation of the three tumblers is desirable and in the present instance this final movement is accomplished while the lug 74 is being passed by the spiral portion 80 of the key slot. The key is then pushed in and while the straight longitudinal portion 81 of the key slot is passing the lug 74 the end of the key pinion comes into engagement with the gear 42 which gear it will be remembered meshes with the pinion 36. The master or guard-key 70 being inserted in its key way, by reason of the formation of its slot it is rotated and successively picks up the guard or supplemental tumblers 55, 56 and 57, moving them so that their gatings 58 will be brought into registered position, and in position to receive the tooth 59, and finally engages the gear 60. Up to this point it is immaterial which key is inserted first and they may be inserted simultaneously. The guard-key 70 is now rotated to the right or clockwise and through the medium of the gear 60 and pinion 53 the cam 50 is moved into engagement with and moves the latch 23, as shown in Fig. 2, the tooth 59 of the hub 51 entering the alined gatings 58 of the master tumblers 55, etc., so that the cam is free to move. The movement of the latch 23 disengages it from the stop 25, the tooth 29 of the same entering the alined gatings of the tumblers 32, 33 and 34. The key 69 is now turned counterclockwise, by reason of the concentric portion 82 of the key slot, and through the medium of the pinions 36 and 42 and rack bar 22 the bolt is retracted; the tooth 29 of the latch being in the gatings 35 the end of the latch clears and passes the stop 25, and as all the parts 38, 39, 40, and 42 are geared up on the depositor's or change-key and rotate together, the parts 32, 33, 34 and 36 meshing therewith respectively are moved thereby, and the rack 22 meshing with the pinion 36 moves the latch 23 in unionism with the gears 32, 33 and 34 so that its tooth 29 will roll out of the gatings as the bolt is retracted, and will move again into engagement with the gatings when the bolt is moved ahead or shot. To throw the bolt the movement of the key 69 is reversed and then both keys may be withdrawn, such action merely reversing the operation and restoring the parts to their locking positions. The master or guard-key may of course be employed with any unlocking key, as its office is merely to release the bolt latch.

The object of the spring pressed yokes 47 and 61 is to maintain the associated gears in proper position when the bolt is thrown and to provide additional security against picking the lock as well as to restore the gears in case the lock is tampered with. If, for example, an instrument should be inserted in the lock and one of the gears moved in an attempt to pick the lock, upon the withdrawal of the implement such tumbler would by means of the spring pressed yokes be returned to its proper position with relation to the other gears, thereby avoiding disarrangement of the parts.

By reason of the interlocking construction described a lock is provided which is absolutely dependent for its operation upon two keys so that where the keys are in the possession of different persons, such as the renter of a safety deposit box and the guard, both such persons must be present to open the lock. Moreover, the lock is made doubly secure against picking inasmuch as two sets of tumblers must be manipulated in order to retract the bolt, and the particular character of the tumblers renders the lock proof against the requisite manipulation without proper keys. In the event that an attempt is made to pick the lock the parts are automatically restored to their predetermined positions so that there is no danger of the lock being put out of order when tampered with.

The means provided for resetting or changing the combination of the lock in the event it is desired for any reason to change the unlocking or depositor's key, and the means for preventing the surreptitious resetting of the lock, may be of any suitable form or character, and these results are accomplished in the present embodiment of the invention in the manner now to be described.

As above described the locking tumblers are in two parts formed by the pinions and gears respectively, and as shown in Fig. 3, that portion of the post 30 on which the pinions 32, 33 and 34 are mounted is eccentric to the pivoted ends of such post, and this post is designed to be rotated so as to disengage the pinions 32, 33 and 34 from the gears 38, 39 and 40 to provide for resetting the combination. For this purpose the end of the post passing through the rear wall of the lock casing may be provided with a threaded socket 82 into which screws a key, such as a bolt 83. By turning this bolt it will be obvious that owing to the eccentric portion of the post the pinions 32, 33 and 34 will be disengaged from their associated gears as shown in Fig. 8. Under normal conditions such disengagement is prevented by a stop or dog 84 which is pivoted to the post 41 and engages a notch 85 in a disk 86 fixed to the post 30. The dog is provided with an

arm 87 having a yoke 88 in which is located a controlling cam or eccentric 89 fixed to the hub 51 back of the pinion 53. The disk 86 is provided with shoulders 90 spaced a suitable distance apart to limit the rotary movement of the post 30. As shown in Fig. 4, the disk 86 is recessed at 91, such recess being in the line of the bolt tail 21 to permit of the retraction of the bolt.

By reference to Figs. 1, 2 and 8, it will be observed that the hub 51 is provided with a second tooth 92 similar to the tooth 59 and spaced a suitable distance therefrom. The tumblers 55, 56 and 57 are provided with gatings 93 adapted by suitable movement of such tumblers to be moved into alinement so as to receive the tooth 92.

In resetting the lock a depositor's key for which the lock has previously been set is inserted in the lock so as to move the locking tumblers into their unlocking position, as shown in Fig. 7. A manager's key 94, which is in the possession of an authorized official, such as the manager of the safety deposit vault, is now employed for the purpose of releasing the dog 84. The manager's key is substantially similar to the other keys heretofore described with the exception that the concentric inner end 95 of the slot 65 extends in a reverse direction from the corresponding portion of the slot of the master or guard-key 70. The sinuous slot 65 of the manager's key 94 is of such character that when the key is inserted in the lock it effects the movement of the tumblers 55, 56 and 57 to bring their gates 93 into alinement and in position to receive the hub tooth 92 so that the hub may be turned. When the manager's key is inserted in the lock its final movement is counterclockwise, the reverse of the final movement of the master or guard-key 70, thereby through the medium of the gear 60 and pinion 53 throwing the hub tooth 92 into the alined gatings 93 and rotating the controlling eccentric or cam 89. The movement of the cam disengages the dog 84 from the disk 86 and the post 30 is now free to turn. It will be remembered that the locking tumblers have been moved to their unlocking positions with their gatings in alinement. The post 30 is now rotated disengaging the registered pinion parts of the locking tumblers from the gear parts, as shown in Fig. 8. The unlocking key is now withdrawn from the lock, their gatings 35 engaging the tooth 29. The new depositor's or change-key is then inserted and during such insertion it rotates the gears 38, 39 and 40 in accordance with the formation of its slot. The key having been entirely inserted it is apparent that the gears 38, etc., are in unlocking position for the new key and that the pinions 32, etc., are also in unlocking position, that is to say, in such position that their gates are in aline-

ment and in the path of the tooth on the bolt latch. The post 30 is now rotated backward so as to throw the pinions into engagement with the gears, and then both the new key and the manager's key may be withdrawn, the withdrawal of the former reversely rotates the gears 38 etc., to return the locking tumblers and associated gears to their locking positions and the withdrawal of the manager's key reversely rotates the supplemental tumblers 55 etc. and gear 60 and pinion 52 to throw the dog 84 back into engagement with the disk to hold the post 30 against movement. The manager's key thus locks and unlocks the resetting eccentric 30.

The tumblers 55, 56, 57 with their associated parts provide a tumbler lock which forms a supplemental lock for locking the adjusting-eccentric 30 against being turned in either direction for resetting the lock to a new key as might readily be done surreptitiously even in the brief interval during which the back of the lock is exposed in use by the door of the safe-deposit box to which it is applied standing open while the inner box is withdrawn. It will be understood, of course, that this supplemental lock is never used except when it is desired to reset the main lock to a new key. At all other times the main lock is used precisely as if the supplemental lock were not in existence. For the legitimate resetting of the main lock to conform to another key, the "manager's" key is indispensable for it must be used to unlock the supplemental lock and effect the turning of the controlling eccentric 89 through the medium of the pinions 60 and 53, and it must also be used to return the controlling eccentric 89 after the tumblers are reset to lock them in reset position on a different combination. While the present embodiment shows the supplemental or safety lock coördinated with a lock requiring the supervision of the guard-key, it is obvious that the supplemental lock for preventing the surreptitious resetting of the main lock may be associated with any type of multiple-key or changeable key lock. It will thus be seen that by the coördination of a supplemental lock with a main lock of the multiple-key or changeable key type, I am enabled to guard against the surreptitious resetting of the tumblers to a new key during the brief exposure of the back of the lock when the box to which it is applied is open. The key to the supplemental lock is kept by the manager of the safe-deposit vault and it is never brought into use except when he is called upon to produce it by the depositor. On the one hand, none of the bank-officials can get at the safety lock to use the manager's key in the absence of the depositor as the tumblers of the main lock must first be alined by the use of the de-

positor's key which the depositor holds and even if the box be left open with the user's key withdrawn as is usual, the guard can not reset the combination as the user's key must be inserted and turned to move the locking tumblers to position to aline their gatings to unlock the bolt before the resetting device can be operated, the tooth 29 otherwise preventing the eccentric movement of the part 30 and its associated gears by abutting on the peripheries of the latter, and furthermore even if the box be left open with the user's key in place the guard can not reset the combination as the manager's key is indispensable for this purpose; on the other hand, in the preferred embodiment of the invention with a lock requiring the coöperation of a master or guard-key to open it, the depositor himself or one finding the depositor's key could not get at the resetting means until the box containing the lock had been opened by the coöperation of the guard holding the guard-key, as these two keys are necessary to unlock the box; and in no case can the guard or other unauthorized person operate the resetting means to reset the combination as the safety lock under the sole control of the manager locks the resetting means against all unauthorized or surreptitious resetting of the combination.

Having described my invention what I claim as new and desire to secure by Letters Patent of the United States, is—

1. In a multiple-key lock, the combination with a two-part tumbler the respective parts whereof are constructed to be reset for coaction with different keys, of means for resetting the said tumbler, and a supplemental lock for locking the said resetting means against surreptitious resetting of the tumblers, said supplemental lock being locked and unlocked by a key.

2. In a multiple-key lock, the combination with a plurality of two-part tumblers the respective parts whereof are constructed to be reset for coaction with different keys of an adjusting-eccentric for resetting the tumblers, and a supplemental lock for locking the eccentric.

3. In a multiple-key lock, the combination with a plurality of two-part tumblers the respective parts of which are constructed to be reset for coaction with different keys, of means for resetting the said tumblers, and a supplemental tumbler lock for locking the said resetting means against surreptitious resetting of the tumblers, said supplemental lock being locked and unlocked by a key.

4. In a multiple-key lock, the combination with a plurality of two-part tumblers the respective parts of which are constructed to be reset for coaction with different keys, of an adjusting-eccentric for resetting the said tumblers, a supplemental tumbler lock, and

pinions interposed between the eccentric and supplemental lock for locking the said eccentric.

5 5. In a multiple-key lock, the combination with a two-part pivoted-tumbler the respective parts of which are constructed to be reset for coaction with different keys, of means for resetting the said tumbler, and a supplemental lock for locking the said resetting means against surreptitious resetting of the tumblers, said supplemental lock being locked and unlocked by a key.

10 6. In a multiple-key lock, the combination with a two-part pivoted-tumbler comprising a main part and a supplemental part constructed to be set in a variety of relations with respect to each other for coaction with different keys, of means for resetting the said tumblers, and a supplemental lock for locking the said resetting means against surreptitious resetting of the tumblers, said supplemental lock being locked and unlocked by the key.

20 7. In a multiple-key lock, the combination with a plurality of two-part pivoted-tumblers each comprising a main part and a supplemental part, and each constructed to have its supplemental part adjusted with respect to its main part; an adjusting-eccentric coacting with all of the tumblers for resetting them for coaction with different keys, and a supplemental lock for locking the eccentric.

25 8. In a multiple-key lock, the combination with a plurality of two-part pivoted-tumblers the parts of which are separable for being set for coaction with different keys, of means coacting with all of the two-part tumblers for simultaneously moving one part of each tumbler with respect to the other part thereof, so as to unlock the two parts of each tumbler, and then restoring the parts of each tumbler to their locked positions after one part of each tumbler has been set to a key, and a supplemental lock for locking the resetting means against surreptitious resetting of the tumblers, said supplemental lock being locked and unlocked by a key.

30 9. In a multiple-key lock, the combination with a plurality of two-part tumblers the parts of which are separable for being set for coaction with different keys, of an adjusting-eccentric passing through all of the tumblers for simultaneously separating their parts to permit them to be reset and simultaneously restoring their parts to their normal positions, and a supplemental tumbler-lock located in the case of the multiple-key lock and connected with the said eccentric by means of pinions whereby the eccentric is held in the position which it has when the respective parts of the tumblers are combined as in use.

35 10. In a multiple-key lock, the combina-

tion with a bolt and a two-part tumbler the respective parts whereof are constructed to be reset for coaction with different keys, of means for resetting the said tumbler only when said tumbler is positioned to unlock the bolt, and a safety lock for locking the said resetting means against surreptitious resetting and preventing its operation until the safety lock is operated by its proper key.

40 11. In a lock, a bolt and tumblers providing a changeable key lock wherein the combination is changed only after the insertion and turning of a change-key to position to move the tumblers to unlock the bolt, a safety locking device for preventing the surreptitious resetting of the tumblers to a different key, and a key for actuating the safety locking device.

45 12. In a lock, a bolt and tumblers providing a changeable key lock wherein the tumbler combination is changed only after the insertion and turning of a change-key to position to move the tumblers to unlock the bolt, means to reset the lock, and a safety locking device preventing the operation of the resetting means until the locking device is operated by its proper key.

50 13. In a lock, a bolt and tumblers providing a changeable key lock wherein the tumbler combination is changed only after the insertion and turning of a change key to position to move the tumblers to unlock the bolt, means operated from the rear face of the lock to reset the combination, and a safety locking device preventing the operation of the resetting means until the locking device is operated by its proper key.

55 14. In a multiple-key lock, the combination with a bolt and a plurality of tumblers constructed to be reset for coaction with different keys, of an adjusting-eccentric operative from the rear of the lock for resetting the said tumblers, a supplemental tumbler-lock, and pinions interposed between the eccentric and supplemental lock for locking the said eccentric.

60 15. In a multiple-key lock, the combination with a bolt and locking-tumblers constructed to be reset for coaction with different keys, of means operative from the rear face of the lock for resetting the said tumblers only when the tumblers are in position to unlock the bolt, and a supplemental lock for locking the said means against surreptitious resetting until said supplemental lock is operated by its proper key.

65 16. In a multiple-key lock, the combination with a bolt and a plurality of locking tumblers constructed to be reset for coaction with different keys, of an adjusting-eccentric for resetting the tumblers and operative only when the locking tumblers are in predetermined position, and a supplemental lock for locking the eccentric.

70 17. In a lock, a bolt and locking tumblers

providing a changeable key lock in which the tumbler combination is changed after the turning of a change key to position to move the tumblers to unlock the bolt, a re-
 5 setting device operative only when the locking tumblers are in a predetermined position by a change key, and supplemental tumblers for controlling the operation of the re-
 setting device.

10 18. In a changeable key lock, a bolt, locking tumblers, means to reset the lock only when the tumblers are in a predetermined position, and a supplemental lock for locking the resetting means against surreptitious
 15 change of the combination.

19. In a changeable key lock, a bolt, locking tumblers, means to reset the lock only when the tumblers are in a predetermined position, and a supplemental lock for locking
 20 the tumblers against surreptitious resetting.

20. In a multiple-key lock, the combination with a bolt and locking tumblers constructed to be set in a variety of relations
 25 for coaction with different keys, of means for resetting the said tumblers only when the latter are in position to unlock the bolt, and a supplemental lock for locking the said means against surreptitious resetting and
 30 operative independent of the position of the bolt or tumblers.

21. In a multiple-key lock, the combination with a bolt and a plurality of tumblers constructed to be reset for coaction with
 35 different keys, of means for resetting the said tumblers only when the latter are in position to unlock the bolt, and a supplemental tumbler-lock for locking the said means against surreptitious resetting and
 40 operative independent of the position of the bolt or locking tumblers.

22. In a changeable key lock, the combination with a bolt, and tumblers which can be reset only when in position to unlock the bolt,
 45 of a safety locking device which must be operated by a key before the main tumblers of the lock can be reset to conform to a different key.

23. In a changeable key lock, the combination with a bolt and tumblers, of a single
 50 key safety locking device which must be operated by its key before the main tumblers of the lock can be reset to conform to a different form of change-key, and is operated by the key after the tumblers are reset.
 55

24. In a changeable key lock, the combination with a bolt and a series of locking tumblers therefor, of a main opening for the key
 60 actuating the bolt, and a single key safety locking device for said locking tumblers which has an independent key-opening and must be operated by its key before the main tumblers of the lock can be reset, and is operated by the key after the tumblers are
 65 reset.

25. In a changeable key lock, the combination with a bolt, a series of locking tumblers therefor, and a key for actuating the tumblers and moving the bolt, of a safety
 70 locking device for preventing surreptitious resetting of the tumblers, and a key for actuating the safety locking device, the parts being arranged whereby the combination remains locked until the locking tumblers are
 75 moved to position to unlock the bolt and the safety lock is operated by its key.

26. In a changeable key lock the combination with a bolt, tumblers therefor, and a key for setting the tumblers and moving the
 80 bolt, of a safety locking device for preventing surreptitious resetting of the tumblers, and a key for actuating the safety locking device, the parts being arranged whereby the lock is secured against resetting for a
 85 different key until the tumblers are moved to position to unlock the bolt and the safety lock is operated by its key.

27. In a multiple key lock, the combination with a bolt and a plurality of locking-
 90 tumblers capable of coöperation in different combinations, an eccentric controlling the resetting of the tumblers, and a supplemental lock permitting the operation of the eccentric when unlocked and for locking the
 95 eccentric against surreptitious resetting when locked.

28. In a multiple-key lock, the combination with a bolt and a plurality of locking
 100 tumblers which are adapted to be set for coaction with different keys, of an eccentric controlling the resetting of the tumblers, and a supplemental lock permitting the operation of the eccentric when unlocked and
 105 for locking the eccentric against surreptitious resetting when locked, the arrangement of parts being such that the tumblers are locked against resetting for a different key until they are moved to position to unlock
 110 the bolt and the supplemental lock is operated.

29. In a changeable key lock the combination with a lock-casing, a bolt therein,
 115 guards' keys and depositors' keys for operating said bolt from the front face of the lock, of a resetting device for changing the combination of the tumblers after the guards and depositors' keys are operated, and a
 120 safety lock for locking the resetting device against surreptitious change of the combination.

30. In a changeable key lock, a bolt, locking tumblers and supplemental tumblers
 125 each of which must be operated by its proper key before the lock can be reset, means to reset the locking tumblers, and a safety lock for locking the resetting means against surreptitious resetting of the tumblers.

31. In a changeable key lock, a bolt, locking tumblers and supplemental tumblers
 130 both of which must be key operated before

the lock can be reset, means to reset the locking tumblers, and a safety lock for locking the resetting means against surreptitious resetting.

32. In a changeable key lock the combination with a bolt, guard tumblers and locking tumblers both of which are set to retract the bolt, and a movable element to prevent surreptitious resetting of the locking tumblers, of a plurality of key-hubs, and three keys one adapted to set the locking tumblers, another to set the guards tumblers, and the other to move the movable element to permit the locking tumblers to be reset.

33. In a changeable key lock the combination with a bolt, guard tumblers and locking tumblers both of which are set to retract the bolt, and a stop to prevent surreptitious resetting of the locking tumblers, of a key for actuating the guard-tumblers, a key for actuating the locking-tumblers, and a key for actuating the stop to permit the locking tumblers to be reset.

34. In a changeable key lock the combination with a bolt, guard tumblers and locking tumblers both of which are set to retract the bolt, an adjusting eccentric for resetting the locking tumblers, means to hold the eccentric in position, of a key for actuating the guard-tumblers, a key for actuating the locking-tumblers and for withdrawing the bolt, and a key for actuating the eccentric-holding means.

35. In a changeable key lock the combination with a bolt, guard tumblers and locking tumblers both of which are set to retract the bolt, and means for controlling the resetting of the locking tumblers, of a plurality of key-openings in the lock-case, and three keys one adapted to set the locking tumblers, another to set the guard tumblers, and the other to control the resetting means.

36. In a changeable key lock the combination with a bolt, guard tumblers and locking tumblers both of which are set to retract the bolt, and means for controlling the resetting of the locking tumblers, of a key for actuating the guard tumblers, a key for actuating the locking-tumblers, and a key for actuating the means for controlling the resetting of the locking tumblers.

37. In a changeable key lock the combination with a bolt, guard tumblers and locking tumblers both of which are set to retract the bolt, and means for controlling the resetting of the locking tumblers, of a key for actuating the guard tumblers, a key for actuating the locking-tumblers and for withdrawing the bolt, and a key for actuating the means for controlling the resetting of the combination after the locking tumblers have been set.

38. In a multiple key lock, the combination with a bolt and a plurality of locking-tumblers comprising two sets of wheels capable of coöperation in different relative po-

sitions, an adjusting eccentric coacting with all of the wheels of one set for resetting them for coaction with the wheels of the other set, and a supplemental lock for locking the eccentrics against surreptitious resetting action.

39. In a multiple-key lock, the combination with a bolt and a plurality of tumblers comprising two sets of coöperating wheels which are separable for being set for coaction with different keys, of an adjusting eccentric coacting with all of the wheels of one set for simultaneously moving said set with respect to the other set so as to unlock the sets, and then restoring the parts to their locked positions after one set of wheels has been set to a key, and a supplemental lock for locking the eccentric against surreptitious resetting action.

40. In a multiple-key lock, the combination with a bolt and a plurality of sets of wheels forming tumblers the sets of which are separable for being set for coaction with different keys, of an adjusting-eccentric passing through all of the wheels of one set for simultaneously demeshing the sets to permit them to be reset and for simultaneously meshing the sets in their reset relation, and a supplemental tumbler lock located in the case of the multiple-key lock and connected with the said eccentric by means of pinions whereby the eccentric is held in the position which it has when the respective parts of the tumblers are combined as in use.

41. In a lock, the combination with a bolt and a dogging latch therefor, of a plurality of rotatable tumblers having gates normally out of alinement and adapted to be moved into a predetermined position to permit of the release of the latch, key operated gears for moving the tumblers into such predetermined position, means for disconnecting the tumblers from the gears whereby the positions of the tumblers may be changed to vary the relative disalined positions of the gates, and a supplemental lock for locking the disconnecting means to prevent surreptitious resetting of the main lock.

42. In a lock, the combination with a bolt and a latch therefor, a plurality of tumblers having gates normally out of alinement, gears for rotating the tumblers to bring the gates thereof into alinement to permit of the release of the latch, a key for engaging the teeth of the gears to rotate the latter, means for disengaging the tumblers from the gears simultaneously, whereby such tumblers may be disengaged when in their unlocking position to permit of the resetting of the lock by another key, and a supplemental lock for locking the disengaging means to prevent surreptitious resetting of the main lock.

43. In a lock, the combination with a bolt and a latch for preventing retraction of the

- bolt, of tumblers having gates normally out of alinement, gears engaging the tumblers, a key having a sinuous slot and provided with a pinion, a key guide having a lug adapted to cooperate with the slot and whereby when the key is inserted the gears are successively engaged and rotated to bring the tumbler gates into alinement to permit of the release of the latch, provision for disengaging the tumblers from the gears when such tumblers are in their unlocking position whereby the gears may be operated by another key to unlocking position to reset the lock and the tumblers then moved into engagement therewith, and a supplemental lock for locking the disengaging means to prevent surreptitious resetting of the main lock.
44. In a lock, the combination with a lock casing, a bolt and a latch for preventing retraction of the bolt, a post pivoted on the casing and having an eccentric portion, a plurality of tumblers pivoted on such eccentric portion and having gates normally out of alinement, gears meshing with the pinions, a key for turning the gears to rotate the tumblers to bring their gates into alinement, means for releasing the latch when the gates of the tumblers are in alinement, a dog for holding the post against movement, a cam for releasing the dog, and provision for turning the post to disengage the tumblers from the gears when the dog is released, whereby such tumblers may be disengaged when their slots are in alinement and the gears may be operated by another key to unlocking position to reset the lock and the tumblers then moved into engagement therewith, and a supplemental lock controlling the cam to prevent surreptitious resetting of the lock.
45. In a lock, the combination with a casing, a bolt, and a latch therefor, of an eccentric post pivoted on the casing, toothed tumblers pivoted on the post and having slots normally out of alinement, gears meshing with the tumblers, a key for successively engaging the gears to rotate the tumblers and bring their slots into alinement to permit of the release of the latch, a hub having a cam to release the latch and a pair of teeth, a pinion and a second cam fixed to the hub, a dog for holding the post against movement and provided with a yoke cooperating with the second cam, tumblers having two sets of notches, keys for actuating the said tumblers one of which keys is adapted to bring one set of notches into alinement to receive one of the hub teeth and to actuate the hub pinion to move the latch-actuating cam and the other of which is adapted to bring the other set of notches in alinement to receive the other hub tooth and to turn the hub pinion in the opposite direction and move the second cam to disengage the dog from the post, and provision for turning the post to disengage the tumblers from their gears when the dog is released, whereby such tumblers may be disengaged when their slots are in alinement and the gears may be operated by another key to unlocking position to reset the lock and the tumblers then moved into engagement therewith.
46. In a multiple-key lock, the combination with a bolt, and a two-part tumbler the respective parts whereof are constructed to be reset for coaction with different keys, of means for resetting the tumbler only when the tumbler is in position to unlock the bolt, and a supplemental lock for locking the said resetting means against surreptitious resetting of the tumblers.
47. In a multiple-key lock, the combination with a bolt, and a plurality of two-part tumblers the respective parts of which are constructed to be reset for coaction with different keys, of means for resetting the tumblers only when the tumblers are in position to unlock the bolt, and a supplemental tumbler-lock for locking the said resetting means against surreptitious resetting of the tumblers.
48. In a multiple-key lock, the combination with a bolt, and a two-part pivoted-tumbler the respective parts of which are constructed to be reset for coaction with different keys, of means for resetting the said tumbler only when the tumbler is in position to unlock the bolt, and a supplemental lock for locking the said resetting means against surreptitious resetting of the tumblers.
49. In a multiple-key lock, the combination with a two-part tumbler the respective parts whereof are constructed to be reset for coaction with different keys, of means for resetting the said tumbler, and a supplemental lock locked by a key to lock the tumblers in reset position.
50. In a multiple-key lock, the combination with a plurality of two-part locking tumblers the respective parts of which are constructed to be reset for coaction with the different keys, of means for resetting the said tumblers, and a supplemental tumbler-lock locked by a key to lock the main tumblers on their new combination.
51. In a lock, the combination with a bolt and locking means therefor, of a tumbler adapted to be moved into position to permit of the release of the said locking means, and independently actuated tumbler mechanism for releasing the said locking means when the first tumbler is in such position.
52. In a lock, the combination with a bolt and locking means therefor, of a plurality of tumblers adapted to be moved into predetermined position to permit of the release of the said locking means, and independently

actuated tumbler mechanism for releasing the said locking means when the first tumblers are in such position.

53. In a lock, the combination with a bolt and a latch for preventing the retraction of the bolt, tumblers adapted to be moved into predetermined position to permit of the release of the latch, and independently actuated tumbler mechanism for releasing the latch when the first tumblers are in such position.

54. In a lock, the combination with a bolt and a latch for preventing the retraction of the bolt, of two sets of tumblers one of which sets is adapted to be moved into predetermined position to permit of the release of the latch and the other of which sets is adapted to control the release of the latch when the first tumblers are moved to such position.

55. In a lock, the combination with a bolt, a latch for preventing retraction of the bolt, of tumblers adapted to be moved into registered position to permit of the release of the latch, means for releasing the latch when the said tumblers are in registered position, and other tumblers for controlling the releasing means.

56. In a lock, the combination with a bolt, a latch for preventing retraction of the bolt, tumblers adapted to be moved into registered position to permit of the release of the latch, a cam for releasing the latch when the tumblers are in registered position and other tumblers for preventing movement of the cam.

57. In a lock, the combination with a bolt, and locking means therefor, of a plurality of rotatable tumblers adaptable to be moved into predetermined position to permit of the release of said locking means, and tumbler mechanism for releasing the said locking means when the first tumblers are in such position.

58. In a lock, the combination with a bolt and locking means therefor, of a plurality of successively actuated rotatable tumblers adapted to be moved into predetermined position to permit of the release of the said locking means, and tumbler mechanism for releasing the said locking means when the first tumblers are in such position.

59. In a lock, the combination with a bolt and a latch pivoted thereon for preventing the retraction of the bolt, rotatable tumblers adapted to be moved into predetermined position to permit of the release of the latch, means for releasing the latch when the tumblers are in such position, and a second set of rotatable tumblers actuated independently of the first mentioned set for controlling the releasing means.

60. In a lock, the combination with a bolt, a latch for preventing retraction of the bolt, tumblers adapted to be moved into registered

position to permit of the release of the latch, a cam for releasing the latch when the tumblers are in registered position, master tumblers for preventing movement of the cam, and means for operating the cam when the master tumblers are in predetermined position.

61. In a lock, the combination with a bolt, and a latch pivoted thereon and engaging a fixed portion of the lock casing to prevent retraction of the bolt, rotatable tumblers adapted to be moved into predetermined position to prevent the release of the latch, a cam for releasing the latch when the tumblers are in such position, and independently operated rotatable tumblers controlling the cam.

62. In a lock, the combination with a bolt, a latch for preventing retraction of the bolt, rotatable tumblers adapted to be moved into registered position to permit of the release of the latch, a cam for releasing the latch when the tumblers are in registered position, master tumblers for preventing movement of the cam, and means for operating the cam when the master tumblers are in predetermined position.

63. In a lock, the combination with a bolt and a latch for preventing retraction of the same, of rotatable tumblers provided with gatings adapted when placed in register by movement of the tumblers to permit of the release of the latch, a cam for releasing the latch when the gatings are in register, and rotatable tumblers for preventing movement of the cam.

64. In a lock, the combination with a bolt and a latch for preventing retraction of the same, rotatable tumblers provided with gatings adapted when in register to permit of the release of the latch, a cam for releasing the latch when the gatings are in register, rotatable tumblers normally holding the cam against movement and provided with gatings adapted when in register to permit the cam to be moved, and means for retracting the bolt.

65. In a lock, the combination with a bolt and a latch for preventing retraction thereof, of tumblers having gatings adapted to be placed in register when the tumblers are moved to permit of the release of the latch, a cam for releasing the latch, master tumblers for preventing the movement of the cam, except when such tumblers are in predetermined position, means for moving the master tumblers, and means for retracting the bolt when the latch is released.

66. In a lock, the combination with a bolt and a latch for preventing retraction thereof, of tumblers having gatings adapted to be placed in register when the tumblers are in predetermined position to permit of the release of the latch, a cam for releasing the latch when the tumblers are in such prede-

terminated position, and tumblers for preventing the movement of the cam and having gatings adapted to be placed in register when the latter are in a predetermined position to permit of the movement of the cam.

67. In a lock, the combination with a bolt and a latch pivoted thereto for preventing retraction of the bolt, of a plurality of locking tumblers having gatings normally out of alinement, a cam for releasing the latch when the tumbler gatings are in alinement, master tumblers having gatings normally out of register to prevent movement of the cam, means for moving the locking tumblers to bring the gatings thereof in alinement, means for moving the master tumblers to place the gatings thereof in alinement, and means for retracting the bolt when the latch is released.

68. In a lock, the combination with a bolt and a latch for preventing retraction of the same, of a plurality of rotatable tumblers having gatings normally out of alinement, means for rotating the tumblers to bring their gatings in alinement to permit of the release of the latch, a cam for releasing the latch, a plurality of rotatable tumblers having gatings normally out of alinement, means for rotating the tumblers to bring their gatings into alinement, means for moving the cam when the gatings of the latter tumblers are in alinement, and means for retracting the bolt when the latch is released.

69. In a lock, the combination with a bolt and a latch for preventing retraction of the same, of a plurality of rotatable tumblers having gatings normally out of alinement, means for releasing the latch when the gatings of the tumblers are in alinement, a plurality of rotating tumblers for preventing movement of the said means, and keys adapted to successively actuate both sets of tumblers.

70. In a lock, the combination with a bolt and a latch for preventing retraction of the same, of a plurality of toothed tumblers having gatings normally out of alinement, a key provided with a pinion adapted to successively actuate the tumblers to bring their gatings into alinement and to finally cooperate with the bolt to retract the same when the latch is released, a cam for releasing the latch, a plurality of gears having gatings normally out of alinement, a key provided with a pinion adapted to successively actuate the gears to bring their gatings into alinement, and means actuated by the key to move the cam when the said notches are in alinement.

71. In a lock, the combination with a bolt and a spring latch for preventing retraction of the same, of a post, a plurality of toothed tumblers pivoted on the post and having gatings normally out of alinement, a plurality of gears meshing with the tumblers, a

pin having a lug, a key adapted to the pin and having a sinuous slot cooperating with the lug and provided with a pinion adapted to successively engage the gears and rotate the tumblers to bring their gatings into alinement to permit of the release of the latch, a hub having a cam for releasing the latch, such hub also being provided with a tooth and having a pinion fixed thereto, a plurality of gear tumblers having gatings normally out of alinement, a gear meshing with the hub pinion, and a key having a pinion adapted to successively engage the gear tumblers to rotate the same and bring their gatings into alinement to receive the hub tooth and then to engage the gear meshing with the hub pinion to rotate the latter to move the cam into engagement with the latch.

72. In a lock, the combination with a bolt, and locking means therefor, of a plurality of tumblers adapted to be moved into predetermined position to permit of the release of the locking means, means for successively actuating the tumblers to move them into such predetermined position to permit of the release of the locking means, and tumbler-controlled means for releasing the locking means when the tumblers are in such predetermined position.

73. In a lock, the combination with a bolt and a locking latch therefor, of a plurality of tumblers adapted to be moved into predetermined position to permit of the release of the latch, tumbler-controlled means for releasing the locking latch, and a key for first moving the tumblers into such predetermined position and then after the release of the locking latch to retract the bolt.

74. In a lock, the combination with a bolt, of a plurality of rotatable tumblers each having a gate, a key for successively actuating the tumblers to move their gates into register, a bolt, a latch pivoted on the bolt and having a tooth to enter the tumbler gates when in register and the latch is moved, and means for moving the latch.

75. In a lock, the combination with a bolt, of a plurality of rotatable tumblers each having a gate, a key for successively moving the tumblers to register their gates, a bolt, a latch pivoted on the bolt and having a tooth to enter the tumbler gates when the latter are in register and the latch is moved, and a cam moving the latch.

76. In a lock, the combination with a bolt, of a plurality of rotatable tumblers each having a gate, a key for successively actuating the tumblers to move their gates into register, a bolt latch having a tooth to enter the tumbler gates when in register and the latch is moved, a cam for moving the latch, and a plurality of tumblers adapted to be moved into predetermined position to permit of the movement of the cam.

77. In a lock, the combination with a bolt, of a plurality of rotatable tumblers each having a gate, a key for successively engaging the tumblers to move their gates into register, a bolt latch having a tooth to enter the tumbler gates when in register and the latch is moved, a cam for moving the latch, a plurality of tumblers adapted to be moved into predetermined position to permit movement of the cam, and means for moving the cam.

78. In a lock, the combination with a bolt, of a plurality of rotatable tumblers each having a gate, a key for successively actuating the tumblers to move their gates into register, a bolt latch having a tooth adapted to enter the tumbler gates when in register and the latch is moved, a cam for moving the latch, and a plurality of rotatable tumblers having gates normally out of register, and a key adapted to first move the latter tumblers to register their gates to permit of the movement of the cam and then actuate the cam.

79. In a lock, the combination with a bolt, a latch means for releasing the latch, of two sets of rotatable tumblers, the tumblers of each set having gates normally out of alignment, a key for successively actuating the tumblers of one set to bring the gates thereof into alignment to permit of the release of the latch, and a key for successively actuating the tumblers of the other set to permit of the actuation of the releasing means.

80. In a lock, the combination with a bolt, a latch, a cam for releasing the latch, of two sets of rotatable tumblers, the tumblers

of each set having gates normally out of alignment, a key for first actuating the tumblers of one set to bring the gates thereof into alignment to permit of the release of the latch and then engaging the bolt to retract the same, and a key for successively actuating the tumblers of the other set to permit of the actuation of the cam.

81. In a lock, a bolt, rotatable tumblers having normally disaligned gates adapted to register to permit of the retraction of the bolt, and spring-pressed yokes for maintaining the tumblers in their normal positions.

82. In a lock, a bolt, rotatable toothed tumblers having normally disaligned gates adapted to register to permit of the retraction of the bolt, a pair of yokes, and a spring acting in opposition against the yokes to maintain the tumblers with their teeth aligned.

83. In a lock, a bolt, rotatable toothed tumblers having normally disaligned gates adapted to register to permit of the retraction of the bolt, pivoted gears for turning the tumblers and having peripheral recesses, a pair of yokes pivoted on the pivot of the gears and located in the recesses, and a spring having opposite arms reacting against the yokes to normally maintain the gears with the teeth aligned.

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

BRUCE BORLAND.

Witnesses:

ARTHUR B. SEIBOLD,
ELIZABETH MOLITOR.