O. J. BLAKESLEY.

KEYLESS PADLOCK.

APPLICATION FILED MAY 14, 1907.

919,415.

Patented Apr. 27, 1909.

2 SHEETS—SHEET 1.

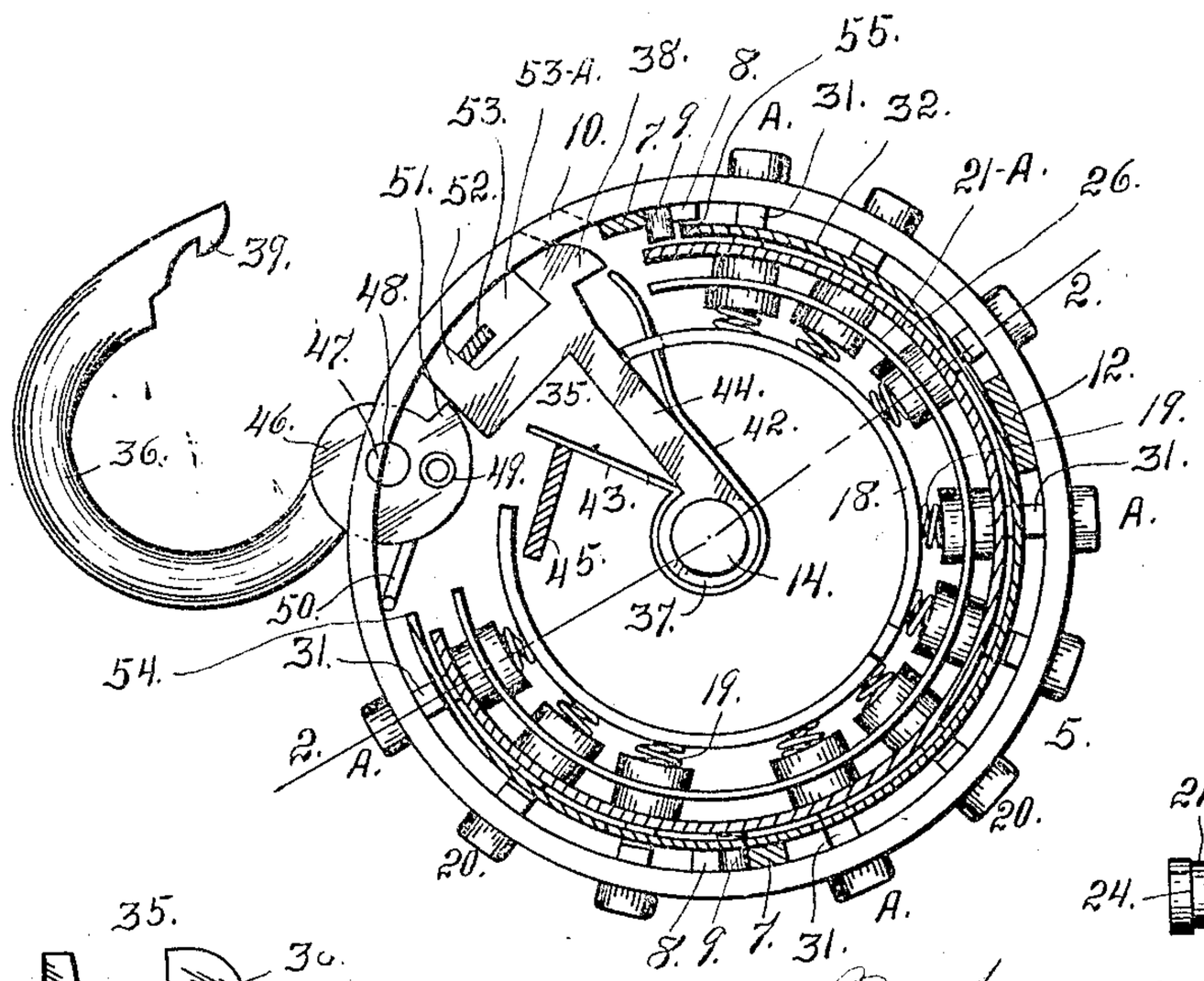

Fig. 1.

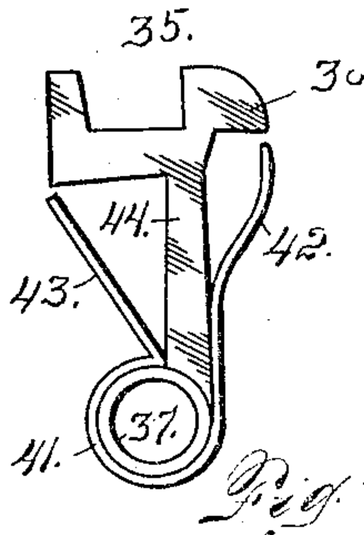

Fig. 4.

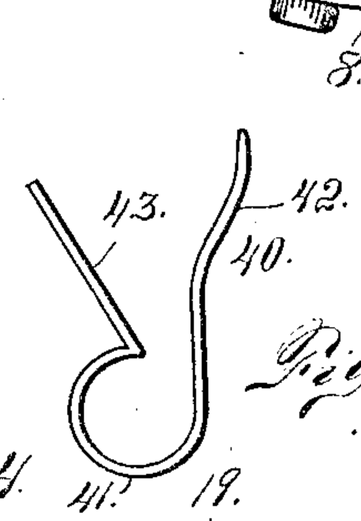

Fig. 5.

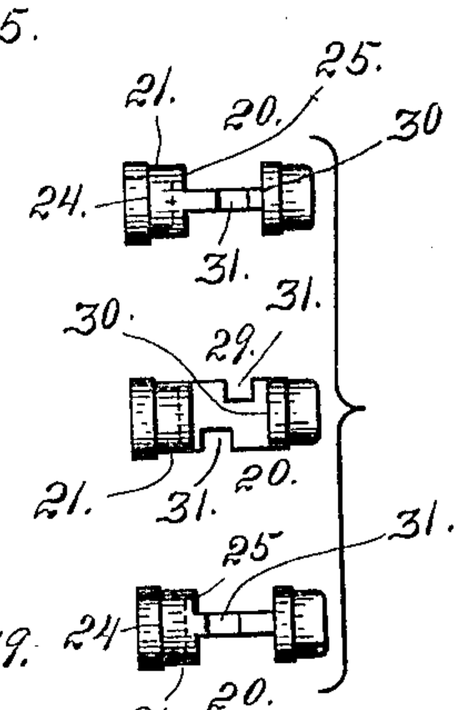

Fig. 3.

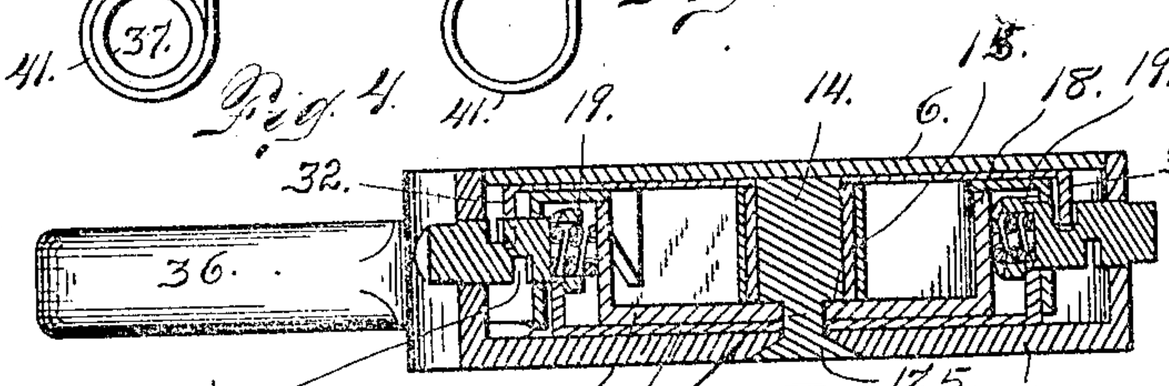

Fig. 2.

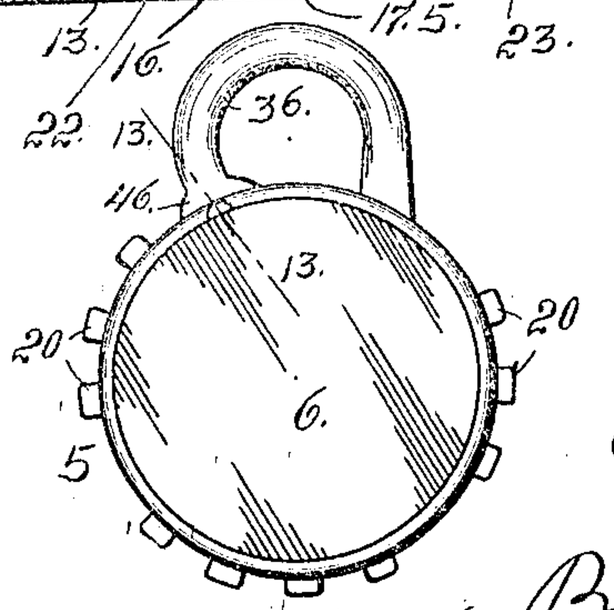

Fig. 6.

Witnesses

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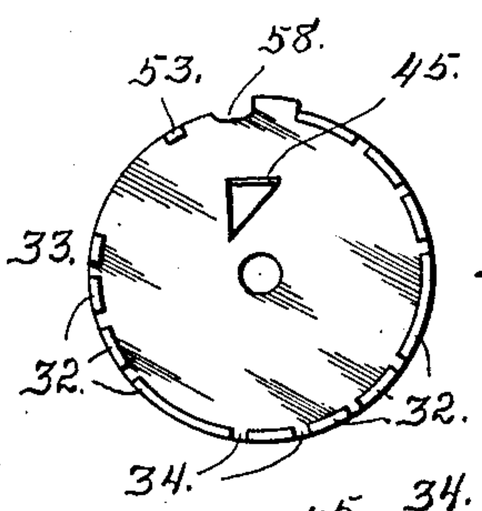

Fig. 9.

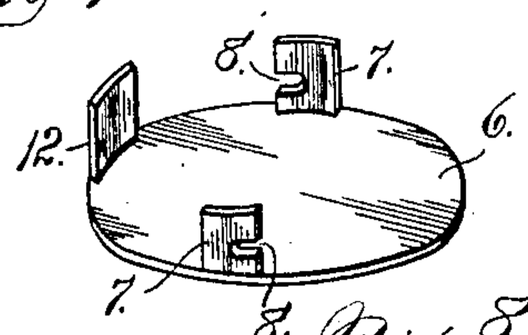

Fig. 8.

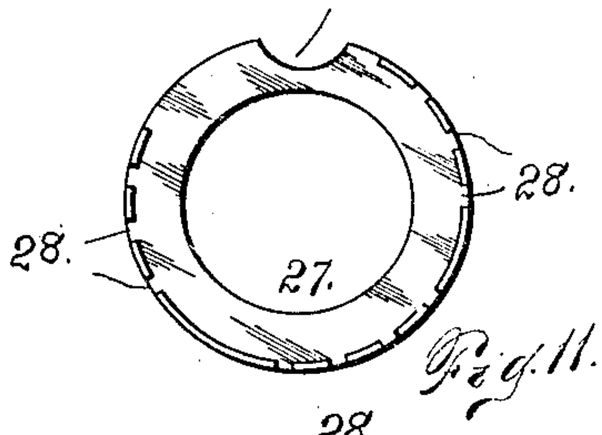

Fig. 11.

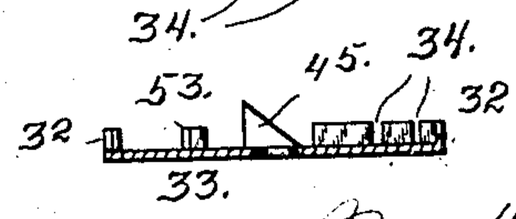

Fig. 10.

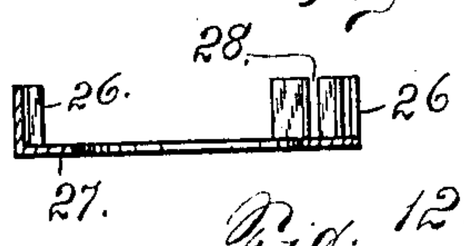

Fig. 12.

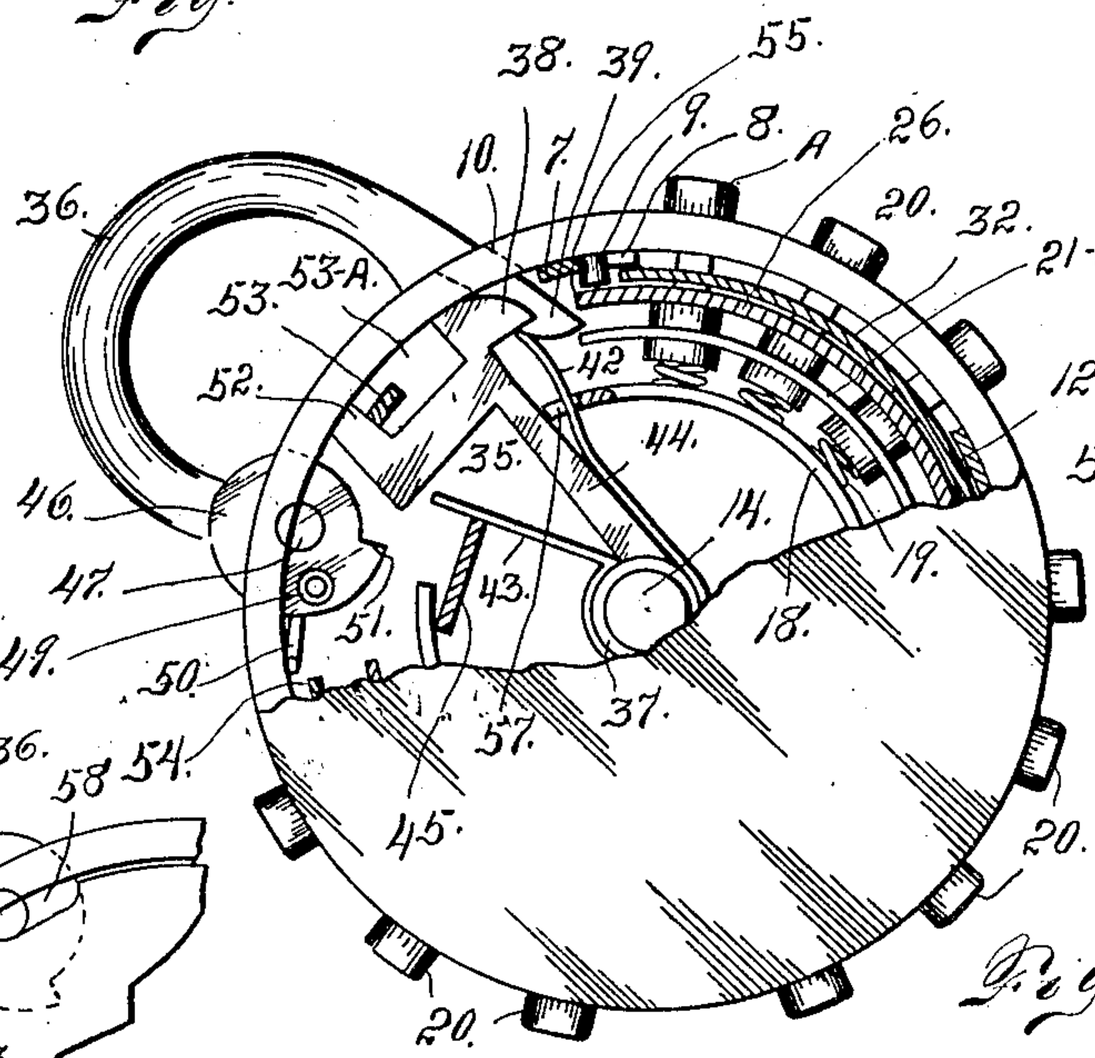

Fig. 7.

Fig. 13.

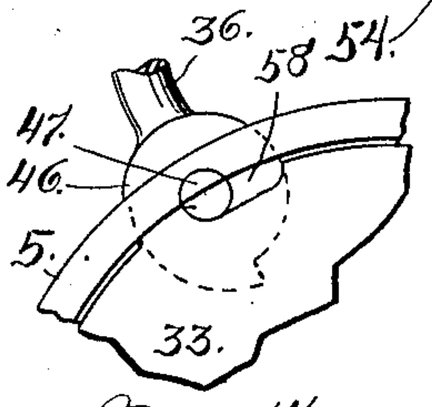

Fig. 14.

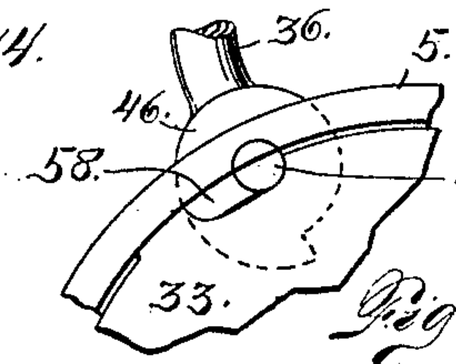

Fig. 15.

Witnesses

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KEYLESS PADLOCK.

No. 919,415. Specification of Letters Patent. Patented April 27, 1909.

Application filed May 14, 1907. Serial No. 373,545.

To all whom it may concern:

Be it known that I, ORSON J. BLAKESLEY, a citizen of the United States, residing at the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Keyless Padlocks; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in keyless padlocks of the class set forth in my previous application Serial No. 274,060, filed Aug. 14th, 1905, allowed July 24th, 1906, renewed Jan. 26th, 1907, Serial No. 354,316, allowed Feb. 25th, 1907, now matured into Patent No. 866,567 dated September 17, 1907.

My present invention relates to certain novel features of construction whereby the mechanism is greatly simplified and also whereby certain novel features of construction are embodied notably the means for changing the combination of the lock, by simply giving a partial rotation to one or more of the spring-actuated pins which are employed to secure the locking disk against movement when the mechanism is in the locked position.

The invention will now be described in detail reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing, Figure 1 is a view of my improved padlock with the outer portions of the cap and locking disk removed, the parts of the said cap and disk which protrude into the casing, being shown in section. Fig. 2 is a section taken on the line 2—2 Fig. 1. Fig. 3 illustrates one of the spring-actuated locking pins shown in three different positions. Fig. 4 is a detail view of the latch which holds the shackle or bolt in place when the mechanism is in the locked position. Fig. 5 is a detail view of a spring applied to the latch and coöperating therewith. Fig. 6 is a view of the entire lock shown normal size. In the other views the mechanism is shown double this size. Fig. 7 is a view of the lock with the cap and locking disk partly broken away, the portions of the said parts which project into the lock casing being sectionized. Fig. 8 is a perspective view of the cap plate. Fig. 9 is an interior view of the locking disk. Fig. 10 is a sectional view of the same. Fig. 11 is an interior detail view of the guide ring for the locking pins. Fig. 12 is a sectional view of the same. Figs. 8 to 12 both inclusive are on the same scale as Fig. 6. Fig. 13 is a section taken on the line 13—13 Fig. 6, the parts, however, being shown on a larger scale. Figs. 14 and 15 are fragmentary top views with the cap plate removed and showing the locking disk in two positions, Fig. 14 showing the said disk at its limit of movement toward the right, while Fig. 15 shows it at its limit of movement toward the left, the pin 47 serving as a stop in both directions.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the lock casing and 6 a cap provided with interiorly projecting lugs 7 having notches 8 adapted to interlock with pins 9 for holding the cap in place. When this cap is inserted and given a partial turn so that the recesses 8 engage the pins 9, it is held securely in place. One of these pins is located in close proximity to the shackle opening 10 (see dotted lines in Figs. 1 and 7), so that one of the lugs 7 before its recess 8 engages the pin 9, partially closes the shackle opening 10. When, however, the cap is given a partial turn to cause the recesses 8 to engage the pins 9, the shackle opening is free. From this it results that when the shackle is in place or in the locking position, the cap cannot be removed since it cannot be given the necessary partial turn to release its lugs 7 from the pins 9. The cap 6 is also provided with an additional lug designated 12, which is not recessed and occupies a position between two of the locking pins (see Fig. 1), there being sufficient space between the lug and the pins to permit the necessary movement of the cap for locking and unlocking purposes.

Within the lock casing is located a disk 13 held in place by a central post 14 having a shoulder 15 which engages the disk 13. This post is provided with a reduced part 16 passing through an opening in the disk, the outer extremity of the post being enlarged and countersunk within the casing as shown at 17. The disk 13 has a circular flange 18 formed concentric with the outer wall of the

casing. This flange 18, forms a stop for the inner extremities of coil springs 19 whose outer extremities engage recesses formed in locking pins 20. The inner recessed extremities 21 of these pins are enlarged and move freely in openings formed in the flange 21^A formed integral with the disk 22 which is interposed between the disk 13 and the bottom 23 of the casing 5. The disk 22 projects outwardly beyond the flange 18 of the disk 13, and its flange 21^A is concentric with the flange 18 as well as with the outer circular wall of the casing. The springs 19 normally hold shoulders 24 of the pins 20 against the inner surface of the flange 21^A thus limiting the outward movement of the pins. Each pin 20 is also provided with an inner shoulder 25 which is normally held in engagement with the inner surface of a flange 26 formed on a guide ring 27. This flange is slotted as shown at 28 to receive the reduced part 29 of each pin, the said part being located between the shoulder 25 and a shoulder 30 located at the inner extremity of the head or the portion of the pin protruding beyond the outer wall of the lock casing. This reduced part 29 is formed flat on two opposite sides and is adapted to slide freely in the slots 28 of the flange 26 of the guide ring. As shown in the drawing the reduced part 29 is provided with two recesses 31 located in its opposite edges, the said recesses being staggered or out of alinement.

Outside of the guide ring 27 and concentrically arranged with the flange of the latter, is an interiorly protruding flange 32 of the locking disk 33. This flange is provided with slots 34 in which the reduced part 29 of the pins 20 reciprocates. When the pins 20 are so arranged that the uppermost series of slots 31 register and are arranged in alinement with the flange 32 of the locking disk, the latter is allowed to move sufficiently to permit the latch 35 to turn far enough on the post 14, to unlock the shackle or bolt 36 and allow it to move through the opening 10 of the lock casing. When the mechanism is in the locked position, one or more of the pins 20, is normally held in such position that its uppermost notch 31 is out of register with the corresponding notches of the other pins, and also out of register with the flange 32 of the locking disk. This prevents the movement of the disk, and consequently holds the latch 35 in the locking position with reference to the shackle 36. This latch 35 is provided at its inner extremity with a sleeve 37 which surrounds the post 14. Its outer extremity is provided with a hook-shaped part 38 adapted to engage the hooked part 39 of the shackle 36. A leaf spring 40 is applied to the latch, the said spring having its inner extremity 41 shaped to fit the sleeve 37. From this part 41, two separated arms 42 and 43 extend outwardly on opposite sides of the arm 44 of the latch. The member 43 of this spring is engaged on one side by a lug 45 formed on the inner surface of the locking disk 33. This lug normally holds the latch 35 in the locking position with reference to the shackle 36. The spring member 43, however, is under sufficient tension to exert considerable pressure on the lug 45, whereby there is a tendency to impart a rotary movement to the locking disk. This movement, is impossible by reason of the fact that one, or more, of the pins 20 is in such position that its recess 31 is out of register with the flange 32 of this disk. In the drawing four of the pins 20 are so adjusted that their recesses 31 are normally out of alinement with the flange 32. These pins are for convenience designated A in Fig. 1. The other pins are so adjusted that the inner recess 31 is uppermost and therefore in alinement with the flange 32; while the pins A are so adjusted that the outer recess 31 of each is uppermost and consequently normally out of alinement with the flange 32. By turning these pins 20 any desired combination may be obtained as will be readily understood. Now if we assume that the shackle 36 is in the locked position, if we wish to unlock the mechanism, the user will press inwardly on the four pins designated A, until the recesses 31 are in register with the corresponding recesses of the other pins, and consequently in alinement with the flange 32 of the disk 33. As soon as this occurs, the tension or pressure of the spring member 43 acting on the lug 45 of the locking disk, moves the said disk sufficiently to allow the latch 35 to turn on the post 14 far enough to release the shackle. It will be understood that the inner extremity 39 of the shackle 36, when in the locking position, exerts a constant pressure on the spring member 42, whereby the tendency of the latch is to move to the unlocked position. It is this pressure by the shackle on the spring member 42 that imparts the tension to the member 43 which acts on the lug 45 of the locking disk.

The shackle 36 is provided with an enlarged extremity 46 having a pivot 47 which engages a bearing 48 formed in the circular flange of the casing. This pivot is loose in the part 46 and its inner portion beyond the bearing 48 is cut away to receive and support the top plate 6 of the casing. This plate holds the pivot pin in proper place and in operative relation with the shackle. In the portion of the enlargement 46 located within the casing, is placed a coil spring 49 one extremity of which is made fast to the head or enlargement of the shackle while the other extremity 50 bears against the inner wall of the casing. This spring is so arranged that it has a tendency to throw the hooked extremity of the shackle outwardly. In other words as soon as the latch is actuated by the

pressure on its spring member 42, to release the shackle, the latter is automatically thrown outwardly or to the unlocked position shown in Fig. 1. The portion of the shackle head 46 which protrudes into the casing, is provided with a cam 51 which as the hooked extremity of the shackle is thrown outwardly, acts on a projection 52 formed on the outer extremity of the latch 35, and returns the latch to the locking position, or in such position that its locking hook 38 is in the path of the shackle extremity 39 as the latter is forced into the casing. The part 52 of the latch is provided with a recess 53^A, into which protrudes a lug 53 formed on the locking plate 33 and in reality constituting a part of the recessed flange 32 of this disk. This flange, however, is cut away between its extremity 54 and its extremity 55 with the exception of the projection 53, in order to make room for the movement of the shackle head and the latch. This projection is necessary, since the locking plate must be actuated simultaneously with the movement imparted to the latch 35 by the cam member 51 of the shackle, in order to bring the recesses 34 of the locking plate back into alinement with the reduced parts 29 of the various locking pins, so that the pins which have been pressed inwardly to unlock the mechanism, may return to their normal position as soon as the pressure thereon is released or ceases to act. Hence by virtue of the mechanism just described, both the latch and the locking plate, as soon as the pins A are pressed inwardly as heretofore explained, are first moved automatically toward the left referring to Figs. 1 and 2 sufficiently to release the shackle, and immediately thereafter returned to their normal position by the action of the cam member 51 of the shackle. Then as the pins A are released, they are thrown outwardly by their springs, whereby the reduced or flattened parts 29 of the pins located inward from the notches 31, engage the flange 32 of the locking plate and hold it in the locked position. Then as the shackle 36 is pressed inwardly, the cam 51 is moved away fr[illegible] the part 52 of the latch whereby the latter when acted on by the entering extremity 39 of the shackle, is allowed to move toward the left sufficiently to permit the shackle to enter, after which its spring returns it to engagement with the shackle whereby the latter is retained in the locking position. The guide ring 27 is provided with a recess 56 in its periphery, to make room for the head of the shackle whereby the latter is allowed to move freely.

The flange 18 of the disk 13, is cut away where the latch is located, and in one of its extremities is formed a recess 57 which receives the member 42 of the spring 40. This same extremity of the flange 18, also forms a stop for the latch during its movement toward the right, under the influence of the cam 51, thus preventing the latch from moving farther than is necessary, as it might otherwise do by virtue of the momentum imparted by the quick action of the cam portion of the shackle.

From the foregoing description the use and operation of my improved lock will be readily understood. Assuming that the parts are assembled, and that the four pins A are so adjusted in the casing that their outer recesses 31 are uppermost (referring to the cap 6 as the upper side of the lock), and that the other pins are so adjusted that the inner recesses 31 are uppermost and in alinement with the flange 32 of the locking plate; and also assuming that the shackle is in the locked position as shown in Fig. 7; if it is desired to unlock the shackle, the four pins A are pressed inwardly by the operator until their recesses 31 are in alinement with the flange 32 of the locking disk, in which event the latch spring 40 acting on the lug 45 of the locking plate, imparts a partial rotary movement to the latter toward the left, and a corresponding movement to the latch, the movement of the latter being sufficient to release the hooked extremity of the shackle, in which event the latter is automatically thrown outwardly to the position shown in Fig. 1, by its spring 49. As the shackle moves outwardly, its cam portion 51 acts on the part 52 of the latch and returns the latter to the locking position, whereby its locking extremity 38 is located in front of the opening 10 for the entrance of the shackle. The locking plate is simultaneously given a corresponding movement, since the part 52 of the latch as it moves toward the right, acts on the lug or projection 53 of the locking plate. This action of the locking plate brings the recesses 34 of its flange back into alinement with the reduced parts 29 of the locking pins, and allows the pins A to move outwardly as soon as the pressure thereon is released, thus bringing the parts of the pins A, located inward from their recesses 31, into position to retain the locking plate as well as the latch, in the locking position, after the shackle has been actuated to disengage its cam from the latch, or in other words after the shackle has been returned to the locking position. The lug 12 of the cap 6 reaches the bottom of the case and forms a support for the cap, thus cooperating with the shackle pivot in this regard.

The notched coöperating extremities 38 and 39 of the latch and shackle, are so arranged that by pulling outwardly on the shackle, there is no tendency to impart a lateral or circular thrust to the locking disk 33. In other words an outward pull on the shackle acts radially on the latch and does not affect the locking disk. This is important since if a pull on the shackle acted on the

locking disk, the latter would be thrust more tightly against the pins A, thus enabling a person wishing to open the lock, to know which pins to push. Attention is also called to the fact that the locking disk 33 is provided with a recess 58 which the pin 47 enters when the parts are assembled. This pin forms a stop to limit the movement of the disk in both directions when the device is operated as heretofore explained. This is important since the disk when returning to its normal or locking position must not vary in its movement since the recesses 34 must always be in exact alinement with the reduced portions of the locking pins, otherwise the said pins could not be operated, neither could the actuated pins return to their normal position under the influence of the spring after being pressed inwardly to unlock the device.

The outer extremities of the pins 20 are slightly reduced in diameter, to prevent them from rubbing on the case, since this rubbing action might indicate the pins to be pressed in unlocking the device. It may also be stated that if any pins besides those arranged to be pressed to unlock the mechanism, are actuated the only result would be to lock the mechanism more securely.

Having thus described my invention, what I claim is:

1. In a lock, the combination with a shackle, of a locking latch, means for holding the said latch in the locking position with reference to the shackle, means for automatically moving the latch when released from the holding means, to the unlocked position and means for moving it back again to the locked position.

2. In a lock, the combination with a latch, of means for holding the latch in the locking position, means for automatically moving the latch when released from the holding means, to the unlocked position, and means for automatically returning it immediately to the locked position.

3. The combination with a shackle, of a locking latch adapted to engage the shackle, said latch being movably mounted, means for holding the latch in the locked position with reference to the shackle, said means being capable of movement to release the shackle, means for automatically ejecting the shackle, means for throwing the latch to the unlocked position and means for throwing it back again to the locked position, as soon as the latch has been released from its holding means.

4. In a lock, the combination with a casing, and a shackle, of a locking latch movable in the casing and normally under spring tension to move it to the unlocked position, a disk for holding the latch in the locked position, spring-held pins movable in the casing and having their outer extremities exposed to facilitate manipulation by inward pressure, said pins normally holding the disk against movement, but which when pressed inwardly release the disk and allow it to move in response to the spring tension acting on the latch, and means for automatically returning the latch from the unlocked to the locked position.

5. In a lock, the combination with a casing and a shackle adapted to enter the casing, the said shackle being normally under spring tension whereby it has a tendency to escape from the casing when in the locked position, of a latch adapted to engage the shackle in the locking relation, the said latch when the shackle is in the locking position being under spring tension with a tendency to move the latch to the unlocked position, a disk serving to hold the latch in the locked position against the tension of its spring, spring-actuated pins protruding from the casing and normally holding the disk in the locked position, the disk being constructed to be released when the said pins are pressed inwardly, whereby the disk allows the latch to move to the unlocked position, and means for automatically returning the latch to the locked position as the shackle moves to the unlocked position.

6. In a lock, the combination with a casing, of a shackle normally under tension to move from the locked to the unlocked position, a latch located in the casing and adapted to hold the shackle in the locked position, the latch, however, being under spring tension to move it to the unlocked position, a disk for holding the latch in the locked position against such spring tension, spring-actuated pins protruding from the casing and normally locking the disk in position to hold the latch in locking engagement with the shackle, the pins and disk being constructed to release the latter when the pins are pressed inwardly whereby the disk is allowed to move in response to the latch-spring tension, the latch moving sufficiently to release the shackle, the pivoted extremity of the shackle being provided with a cam portion adapted to act on the latch and return it to the locking position as the shackle moves to the unlocked position.

7. In a lock, the combination with a latch, of a disk for locking the latch in the locked position, pins for holding the disk in the locking position with reference to the latch, the latch being under spring tension to move to the unlocked position, the said pins being spring-actuated and mounted to reciprocate in the casing, the said disk having a flange recessed to receive the pins and permit them to move freely when the disk is in the locking position, the locking pins being provided with recesses which are brought into register with the flange of the disk when the pins are pressed inwardly whereby the disk is allowed

to move in response to the spring tension of the latch whereby the latter is moved to the unlocked position, and suitable means for automatically returning the disk and latch to the locking position immediately after the said parts are moved to the unlocked position.

8. In a lock, the combination with a casing of a series of pins mounted to reciprocate therein and having exposed extremities, the said pins being spring-held at their outward limit of movement, a disk having a flange recessed to receive the pins whereby they are allowed to reciprocate freely when the disk is in the locking position, the disk being under spring tension to move to the unlocked position, a number of the pins having recesses normally in register with the flange of the disk, while the recesses of the other pins are normally out of register with the flange of the disk but adapted to be brought into register therewith by inward pressure, whereby the disk is allowed to move to the unlocked position under the influence of its spring tension, and suitable means for automatically returning the disk to the locked position, whereby the recesses of its flange are brought into register with the actuated pins, whereby as soon as the latter are released they are allowed to assume their normal position.

9. In a lock, the combination with a casing of a series of spring-actuated pins mounted to reciprocate in the casing and having exposed outer extremities, each pin being provided with a number of recesses which are out of register with each other, the said pins being mounted to rotate whereby the recesses of one set of pins may be brought into register with one another, but out of register with the corresponding recesses of the other set of pins, a locking part adapted to engage the recesses of one set of pins while it is locked against movement by the other set of pins, the latter, however, being capable of movement whereby their recesses are brought into register with the recesses normally engaged by the said locking part, thus allowing the said part to move freely in the recesses of all the pins for the purpose set forth.

10. A lock provided with a casing, a series of pins mounted to reciprocate therein, the said pins being provided with notches in their upper and lower edges, the upper and lower notches or recesses of each pin being out of register with each other, the said pins being rotatable in the casing whereby the upper recesses of one set of pins shall be out of register with the corresponding recesses of the other set of pins for the purpose set forth.

11. In a lock, the combination with the casing, of a series of spring-actuated pins protruding from the casing, said pins being mounted to reciprocate and also mounted to rotate, a guide flange slotted to permit the reciprocation of the pins but arranged to lock them against rotation, the said pins having a flattened part engaging said guide flange, the said pins each having recesses in its upper and lower edges, the upper and lower recesses of each pin being out of register, and a locking device having a flange recessed to receive the flattened portion of the said pins, the said flange being normally in register with the upper recesses of a portion of the pins and out of register with the upper recesses of the other pins, one set of pins being capable of movement to bring their upper recesses into register with the flange of the locking device for the purpose set forth.

12. In a lock, the combination with a casing, of a locking device mounted to oscillate therein, spring-actuated pins for holding the locking device in a predetermined position, the said locking device when so held by the pins, being under spring tension, the pins being capable of movement to release the locking device whereby it is allowed to move in response to said tension, and means for automatically returning the locking device to the aforesaid predetermined position.

13. In a lock, the combination with a casing, of a locking device, means for holding the locking device in the locking position, means for automatically moving the locking device when released from the holding means, to the unlocked position, means for automatically moving it back again to the locked position, and means for positively limiting the movement of the locking device in both directions.

14. In a lock, the combination with a casing, of a locking disk, means for holding the disk in the locking position, means for automatically moving the disk when released from the holding means, to the unlocked position, means for automatically moving it back again to the locked position, the said disk being provided with a recess, and a pin projecting into said recess and positively limiting the movement of the disk in both directions, substantially as described.

15. The combination with a lock casing provided with a shackle opening, of a shackle pivotally connected with the casing and having one extremity adapted to enter said opening, and a cap for closing the casing, the said cap having an interior projection which when the cap is applied partially closes the shackle opening, the said cap plate being capable of partial rotary movement whereby it is locked against removal from the casing, the construction being such that when the shackle projects into the casing, the cap plate cannot be removed.

16. The combination with a lock casing having a shackle opening, of a shackle connected with the casing and having one extremity adapted to enter said opening, and a cap plate having an interior projection pro-

vided with a recess, the casing being provided with an interiorly projecting pin adapted to engage said recess after the cap is applied and given a partial rotation, the construction being such that when the cap is originally applied the said projection partially closes the shackle opening, while after it is given a partial rotation whereby it is made to engage the said pin, the shackle opening is free, allowing the shackle extremity to enter and hold the cap plate in the locked position against removal as long as the shackle is in the locked position.

In testimony whereof I affix my signature in presence of two witnesses.

ORSON J. BLAKESLEY.

Witnesses:
DENA NELSON,
A. J. O'BRIEN.