Feb. 14, 1933. A. A. BRADSHAW 1,897,922

LOCK

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Fig. 1.

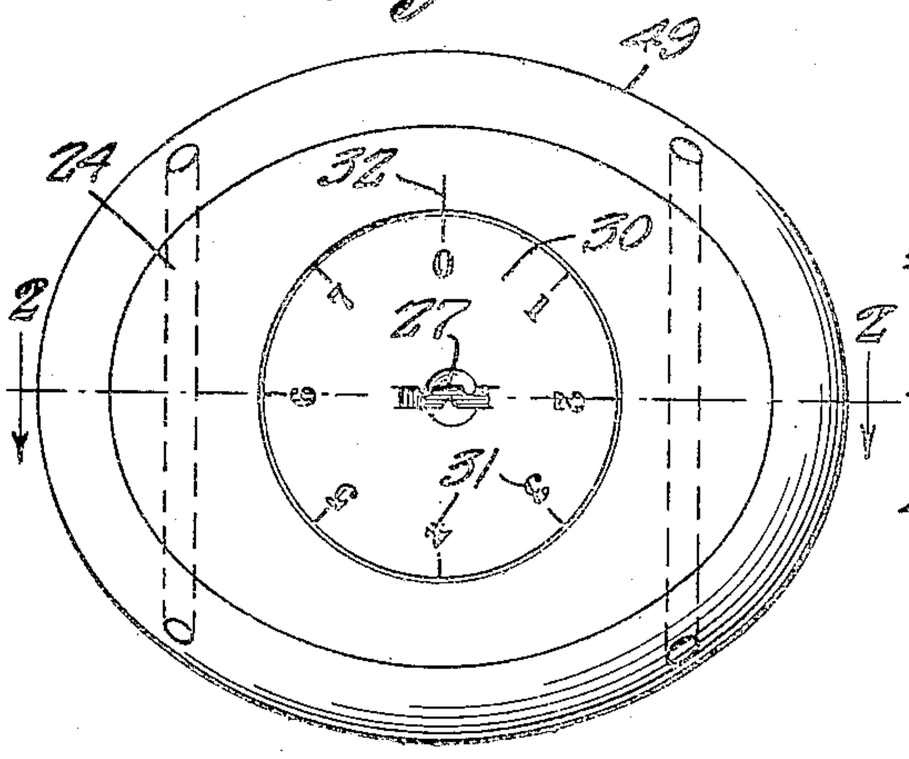


Fig. 3.

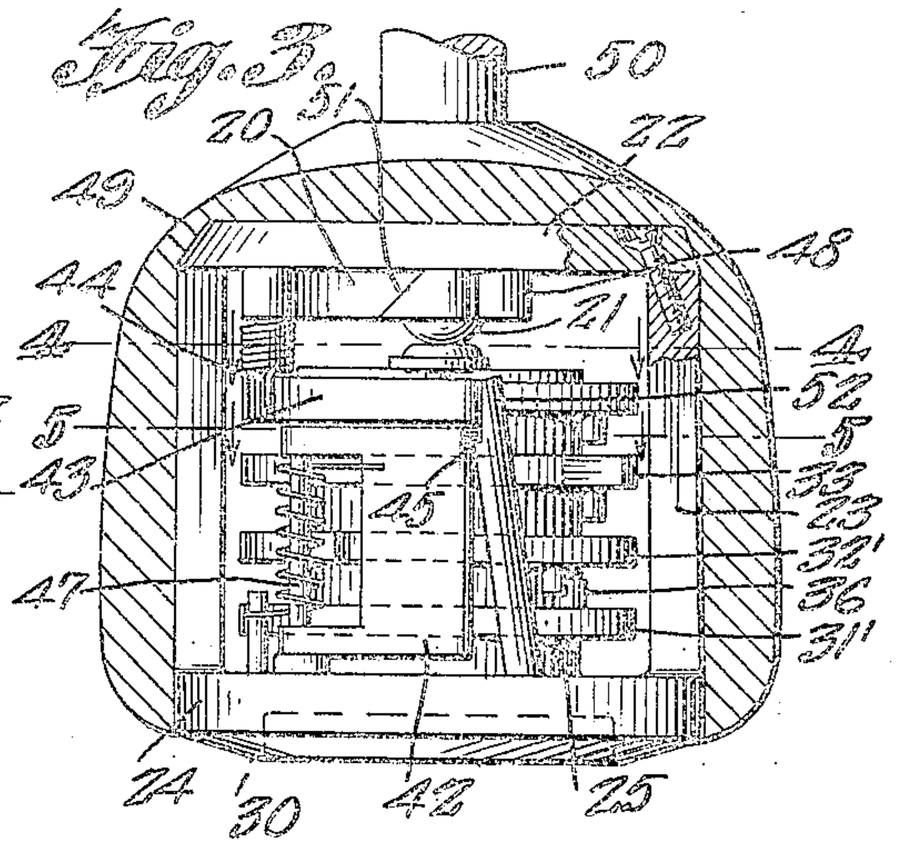


Fig. 2.

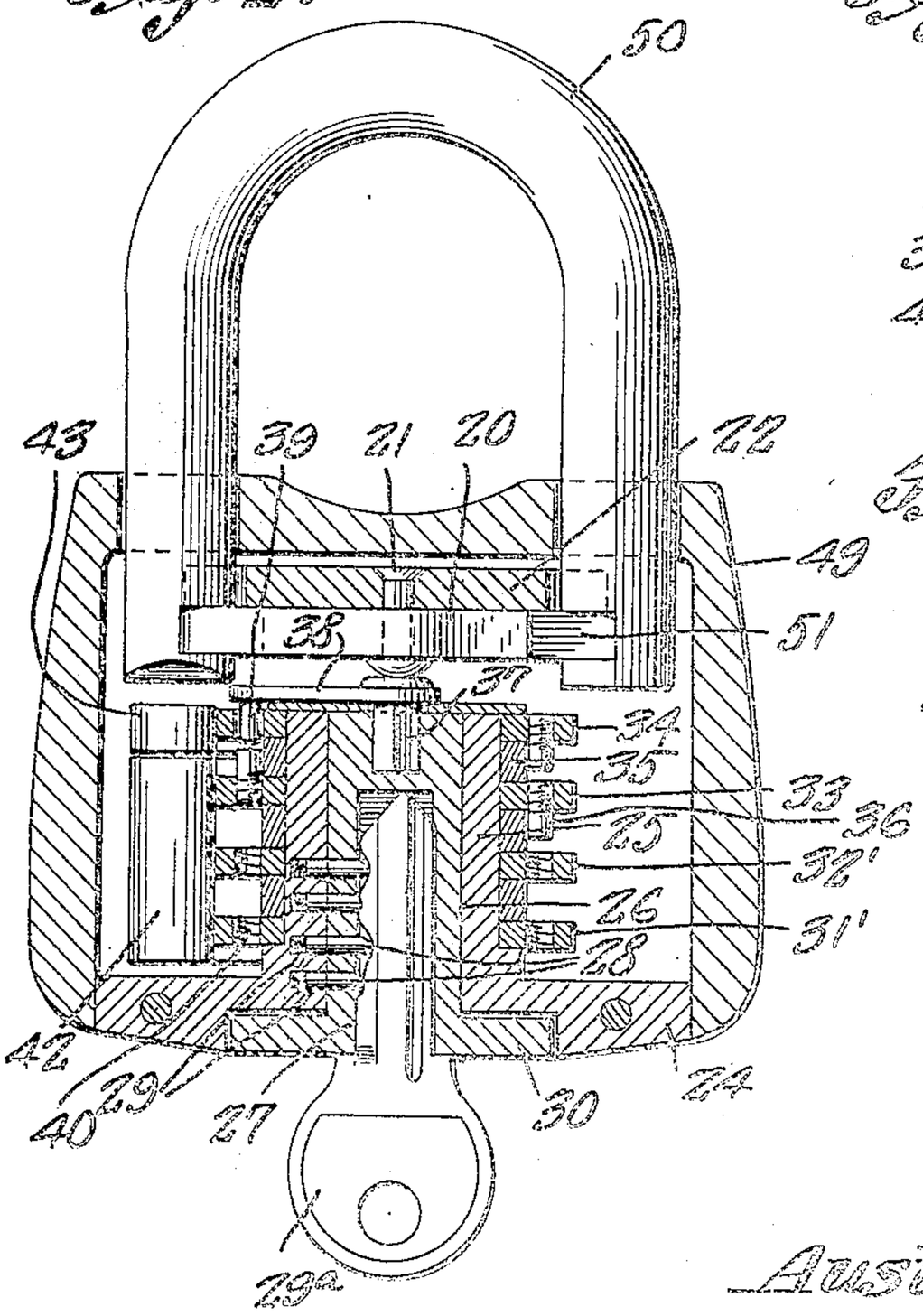


Fig. 4.

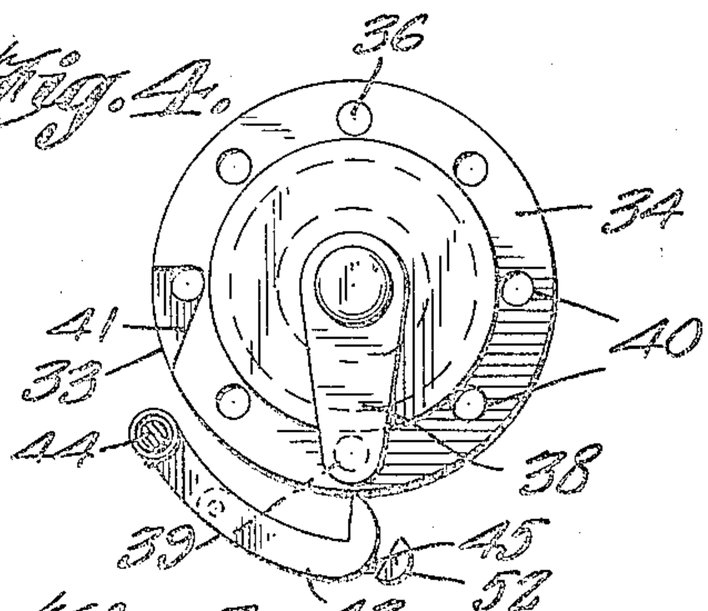
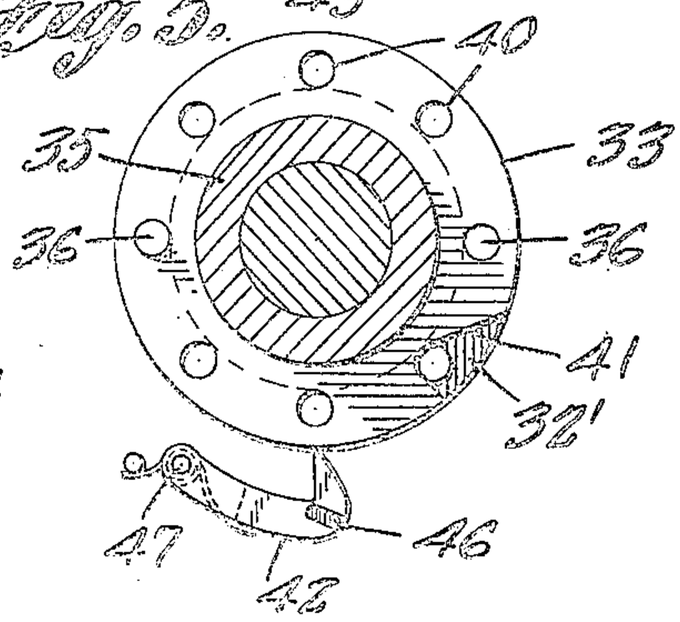


Fig. 5.



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WITNESS:

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LOCK

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Fig. 6.

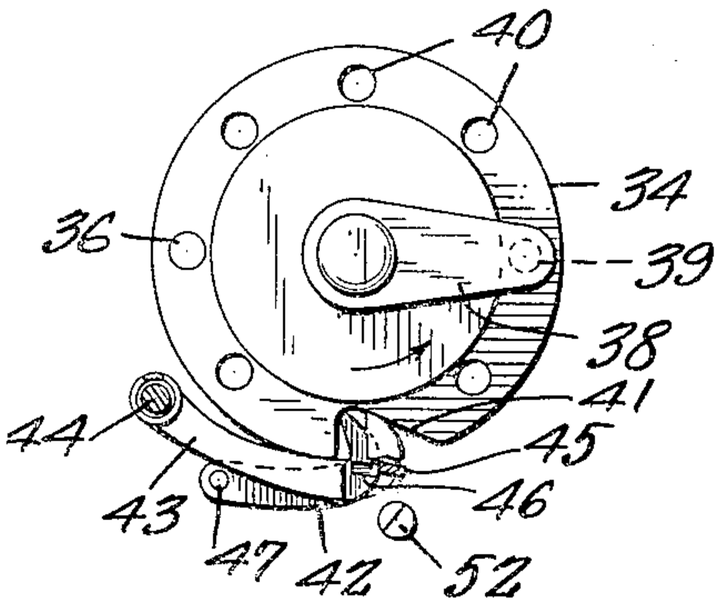


Fig. 7.

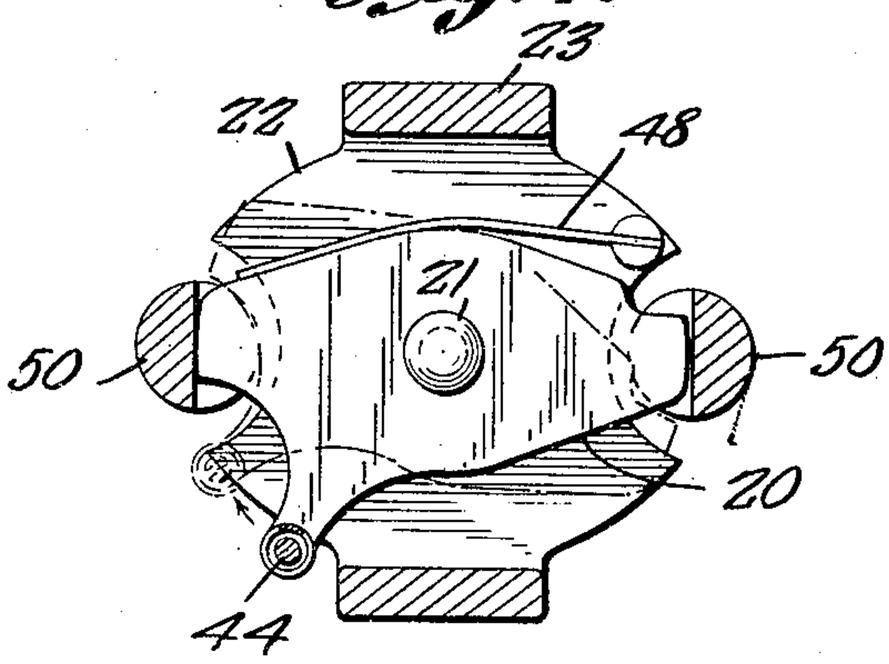
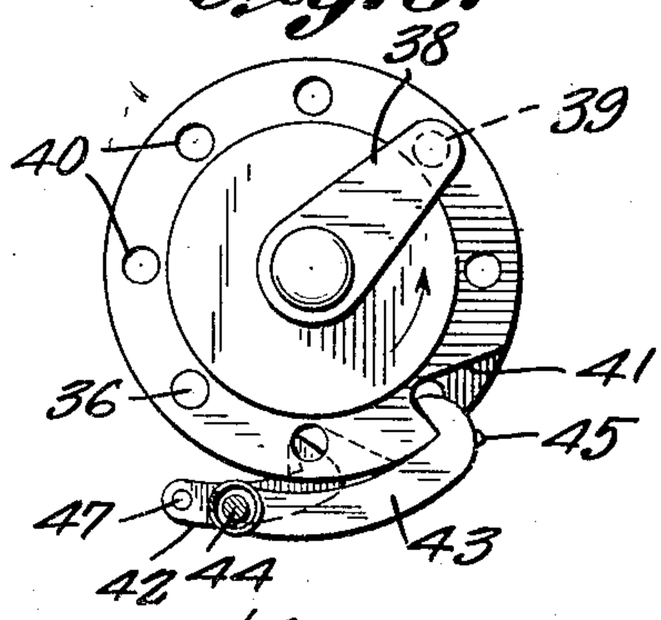


Fig. 8.



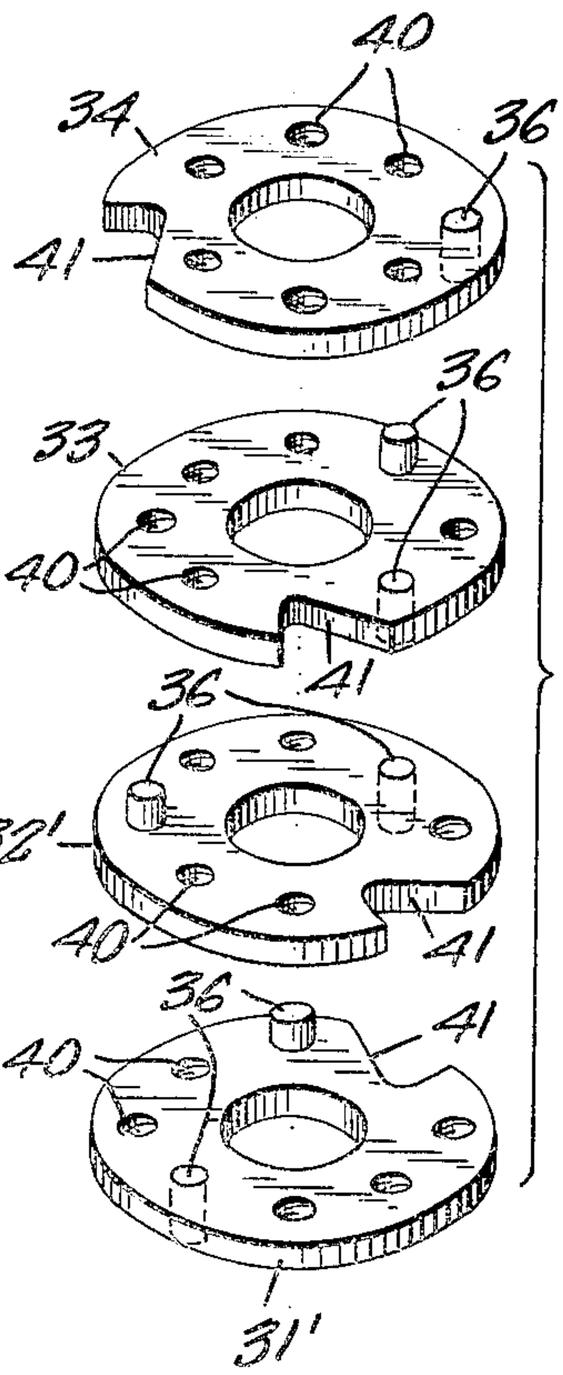


Fig. 9.

Fig. 10.

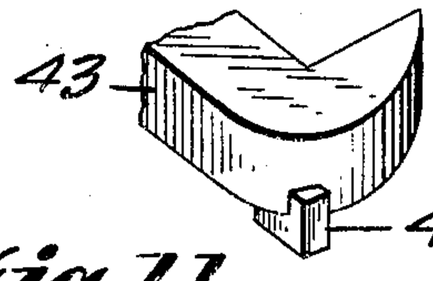
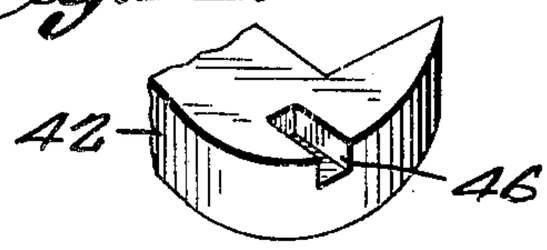


Fig. 11.



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WITNESS:

Patented Feb. 14, 1933 1,897,922

UNITED STATES PATENT OFFICE

AUSTIN A. BRADSHAW, OF HICKORY, NORTH CAROLINA, ASSIGNOR OF ONE-HALF TO J. A. BRADSHAW, OF BUNCOMBE COUNTY, NORTH CAROLINA

LOCK

Application filed February 23, 1932. Serial No. 594,715.

The object of the invention is to provide a lock which not only needs a key to effect the releasing operation but requires that the key shall be worked according to a specified combination before the lock may be moved to release position; to provide a lock of this kind in which the combination may be changed to necessitate the operation of the key in a certain manner to release the lock; and generally to provide a lock which, while apparently complicated in the process of unlocking, so that it may be proof against release by unauthorized persons, is of comparatively simple form and, therefore, susceptible of cheap manufacture.

With this object in view, the invention consists in a construction and combination of parts of which a preferred embodiment is illustrated in the accompanying drawings but to which embodiment the invention is not to be restricted. Continued use in practice may suggest certain changes or alterations and the right is claimed to make any which fall within the scope of the appended claims.

In the drawings:

Figure 1 is a bottom plan view of a lock constructed in accordance with the invention.

Figure 2 is a sectional view on the plane indicated by the line 2—2 of Figure 1.

Figure 3 is a view similar to Figure 2 but taken on a line at right angles to that in which Figure 2 is taken.

Figures 4 and 5 are sectional views on the planes indicated by the lines 4—4 and 5—5 respectively of Figure 3.

Figure 6 is a view similar to Figure 4 but showing a different position of the parts.

Figure 7 is a view partly in plan and partly in section looking at the latch bar.

Figure 8 is a view similar to Figure 4 but showing still another position.

Figure 9 is a collective perspective view of the several disks constituting the combination elements of the device.

Figure 10 is a perspective view of the nose end of the latch bar engaging pawl.

Figure 11 is a view similar to Figure 10 but showing the upper end of the nose of the combination disk engaging pawl.

The latch bar 20 is mounted for rocking movement on a pivot stud 21 which is carried by the transverse plate 22 of a yoke 23, the latter being connected with a base 24 formed with a hub 25 in which the cylinder 26 is rotatably mounted, the cylinder being formed with a key slot 27 and having radial holes extending from the key slot to the periphery and carrying pins 28, which, when the key 29^a is inserted in the key slot, are forced radially outward and bring all of the pins 29, which are mounted in correspondingly arranged holes in the hub, to the peripheral surface of the barrel, so that the latter may be rotated. The pins 29 are spring pressed radially inward, so that when the key is withdrawn, they are projected across into the mating holes in the barrel which will positively preclude rotation of the same.

The barrel is formed with a disk portion 30 seated in a counterbore in the base and suitably inscribed with characters such as indicated at 31, for registration with a mark 32 on the base, so that by rotation of the barrel first in one direction and then in the other, according to a specified arrangement of characters, may so result in positioning of the combination disks that the latching bar may be released.

Rotatably mounted on the exterior of the hub are the disks 31′, 32′, 33 and 34, suitable spacers, such as indicated at 35, being interposed between them. The lowermost disk 31′ carries on its upper face a pin, as indicated at 36, and similar pins are mounted on the under and upper faces of the disks 32′ and 33 and on the under side or face of the disk 34. All of the pins are mounted on the disks at uniform radial distances from the axis of the barrel or hub, so that as one disk is turned, the pins are brought into abutting relation and this motion transmitted to the next disk and so on.

The uppermost disk 34 is locked to the barrel, a cross-sectionally angular stud 37 being inserted in a correspondingly formed socket or hole in the barrel and carrying a radially disposed arm 38, having a pin 39 which is positionable in any one of the holes 40 with

which all of the disks are provided. The holes 40 are interiorly threaded and the pins 36 are exteriorly threaded, so that they may be disposed in any selected holes. This for the purpose of changing the combination so that certain definite movements of the barrel may be required to position all of the disks so that the notches 41 may be brought into registration, those in the disks 31′, 32′ and 33 being for the reception of the nose of the dog 42 and that in the disk 34 for the reception of the nose of the dog 43 which is pivotally mounted, as indicated at 44, on the under side of the latching bolt 20. The dog 43 is spring impelled toward the periphery of the disk 34. An interlocking connection between the dogs 43 and 42 is provided in the form of a flat lug 45 on the former engaging a seat notch 46 on the latter. The dog 42 is pivotally mounted on the base 24 as indicated at 47 and is spring pressed toward the periphery of the disk.

The latching bar 20 is spring actuated as indicated at 48 to yieldingly hold the same in obstructing position with reference to the shackle openings in the casing 49 through which the shackle 50 is inserted to be engaged by the latching bolt, the inclined noses 51 resulting in the latch bar being deflected against the pressure of the spring to engage the shackle with the latch bolt.

Except when the notches 41 in the several disks are in registration, the noses of the pawls or dogs 42 and 43 bear on the peripheries of the disks and the pawl 42 spanning the three disks, may not enter the notch in either disk singly and the interlocking connection provided by the lug 45 and slot 46 precludes the dog 43 from entering the notch in the top disk when the latter passes the nose of the dog. This so that the dog 43 may not be engaged with the notch in its attendant disk except when the dog 42 may enter the notches in the remaining disks.

In the outer position where its nose bears on the periphery of its associated disk, the dog 43 is disposed in obstructing relation to a post 52 carried by the base 24. Being carried by the latching bar, the latter is positively precluded from being accidentally turned because angular or turning movement is then precluded by the post.

In the operation of the invention, if the shackle is engaged with the latching bar and the proper key 29ª inserted, the latter's shifting of the pins 28 and 29 will release the barrel for rotation in the hub and being turned in one direction, will carry with it the disk 34 and later the disk 33 when the pins 36 on the two engage, then later on the disk 32′ and finally the disk 31′. The pins having been set for a definite combination, the barrel after a certain number of revolutions is stopped when the desired figure or indication 31 is opposite the mark 32, which will mean that the notch 41 in the lowermost disk 31′ is opposite the nose or pawl of the dog 42. The barrel is then rotated in the opposite direction, the pins 36 on the disks 34, 33 and 32 being engaged until this last disk is rotated in the reverse direction to position its notch opposite the nose of the dog 42, which will be when a certain mark 31 on the disk 30 stands opposite the mark 32. Rotation in the opposite direction then follows to a definite position of the disk 30, when the notch in the disk 33 will be positioned opposite the nose of the pawl 42. But this pawl, at that time, can not fall into the notches, because of the interlocking connection with the pawl or dog 43. Therefore, the barrel is further rotated in the reverse direction than previously to position the notch 41 at a point where the nose of the dog 43 may enter it. Thus the noses of the two dogs drop into the notches in the several disks and the latch bar then becomes locked to the uppermost disk which is locked to the barrel through the arm 38 and its associated pin and if the barrel then be turned, the latch bar will be swung around to a position permitting release of the shackle, this turning movement being possible by reason of the dog 34 being out of obstructing position with reference to the post 52. After the shackle has been released, the lock may be reset to latching position by rotating the barrel in the opposite direction from which it was rotated in effecting the last operation in the release of the shackle, this movement of the barrel shifting the pawls out of engagement with the notches 41 by reason of the rounded edges of the noses of the pawls on the one side and the inclination of the edges of the notches from radial lines on the one side.

The invention having been described, what is claimed as new and useful is:

1. A key actuated combination lock comprising a latching bar, a rotatable barrel having a key slot therein, a plurality of rotatable disks of which one is connected with the barrel, members carried by the several disks in obstructing relation to each other, so that rotation of the one disk by the barrel will result in the eventual rotation of all, a dog spanning all of the disks except that connected with the barrel, said disks having notches for the reception of the nose of the dog, and a dog carried by the latching bar and having a nose engageable in a notch formed in the barrel actuated disk, the first said dog being interconnected with the latching bar carried dog to prevent independent seating of the latter in said notch.

2. A key actuated combination lock comprising a latching bar, a rotatable barrel having a key slot therein, a plurality of rotatable disks of which one is connected with the barrel, members carried by the several disks in obstructing relation to each other, so that ro-

tation of the one disk by the barrel will result in the eventual rotation of all, a dog spanning all of the disks except that connected with the barrel, said disks having notches for the reception of the nose of the dog, and a dog carried by the latching bar and having a nose engageable in a notch formed in the barrel actuated disk, the dogs having interlocking connection to prevent the one from engaging its notch without corresponding notch engagement by the other.

3. A key actuated combination lock comprising a latching bar, a rotatable barrel having a key slot therein, a plurality of rotatable disks of which one is connected with the barrel, members carried by the several disks in obstructing relation to each other, so that rotation of the one disk by the barrel will result in the eventual rotation of all, a dog spanning all of the disks except that connected with the barrel, said disks having notches for the reception of the nose of the dog, and a dog carried by the latching bar and having a nose engageable in a notch formed in the barrel actuated disk, the dogs having interlocking connection to prevent the one from engaging its notch without corresponding notch engagement by the other, the dogs having their noses normally in peripheral contact with the disks and spring pressed toward the latter.

4. A key actuated combination lock comprising a latching bar, a rotatable barrel having a key slot therein, a plurality of rotatable disks of which one is connected with the barrel, members carried by the several disks in obstructing relation to each other, so that rotation of the one disk by the barrel will result in the eventual rotation of all, a dog spanning all of the disks except that connected with the barrel, said disks having notches for the reception of the nose of the dog, and a dog carried by the latching bar and having a nose engageable in a notch formed in the barrel actuated disk, and mounting means for the barrel comprising a base, the barrel being formed with a disk rotatable with respect to the base and inscribed with indications registerable with a mark on the base.

5. A key actuated combination lock comprising a latching bar, a rotatable barrel having a key slot therein, a plurality of rotatable disks of which one is connected with the barrel, members carried by the several disks in obstructing relation to each other, so that rotation of the one disk by the barrel will result in the eventual rotation of all, a dog spanning all of the disks except that connected with the barrel, said disks having notches for the reception of the nose of the dog, and a dog carried by the latching bar and having a nose engageable in a notch formed in the barrel actuated disk, the dogs having interlocking connection to prevent the one from engaging its notch without corresponding notch engagement by the other, the dogs having their noses normally in peripheral contact with the disks and spring pressed toward the latter, and a post disposed in obstructing relation to the latching bar carried dog, except when the latter has its nose seated in the notch of its attendant disk.

6. A key actuated combination lock comprising a latching bar, a rotatable barrel having a key slot therein, a plurality of rotatable disks of which one is connected with the barrel, members carried by the several disks in obstructing relation to each other, so that rotation of the one disk by the barrel will result in the eventual rotation of all, a dog spanning all of the disks except that connected with the barrel, said disks having notches for the reception of the nose of the dog, and a dog carried by the latching bar and having a nose engageable in a notch formed in the barrel actuated disk, the dogs having interlocking connection to prevent the one from engaging its notch without corresponding notch engagement by the other, the dogs having their noses normally in peripheral contact with the disks and spring pressed toward the latter, and a post disposed in obstructing relation to the latching bar carried dog, except when the latter has its nose seated in the notch of its attendant disk, a yoke on which the latching bar is rotatably mounted, and a base supporting the yoke, said base having a hub in which said barrel is rotatably mounted and on which said disks are rotatably mounted.

In testimony whereof I affix my signature.

AUSTIN A. BRADSHAW.