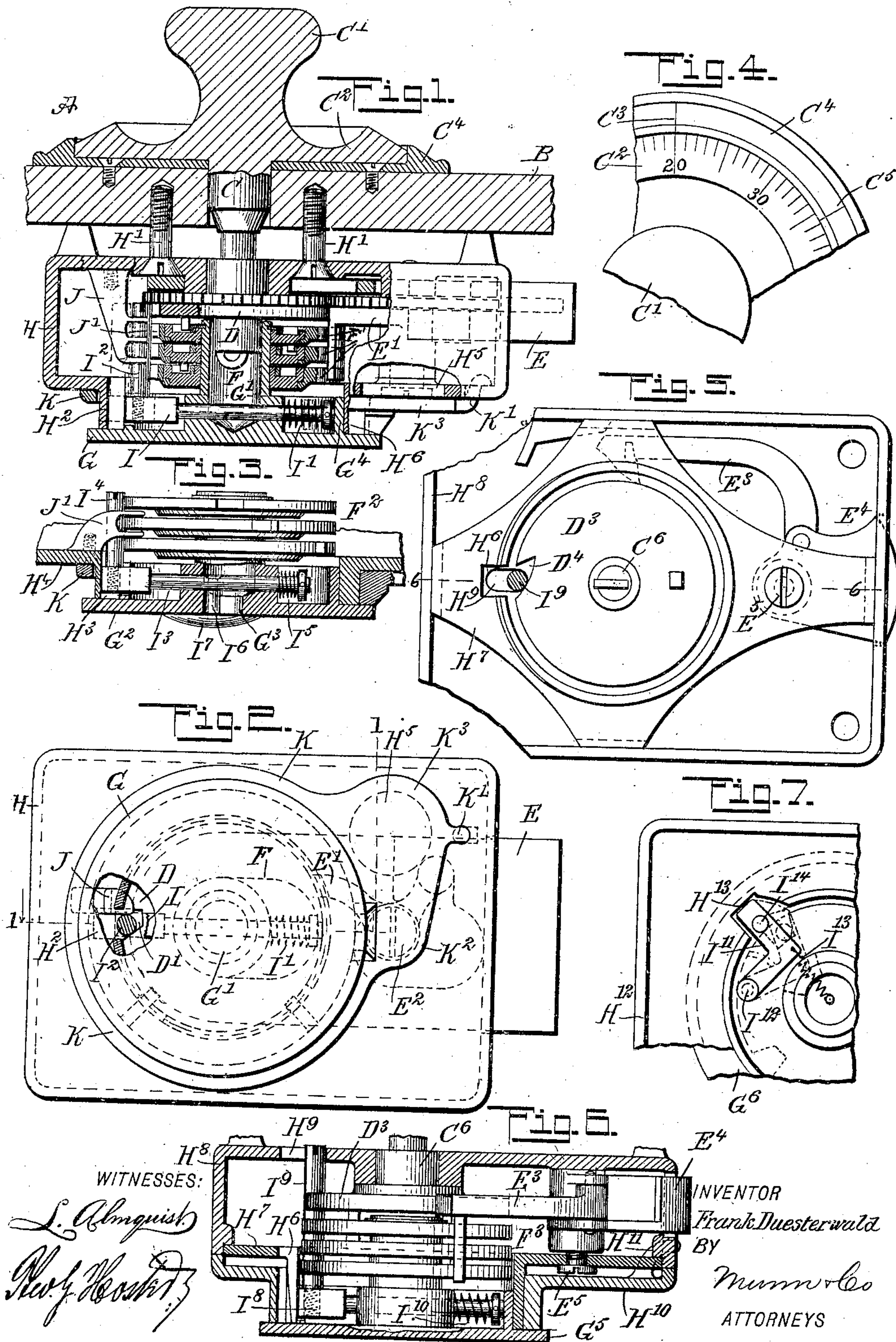


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F. DUESTERWALD.
LOCKING DEVICE FOR PERMUTATION LOCKS.

APPLICATION FILED DEC. 28, 1905.



UNITED STATES PATENT OFFICE.

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LOCKING DEVICE FOR PERMUTATION-LOCKS.

No. 832,542.

Specification of Letters Patent.

Patented Oct. 2, 1906.

Application filed December 28, 1905. Serial No. 293,627.

To all whom it may concern:

Be it known that I, FRANK DUESTERWALD, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Locking Device for Permutation-Locks, of which the following is a full, clear, and exact description.

10 The invention relates to locking devices for casings of permutation-locks, and is intended for the same purpose as the devices shown and described in the Letters Patent of the United States No. 778,018, granted to me December 20, 1904, and in Letters Patent of the United States No. 828,276, dated August 7, 1906.

20 The object of the present invention is to provide a new and improved locking device for the casings of permutation-locks arranged to prevent unauthorized persons from gaining knowledge of the combination of the permutation-lock while the safe is open and to enable the owner or person in charge of the safe to readily and conveniently change the combination whenever it is desired to do so and without danger of forming a "lock-out."

30 The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

35 A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

40 Figure 1 is a sectional plan view of the improvement as applied to the permutation-lock of a safe, the section being on the line 1 1 of Fig. 2. Fig. 2 is a face view of the same, part being broken out and parts being shown in section. Fig. 3 is a sectional plan view of an alternative form of the improvement. Fig. 45 4 is a front face view of part of the permutation-lock. Fig. 5 is a face view of an alternative form of the improvement, part being shown in section. Fig. 6 is a sectional plan view of the same on the line 6 6 of Fig. 5, and 50 Fig. 7 is a face view of another alternative form of the improvement.

In the locking device for the casings of permutation-locks shown and described in

the Letters Patent of the United States No. 778,018, above referred to, the cover of the casing of the permutation-lock and carrying the tumblers is held against removal by a lock separate and independent of the permutation-lock, and in the arrangement shown and described in Letters Patent No. 828,276, 55 above referred to, the locking device for the cover of the permutation-lock casing is controlled by the mechanism of the permutation-lock, the locking device having movement independent of the movement of the bolt of the permutation-lock; but the locking device 60 and the bolt are controlled by the same combination of tumblers, which read at different points.

65 In the invention presently to be described in detail the locking device for the cover is controlled by the tumblers and is shifted into locking position on turning the spindle of the permutation-lock.

70 The permutation-lock A is arranged on the door B of the safe, vault, or like device, and on the spindle C of the said permutation-lock is secured the usual notched disk or false tumbler D, having a notch D' for engagement with a dog E', connected with a bolt E, to swing the same into an open or closed position in the usual manner. The notched disk D' controls tumblers F in the usual manner, the tumblers being mounted to turn on a stud G, arranged on the removable section or cover 75 G of the casing H, fastened by screws H' or other fastening devices to the door B of the safe, the said casing H containing the tumblers F, the notched disk D, the dog E', and the bolt E, as will be readily understood by 80 reference to the drawings. It is understood that the tumblers F are set to a desired combination and are controlled according to this combination from the disk D turning with the spindle C, the latter having the usual knob C' under the control of the operator. 85 The spindle C carries a dial C², indicating on a fixed point C³, arranged on a ring C⁴, attached to the front of the safe-door B. (See Figs. 1 and 4.) 90 95 100

In order to lock the cover G in position on the casing H, a locking-bolt I is provided, mounted to slide in a bearing formed on the inside of the cover G, the bolt being adapted to pass into a notch H², formed on the casing H, and a spring I' tends to draw the bolt I 105

out of engagement with the notch H^2 . On the bolt I is screwed or otherwise removably secured an inwardly-extending pin I^2 , reaching across the peripheral faces of the tumblers F. This pin normally prevents the spring I' from withdrawing bolt I by engaging the edges of the tumblers F and false tumbler D; but said pin is adapted to pass into the registering notches F' of the said tumblers whenever the latter have been set according to the combination of the permutation-lock and whenever the notch D' of the notched disk D is in register with the notches F' in the tumblers F. When this takes place, the spring I' withdraws the bolt I from the notch H^2 , thus unlocking the cover G to allow removal thereof from the casing H, with a view to enable the owner or person in charge of the safe to change the combination in the usual manner. When the combination has been reset and the cover H returned to position, together with the tumblers F, and the operator turns the spindle C, then the wall of the notch D' of the disk D acts as a cam on the pin I^2 , so as to push the bolt I outward into engagement with the notch H^2 to lock the cover G again on the casing H. It is understood that when the pin I^2 is acted on by the notched disk D as described, it moves out of engagement with the notches F' in the tumblers F, and consequently the bolt I cannot be withdrawn unless the tumblers have their notches F' in register with the pin I^2 , and the notch D' is at the same time in register with the said tumbler-notches F' and the pin I^2 .

From the foregoing it will be seen that the cover G is locked to the casing H by a locking device having a member controlled by the tumblers F and shifted into locking position by the notched disk D of the permutation-lock.

It is important to provide means for throwing this locking device out of action when desired, both to prevent a possible lock-out through failure to note correctly the combination after changing the same and for the convenience of the lock and safe dealers, who customarily will desire to put the locking device into action only after delivery of the lock or safe to a purchaser. To this end, I make the pin I^2 removable from the bolt I, said pin being, as already stated, a mere screw which may be unscrewed readily when the back plate G is detached from the lock-casing and may be replaced as readily. When said pin I^2 is removed, the bolt I is not controlled at all by the tumblers F and false tumbler D, and the back plate may be removed at any time independent of the position of the tumblers, the bolt I being held back by the spring I' . This is a considerable convenience to the safe and lock dealers, but is of much more importance to the safe owner, who may make a mistake in noting down the new combination

after changing the combination. Before replacing the cover or back plate G after changing the combination the screw I^2 should be removed temporarily, the back plate being then put in place and the lock tested. In case a mistake is made the cover G is removed and the mistake rectified, and then the pin I^2 is secured to the bolt I and the cover G, with the tumblers thereon, is placed in position and the knob C' is turned to cause the bolt I to lock the cover G in place, as above described.

In order to properly guide the pin I^2 when pushed out of engagement with the notches F' of the tumblers F, a bearing J is provided, secured to or formed in the casing H and extending over the top of the pin I^2 , as will be readily understood by reference to Figs. 1 and 2. Thus when the notched disk D acts on the pin I^2 with a view to move the bolt I into a locking position then the pin I^2 by abutting against the under side of the bearing J is prevented from bending or springing, and consequently a proper pushing of the bolt I into locking position is obtained. In the arrangement shown in Figs. 1 and 2 the bolt I is pushed into locking position by the action of the notched disk D; but, if desired, one of the tumblers F may be used for this purpose. For instance, as shown in Fig. 3, a bolt I^3 is mounted to slide in a cover G^2 to engage a notch H^3 in the casing H^4 with a view to lock the cover G^2 to the casing H^4 . A removable pin I^4 on the bolt I^3 extends across the peripheral surfaces of the tumblers F^2 and when in register with the notches thereof is drawn into the same by the action of the spring I^5 pressing the bolt I^3 with a view to withdraw the same from the notch H^3 . When the tumblers F^2 are turned, one or all of the same push the pin I^4 outward, so that the bolt I^3 is moved into locking position against the tension of a spring I^5 . In case the spring I^5 should become broken or it is desired to shoot the bolt I^3 by hand out of engagement with the notch H^3 at the time the notches of the tumblers F^2 are in register with the pin I^4 , then use is made of a pin I^6 , projecting from the bolt I^3 and extending through an elongated slot G^3 , formed in the cover G^2 , to the outside thereof. On the outer end of the pin I^6 is secured or formed a knob I^7 under the control of the operator for withdrawing the bolt I^3 from the notch H^3 whenever the pin I^4 registers with the notches in the tumblers F^2 , said knob I^7 covering, and thereby concealing, the elongated slot G^3 . In order to properly guide the pin I^4 and push it out of the tumblers F^2 by the action thereof, as above explained, a guide J' is provided secured to or formed on the casing H^4 .

In order to provide another means to prevent a lock-out when making a mistake in resetting the tumblers F^2 , the casing H is

provided with an opening H^5 , through which the operator may pass a finger to reset the tumblers F in case there should have been a mistake made in changing the combination.

5 This opening H^5 is closed to prevent unauthorized persons from operating the tumblers, and in a like manner the pivot-pin E^2 for the dog E' is covered to prevent access by unauthorized persons to the said pivot-pin.

10 For the purpose mentioned a ring K is fitted over an annular flange H^6 , into which fits the annular flange G^4 of the cover G , the latter being extended beyond the flange H^6 to prevent removal of the ring K as long as the
15 cover G is in a locked position. (See Figs. 1 and 3.) The ring K is provided with a hook K' , adapted to hook onto the casing H from the inside thereof, and on the ring K are formed extensions K^2 and K^3 , (see Fig. 2,) of
20 which the extension K^2 covers the pivot-pin E^2 and the extension K^3 covers the opening H^5 . In the non-lock-out device just described it is not necessary to remove the pin I^2 from the bolt I , as before described.

25 In the alternative form illustrated in Figs. 5 and 6 a locking-bolt I^8 is mounted to slide in suitable bearings on a cover G^5 and is adapted to pass into a notch H^6 , formed in a plate H^7 , secured to the casing H^8 , provided
30 with an elongated slot H^9 , forming a bearing for the free end of a pin I^9 , removably secured to and projecting transversely from the bolt I^8 and pressed on by a spring I^{10} for withdrawing the bolt I^8 from the notch H^6 .

35 In the alternative form shown in Figs. 5 and 6 the pin I^8 is pushed into a locking position by a notched disk D^3 , turning with a spindle C^6 and actuating a dog E^3 , connected with a bolt E^4 , fulcrumed on a pivot-pin E^5 ,
40 held on the casing H^8 . A cover G^5 fits onto a removable auxiliary cover H^{10} for the casing H^8 , and this cover H^{10} is provided with a hook H^{11} , engaging the side wall of the casing H^8 , as plainly indicated in Fig. 6. The pivot
45 pin E^5 extends through the plate H^7 , covered by the auxiliary cover H^{10} . Now by the arrangement described the user of the safe after resetting the combination first places the cover G^5 with the reset tumblers F^3 in po-
50 sition in the casing H^8 and without the auxiliary cover H^{10} being in position. If the combination is found to be not correct on working the combination-lock, then the operator can insert his finger between the edge
55 of plate H^7 and the wall of the casing H^8 to turn the tumblers, and thereby properly set the combination. When this has been done, the cover G^5 , with the tumblers F^3 properly set, is removed to allow of first
60 placing the auxiliary cover H^{10} in position, after which the cover G^5 , with the tumblers thereon, is replaced and locked in position on turning the spindle C' . Thus a lock-out when making a mistake in resetting the com-
65 bination is prevented.

The tumblers F^3 in the alternative form shown in Figs. 5 and 6 are similar to the ones shown in Fig. 1, so that further description of the same is not deemed necessary, it being, however, expressly understood that the bolt
70 I^8 cannot be withdrawn by the action of its spring I^{10} until the pin I^9 of the bolt I^8 is in register with the notches in the tumblers F^3 and in register with the notch of the disk D^3 . The pin I^9 is unscrewed and removed to
75 avoid lock-outs, the same as above described in reference to the pin I^2 .

In order to indicate the registering position of the notches of the tumblers F^3 and that of the disk D^3 , it is necessary to turn the
80 dial C^2 until the combination indicates on a point C^5 , formed on the ring C^4 and spaced from the point C^3 , as plainly shown in Fig. 4. As this arrangement is similar to the one shown and described in the application for
85 Letters Patent above referred to, it is not deemed necessary to further describe the same in detail.

In the alternative form shown in Fig. 7 the bolt I^{11} for locking the cover G^6 to the casing
90 H^{12} is made in the form of a lever fulcrumed at I^{12} on the cover G^6 , and a spring I^{13} is provided for withdrawing the bolt I^{11} from the notch H^{13} , formed in the casing H^{12} . The bolt I^{11} is provided with a removable trans-
95 verse pin I^{14} for engagement by the tumblers F and the notched disk D , as above described in reference to Fig. 1. This form of my invention is described and claimed in my ap-
plication for Letters Patent filed July 18, 1906, Serial No. 326,729.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A permutation-lock comprising a main
105 bolt, permutation mechanism, a casing inclosing said mechanism and having a removable closure, and locking means for said closure movable with respect thereto and to said main bolt, and controlled by the permu-
110 tation mechanism, said permutation mechanism comprising means for operating said locking device.

2. A permutation-lock comprising a main
115 bolt, permutation mechanism, a casing inclosing said mechanism and having a removable closure, locking means for said closure movable with respect thereto and to said main bolt, and automatic means for moving
120 said locking means out of the locking position and into an unlocking position, said permutation mechanism comprising means for moving said locking device from the unlocking to the locking position.

3. A permutation-lock comprising a main
125 bolt, permutation mechanism, a casing inclosing said mechanism and having a removable closure, locking means for said closure movable with respect thereto and to said main bolt, and automatic means for moving
130

said locking means out of the locking position and into an unlocking position, said permutation mechanism comprising a cam for moving said locking device from the unlocking to the locking position.

4. A permutation-lock comprising a main bolt, permutation mechanism, a casing inclosing said mechanism and having a removable closure, locking means for said closure movable with respect thereto and to said main bolt, and a retractile spring for said locking means, said permutation mechanism comprising means for moving said locking device from the unlocking to the locking position.

5. A permutation-lock comprising a main bolt, permutation mechanism including tumblers, a spindle, and a disk thereon, a casing inclosing said mechanism and having a removable closure, locking means for said closure movable with respect thereto and to said main bolt, and comprising means engaging the tumblers and said disk, and means for moving said locking means out of locking position, said disk having a notch formed to force said locking means back into locking position upon rotation of said disk.

6. A permutation-lock comprising permutation mechanism including tumblers and a notched disk, and a casing for said mechanism provided with a removable cover, a locking device for the said cover having a locking member movable with respect to said cover for locking the cover to the casing, the said locking member being held in locking position by the tumblers and the notched disk of the permutation mechanism, and means independent of the permutation mechanism for moving the said locking member into unlocking position.

7. A permutation-lock comprising permutation mechanism including tumblers and a notched disk, and a casing for said mechanism provided with a removable cover, a locking device for the said cover having a locking member movable with respect to said cover for locking the cover to the casing, the said locking member being held in locking position by the tumblers and the notched disk of the permutation mechanism, and means independent of the permutation mechanism for moving the said locking member into unlocking position, the said means being inside of the said casing.

8. A permutation-lock comprising permutation mechanism including tumblers and a notched disk, and a casing for said mechanism provided with a removable cover, a locking device for the said cover having a locking member movable with respect to said cover for locking the cover to the casing, the said locking member being held in locking position by the tumblers and the notched disk of the permutation mechanism, and a spring within the said casing pressing the said lock-

ing member to move the latter into unlocking position.

9. A permutation-lock comprising a main bolt and permutation mechanism, and a casing inclosing said mechanism and provided with a removable cover, and a locking device for the cover movable with respect to said main bolt and contained wholly within the said casing and adapted to be moved into locking position by a member of the said permutation mechanism.

10. A permutation-lock comprising a main bolt and permutation mechanism, and a casing inclosing said mechanism and provided with a removable cover, and a locking device for the cover movable with respect to said main bolt and contained wholly within the said casing and adapted to be moved into locking position by the member of the permutation-lock employed for actuating said main bolt.

11. A permutation-lock comprising a main bolt and permutation mechanism, and a casing inclosing said mechanism and provided with a removable cover, a locking device for the cover movable with respect to said main bolt and contained wholly within the said casing and adapted to be moved into locking position by a member of the said permutation-lock, and a guide for the said locking device.

12. A permutation-lock comprising a main bolt and permutation mechanism, and a casing inclosing said mechanism and provided with a removable cover, a locking device for the said cover comprising a cover-bolt mounted on the said cover and adapted to engage the casing to lock the cover against removal, said permutation mechanism comprising cover-bolt-operating means operated by the operation of the permutation mechanism to move the cover-bolt into locking position.

13. A permutation-lock comprising a main bolt and permutation mechanism, and a casing inclosing said mechanism and provided with a removable cover, a locking device for the said cover comprising a cover-bolt mounted on the said cover and adapted to engage the casing to lock the cover against removal, said permutation mechanism comprising cover-bolt-operating means operated by the operation of the permutation mechanism to move the bolt into locking position, and a spring on the said cover-bolt for withdrawing it.

14. A permutation-lock comprising a main bolt and permutation mechanism, and a casing inclosing said mechanism and provided with a removable cover, a locking device for the said cover comprising a cover-bolt mounted on the said cover and adapted to engage the casing to lock the cover against removal, said permutation mechanism comprising cover-bolt-operating means operated

by the operation of the permutation mechanism to move the cover-bolt into locking position, and a guide for the said cover-bolt.

15. A permutation-lock comprising a main bolt and permutation mechanism, and a casing inclosing said mechanism and provided with a removable cover, and a locking device for the said cover comprising a bolt movable with respect to said cover and main bolt and mounted on the said cover and adapted to engage the casing to lock the cover against removal, the said bolt having a transverse pin extending peripherally across the tumblers to engage the notches thereof, said permutation mechanism comprising means operated by the operation of the permutation mechanism to engage the said pin for moving the cover-bolt into locking position.

16. A permutation-lock comprising a main bolt and permutation mechanism, and a casing inclosing said mechanism and provided with a removable cover, a locking device for the said cover comprising a bolt movable with respect to said cover and main bolt and mounted on the said cover and adapted to engage the casing to lock the cover against removal, the said bolt having a transverse pin extending peripherally across the tumblers to engage the notches thereof, said permutation mechanism comprising means operated by the operation of the permutation mechanism to engage the said pin for moving the cover-bolt into locking position, and a guide for the said pin located at a point distant from the support thereof.

17. A permutation-lock comprising permutation mechanism, a casing inclosing the same having a removable closure and an opening other than that closed by said removable closure, through which opening access to the permutation mechanism may be obtained, means for covering the said opening, and a locking device for said removable closure, said closure arranged while in place to prevent removal of the said covering means.

18. A permutation-lock comprising a casing having an opening and a removable closure covering the same, permutation mechanism within said casing having a member projecting therethrough, covering means covering the exposed portion of said projecting member and normally held in place by said removable closure, and a locking device

for said removable closure controlled by the permutation mechanism.

19. A permutation-lock comprising a main bolt, permutation mechanism, a casing inclosing said mechanism and having a removable closure, and locking means for said closure movable with respect thereto and to said main bolt, controlled by said permutation mechanism, and comprising automatic means for moving said locking means out of the locking position and into an unlocking position.

20. A permutation-lock comprising a main bolt, a casing having a removable closure, mechanism inclosed by said casing including permutation means controlling said bolt and locking means for said removable closure movable with respect to said main bolt, and automatically operated.

21. A permutation-lock comprising a main bolt, a pivot therefor, permutation mechanism controlling said bolt, a casing inclosing said mechanism having an opening, a cover therefor, locking means for said cover, the pivot for said main bolt projecting through the back of the casing, and means for covering the end of said pivot, held in place by said cover.

22. A permutation-lock comprising a main bolt, permutation mechanism comprising rotary tumblers, a casing inclosing said mechanism having a removable back plate provided with a spindle on which said tumblers are mounted, and locking means for said back plate comprising a sliding bolt mounted on said back plate, and adapted to engage the main portion of said casing and thereby lock said back plate in place, and a spiral retractile spring for said sliding bolt mounted thereon, said sliding bolt carrying means adapted to engage and be controlled by said permutation mechanism, said permutation mechanism comprising means for operating said sliding locking-bolt in opposition to said spring.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK DUESTERWALD.

Witnesses:

THEO. G. HOSTER,
EVERARD B. MARSHALL.