

C. J. EVANS.
PERMUTATION PADLOCK.
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1,021,456.

Patented Mar. 26, 1912.

2 SHEETS—SHEET 2.

Fig. 3.

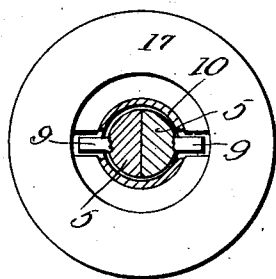


Fig. 4.

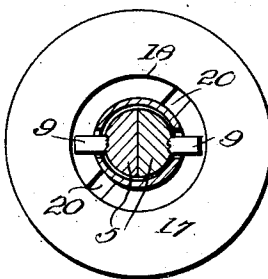


Fig. 7.

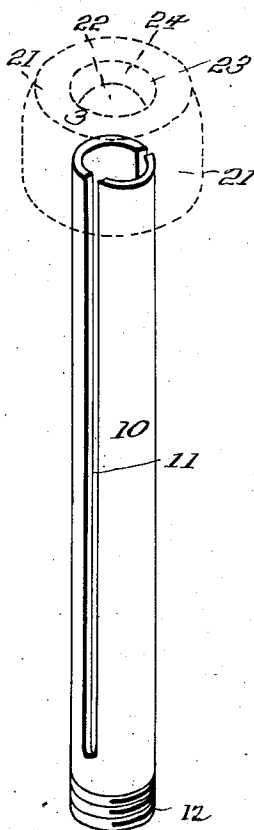


Fig. 8.

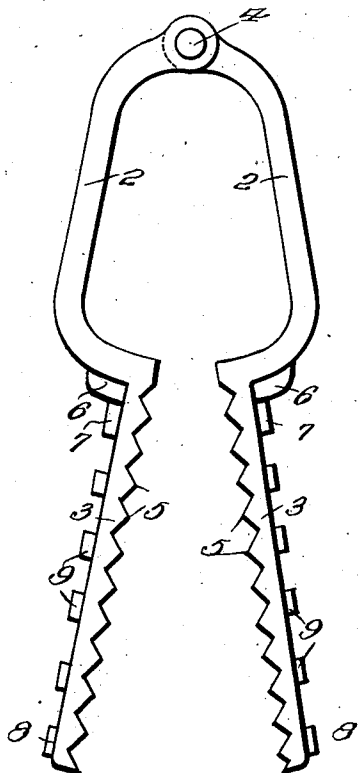


Fig. 5.

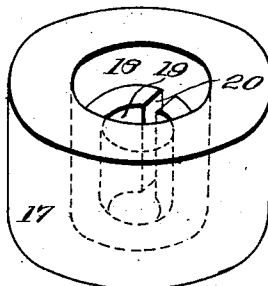
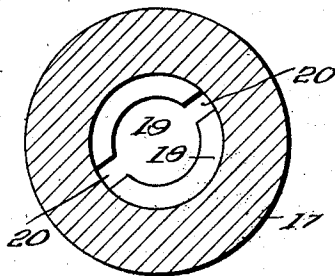


Fig. 6.



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PERMUTATION-PADLOCK.

1,021,456.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES J. EVANS, citizen of the United States, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented certain new and useful Improvements in Permutation-Padlocks, of which the following is a specification.

My invention relates to locks and particularly to permutation padlocks.

The primary object of my invention is to provide a keyless permutation lock of a very simple and effective construction having a shackle formed of two members pivoted to each other and arranged to be inserted through a plurality of tumblers and interlocked therewith, the legs of the shackle being provided with interlocking teeth preventing the removal of one part of the shackle by the removal of the pivot therewith and holding the two parts of the shackle in rigid engagement with each other when inserted in place within the tumblers.

A further object is to provide, in connection with a shackle having pivoted legs, a tubular pintle through which the shackle is passed, and a series of rotatable tumblers mounted on the tubular pintle, of means for preventing any removal of the tumblers from the pintle while the shackle is in place.

My invention is illustrated in the accompanying drawings wherein:

Figure 1 is a perspective view of my padlock with the shackle locked in place. Fig. 2 is an enlarged vertical section of the body portion of the padlock, the shackle being shown in elevation and in place. Fig. 3 is a top plan view of one of the locking disks, the tubular pintle and the shackle being shown in section. Fig. 4 is a like view to Fig. 3 but showing the locking disk so turned as to prevent the withdrawal of the shackle. Fig. 5 is a perspective view of one of the locking disks. Fig. 6 is a transverse section of the same. Fig. 7 is a perspective view of the tubular pintle, the uppermost of the locking disks being shown in dotted lines. Fig. 8 is a side elevation of the shackle detached from the body and opened.

Referring to Fig. 2 it will be seen that the shackle of the padlock is made in two parts or legs hinged to each other like the legs of a compass so that the legs may open out or be closed together. Preferably the shackle has the form shown in Fig. 8,

each leg comprising a bowed portion 2, a straight shank 3, the bowed portion of the shackle forming the usual loop or "bow" of the lock. The upper ends of the bowed portions of the legs are hinged to each other by means of a pivot 4. The straight shanks 3 are each semicylindrical in section and formed each on its inside face with teeth 5 which bear a staggered relation to each other, the teeth on one shank intermeshing with the teeth on the opposed shank when the shanks are forced together in the position shown in Fig. 2. It will be seen that these intermeshing teeth prevent any relative longitudinal movement between the two legs of the shackle when the shanks are held in engagement with each other.

At the junction of the shanks 3 with the bowed portions 2, each leg is formed with a convex head 6. Immediately below the convex head each of the shanks on their outside face is provided with the radially extending lug 7. The lower end of each shank on its outside face is also provided with the radial lug 8, and between the lug 8 and the lug 7 on each shank are a plurality of radially projecting lugs 9. In the drawing these lugs 7, 8 and 9 on each shank are disposed diametrically opposite to each other, and this is the preferable form of the construction.

The body portion of the padlock comprises a central tube 10, which tube is longitudinally slotted as at 11 at diametrically opposite points, the slots extending nearly to the bottom of the tube. The lower end of the tube is screw threaded as at 12 for engagement with the lowermost disk 13 of the series. This disk is formed with the central bore 14 which is screw threaded on its interior as at 15 to engage with the screw threads of the tube 10. The upper face of this disk is also radially notched or slotted as at 16, the slots opening at their inner ends at the central bore and being adapted to engage with the lugs 8 on the lower ends of the shanks 3.

Supported upon the lowermost disk and rotatably mounted upon the tubular pintle 10 are a plurality of independently rotatable disks 17. Each of these disks is of precisely the same construction and hence a description of one applies to all of the disks. Each disk is concavo-convex, the convex face of the disk being upward. Each disk is formed upon its upper face with the re-

cess 18 having a diameter equal to the distance between the outer edges of the lugs 9. Passing centrally through the disk and opening at one end upon the recess 18 is the central bore 19, and extending from diametrically opposite points of this bore radially outward, are the slots or notches 20, the outer ends of these notches being in alinement with the circumference of the recess 18 and being adapted to permit the passage of the lugs 8 and 9.

It will be obvious that when the disks 17 are turned into proper relation to the tubular pintle 10, that the notches or slots 20 will register with the slots 11 in the tubular pintle and that then the shanks of the shackle may be inserted into or withdrawn from the body portion of the lock. The uppermost disk 21 has practically the same form as the disk previously described and is fast on the upper end of the tubular pintle. This disk 21 is attached to the tubular pintle in such manner that it cannot be rotated relatively to the pintle. This disk 21 forms the head of the tubular pintle and is provided with radial slots 23 for engagement with the lugs 7 and a central concave recess 24 for the reception of the convex head 6 on the shackle.

The periphery of each of the disks 17 is provided with a plurality of division lines or index marks 25, the spaces between these marks being provided with suitable symbols, as for instance the letters of the alphabet, so as to show when the disks have been rotated into proper relation to each other, and the disk 21 is also provided with like index marks 25 with which the marks on the next adjacent disk are adapted to align when the next adjacent disk has been properly rotated. The index marks on the disk or head 21 are relatively fixed, the disk or head 21 not being rotatable, and the several disks 17 are therefore rotated with reference to the index marks on the disk or head 21.

The operation of the invention is entirely obvious from what has gone before. When it is desired to lock the padlock the shackle is closed and the shanks thereof inserted into the central opening in the tube 10. After the shackle has been inserted, disks 17 surrounding the tubular pintle 10 are rotated in any desired manner so that the notches in the disks are out of alinement with each other and with the lugs 8 and 9. When so out of alinement it will be obviously impossible to withdraw the shackle from its engagement with the body and it will also be impossible by removing the pivot 4 to remove one of the legs of the shackle from its engagement with the body portion, for the reason that the legs are locked with each other by the teeth 5 formed upon their inside faces and cannot be independently moved longitudinally. When

it is desired to unlock the padlock, the disks 17 are rotated into such relation that the notches 20 on each disk are in alinement with the lugs 8 and 9. When in proper alinement, the shackle may be withdrawn and opened out. It is to be noted that the lugs 9 are so placed upon the shanks 3 with relation to the disks that the lugs are accommodated in the recessed portions 18 of the disks 17 when the parts are in their locked position, and that in this position the disks 17 may be freely rotated around the pintle 10 and the shackle contained therein. It will be obvious that this lock cannot be picked by rotating the next to the lowermost disk until it is in alinement with the lugs on the shank and then pulling up upon the shank, but that it is necessary to get all of the disks in proper relation before the shackle can be moved at all.

While the lowermost disk 13 has screw threaded engagement with the tubular pintle, this lowermost disk 13 cannot be turned upon the tubular pintle so long as the shackle is in place within the padlock, for the reason that the lugs 8 on the extremity of the shackle enter the slots 20 of the disk 13 and prevent any rotation of the disk relative to the tubular pintle. When, however, the shackle is withdrawn so that the lugs 8 escape from the recess 18 in the upper face of the disk 13, then the disk 13 may be rotated relative to the tubular pintle and removed therefrom.

In order to provide for the attachment of a chain to the body of the padlock I form the lowermost disk 13 with a ring 26 to which the chain 27 may be attached, the other end of the chain being attached to the bowed portion of the shackle. The disks are interchangeable and by shifting the disks upon the pintle so as to change their relative order the combination may be easily changed. In order to take apart the disks and the pintle the shackle is removed, the disk 13 is held firmly in the hand and the disk 21 rotated, thus rotating the pintle 10 and unscrewing it from its engagement with the lowermost disk. As soon as this is done the intermediate disks may be removed, care being taken that their positions are not shifted as by so doing the combination is changed.

What I claim is:—

1. A permutation padlock having a shackle composed of two coacting parts having coextensive legs adapted to be placed together to form a shank, the inner faces of the legs being formed with interlocking teeth, said shank having radial lugs projecting therefrom, and a body portion including a plurality of rotatable superposed locking disks surrounding the shank but removable therefrom, each disk having radially extending notches, the locking

disks being rotatable to bring the notches into alinement with each other and with the lugs on the shank to permit the shank to be inserted and removed.

5 2. A permutation padlock having a shackle composed of two coacting parts having coextensive legs adapted to be placed together to form a shank, the contacting faces of the parts being interlocked with each other, the outside faces of said parts having radial lugs projecting therefrom, said lugs being spaced at intervals along the length of the shank, and a body portion including a slotted pintle and a plurality of rotatable locking disks mounted on the sleeve for rotation therearound, said locking disks having radially extending notches, the disks being independently rotatable to bring the notches into alinement with each other and with the slot in the central pintle to permit the shackle to be inserted or withdrawn.

3. A permutation padlock having a shackle composed of two coacting parts, each part comprising a straight portion and a bowed portion, the bowed portions of the shackle being pivoted to each other, the straight portions of the shackle being provided with outwardly projecting lugs spaced at intervals along the shackle, and a body portion composed of a tubular pintle oppositely slotted to receive the lugs on the shackle and a plurality of rotatable disks surrounding the pintle, said disks being radially notched, the notches extending

from the inside of the disk outward, the disks being independently rotatable to bring the notches into alinement with each other and with the slots in the pintle to permit the introduction and removal of the straight portion of the shackle.

4. In a permutation padlock, the combination with a shackle having a shank, of a longitudinally slotted tubular pintle having a fixed head at one end and a rotatable, removable terminal disk at the other end having a centrally disposed recess in its upper face for the reception of the extremity of the pintle and a radially extending slot leading from said recess, a plurality of rotatable locking members disposed between the fixed head and the terminal disk, each having a central passage to receive and surround said tubular pintle and being provided with means whereby they may have a locking engagement with the lugs of the shank, and a radially projecting lug on said shank engaging in the said radial slot in the terminal disk and preventing the rotation of the terminal disk on the pintle when the shank of the shackle is inserted through said pintle and into the central recess.

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

CHARLES J. EVANS. [L. s.]

Witnesses:

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T. ELMER WILSON.