

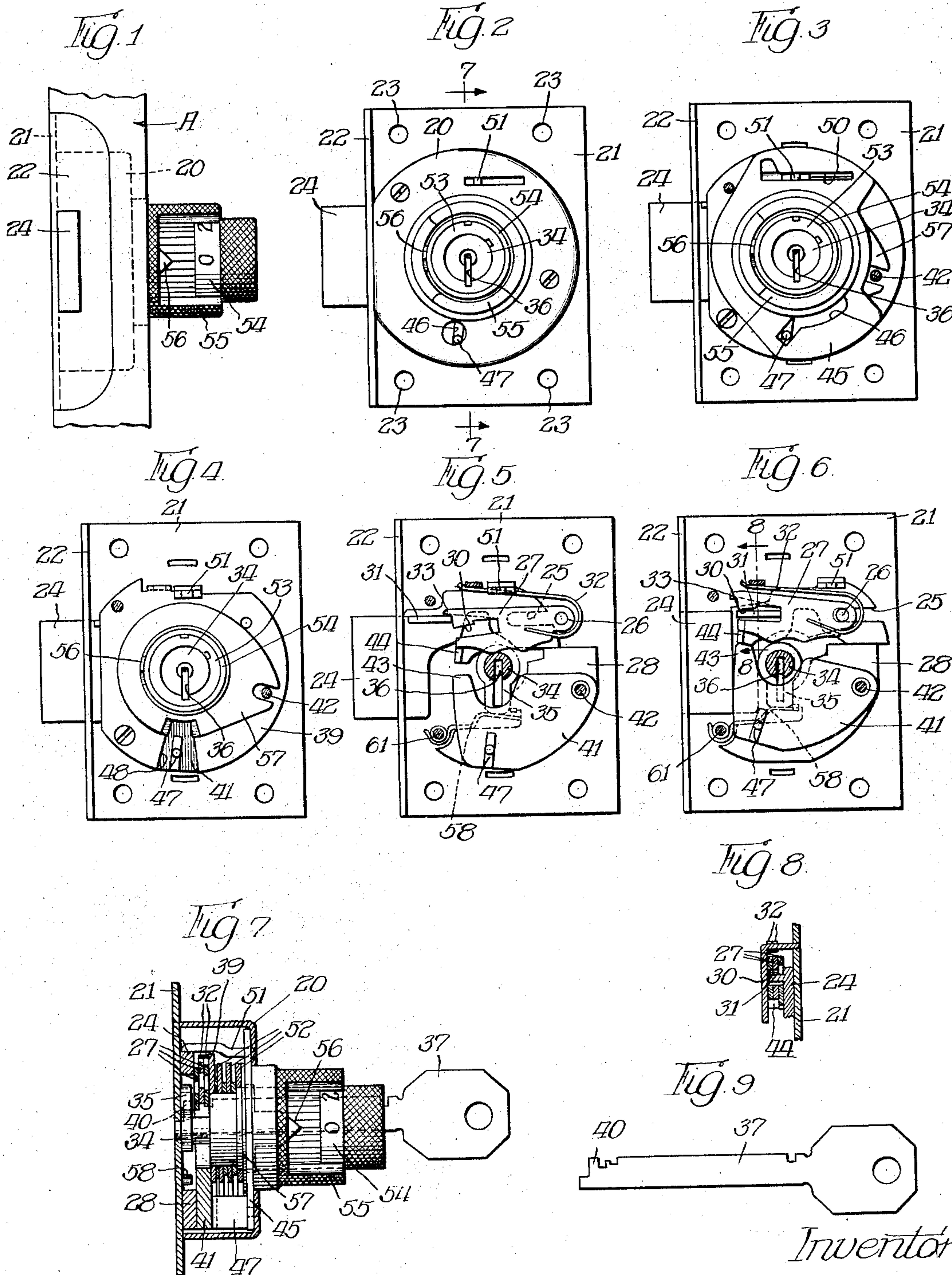
June 5, 1934.

G. W. ALDEEN

1,961,187

MORTISED LOCK

Filed July 18, 1930



Inventor:
Gedor W. Aldeen,
By Chindell Baker *Carlson*
Attys

Patented June 5, 1934

1,961,187

UNITED STATES PATENT OFFICE

1,961,187

MORTISED LOCK

Gedor W. Aldeen, Rockford, Ill., assignor to
American Cabinet Hardware Corp., Rockford,
Ill., a corporation of Illinois

Application July 18, 1930, Serial No. 468,877

23 Claims. (Cl. 70—53)

The invention relates in general to locks and more particularly to a lock constructed to fit in a mortise cut in the door of a locker, cabinet, closet or the like.

5 The general object of the invention is to provide a novel lock for this purpose which has a key-operated device and a permutation-operated device, either of which may be used to open the lock independently of the other.

10 Another object is to provide a lock of this character which cannot easily be forced open or picked, and yet may be manufactured at a relatively low cost.

15 A further object is to provide a lock of this character, the only part of which to appear on the front face of the door is the dial and a concentric sleeve for operating the permutation-operated device and a key cylinder concentrically arranged within the dial.

20 Still another object is to provide a lock having a plurality of tumblers which must be properly positioned before the bolt may be thrown and which may be so positioned either by the key or by a lever whose movement is controlled
25 by the permutation-operated device.

30 A still further object is to provide a lock of this character having a cam member first for moving the tumbler-positioning lever when the permutation-operated device is properly set, and then for throwing the bolt.

Another object is to provide a lock in which the permutation device is not affected by any pressure that may be applied to the bolt.

35 Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawing, in which:

40 Figure 1 is a fragmentary edge elevation of a door or the like having a lock embodying the features of the invention mounted in a mortise cut in the door.

Fig. 2 is a side elevation of the lock.

Fig. 3 is a view similar to Fig. 2 but with part of the casing removed.

45 Fig. 4 is a view similar to Fig. 3 but with parts removed to show the permutation device.

Fig. 5 is a view similar to Fig. 4 but with the permutation device removed, the bolt being in a locked position.

50 Fig. 6 is a view similar to Fig. 5 but with the parts in their position when unlocked by the permutation device.

55 Fig. 7 is a section through the lock taken on the line 7—7 of Fig. 2, but with the parts in their position when unlocked by the key.

Fig. 8 is a fragmentary section taken on the line 8—8 of Fig. 6.

Fig. 9 is a view of the key.

60 While the invention is susceptible of various modifications and alternative constructions, I

have shown in the drawing and will herein describe in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

The present embodiment of the invention comprises in general a casing, a bolt, means normally preventing movement of the bolt but permitting such movement when shifted to a predetermined position, a key-operated device for shifting said means and moving said bolt, a lever for shifting said means, a permutation device controlling the movement of said lever, and a cam member for moving said lever and said bolt when the permutation device is set.

As shown in Fig. 1 of the drawing, the present embodiment of the lock is constructed to fit in a mortise cut in the edge of the door of a locker, cabinet, or the like, the door being indicated at A. The lock has a casing comprising a cup portion 20, which is completely enclosed within the mortise, and a mounting plate 21 arranged to fit flush with one face of the door and having a right-angle portion 22 fitting flush with the edge of the door. The cup portion 20 and the mounting plate 21 are secured together as by screws. The mounting plate 21 may have a plurality of holes 23 to receive screws for firmly securing the lock to the door.

A bolt 24 is slidably supported at one end in an aperture in the right-angle portion 22 of the mounting plate and is arranged to be moved from a position flush with the portion 22 to a position extending beyond the portion 22 and into an aperture in a plate (not shown) in the door jamb to lock the door in the usual manner.

The other end of the bolt 24 lies within the casing and has a slot 25 which is arranged to embrace a pin 26 when the bolt is moved inwardly of the casing, the edge of the bolt sliding along a plate 28 secured to the mounting plate 21. The pin 26 and slot 25 and the plate 28 thus accurately guide that end of the bolt while the other end of the bolt is guided by the aperture in the right angle portion 22 of the mounting plate 21.

As mentioned above, the invention includes a means normally preventing movement of the bolt but permitting such movement when shifted to a predetermined position, the means herein illustrated comprising a plurality of tumblers 27 which are pivotally mounted on the pin 26. Each tumbler has a notch 30 cut in the end opposite to the pivot pin 26 and lying substantially in line with the direction of movement of the bolt. A projection or fence 31 is formed on the bolt and is arranged normally to abut against the end of the tumblers, as shown in Fig. 5, to prevent

movement of the bolt, but, when the tumblers are shifted to a predetermined position, the fence 31 may enter the notches 30 in the tumblers and permit the bolt to be moved.

- 5 The tumblers are normally held in a position to prevent movement of the bolt by means of springs 32, and lugs 33 are formed on the ends of the tumblers which are arranged to abut against the fence 31 to prevent movement of the tumblers beyond such position by the springs.

- 10 The key-operated device, mentioned above, for shifting the tumblers and for moving the bolt comprises, in the present instance, a key cylinder 34 centrally mounted in the casing and having a cam 35 formed on its inner end. The cylinder 34 has a slot 36 constructed to receive a key 37 which has a bit 40 at its end arranged to fit in a slot in the cam 35. Other bits are formed on the key adjacent the bit 40 which are constructed to strike the edges of the tumblers 27 adjacent the cylinder 34 (see Fig. 7).

- 20 When the key 37 and cylinder 34 are rotated, the bits adjacent the bit 40, which strike the edges of the tumblers individually, cause the latter to pivot about the pin 26 against the action of the springs 32 to a position in which the fence 31 may enter the notches 30 in the tumblers, and the cam 35 then strikes the bolt and moves it inwardly of the casing to unlock the lock. A reverse rotation of the key and cylinder moves the bolt outwardly and permits the springs 32 to throw the tumblers back to their normal position. Thus, the lock may be opened by the key-operated mechanism.

- 35 An alternative mechanism for opening the lock is provided which is controlled by a permutation-operated device. The alternative mechanism comprises a lever 41 which is pivoted to the plate 28 by a pin 42. The free end of the lever 41 has a boss 43 constructed to strike a lug 44 formed on one of the tumblers 27. The lug 44 extends transversely past the edges of all the tumblers so that, when the lever 41 is swung and the lug 44 is moved, all the tumblers are collectively shifted to a position in which the fence 31 may enter the notches in the tumblers. An intermediate plate 39 overlies the lever, tumblers and bolt and is secured to the mounting plate 21.

- 50 To swing the lever 41, a member 45 is rotatably mounted within the casing and has a cam slot 46 which receives the end of a lug 47 extending transversely from the lever 41 through a notch 48 cut in the intermediate plate 39. The member 45 also has a second cam slot 50 which loosely receives the end of a lug 51 extending transversely from the side of the bolt past the edge of the intermediate plate 39. The cam slots 46 and 50 are so formed that on rotation of the member 45, the lever 41 is swung about the pivot 42, by means of the lug 47, to shift the tumblers to a position in which the fence 31 may enter the notches 30, and the bolt is then moved inwardly of the casing by means of the lug 51.

- 65 To control the movement of the lever 41, a permutation device is mounted on the intermediate plate 39 and is arranged when set to permit the lug 47 to be moved by the cam member 45, and thus permit the lock to be opened thereby. The permutation device comprises a plurality of disks 52 rotatably mounted on a spindle 53 secured on the intermediate plate 39. The outer disk has a sleeve secured thereto constituting a cylindrical dial 54 surrounding the spindle 53, the outer disk being rotated by manual rotation of the dial 54. The disks have the usual transversely

extending lugs coacting with corresponding lugs on the adjacent disks to permit them all to be rotated, and each disk has a notch which, when alined with the notches in the other disks, is adapted to receive the lug 47 on the lever 41 when it is swung by the cam member 45. Thus, the permutation device controls the movement of the lever 41, and hence the opening of the lock by the alternative mechanism.

The spindle 53 and the cylindrical dial 54 extend beyond the casing and beyond the surface of the door (see Fig. 1) when the lock is mounted in the mortise therein. The spindle is tubular and encloses the key-cylinder 34 so that the dial 54 and the key-cylinder are concentric.

The cam member 45 has a sleeve 55 extending beyond the surface of the door and surrounding the cylindrical dial 54. A segment of the sleeve 55 is cut away so that characters marked on the dial may be seen. A pointer 56 extends from within the casing between the sleeve 55 and the dial 54 adjacent the cut-away segment of the sleeve 55 and coacts with the characters marked on the dial to permit the permutation disks 52 to be set to a position where their notches are alined. The pointer 56 has a flange 57 within the casing resting on the permutation disks 52 and is held against rotation by one of the screws securing the cup portion 20 of the casing to the mounting plate 21.

When the key-operated mechanism is not in use, and it is desired to operate the lock by means of the permutation device, it is desirable to prevent the key-cylinder from rotating so that the cam 35 will not interfere with the bolt when the latter is moved by the cam member 45. To accomplish this, a spring 58 is anchored to the mounted plate 21 as by a pin 61 and extends toward and presses against the cam 35 when it is in the inactive position, the pressure of the spring 58 holding the cam 35 and hence the key-cylinder 34 against rotation but permitting rotation thereof when the key-cylinder is turned by the key.

One important use of the present type of lock is in lockers for clubs, schools or the like. It is there often desirable to place the lockers in groups and provide one key which will open only the locks in one group, other keys being provided for other groups, and also to provide a key which will open all the locks in the several groups. The present construction employing a plurality of tumblers permits the use of such keys with adequate protection against the chance of the lock being easily picked.

In a school, for instance, each student is given the characters of the setting of the permutation device at which the lock may be opened. If the authorities wish to have access to the locker, the key for the group including the locker may be used, or the master key which will open all the locks. Thus, the key-operated mechanism and the mechanism controlled by the permutation device may be selectively operated to open the lock.

The lock when mounted in a door presents a neat appearance as the only parts to appear on the outer face of the door are the concentrically arranged key-cylinder, dial, and operating sleeve for the cam member 45. It is evident that, on account of the simplicity of the lock, it may be manufactured at a low cost and yet its construction is such that it cannot easily be forced open.

I claim as my invention:

1. A lock comprising, in combination, a movable bolt, means normally lying in the path of

said bolt to prevent movement thereof and constructed to permit such movement when shifted out of said path, and two selectively-operable mechanisms adapted when operated to shift said means and move said bolt, one of said mechanisms being key-operated and the other permutation-operated.

2. A lock comprising, in combination, a bolt, means normally lying in the path of said bolt to prevent movement thereof and shiftable out of said path, two selectively-operable mechanisms adapted when operated to shift said means and to move said bolt, one of said mechanisms being key-operated, and a permutation device controlling the operation of the other of said mechanisms.

3. A lock comprising, in combination, a bolt, a plurality of tumblers normally lying in the path of said bolt to prevent movement thereof and shiftable out of said path, a key-operated mechanism for individually shifting said tumblers out of said path and for moving the bolt, an alternative mechanism for collectively shifting said tumblers out of said path and for moving the bolt, and a permutation device controlling the operation of said alternative mechanism.

4. A lock comprising, in combination, a bolt, means normally abutting said bolt to prevent movement thereof and constructed to permit such movement when shifted to a predetermined position, a lever independent of said means and operable when swung to shift said means, a permutation device operable when set to permit said lever to swing, and a manually movable member having separate connections with said lever and said bolt respectively operable to swing said lever to shift said means to said predetermined position and operable to move said bolt.

5. A lock comprising, in combination, a bolt, means normally preventing movement of said bolt and constructed to permit such movement when shifted to a predetermined position, a lever operable when swung to shift said means, a permutation device operable when set to permit said lever to swing, and a rotatable member having a pair of cam slots respectively for swinging said lever and for moving said bolt.

6. A lock comprising, in combination, a bolt having a lug projecting therefrom, means normally preventing movement of said bolt and constructed to permit such movement when shifted to a predetermined position, a lever operable, when swung, to shift said means and having a lug projecting therefrom, a permutation device comprising a plurality of disks each having a notch in its periphery, said notches when aligned being arranged to receive the lug on said lever and permit the lever to be swung, and a rotatable member having a pair of cam slots respectively engaging said lugs for swinging said lever and for moving said bolt.

7. A lock comprising, in combination, a casing, a bolt, means normally preventing movement of said bolt and constructed to permit such movement when shifted to a predetermined position, a lever operable when swung to shift said means, a permutation device comprising a plurality of disks one of which has a cylindrical dial extending from said casing, and a rotatable member having cam slots for swinging said lever and for moving said bolt, said member having a sleeve portion extending from said casing and surrounding said dial with a segment thereof cut away to permit said dial to be seen.

8. A lock comprising, in combination, a casing,

a bolt, means normally preventing movement of said bolt and constructed to permit such movement when shifted to a predetermined position, a lever operable when swung to shift said means, a rotatable member for swinging said lever and for moving said bolt having a sleeve extending from said casing, a permutation device comprising a plurality of disks, one of which has a cylindrical dial extending from said casing through said sleeve, said sleeve having a segment thereof cut away to permit the dial to be seen, and a pointer secured within said casing and extending between said dial and said sleeve coacting with said dial to permit the setting thereof.

9. A lock comprising, in combination, a casing, a plate mounted intermediate the sides of said casing, a bolt mounted on one side of said plate and having a lug extending to the other side thereof, means mounted on the same side of said plate normally preventing movement of said bolt and constructed to permit such movement when shifted to a predetermined position, a lever mounted on the same side of said plate and having a lug extending to the other side thereof, said lever when swung being operable to shift said means, a spindle mounted centrally on the side of said plate opposite to said bolt and extending externally of said casing, a plurality of spaced permutation disks rotatably mounted on said spindle and having notches which when aligned are arranged to receive the lug on said lever to permit the latter to be swung, the disk farthest from said plate having a sleeve surrounding said spindle and extending externally of said casing with a scale marked on the periphery thereof, a rotatable member having a pair of cam slots respectively engaging the lugs on the bolt and the lever for moving the bolt and the lever and having a sleeve extending externally of the casing around the sleeve of the disk, the sleeve of said rotatable member having a segment cut away to permit the scale on said disk sleeve to be seen, and a pointer secured with said casing and extending between said sleeves adjacent said scale to permit the setting of said disks.

10. A lock comprising, in combination, a casing, a plate mounted intermediate the sides of said casing, a bolt mounted on one side of said plate, movable means mounted on the same side of said plate controlling the operation of the bolt, a lever mounted on the same side of said plate for moving said means out of said path, a tubular spindle fixed at one end to said plate and extending from the other side of said plate externally of said casing, a key cylinder mounted within said spindle constructed to receive a key for operating said movable means and said bolt, a permutation device including a plurality of disks and a dial rotatably mounted on said spindle and controlling the movement of said lever, and a member for moving said lever and said bolt rotatably mounted concentrically with the dial.

11. A lock comprising, in combination, a bolt having a fence formed thereon, a plurality of movable tumblers normally preventing movement of said bolt, each tumbler having a slot arranged to receive said fence and to permit said bolt to be moved when the tumblers are shifted to a predetermined position, each of said tumblers being arranged to be shifted individually by a key, a lug formed on one of said tumblers arranged to abut against the other tumblers, a lever arranged when swung to abut against said lug to shift said tumblers collectively, and a permutation-operated device controlling the swinging of said lever.

12. A lock comprising, in combination, an apertured casing, a bolt having one end slidably guided in the aperture in said casing and having a notch in its other end, a pin secured to said casing and fitting within said notch to guide the latter end of said bolt, a fence formed on the bolt, a plurality of tumblers pivotally mounted on said pin and having notches arranged to receive said fence when pivoted to a predetermined position to permit said bolt to be moved, springs tending to pivot said tumblers out of said predetermined position to prevent movement of said bolt, said tumblers being constructed to be individually moved to said predetermined position by a key, a lever for collectively moving said tumblers to their predetermined position, and a permutation-operated device controlling the movement of said lever.
13. A lock comprising, in combination, a bolt, rotatable means for moving said bolt, and a permutation device controlling the operation of said means and having a cylindrical dial movable relative to said means, said means including as a portion thereof a sleeve surrounding said dial with a segment thereof cut away to permit the dial to be seen.
14. A lock comprising, in combination, a bolt, rotatable means for moving said bolt, a permutation device controlling the operation of said means and having a cylindrical dial movable relative to said means, said means having a sleeve surrounding said dial with a segment thereof cut away to permit the dial to be seen, and a fixed pointer extending in an axial direction out from between said sleeve and said dial within the cut-away segment to cooperate with said dial in the setting thereof.
15. A lock comprising, in combination, a bolt, key-operated mechanism for moving said bolt including a rotatable key cylinder, means connected with said bolt for moving said bolt independently of the rotation of said key cylinder, and a permutation device controlling the operation of said means and having a tubular cylindrical dial rotatably mounted on and surrounding said key cylinder, said means having a sleeve surrounding said dial by which said means may be manually operated.
16. A lock comprising, in combination, a casing, a plate mounted intermediate the sides of said casing and having a tubular spindle secured at one end to said plate and extending from one side thereof, a bolt, a key-operated mechanism for moving said bolt mounted on the other side of said plate and having a key cylinder extending through said tubular spindle, and a permutation-operated device for moving said bolt including a plurality of disks rotatably mounted on said tubular spindle, and a manually movable operating member for moving said bolt rotatably mounted around the outside of said spindle.
17. A lock comprising, in combination, a bolt, a permutation device, a member rotatable relative to said permutation device and operable when said device is set to move said bolt, and a key-operated mechanism mounted concentrically with the permutation device and operable on rotation to move said bolt, the rotation of said key-operated mechanism being relative to and independent of the said member.
18. A lock comprising, in combination, a bolt, a key-operated mechanism operable on rotation to move said bolt and including a key cylinder, a manually operable member mounted concentrically with said key cylinder and rotatable relative to and independently of said key-operated mechanism for moving said bolt, a permutation device controlling the operation of said member and including a plurality of disks rotatably mounted on said key cylinder and a manually operable member independent of said bolt moving member for setting said disks.
19. A lock comprising, in combination, a casing, a plate mounted intermediate the sides of said casing and having a tubular spindle extending from one side thereof, a bolt, a key-operated mechanism operable on rotation to move said bolt mounted on the other side of said plate and having a key cylinder extending through said tubular spindle, a member movable relative to said key-operated mechanism and connected with said bolt for moving the latter, and a permutation device controlling the operation of said member and including a plurality of disks rotatably mounted on said tubular spindle.
20. A lock comprising, in combination, a casing, a plate mounted intermediate the sides of said casing, a bolt mounted on one side of said plate, key-operated mechanism mounted on said side of said plate and including a cam adapted on rotation to move said bolt, a lug extending from said bolt to the other side of said plate, and a permutation-operated device mounted on said other side of said plate concentrically with said key-operated mechanism and including a member adapted on rotation to engage said lug and move said bolt.
21. A lock comprising, in combination, a movable bolt, means normally preventing the movement of said bolt and shiftable to permit such movement, and two selectively operable mechanisms, each of which is independently capable of actuation to shift said means out of the path of said bolt and thereafter to move said bolt, one of said mechanisms being key-operable and including a rotary key-receiving member which by rotation shifts said means and moves said bolt, and the other of said mechanisms being permutation-operated and acting independently of said key-receiving member to shift said means and move said bolt.
22. A lock comprising, in combination, a movable bolt, means normally lying in the path of said bolt to prevent movement thereof and constructed to permit such movement when shifted out of said path, and two selectively operable mechanisms, one of which is key-operated and the other permutation-operated, each of said mechanisms being capable of actuation independently of the other to shift said means out of the path of said bolt and thereafter to move said bolt.
23. A lock comprising, in combination, a movable bolt, means normally preventing the movement of said bolt and shiftable to permit such movement, and two selectively operable mechanisms to shift said means and to move said bolt, one of said mechanisms being key-operated and the other permutation-operated, each of said mechanisms being connected with said bolt and with said means independently of the other mechanisms.

GEDOR W. ALDEEN.

CERTIFICATE OF CORRECTION.

Patent No. 1,961,187.

June 5, 1934.

GEDOR W. ALDEEN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, line 125, claim 10, for "controlling the operation" read and normally lying in the path; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 24th day of July, A. D. 1934.

Bryan M. Battey

(Seal)

Acting Commissioner of Patents.