

C. E. ANABLE.
 PERMUTATION PADLOCK.
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1,312,939.

Patented Aug. 12, 1919.

Fig. 1

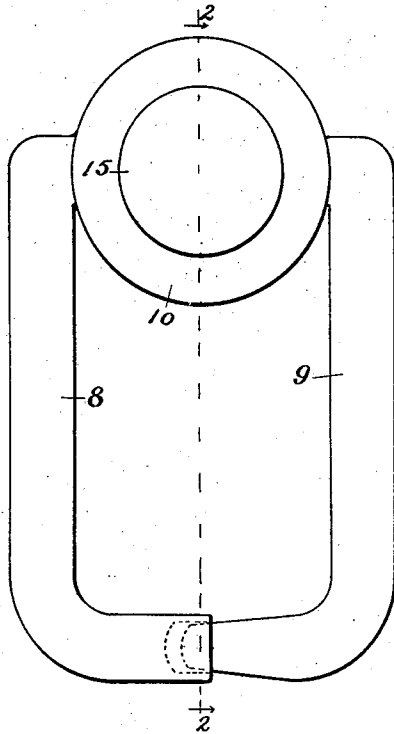


Fig. 2

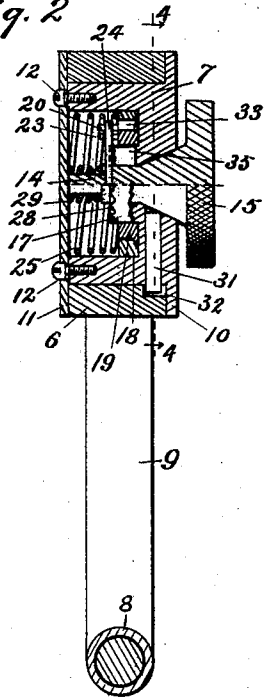


Fig. 3

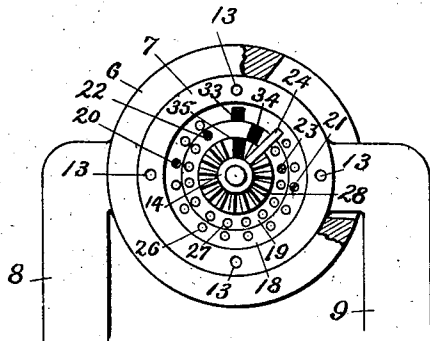
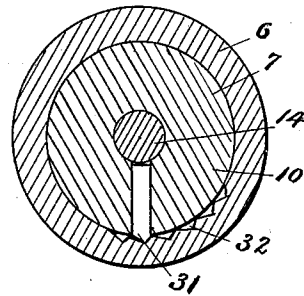


Fig. 4



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UNITED STATES PATENT OFFICE.

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PERMUTATION-PADLOCK.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CLARENCE E. ANABLE, a citizen of the United States, residing at Sacramento, in the county of Sacramento and State of California, have invented certain new and useful Improvements in Permutation-Padlocks, of which the following is a specification.

This invention contemplates the construction of a permutation lock which may be manipulated in the dark as well as in the light and one which may be applied wherever a padlock may be required.

Therefore the invention for which patent protection is sought consists in the structure of parts and their combination for the purpose specified, substantially as herein set forth and claimed.

In the accompanying drawings, which form a part of this specification, Figure 1 represents the improved lock in the form of a "robe lock" for use in automobiles, the shackle being divided in approximately equal parts. Fig. 2 is a transverse medial section of said lock on the line 2—2. Fig. 3 is a rear view of the interior of the lock, the back-plate being removed and parts broken away and the shackle broken off. Fig. 4 is a section on the line 4—4, Fig. 2.

In the form of lock selected for illustrating this invention, the casing is composed of concentric drums 6 and 7, the half shackle 8 being integral with drum 6 and the half shackle 9 being integral with drum 7. The head 10 of the inner drum 7 is also preferably integral therewith, while the outer drum 6 is confined to the inner drum by a removable head 11, secured to the inner drum by screws 12, the sockets for which are seen at 13 in Fig. 3. After the lock has been assembled the heads of these screws may be filed down to remove the nicks thereby preventing removal of the screws by a screw-driver.

The combination-operating spindle 14 with its milled head 15 is located in the common axis of said drums and is journaled for rotary and axial movement in a stud 17 in the center of the head 10 of drum 7. About said stud 17 are located concentric permutation rings or tumblers 18 and 19 provided with screw pins 20, 21, 22, and 23 by which said rings may be moved through the agency of a finger 24 projecting from the spindle 14. The ring 19 has a flange formed on it which enters an annular recess in ring

18, the latter being held to the head 10 by a spring 25 confined by the head 11. Said spring therefore holds both rings to head 10 and restrains ring 18 while ring 19 is being moved.

The lock is set for a particular combination by locating the pins 20—23 in the desired sockets 26 and 27 in the concentric rings. A "click mechanism", through which to work the combination by sound or touch, is composed of a notched disk 28, formed on the end of stud 17, and the finger 24, the finger being held to the disk by a spring 29 located about the spindle 14 between a shoulder thereon and the head 11.

The element by which the parts of the shackle are locked together consists of a bolt 31 located radially in the head 10, Fig. 4, and formed to engage notches 32 in the drum 6. The inner end of said bolt is engaged by a conical portion of the spindle 14 and is forced thereby into said notches. The inclined faces of the notches force the bolt inward when the spindle is pulled outward and the shackle opened. The axial movement of the spindle therefore controls the locking bolt, and the axial movement of the spindle depends upon the position of the combination rings 18 and 19, which are notched to receive the finger 24. These notches or recesses appear at 33 and 34. There is also a notch or recess 35 in the ratchet disk 28. When these three recesses are brought into alinement by proper rotation of the spindle the finger may enter them on pulling out on the knob 15. Then the Bolt 31 will slide in as opening force is applied to the divided shackle.

The drawings show the mechanism in locked position and the combination set arbitrarily for "3 right—2 left". The starting point is taken at the blank space in the notched disk, it being composed of the recess 35, which obliterated one ridge of the notched disk, and the smooth surface at the left (Fig. 3) of said recess, the width of another ridge. This blank space, equal to two ridges, is easily felt and likewise noted by the ear, when the finger 24 is moved over the disk on turning the knob 15.

To unlock the lock: Rotate the knob till finger 24 slides into the blank space, then turn to the right three steps, the spring forcing said finger into the successive notches of the disk 28 thereby enabling the operator to sense each step. Recess 34 is then in line

with recess 35. Then reverse till said finger again slides into the blank and continue two steps to the left. Recess 33 is then in alinement with 34 and 35. Then turn back to the blank space, when finger 24 may be drawn into said alined recesses and the spindle drawn out so that the conical portion thereof will recede from the end of the bolt 31, which will be free to slide in when the shackle is opened. The spring 29 tends to keep the parts in unlocked position.

To apply the lock, the parts of the shackle may be inserted where desired or clamped upon the thing to be held, then the spindle is pushed in till finger 24 is out of the recesses, when, on twirling the knob in either direction, said recesses will be thrown out of alinement by the finger striking the pins in the combination rings. The finger then holds the spindle in and the conical portion thereof has forced the bolt out into one of the notches 32. Therefore the drums 6 and 7 will be held against rotation upon one another and the parts of the shackle will be maintained in locked position.

Obviously a dial may be used on head 10 for coöperation with knob 15 if desired, but the combination is so readily followed by touch and sound that a visual indicator is not at all necessary.

The invention claimed is:

1. In a permutation lock, the combination of two concentric rotatable drums, each of said drums carrying a portion of a part to be locked, a radially movable bolt for locking the drums against rotation, a spindle having a rotary and axial movement, said bolt being controlled by the axial movement of said spindle, means on the spindle for controlling its axial movement, and permutation tumblers within the innermost drum concentric with each other and having openings adapted, when alined, to permit the passage of the spindle-controlling means.

2. In a permutation lock, the combination of two concentric rotatable drums, each of said drums carrying a portion of a divided shackle, a radially movable bolt for locking

the drums against rotation, an actuating spindle having a rotary and axial movement, means mounted on the spindle for controlling its axial movement, permutation tumblers concentric with the drums, said tumblers having openings adapted, when alined, to permit the passage of the spindle-controlling means, and other means, also mounted on the spindle, for controlling the movement of the bolt by the axial movement of the spindle.

3. In a padlock, a divided shackle having the parts thereof pivoted together at one end, a hollow stud in the axis of said pivot and having a recess in its end, concentric, movable permutation rings mounted about said stud and each provided with a radial opening, an actuating spindle journaled in said stud and axially movable, a finger extending laterally from said spindle for moving said rings and adapted to enter the openings in the rings and in the stud when brought into alinement, and means projecting into the path of movement of the spindle and controlled by the axial movement thereof for locking the parts of the shackle together.

4. In a padlock, a divided shackle having the parts thereof pivoted together at one end, a hollow stud in the axis of the pivot and having a ratchet disk on its end and a recess therein, concentric, movable, permutation rings mounted about said stud and each provided with a radial opening and with changeable operating pins, an actuating spindle provided with a conical portion and journaled in said stud and axially movable, a finger extending laterally from said spindle for engaging said pins and adapted to enter the openings in the rings and in the stud when brought into alinement, and a radially reciprocating bolt for locking the parts of the shackle engaged by said conical portion of the spindle when the spindle is axially moved.

In testimony whereof I affix my signature.

CLARENCE E. ANABLE.