Dec. 26, 1933. A. DIAZ 1,940,789

LOCK

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Fig. 1.

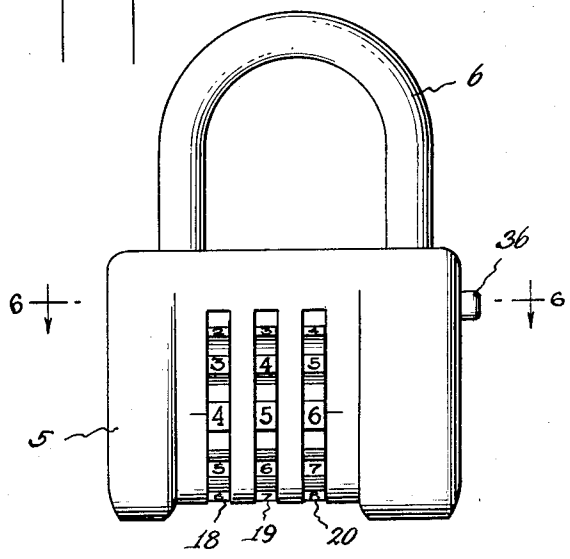
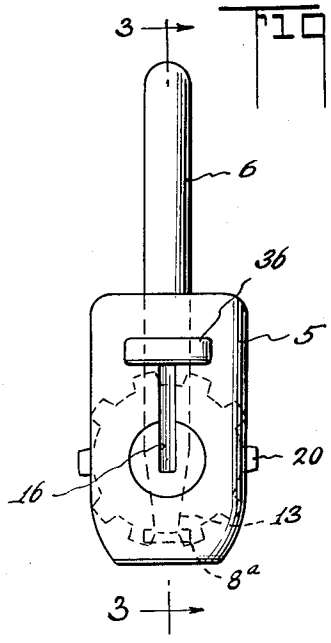


Fig. 2.



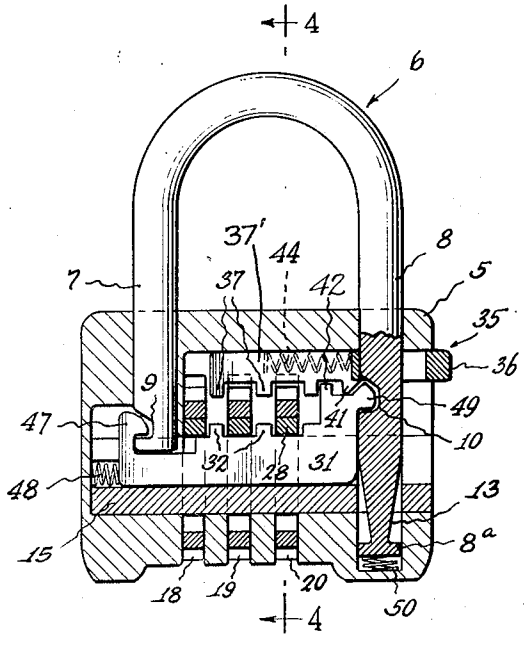
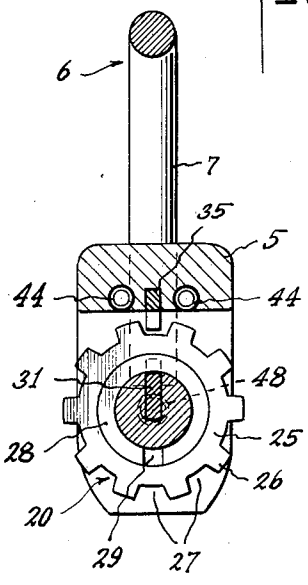


Fig. 3.

Fig. 4.



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Fig. 5.

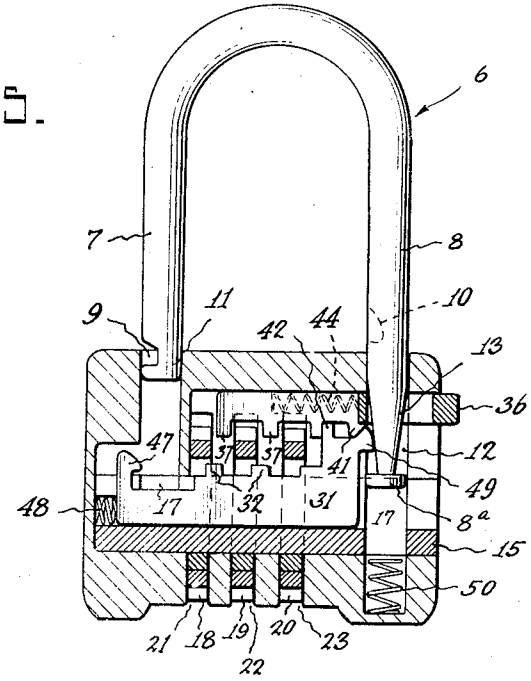


Fig. 6.

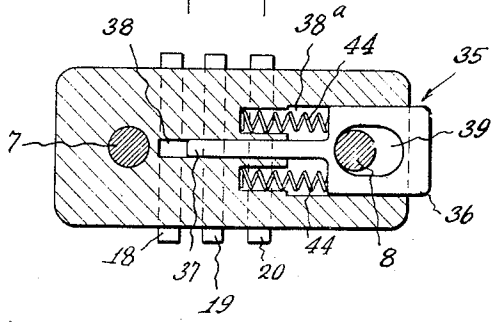
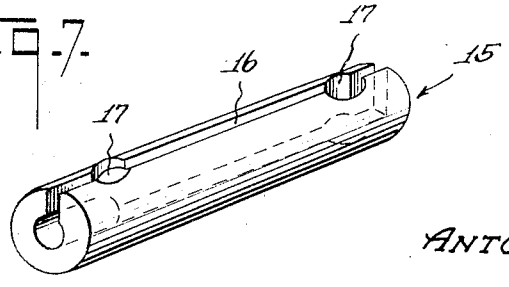


Fig. 7.



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Patented Dec. 26, 1933 1,940,789

UNITED STATES PATENT OFFICE

1,940,789

LOCK

Antonio Diaz, Habana, Cuba

Application May 24, 1932. Serial No. 613,292

1 Claim. (Cl. 70—113)

This invention relates to locks.

One of the objects of the invention is the provision of a lock proof against picking.

Another object of the invention is the provision of a lock in which the combination may be very easily changed.

Other objects of the invention will be appreciated from a reading of the following specification.

The invention will be fully and comprehensively understood from a consideration of the following detailed description when read in connection with the accompanying drawings which form part of the application with the understanding, however, that the improvement is capable of extended application and is not confined to the exact showing of the drawings nor to the precise construction described and, therefore, such changes and modifications may be made therefrom as do not affect the spirit of the invention nor exceed the scope thereof as expressed in the appended claim.

In the drawings:

Fig. 1 is a front elevation of the lock.

Fig. 2 is a side elevation.

Fig. 3 is a section taken on line 3—3 of Fig. 2, the parts being shown in locking or locked position.

Fig. 4 is a section taken on line 4—4 of Fig. 3.

Fig. 5 is a section similar to Fig. 3, in which however the parts are shown in unlocked position.

Fig. 6 is a section taken on line 6—6 of Fig. 1; and

Fig. 7 is a perspective view of a pin forming part of the lock.

Referring to the drawings for a more detailed description thereof, the numeral 5 indicates the body of the lock and the numeral 6, the shackle. Said shackle is in the form of an open loop comprising legs 7 and 8, the former having a notch 9 and the latter a notch 10. The leg 7 is insertable in a recess 11 of the lock body while the leg 8 is insertable in a recess 12 in the same body. Slightly above the lower end of the leg 8, the same is tapered as indicated by the numeral 13, for a purpose hereinafter mentioned.

A cylindrical pin 15, shown in Fig. 7, is positioned in the body of the lock lengthwise thereof and is provided with a longitudinal slot 16 which is enlarged at 17 for a purpose hereinafter mentioned. Circular tumblers 18, 19 and 20 are rotatably mounted on the pin 15 and work in recesses 21, 22 and 23, respectively, in the body of the lock. The mentioned tumblers are similar in construction, and, as shown in Fig. 4, each comprises a ring 25 having peripheral teeth 26 separated by spaces 27. The peripheries of the teeth 26 bear numerals so that the position of the tumblers may be known, as shown in Fig. 1. Bushings 28 are positioned within the rings 25 and the ends of these bushings are spaced from each other, leaving a space 29 therebetween, as shown in Fig. 4. The spaces 29 in the various tumblers are dissimilarly located relative to corresponding numbers on the peripheral teeth 26 of the tumblers, so that different numbers will be in horizontal alignment when the spaces 29 are in alignment.

A key 31 is positioned and slidable in the groove 16 of the cylindrical pin 15 and comprises a ward including teeth 32 located between the bushings 28 of adjacent tumblers when the parts are in locked or locking positions, the key thereby being held in fixed position. When, however, the tumblers are in unlocking position, that is to say, when the spaces 29 are in alignment with each other and with the teeth 32, the key 31 may be pushed to one side by means presently to be described, the teeth 32 sliding through the spaces 29. The means for sliding the key 31 comprises a manually operable member 35 which includes a thumb piece 36 mainly in the body of the lock but projecting slightly beyond the side of the same. The member 35 includes a tongue 37' integral with the thumb piece 36 and lying in the body of the lock and slidable in a correspondingly sized recess 38, the thumb piece 36 being slidable in a space 38a which is continuous with the space 38. The leg 8 passes through an aperture 39 in the thumb piece 36, the major diameter of said aperture being greater than the diameter of the leg 8 of the shackle to allow for lengthwise movement of the member 35, which lengthwise movement is possible only when the tumblers are in unlocking position, that is to say, when the spaces 29 are in alignment and one of the peripheral spaces 27 of each of the tumblers is in alignment with one of the peripheral spaces 27 of each of the other tumblers, it being understood that the space 29 of each tumbler is in radial alignment with one of the peripheral spaces 27 of the same. When the spaces 29 are in alignment the peripheral spaces 27 are also in alignment so that the teeth 37 of the member 35 may pass through aligned spaces 29, thus allowing inward movement of the member 35 when the thumb piece 36 is pressed inwardly by the person operating the same. The inward movement of the member 35 moves the key 31 to the left, or, in other words, to unlocking position, the

member 35 being effective to move the key 31 by reason of the pressure of the projection 41 of the member 35 against the projection 42 of the key 31. The projection 41 is normally held out of contact with the projection 42 by coiled springs 44, bearing against the thumb piece 36, making it necessary for the person opening the lock to apply pressure to the thumb piece 36 in order to move the key 31 to open position, it being understood that when the tumblers are in locking position, the member 35 cannot be pressed inwardly due to the fact that the teeth 37 of said member 35 are in alignment with the peripheral teeth 26 of the tumblers. The key 31 includes a latch 47 adapted to enter the recess 9 of the leg 7 of the shackle when the latter is pushed home, the key 31 being held in such position by spring 48 that the projection 47 is in the path of the leg 7 of the shackle. The leg 7 presses, by pressure against the projection 47, moves the key 31 to the left against the pressure of the spring 48, the mentioned projection entering the recess 9 when the shackle is pushed home. A latch 49 formed on the other end of the key 31 enters the recess 10 of the leg 8 when the shackle is sufficiently pushed down. The lower end portions of the legs 7 and 8 of the shackle are disposed in the enlargements 17 of the groove 16 formed in the pin 15 when the shackle is locked. When the tumblers have been turned to open position and the member 35 has been pressed inwardly, a coiled spring 50 which, as shown in Fig. 3, is compressed when the shackle is locked, expands and pushes the shackle upwardly, the leg 8 of the shackle being still retained in the body of the lock due to the fact that the projection 49 is in the path of the lower end portion 8*a* of the leg 8; a second inward motion of the thumb piece 36 is necessary if the shackle is to be entirely removed from the body of the lock, it being understood that the inward motion of the member 35 pushes the key 31 to the left to effect the same motion of the projection 31 to remove the latter from the path of the lower end portion 8*a* of the leg 8.

An important feature of this invention is the provision of a lock which may not be picked by "feeling". To that end the projections or teeth 32 of the key 31 are shorter than the spaces between the tumblers so that said teeth or projections do not normally touch the tumblers and cannot be pushed over to the tumblers until the tumblers are in unlocking position, due to the fact that the member 35, which is the only means by which the key 31 can be moved, cannot push said key until the projection 41 of the member 35 contacts the projection or tooth 42 of the key 31 and, since there is normally a space between the projections 41 and 42, the teeth 37 of the member 35 enter the peripheral space 27 of the tumblers to lock the same against rotation before the projection 41 exerts pressure against the tooth 42.

Another valuable feature of my invention is the provision of means whereby the combination of the lock may be readily changed, which change may be made by rotating the tumblers with the teeth 32 of the key 31 in the spaces 29 existing between the ends of the bushings 28; the bushings are then locked in position, but, being movable relative to the main portions of the tumblers when the latter are forcibly rotated, their position relative to the main parts of the tumblers may be changed by such rotation of the latter.

What is claimed as new is:

A lock comprising a body, a shackle in said body, a key within said body for locking said shackle therein, a pin in said body, manually operable tumblers rotatably mounted on said pin and adapted to hold said key in shackle-locking position, said tumblers each having an opening to allow said key to be moved to shackle-unlocking position when said tumblers are in a predetermined position and means manually operable for moving said key to shackle-unlocking position, said tumblers being spaced from each other and said key comprising projections between said tumblers and narrower than the space between the same, said tumblers having spaced peripheral notches therearound and said means having projections movable into certain of said notches to prevent rotation of said tumblers without actuating said key to the extent of pushing the projections of the latter against said tumblers.

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