F. E. BEST.

LOCK.

APPLICATION FILED AUG. 28, 1919.

1,384,022.

Patented July 5, 1921.

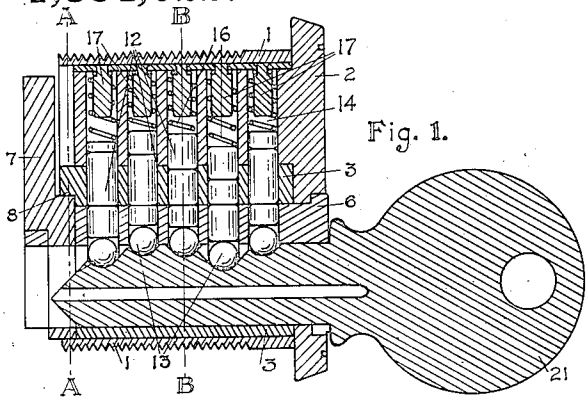

Fig. 1.

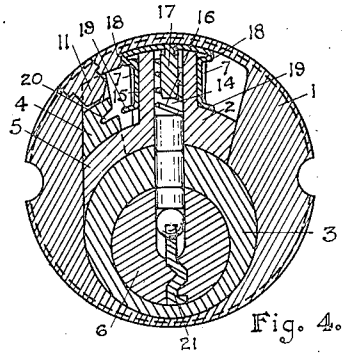

Fig. 4.

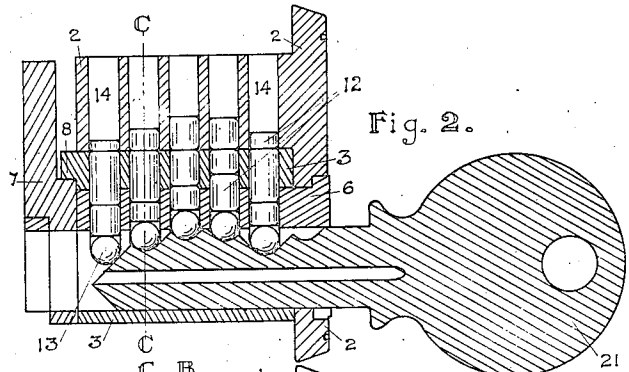

Fig. 2.

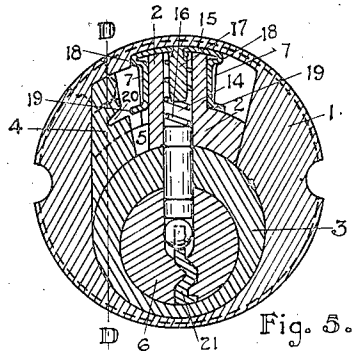

Fig. 5.

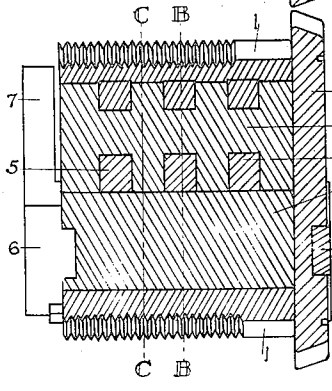

Fig. 3.

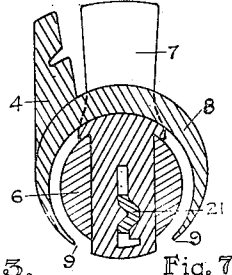

Fig. 7.

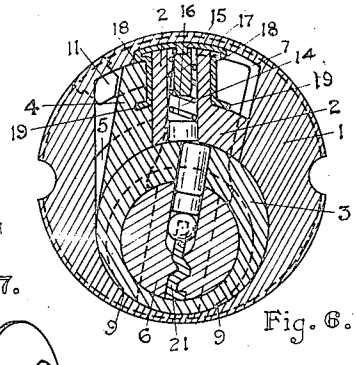

Fig. 6.

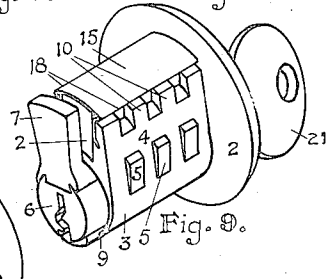

Fig. 9.

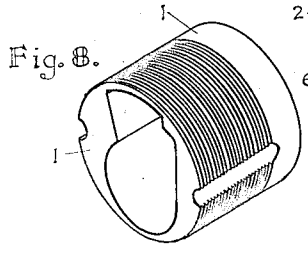

Fig. 8.

Frank Ellison Best,

Inventor.

UNITED STATES PATENT OFFICE.

FRANK ELLISON BEST, OF SEATTLE, WASHINGTON.

LOCK.

1,384,022. Specification of Letters Patent. Patented July 5, 1921.

Application filed August 28, 1919. Serial No. 320,521.

To all whom it may concern:

Be it known that I, FRANK ELLISON BEST, a citizen of the United States, residing at 3210 33rd Ave., So., Seattle, in the county of King and State of Washington, have invented a new and useful Lock, of which the following is a specification.

My invention relates to improvements in locks and especially to one for which I filed an application April 24th 1919, whose Serial Number is 292,365, to which these improvements are directed.

The objects of my improvements are; first, to provide in a secondary lock which controls the assembling and disassembling of the locking mechanism, annular operation instead of axial to eliminate certain resistance to the removal of the primary key caused by the shearing tendency of the secondary locking shears upon the pins due to the natural tendency of the core to remove with the key, thereby causing undesirable resistance to the movement of said pins, and consequently, to the removal of said key; second, to provide means for removing the core from the case by pulling on the key, after the secondary locking mechanism has been unlocked; third, to provide an easily removable one piece capping device including tumbler springs and plugs, said plugs limiting the upward movement of the pins to prevent lock picking, protecting the springs when the device is removed and facilitating their re-insertion into the device; fourth, to provide pin tumbler combinations such that one key may operate both the primary and secondary locks by being inserted to different positions; fifth, to restore the face of the lock to the solidarity of an ordinary pin tumbler and cylinder lock; sixth, to provide stronger interlocking mechanism between the case and the core; seventh, to provide a shorter lock; eighth, to reduce the number of parts; and ninth, to retain all of the advantages of the lock referred to.

I attain these objects by mechanism illustrated in the accompanying drawings, in which—

Figures 1 and 2 show vertical longitudinal sections of the device taken through the center with the key in the two different positions required to operate the primary and secondary locks respectively. Fig. 3 shows a section of the lock taken on line DD, Fig. 5. Fig. 4 represents a section taken on line BB, Figs. 1 and 3. Fig. 5 shows a section taken on line CC, Figs. 2 and 3. Fig. 6 shows the same section with the secondary lock unlocked ready for the removal of the core. Fig. 7 shows a section taken on line AA, Fig. 1. Figs. 8 and 9 represent isometric projections of the two main units of the lock, the case and the core respectively.

Similar letters and figures refer to the same or similar parts throughout the several views.

The case 1, Fig. 8, may be secured in any ordinary manner to a door or other object to be locked and the core, Fig. 9, may be inserted and locked therein and unlocked therefrom at pleasure.

The core contains the locking mechanism of a primary and a secondary lock. The primary lock performs the usual functions of a lock while the secondary lock controls the insertion and removal of the core from the case.

The core possesses a frame 2, forming the face of the lock and extending backward through the device, carrying other members adjusted thereon. To frame 2 is adjusted eccentric sleeves 3, integral with which is gate 4, which for convenience in manufacture may be brazed thereon. Prongs 5 of frame 2, fitting into holes in gate or locking projection 4, facilitate the adjustment of eccentric sleeve 3 to frame 2 and permit a limited annular movement of the one relative to the other, while preventing any other movement. Passing through a hole in the face of frame 2 and through eccentric sleeve 3 is key cylinder 6 into which is mortised and housed throw bar 7 which, in turn, secures said key cylinder in place. Throw bar 7 is secured in place by an extension 8 of eccentric sleeve 3, and also by case 1 when the core is enhoused in said case. The throw bar 7 can only be inserted and withdrawn when the core is removed from the case, the key and pin tumblers removed and the key cylinder inverted from its position as shown in the several views. This permits said throw bar being inserted upward or withdrawn downward between the open ends 9, (Fig. 7), of the crescent, which projection 8 of eccentric sleeve 3 forms at that section.

Gate 4 is provided with teeth 10, Fig. 9, which engage with projections 11 in case 1,

thereby securing the core within the case as shown in Figs. 4 and 5.

The lock is provided with pin tumblers 12, and balls 13, operating in the usual multiple pin tumbler barrels 14 of which there are five in this instance.

A one piece capping device is employed consisting of frame 15 to which plugs 17 are riveted or otherwise secured after ends of springs 16 are closely fitted about the neck thereof for inclusion in the securing process, Figs. 1, 4, 5 and 6. The capping device is also provided with projections 18 which facilitate its removal by thumb and finger. It is also provided with projections 19 one of which fits into a groove 20 in gate 4 of eccentric sleeve 3 for the purpose of preventing the removal of the capping device when the core is being removed or inserted into the case. The capping device is made symmetrical to render it reversible.

The shearing line of the primary lock is at the upper surface of the key cylinder and the shearing line of the secondary lock is at the upper surface of the eccentric sleeve.

When a break in the pins of each barrel is alined flush with the upper surface of the key cylinder 3 by means of a key as shown in Figs. 1 and 4, the primary lock is operable, controlling the throw bar, while the secondary lock remains locked. By alining a break in the pins of each barrel flush with the upper surface of the eccentric sleeve as shown in Figs. 2 and 5, the primary lock becomes locked while the secondary lock becomes operable, making possible the disengaging of the gate 4 of eccentric sleeve 3 from projections 11 of case 1 as shown in Fig. 6, in which position the core may be withdrawn axially from said case as shown in Figs. 8 and 9. Upon withdrawing the core, the pin tumbler barrels may be realined making possible the removal of the capping device and subsequently the pins and balls from the barrels for the purpose of changing the combinations of the device, or disassembling it.

It will be apparent that by selecting pins of proper length, the lock may be so adjusted that one or a number of keys may operate either the primary or secondary lock, or a key may operate either without operating the other or may operate both when so desired. For instance, in a certain lock, a dozen different keys may operate the primary lock, while the secondary lock is operated only by one key and that one different from any of the said dozen.

This device makes it possible for an individual to adjust several locks to operate by one key thus removing the necessity of carrying a large bunch of keys and laboriously seeking the right one in the dark. It also makes possible changing the lock so that the finder of a lost key or a former tenant cannot operate the lock. It makes desired changes practical, even within a complicated master-keyed series of locks, and without sacrificing the security of any. It rather adds to the security of the lock as access to the tumblers is lock controlled.

I anticipate employing a system of numbering the key and corresponding pin tumbler combinations so that there will be as many digits in the combination number as there are pin tumbler barrels in the lock and that each digit of this number will represent the correspondingly positioned key bitting and pin tumbler barrel, and that the depth of each bitting in the key, and the height of the corresponding pin tumbler break will be proportional to the numerical value of the digit representing said bitting and tumbler break.

By having an assortment of pins stamped with numerals indicative of their length, any desired combinations can readily be set up, and by employing a key fitting punch such as the one for which I filed application, May 16, 1919, whose Serial Number is 297,604, a new key to match the lock can readily be obtained also.

In conclusion I wish to have it understood that I do not limit my invention to locks of any definite number of tumbler barrels or in any other way.

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

I claim:

1. In a pin tumbler lock the combination with the locking mechanism thereof, of a key operated lock for releasably retaining said mechanism within said pin tumbler lock.

2. In a lock, the combination with the lock case, of a core therein, locking mechanism in said core to lock said mechanism to said case, a key for operating said mechanism to release and withdraw said core and mechanism as a unit from said case.

3. In a lock, the combination with the case and locking mechanism therein, of a key adapted to be used selectively for operating said mechanism for lock-operating purposes or for removal of said mechanism from the case.

4. In a lock, a lock case, a core containing pin tumbler locking mechanism removable therefrom bodily, lock controlled means in said core for retaining said core in place within the lock case.

5. A pin tumbler lock comprising a case and a key-operable member, means integral with said case adapted to be engaged by said key-operable member to retain said key-operable member in said case.

6. In a pin tumbler lock, a core removable from said lock by means of a key, a frame for said core, a sleeve adjusted on said frame,

said sleeve having a gate element, said element interlocking said sleeve with said frame.

7. In a pin tumbler lock having a case and a key plug, a sleeve engaging the key plug, key operated means provided on said sleeve to engage with said case to retain said sleeve and key plug within the case.

8. In a pin tumbler lock having a frame and a key plug, a sleeve interlocking said frame and key plug together, said sleeve being adjusted on said frame for rotary movement.

9. In a lock having a case and a frame, the combination with said frame, of a device arranged for rotary movement thereon, and with said frame constituting the shears of a pin tumbler lock for retaining said frame in said case.

10. In a lock, a device, a locking projection thereon, said device being adapted to form, with a contiguous surface of said lock locking shears, said locking projection being adapted to retain said device within said lock, or release the same for removal.

11. In a pin tumbler lock having a key plug, means for retaining said key plug in place, a sleeve engaging said key plug and serving to retain said means in place.

12. A key plug usable in a pin tumbler lock, said plug being provided with a mortise and a throw-bar enhoused in said mortise.

13. In a pin tumbler lock, a member enhousing a key plug, a throw-bar housed in said key plug, said member serving to retain said throw-bar in place.

14. A pin tumbler lock having a key plug and enhousing members, a throw-bar mortised in said plug and retained in place by said enhousing members.

15. In a pin tumbler lock, a key plug having a mortise therein, a throw-bar on said key plug, a tenon on said throw-bar adapted to engage in the mortise of said key plug and serving to retain said throw-bar and key plug in operative positions.

16. In a pin tumbler lock, a plurality of locking shears having pins, barrels, springs and a key way in common, pin tumbler combinations such that a key in one position will aline a break in the pin tumblers flush with one set of locking shears while the same key in another position will aline a break in the pin tumblers flush with another set of locking shears.

17. In a pin tumbler lock, pin tumbler receiving barrels, and a capping device for enfolding said barrels.

18. A capping device, usable in a pin tumbler lock, projections on said device to facilitate removal by thumb and finger.

19. A capping device, usable in a pin tumbler lock having a key operable member, said device having a part adapted to be engaged by said member to secure the capping device in place.

20. A multiple barrel capping device, usable in a pin tumbler lock, tumbler springs secured to said device.

21. A multiple barrel capping device, usable in a pin tumbler lock, plugs secured to said device.

22. A multiple barrel capping device, usable in a pin tumbler lock, springs and plugs secured to said device to form an integral capping device.

23. In a lock, a case, pin tumbler barrels, a capping device provided therefor, a locking projection engageable with said capping device for securing said capping device in place during the insertion and removal of said barrels into and from said case.

24. In a lock having a case, and provided with a key, pin tumbler barrels, a capping device provided therefor, and a locking projection engaging said capping device for securing the latter in place during the insertion and removal of said barrels into and from said case, said locking projection adapted to release said capping device upon alining the key for withdrawal of the same from said lock.

25. A pin tumbler lock comprising a key plug and throw-bar capable of rotary and longitudinal movement, key-operable means for locking said plug and throw-bar from rotary movement and other key-operable means for locking said plug and throw-bar from longitudinal movement.

FRANK ELLISON BEST.

Witnesses:
HAZEL M. FLEMING,
MCNEIL ELLIS.