Sept. 9, 1952 F. J. BREMER ET AL 2,609,679

SAFE LOCK

Filed July 22, 1949 2 SHEETS—SHEET 1

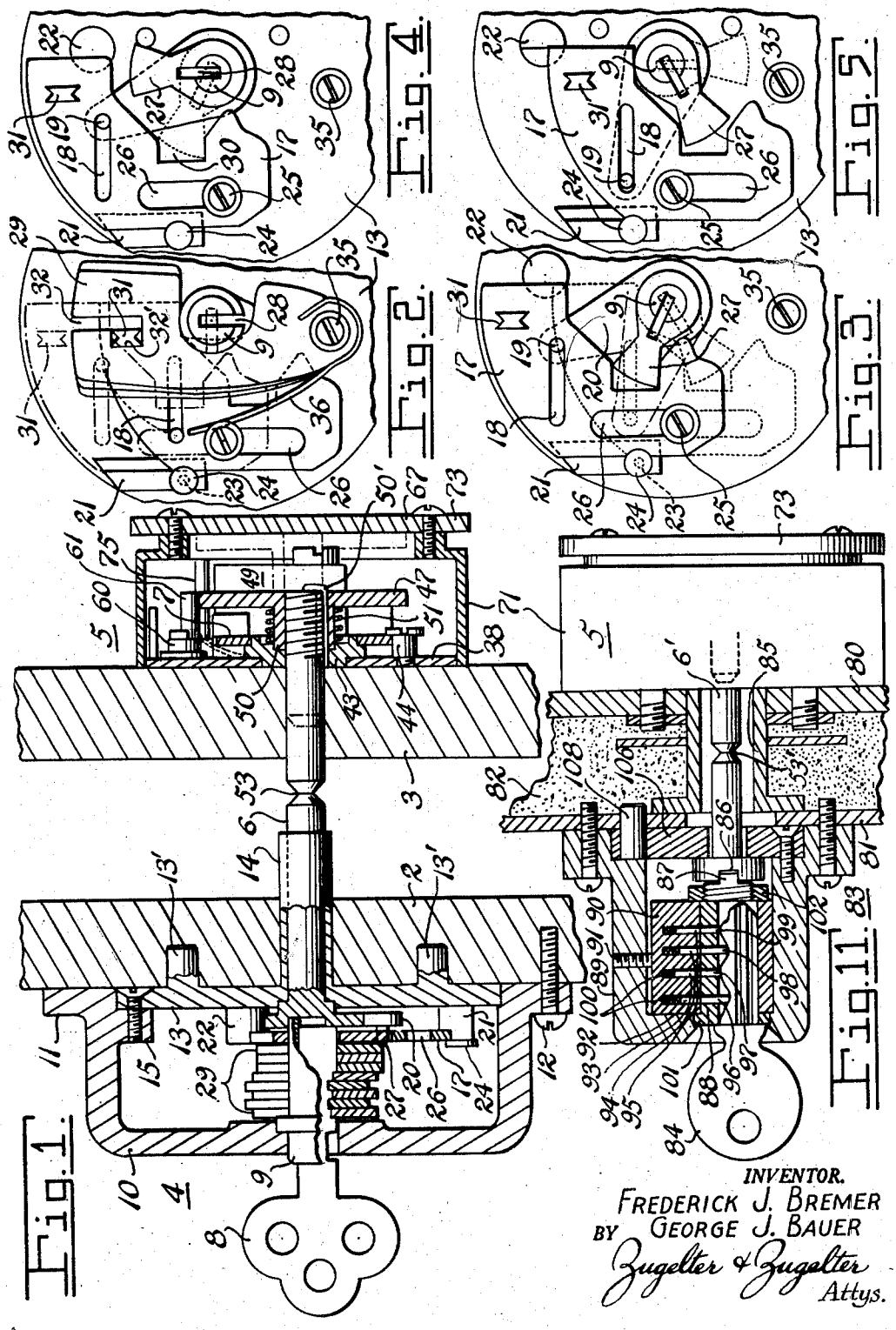


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 11.

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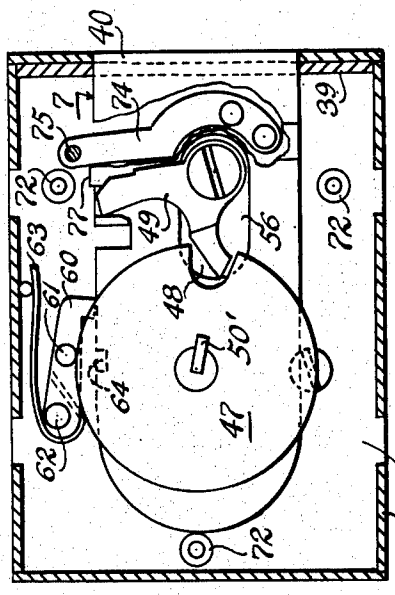


Fig. 6.

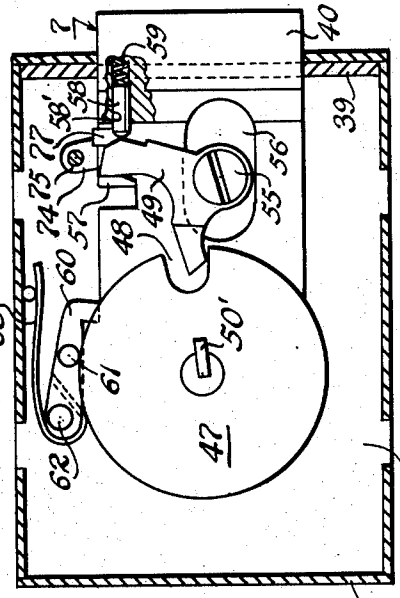


Fig. 7.

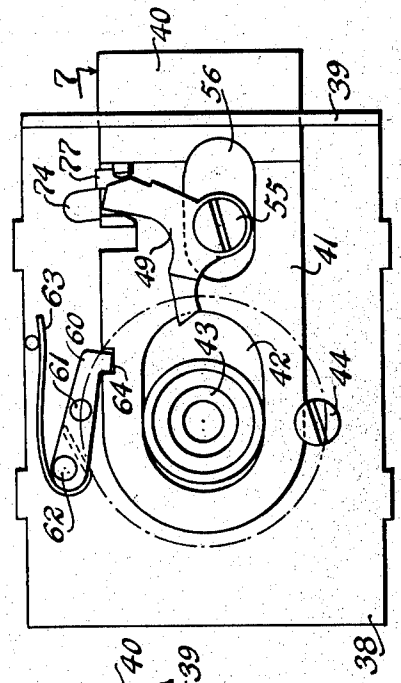


Fig. 9.

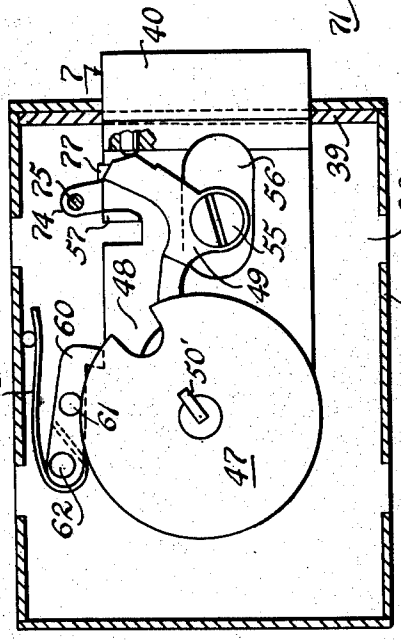


Fig. 8.

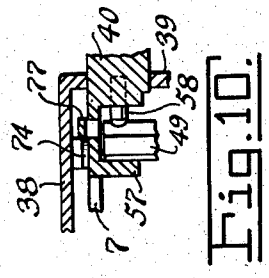


Fig. 10.

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2,609,679

SAFE LOCK

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11 Claims. (Cl. 70—1.5)

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This invention relates to safe locks and more particularly to key locks for safes.

Ordinarily, safes are provided with combination locks. Such locks are usually mounted on or near the inner faces of the safe doors and are opened and closed from the front of the door by a knob which is part of the combination mechanism. Safe doors usually are heavy and thick which makes the use of a key for opening or closing a safe lock located deep in or on the inside face of the door, impractical because of the long key that would be required.

An object of this invention is to provide a lock and lock mechanism for safes which are so designed that a relatively short key may be employed for actuating the mechanism to open or close the lock.

Another object of the invention is to provide a key-actuated key lock that will be substantially pick-proof and capable of withstanding unauthorized openings of the lock by demolition tactics.

A further object of the invention is to provide a key-actuated safe lock and lock mechanism that comprises a lock adapted for mounting on the inside face of the door, a lock mounted on the outside face of the door and a driving connection between the mechanisms of the inner and outer locks controlled by a key insertable in the outer lock.

A still further object of the invention is to provide a key-actuated lock as above set forth, which shall be so constructed that the driving connection is rendered inoperative to actuate the inner lock mechanism in the event the outer lock is knocked off the safe door.

A still further object of the invention is to provide a key-actuated lock, as above set forth, in which the actuating mechanism of the bolt of the inner lock is locked in closed position when the driving connection between the inner and outer locks is broken.

And a still further object of the invention is to provide a safe lock of the character set forth above, provided with means which are inaccessible through the door for further securing the inner lock bolt in locked position when the bolt actuating mechanism is knocked off the inner face of the door.

The foregoing and other objects of the invention will be apparent to those skilled in this art, from the following description and the drawings, in which:

Figure 1 is a fragmentary view in horizontal section of a safe door and a horizontal section of a safe lock mounted on the door and arranged and constructed in accordance with an embodiment of the invention;

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Fig. 2 is a view in front elevation of the lock mechanism of the outer lock illustrated in Fig. 1, the tumblers of the lock being shown in full lines corresponding to the open position of the lock and in dotted lines to indicate the locked position thereof;

Fig. 3 is a view similar to Fig. 2 with the tumblers removed;

Figs. 4 and 5 are front views of the key-actuated drive mechanism of the outer lock showing the motion of the parts when moving from closed to open position;

Figs. 6, 7 and 8 are end views of the lock mechanism of the inner lock with the housing removed and illustrating the motions of the bolt actuating mechanism while the bolt moves from the open or unlocked position of Fig. 6 to the locked or closed position of Fig. 8.

Fig. 9 is a view similar to Fig. 8, showing two safety lock features for the bolt which become operative in sequence, first, when the outer lock has been knocked off the door, and second, when the inner lock housing and the actuating mechanism for the bolt have been knocked off the inner door;

Fig. 10 is a view in section taken on line X—X of Fig. 9; and

Fig. 11 is a fragmentary view in section of a safe door, provided with an inner lock, as shown in Fig. 1, and an outer cylinder lock, the latter being in section.

In Figure 1 of the drawings we have illustrated what now appears to be a preferred form of the key safe lock embodying a form of the invention. The safe lock is shown mounted on a safe door. The door is shown as having spaced outer and inner walls 2 and 3 made of alloy steel of the type commonly employed in safe doors.

The lock mechanism comprises an outer lock 4, an inner lock 5 and a driving connection or spindle 6 operatively connected to the lock mechanisms of the inner and outer locks. The inner lock is provided with a sliding or reciprocating bolt 7 adapted to be moved into or out of a lock keeper (not shown) that would be mounted in the safe door frame (not shown).

The safe lock is actuated by a key 8 which is inserted in a slotted key cylinder 9 in the outer lock. The key cylinder can be turned in one direction or the other to open or close the lock.

The outer lock comprises a housing 10 of cup shape having a flange 11 by means of which

the housing may be secured to the safe door by means of suitable bolts 12. The housing 10 is closed by means of a plate 13 which rests against the outer face of the door and which is provided with a bearing sleeve 14 integral therewith. The bearing sleeve 14 extends through the outer wall 2 of the door and forms a journal or bearing for spindle 6. Plate 13 is secured to the cup 10 by means of screws which are threaded into the bosses 15 integral with the inner wall of the cup. Within the housing 10 is disposed the lock actuating mechanism through which spindle 6 may be turned by key 8 to operate the slide bolt 7. Plate 13 is provided with integral heavy pins 13' that extend into suitable apertures in the front wall 2. The function of pins 13' is to prevent turning of the outer lock, after removal of screws 12, in an attempt to open the inner lock. The outer lock housing 10, plate 13, pins 13' and sleeve 14 are made of file, drill and saw resistant alloy steel to prevent unauthorized removal thereof from the door except by demolition tactics.

The mechanism in the outer lock comprises a member 17 which is given a linear motion by the rotary motion of the key cylinder 9, and member 17 converts its linear motion into rotary motion of spindle 6. Member 17 may be in the form of a Scotch yoke and is mounted in the housing so as to be moved with reciprocating motion vertically or at any other suitable angle. For convenience, it is shown mounted for horizontal reciprocating motion in housing 10.

Member 17 is provided with a slot 18 disposed transversely to the line of motion thereof and in which a crank pin 19 is disposed. Crank pin 19 is secured to a crank 20 attached to the outer end of spindle 6. The yoke 17 is guided at its opposite horizontal edges in slide bearings 21 and 22, bearing 21 being provided with a pin 23 having a head 24 overlying the edge of the yoke so as to hold it on its bearing. Yoke 17 is also guided by a post 25 secured to plate 13 and extending through a horizontal slot 26 in the yoke.

Yoke 17 may be reciprocated by a cam 27 carried by the inner end of key cylinder 9. The key cylinder 9 is provided with a slot 28 extending longitudinally thereof and which opens through one side thereof to allow the teeth and notches of the key to engage a series of lock tumblers 29. When key 8 is turned clockwise (assuming the lock bolt 7 of the inner lock to be in open position) spindle 6 is turned clockwise whereby the bolt-actuating mechanism of the inner lock is operated to closed position. When the key is turned clockwise as seen in Figure 1, the yoke is moved to the left in a horizontal direction causing crank pin 19 to move towards a horizontal plane passing through the center line of spindle 6 whereby crank 20 is turned clockwise. Turning of the key in the opposite direction moves the yoke to the right, causing spindle 6 to turn counterclockwise to unlock the lock bolt 7. As shown in Fig. 1, the inner end of the key cylinder 9 is journaled in a socket in the outer end of spindle 6 and the outer end of the cylinder is journaled in an opening in the front wall of housing cup 10. As shown by Figs. 2 to 5 inclusive, cam 27 of the key cylinder 9, when rotated, enters a notch 30 in yoke 17. When the cam 27 is in this notch and it is turned either clockwise or counterclockwise the yoke 17 is moved either to the left or the right. The yoke is cut away on both sides of the notch 30 to provide clearance for the cam when it is turned to its extreme positions through an arc of 180 degrees. Thus there is provided a certain travel of the key cylinder cam 27 during the initial turning of the key from either open or closed position before it actuates yoke 17, to allow time for the key to pre-position the tumblers 29. The yoke 17 is provided with a fence 31 that projects outwardly from the outer face of the yoke, the fence being located near the left hand edge of the yoke.

The fence 31 and the tumblers 29 form a lock for the actuating mechanism of spindle 6. When yoke 17 is in the dotted line position indicated in Fig. 2, fence 31 is disposed adjacent the free ends of tumblers 29. When the key has been turned counterclockwise through the portion of its stroke preceding entry of cam 27 into notch 30, the tumblers shift downwardly to the positions where an unobstructed horizontal gate 32 is formed by the tumblers which allows the fence 31 to move through it as the key is turned to unlock the lock bolt 7. Each of the tumblers, it will be understood, is provided with a horizontal gate and that when the lock is locked these gates are out of alignment, but when the key is turned to unlock or open the lock, the tumblers are so shifted that they are moved into alignment. When the key has been turned to the full open position which is that corresponding to the dotted lines of Fig. 5, the tumblers move upwardly to position the fence in a vertical notch 32' in the tumblers.

As shown in Fig. 2, the tumblers are pivotally mounted at their right hand ends on a post 35, the post being secured to plate 13. Each tumbler is provided with a spring 36 anchored at one end to the pivotal end of the respective tumblers and with the free end thereof bearing against guide post 25. These springs tend to urge the tumblers in a clockwise direction about pivot pin 35. It will be observed also that the tumblers are provided with a semi-circular notch at about their middle to provide clearance about the key cylinder 9.

The inner lock 5 comprises a plate 38 secured to the inner face of the inner wall 3 of the safe door and provided with a flange 39 in which the lock bolt 7 is guided there being an opening in this flange accommodating the bolt. As shown, the forward end 40 of bolt 7 is relatively heavy and thick. Extending rearwardly from the heavy section 40 is a relatively thin plate section 41. This section is provided with an elongated slot 42 through which extends a bushing 43 in which the inner end of the spindle 6 is journaled. Portion 41 of the bolt is guided on a screw or pin 44 having a head which forms a retaining flange for the lower edge of portion 41. On the inner end of spindle 6 is secured a cam 47 having a notch 48 in the edge thereof which co-acts with a bell crank 49 arranged to move the slide bolt 7 to or from locked position. The cam 47 is provided with a threaded hub 50 whereby it may be threaded onto the inner end of spindle 6 and locked in position by a key 50'. Between the cam 47 and the bushing 43 a compression spring 51 is mounted which tends to urge cam 47 to the right as seen in Fig. 1. This spring is provided to disengage cam 47 from the bell crank 49 in the event the outer lock mechanism 4 is knocked off the front of the safe door and the spindle 6 is fractured at a point between the outer and inner walls of the door. When spindle 6 is unbroken, inward movement thereof is prevented by the hub of crank 20 which abuts plate 13 as shown in Fig.

1. To make certain that the spindle will fracture under such circumstances, it is provided with a neck portion 53 of reduced area or cross section. When the spindle is fractured at neck 53, cam 47 and the portion of spindle 6 to the right of the neck 53 move laterally to the dotted line position indicated in Fig. 1. In this position the portion of the spindle connected to cam 47 is rendered inaccessible to a tool that someone might try to use to turn the spindle.

As shown in Figs. 6 to 10 inclusive, bell crank 49 is pivotally mounted on a pin or screw 55 secured to plate 38. The slide bolt 7 is provided with an elongated opening 56 to accommodate the pin 55 and permit reciprocating motion of the slide bolt. One arm of the bell crank is disposed between a lug 57 and the heavy portion 40 of the slide bolt 7 so that as the crank turns counterclockwise, as seen in views 6 to 9 inclusive, the bolt moves to the left and when turned clockwise the bolt slides to the right. The other arm of the bell crank is disposed to ride on the periphery of the cam 47 and to drop into notch 48 as the cam is turned, so that the bell crank may be turned in one direction or the other, as shown. In order that the bell crank may be made to follow and remain in contact with the cam 47, a pin 58 is mounted in a socket 58' in the heavy portion of the bolt behind which is a compression spring 59. This spring urges the pin into contact with the bell crank arm between lug 57 and the heavy portion 40 of the bolt. Views 6, 7 and 8 indicate the motion of the cam, bell crank, and slide bolt 7 when key 8 is turned to move the bolt into locked position. The sequence of motion of these parts, when the bolt is moved from locked to open position, is represented by Figs. 8, 7, and 6, respectively.

In order to further guard against manipulation of spindle 6 after it has been fractured, in an attempt to move the lock bolt 7 to open position, a pawl 60 is provided. Pawl 60 is disposed above the slide bolt portion 41 and is provided with a pin 61 that normally rides on the periphery of cam 47 and holds the pawl out of engagement with the slide bolt portion 41. Pawl 60 is pivotally mounted on a pin 62 and is urged in a direction towards the slide bolt and cam 47 by means of a spring 63. The bolt portion 41 is provided with a notch or shoulder 64 so located that when the slide bolt 7 is in locked position this notch or shoulder is under the free end of the pawl 60. Thus, when the cam 47 is moved to the dotted line position of Fig. 1, in response to severance of spindle 6, the pawl 60 moves into position to engage the notch or shoulder 64 so as to hold the bolt in locked position, thus preventing manipulation of bolt 7 by means of tools inserted through the openings in the door walls 2 and 3, through which the sleeve bearing 14 and the spindle 6 extend.

The mechanism of the inner lock 5, above described, is ordinarily enclosed by a cover or housing 71 which is secured to the plate 38 by means of rivets 72. The inner ends of these rivets are secured to plate 38 and the outer ends are peened over the outer face of the cover. The cover is provided with an access opening which normally is closed by a plate 73, whereby the cam 47 may be threaded onto the spindle 6 in the assembly of the lock, or, whereby it may be adjusted or removed if the lock requires servicing. When the lock housing 71 is in place it engages an additional safety lock 74 which is mounted on plate 38 at a location between bell crank 49 and flange 39 of plate 38. When the cover is in place lock 74 is held flatwise against plate 38 by a pin 75 secured to cover 71.

If the lock bolt 7 is in locked position, that is, in the position shown in Figs. 7, 8, and 9, and an attempt is made to open the inner lock after the outer lock has been knocked off the door, and the spindle has been fractured, as by inserting a drive pin through the holes in the door and a hammer blow is struck on the pin while in engagement with spindle 6, the cover or housing 71 and its access plate 73 will be driven off the door, the rivet heads of the securing pins being sheared. When this happens plate 38 will remain secured to the door. Since the lock bolt is secured to the plate 38 it will not be knocked off the door. However, as soon as the housing is knocked off the inner lock, lock 74 springs outwardly from the plate 38 and engages a lug 77 on the slide bolt. This lock is difficult, if not impossible to reach, thereby insuring that the slide bolt will remain in closed position even though manipulating tools successfully disengage pawl 60 from the bolt. The relative positions of the lock 74 and the lug 77 after the housing 71 has been knocked off the inner face of the door, are indicated in Fig. 10.

To summarize: assuming that the safe lock is locked, tumblers 29 will be in the full line positions shown in Fig. 2, and the yoke will be in the position shown in Fig. 4. As key 8 is turned counter-clockwise, the tumblers are shifted downwardly as shown in Fig. 2, and the key crank 27 moves as indicated by Figs. 4, 3 and 5, whereby the yoke 17 is moved to its full open position indicated by Fig. 5. When the cam is turned to the dotted line position of Fig. 5, the key will have been turned 180 degrees from its initial starting position and fence 31 will come to rest in the lateral notches 32' of the tumblers 29.

To lock the safe lock, the key is turned to move the key cam 27 from the dotted line position of Fig. 5 to the full line position of Fig. 4. In this position the tumblers turn clockwise about the pivot pin 35 and the tumbler gates are out of alignment, so that on removal of the key from the key cylinder 9 the lock can not be opened.

While we have indicated a single key lock for the outer lock, it will be apparent that this lock may be designed to require a plurality of access keys, so that more than one individual must be present to open the lock. It will also be apparent that instead of employing a Scotch yoke mechanism for turning spindle 6 and a flat type tumbler lock therefor, we may also employ a cylinder type outer lock to provide a driving connection between the key and the spindle 6 to actuate the inner lock. Such an arrangement is shown in Fig. 11.

In Fig. 11, the inner and outer walls of the safe door are indicated by reference characters 80 and 81, the space between them being filled with a grouting 82. A lock 5 such as shown in the preceding views, is secured to the inner face of the door and a cylinder lock 83 is mounted on the front of the door to provide a driving connection between the key 84 and spindle 6'. The lock 83 is illustrated as being of the paracentric key-cylinder type.

Spindle 6' is like spindle 6 except that it does not have a crank corresponding to crank 20. Spindle 6' extends through a sleeve 85 located in the space between door walls 80 and 81 and secured thereto. The outer end of the spindle is

provided with a shouldered socket 86 into which is received a correspondingly shaped end 87 of key-cylinder 88.

Lock 83 comprises a flanged cup-shaped housing 89 secured to the outer door wall by screws or other suitable means, the key-cylinder 88 and a stationary cylinder 90 secured by a set screw 91, and tumblers 92 to 95 and 96 to 99 disposed in sockets in the stationary and key cylinders 88 and 90, respectively. These tumblers operate against compression springs 100 as shown. The forward end of the key-cylinder is provided with a flange 101 abutting the stationary cylinder, and the inner end is threaded and provided with a nut 102 that abuts the inner end of the stationary cylinder, thus locking the key cylinder in the stationary cylinder. The key cylinder is provided with a key slot 103 which opens outwardly to provide access for the key 84 through an opening 104 in the housing.

The open side of housing 89 is closed by a plate 105 secured in place by screws 107. Plate 106 may be provided with one or more hardened steel alloy pins 108 that extend through suitable openings in the outer wall 81 for locating the outer lock in a desired position and preventing turning thereof for the purpose of opening the inner lock. The outer lock housing, plate 106 and pins 108 are made of hardened steel alloy of a character to resist files, saws, drills and other or similar tools employed by "safe-crackers."

The lock shown in Fig. 11, operates in substantially the same manner as the lock disclosed by Figs. 1 to 10. The inner lock 5 may be assumed to be identical, the difference being in the type of lock employed as the outer lock. When key 84 is inserted as shown in Fig. 11, the tumblers are so positioned that the key cylinder is free and can be turned by the key. When the lock is in locked position and the key is removed, the tumblers in the stationary cylinder move partially into the key cylinder and prevent turning thereof by means other than the appropriate key.

If the outer lock is knocked off the door with a sledge hammer, for example, spindle 6' will fracture at its neck 53' as in the case of spindle 6 in Fig. 1, whereby the portion of the spindle attached to the inner lock is projected into the inner wall of the door, rendering it inaccessible to turning tools. If a drive pin is placed against the inner portion of the spindle in an attempt to knock the inner lock off, the bolt 7 will be held in locked position by the safety locks described in connection with Figs. 6 to 10 inclusive.

Having thus described the invention, it will be apparent to those skilled in this art, that various modifications and changes may be made without departing from either the scope or the spirit of the invention as set forth in the appended claims.

What we claim as new and desire to secure by Letters Patent is:

1. A key lock for a safe door having a closed hollow space between the inner and outer faces thereof, said lock comprising a housing adapted for mounting on the outer face of the door, a key lock in said outer housing, a lock adapted for mounting on the inner face of the door having a bolt adapted for actuation into and out of a lock keeper, a spindle adapted to extend from the interior of the exterior housing through said door into the lock on the inner door face, means providing a driving connection between the inner end portion of said spindle and said bolt, said lock in the outer housing being disposed when unlocked by a key to effect a driving connection between said key inserted into said outer lock and said spindle whereby upon turning the key the inner lock may be opened and closed by the driving connection effected through said outer lock and spindle, said spindle having a reduced area fracture section adapted to be normally located in said hollow space, and means responsive to fracture of said section for disengaging the driving connection between the inner portion of said spindle and said inner lock.

2. A lock according to claim 1 characterized by the fact that means responsive to the breaking of said spindle are provided for actuating the portion of the spindle connected to said inner lock inwardly towards said inner lock, and that means are provided for enclosing the fractured end of the portion of the spindle connected to said inner lock when actuated inwardly in response to fracture to render the same inaccessible to tools intended for turning said portion of the spindle.

3. A key lock for a safe door comprising a housing adapted for mounting on the outer face of the door, a key lock in said outer housing, a lock adapted for mounting on the inner face of the door having a bolt adapted for actuation into and out of a lock keeper, a spindle adapted to extend from the interior of said exterior housing through said door into the lock on the inner door face, mechanism connecting the inner end portion of said spindle and said bolt for actuating the same into and out of locking position in response to turning of the spindle, said spindle being provided at a location between said inner and outer locks with a necked portion at which said spindle breaks when the outer lock housing is knocked off the safe door, thereby severing the driving connection between said outer lock and the portion of the spindle extending inwardly from said necked portion into said inner lock, and means responsive to the breaking of said spindle for disconnecting the inner portion of the spindle from the bolt-actuating mechanism of the inner lock to thereby prevent actuation of said bolt from locked to unlocked position, said lock in the outer housing being disposed when unlocked by a key to effect a driving connection between said key inserted into said outer lock and said spindle, whereby upon turning the key the inner lock may be opened and closed by the driving connection effected through said outer lock and spindle.

4. A safe lock comprising an inner lock having a sliding bolt therein adapted for mounting on the inside face of a safe door, an outer lock disposed for mounting on the outer face of said door, a spindle adapted to extend through the said door, the inner end of said spindle having a driving connection with the sliding bolt of said inner lock, said outer lock including means adapted to be actuated by a key inserted therein for establishing a driving connection in the outer lock between said key and spindle when said key is turned to open or close said inner lock, means for locking the spindle driving connection between the outer and inner locks when the key has been turned to the position in which the bolt of the inner lock has been turned to locked position and means for disestablishing the driving connection between the inner end of said spindle and said sliding bolt in response to fracture of the spindle that results when the outer lock is knocked off the door.

5. A safe lock comprising an inner lock having a sliding bolt therein adapted for mounting on the inside face of a safe door, an outer lock dis-

posed for mounting on the outer face of said door, a spindle adapted to extend through the said door, the inner end of said spindle having a driving connection with the sliding bolt of said inner lock, a driving connection in the outer lock between the key and the outer end of the spindle comprising a Scotch yoke mounted for linear reciprocating movement and having a crank pin slot extending transversely to the line of motion thereof, a crank on said spindle having a crank pin extending into said slot, and a rotatable member having a key slot therein and a cam disposed on said rotatable member to reciprocate said yoke in response to rotation of said rotatable member by a key inserted in said slot, said outer lock including means adapted to be actuated by a key inserted in said key slot for locking or unlocking said yoke whereby the driving connection in the outer lock is established through said key, yoke and spindle when said key is turned to open or close said inner lock.

6. A safe lock comprising an inner lock having a sliding bolt therein adapted for mounting on the inside face of a safe door, an outer lock disposed for mounting on the outer face of said door, a spindle adapted to extend through the said door, the inner end of said spindle having a driving connection with the sliding bolt of said inner lock, a driving connection in the outer lock between the key and the spindle comprising a Scotch yoke mounted for linear reciprocating movement and having a crank pin slot extending transversely to the line of motion thereof, a crank on said spindle having a crank pin extending into said slot, a rotatable member having a key slot therein and a cam disposed on said rotatable member to reciprocate said yoke in response to rotation of said rotatable member by a key inserted therein, a fence on said yoke, said outer lock including a plurality of tumblers each provided with a gate, said key having means to adjust said tumblers to align said gates to provide a passageway for said fence as the key is turned from closed towards open position whereby the yoke may move linearly and turn said crank and spindle, said tumblers being urged to positions to which said gates are out of alignment after said key has been turned to closed position in which position the fence is in abutment with said tumblers to lock said yoke.

7. A safe lock comprising an inner lock having a sliding bolt therein adapted for mounting on the inside face of a safe door, an outer lock disposed for mounting on the outer face of said door, a spindle adapted to extend through the said door, the inner end of said spindle having a driving connection with the sliding bolt of said inner lock, a driving connection in the outer lock between the key and the spindle comprising a Scotch yoke mounted for linear reciprocating movement and having a crank pin slot extending transversely to the line of motion thereof, a crank on said spindle having a crank pin extending into said slot, a rotatable member having a key slot therein and a cam mounted thereon and actuated thereby, disposed to reciprocate said yoke in response to rotation thereof, a fence on said yoke, said outer lock including a plurality of tumblers each provided with a gate adapted to be aligned by said key to provide a passageway for said fence, said key having means to adjust said tumblers to align said gates as the key is turned from closed towards open position whereby the yoke may move linearly and turn said crank and spindle, said tumblers being urged to positions in which said gates are out of alignment when the key has been turned to closed position in which position the fence is blocked by said tumblers against movement and locks the yoke, and a housing inclosing the outer lock mechanism, the outer end of said rotatable member containing the key slot being journalled in a wall of said housing and accessible to said key.

8. A safe lock according to claim 4 characterized by the fact that the inner lock includes means for locking said bolt in locked position in response to the disestablishment of the driving connection between said spindle and said bolt.

9. A safe lock comprising outer and inner locks adapted for mounting on the outer and inner faces, respectively, of a safe door, a driving spindle for said locks adapted to extend through said door with the respective opposite ends thereof disposed within the outer and inner locks, respectively, said spindle having a reduced area fracture section located between said locks, an abutment on the portion of the spindle in the outer lock for preventing the portion of the spindle located inwardly of the fracture section from moving inwardly of the door while the fracture section is unbroken, said inner lock having a base plate adapted to be secured to the inside face of the safe door, a bolt slidably mounted on said base plate, a cam adjacent said bolt and secured to the inner end of said spindle, a bell crank pivotally mounted on said base plate and having one arm connected to said bolt to reciprocate the same, the other arm of said crank being disposed for actuation by said cam whereby on turning the cam the bell crank is turned and the bolt actuated to and from locking position, a spring exerting a force on said cam and spindle in a direction to disengage said cam from the bell crank and to shift inwardly of the door the portion of the spindle located inwardly of the fracture section in response to fracture of the spindle at said fracture section, a locking pawl pivotally mounted on said base plate and riding on said cam, said bolt having a notch in which said pawl is received to lock said bolt when the cam is disengaged from said bell crank in response to fracture of the spindle, said outer lock including means adapted to be actuated by a key inserted therein for establishing in the outer lock a driving connection between said key and spindle when said spindle is turned by the key to open or close said inner lock.

10. A safe lock comprising outer and inner locks adapted for mounting on the outer and inner faces, respectively, of a safe door, a driving spindle for said locks adapted to extend through said door with the respective opposite ends thereof disposed within the outer and inner locks, respectively, said spindle having a reduced area fracture section located between said locks, an abutment on the portion of the spindle in the outer lock for preventing the portion of the spindle located inwardly of the fracture section from moving inwardly of the door while the fracture section is unbroken, said inner lock having a base plate adapted to be secured to the inside face of the safe door, a bolt slidably mounted on said base plate, a cam adjacent said bolt and secured to the inner end of said spindle, a bell crank pivotally mounted on said base plate and having one arm connected to said bolt to reciprocate the same, the other arm of said crank being disposed for actuation by said cam whereby on turning the cam the bell crank is turned and the bolt actuated to and from locking position, means exerting a force on said cam and spindle in a

direction to disengage said cam from the bell crank and to shift inwardly of the door the portion of the spindle located inwardly of the fracture section in response to fracture of the spindle at said fracture section, a locking pawl pivotally mounted on said base plate and riding on said cam, said bolt having a notch in which said pawl is received to lock said bolt when the cam is disengaged from said bell crank in response to fracture of the spindle, a housing for said inner lock secured to said base plate, a locking member normally held in non-locking position by said housing and adapted to be released to engage and lock said bolt when the housing is knocked off said plate, said outer lock including means adapted to be actuated by a key inserted therein for establishing in the outer lock a driving connection between said key and spindle when said spindle is turned by the key to open or close said inner lock.

11. A safe lock comprising outer and inner locks adapted for mounting on the outer and inner faces, respectively, of a safe door, a driving spindle for said locks adapted to extend through said door with the respective opposite ends thereof disposed within the outer and inner locks, respectively, said spindle having a reduced area fracture section located between said locks, an abutment on the portion of the spindle in the outer lock for preventing the portion of the spindle located inwardly of the fracture section from moving inwardly of the door while the fracture section is unbroken, said inner lock having a base plate adapted to be secured to the inside face of the safe door, a bolt slidably mounted on said base plate, a lock lug on said bolt, a cam adjacent said bolt and secured to the inner end of said spindle, a bell crank pivotally mounted on said base plate and having one arm connected to said bolt to reciprocate the same,

the other arm of said crank being disposed for actuation by said cam whereby on turning the cam the bell crank is turned and the bolt actuated to and from locking position, a compression spring between said cam and said plate exerting a force on said cam and spindle in a direction to disengage said cam from the bell crank and to shift inwardly of the door the portion of the spindle located inwardly of the fracture section in response to fracture of the spindle at said fracture section, a locking pawl pivotally mounted on said base plate and riding on said cam, said bolt having a notch in which said pawl is received to lock said bolt when the cam is disengaged from said bell crank in response to fracture of the spindle, a housing for said inner lock secured to said base plate, a locking member normally held in non-locking position by said housing and adapted to be released to engage said lock lug and lock said bolt when the housing is knocked off said plate, said outer lock including means adapted to be actuated by a key inserted therein for establishing in the outer lock a driving connection between said key and spindle when said spindle is turned by the key to open or close said inner lock.

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