

C. J. EVANS.
PERMUTATION PADLOCK.
APPLICATION FILED JAN. 23, 1915.

1,177,093.

Patented Mar. 28, 1916.

Fig. 1.

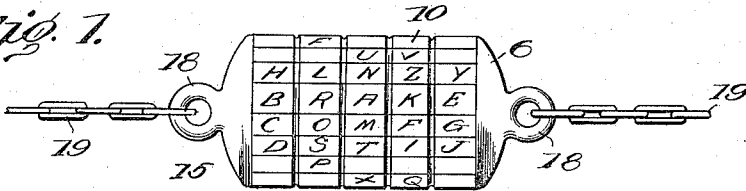


Fig. 2.

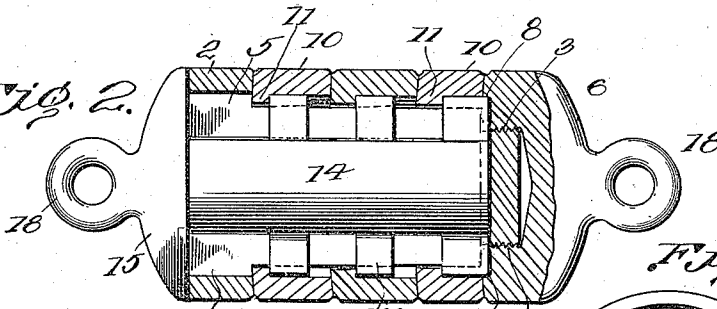


Fig. 3.

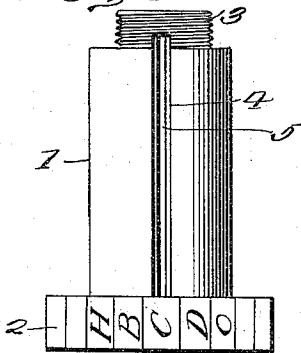


Fig. 4.

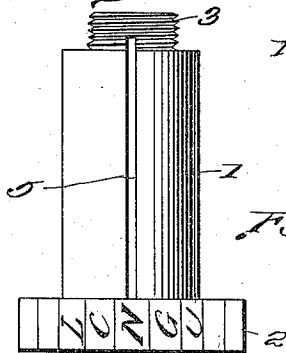


Fig. 8.

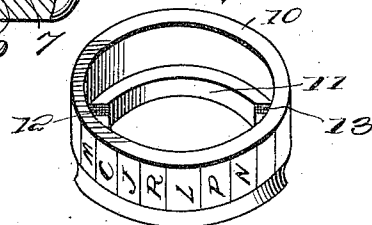


Fig. 6.

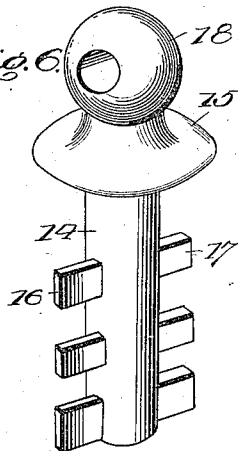


Fig. 7.

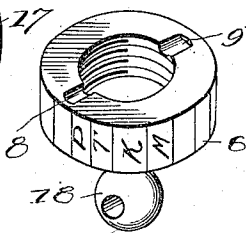


Fig. 5.

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UNITED STATES PATENT OFFICE.

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PERMUTATION-PADLOCK.

1,177,093.

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To all whom it may concern:

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

This invention has relation to the type of locks which embody coöperating locking device whereby the lock may be made secure or released without requiring the use of a key, the locking mechanism embodying a plurality of manually operable tumblers which are adapted to be arranged in a predetermined position to admit of the complementary parts of the lock being placed together or separated.

This invention relates more particularly to locks of the shackle type, the shackle being insertible in the body of the lock and fastened by rotary tumblers or locking rings which are adapted to be arranged in a given position to admit of the shackle being placed in position or removed from the body.

The invention aims to obtain greater security in locks of this type as it is necessary to arrange the shackle in a given position, said shackle being provided with locking projections of varying thickness and the barrel having longitudinal slots in its sides of different width corresponding to the thickness of the locking projections of the shackle and the tumblers having notches of different width to register with the said longitudinal slots and locking projections.

In the accompanying drawings has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the invention as claimed may be resorted to when desired.

Referring to the drawings:—Figure 1 is a view in elevation of a permutation padlock embodying the invention; Fig. 2 is a central longitudinal section of the lock on a larger scale, the shackle being shown in full lines; Figs. 3 and 4 are obverse and reverse views of the barrel; Fig. 5 is a cross section of the shackle and barrel in line with a set of locking projections; Fig. 6 is a perspective view of the shackle; Fig. 7 is a perspective view of the end piece which is removably fitted

to the barrel; Fig. 8 is a detail view of one of the locking rings or tumblers.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

The body of the lock comprises a barrel 1 which is open at one end and formed with an outer flange 2 and which has its opposite end closed and reduced and externally threaded, as indicated at 3. Longitudinal slots 4 and 5 are formed in the sides of the barrel 1 preferably at diametrical opposite points. The slot 4 is of greater width than the slot 5, the purpose being to increase the difficulty of unauthorized opening of the lock. The slots 4 and 5 extend a short distance into the reduced externally threaded end 3 and also extend through the inner walls of the outer flange 2, as indicated most clearly in Fig. 2. An end piece 6 is fitted to the reduced threaded end 3 of the barrel and is formed with a recess 7 which is internally threaded to match the screw threads of the end 3. Notches 8 and 9 are formed in the inner face of the end piece 6 and lead into the threaded recess 7. These notches 8 and 9 are disposed at diametrically opposite points and are adapted to register with the longitudinal slots 5 and 4 of the barrel when the end piece is screwed home upon the end 3. The outer edge of the end piece 6 as also the outer edge of the flange 2 are formed with indicating marks which are adapted to aline, the spaces between such marks being provided with suitable indicia.

A plurality of locking rings or rotary tumblers 10 are slipped upon the barrel 1, each being formed at one end with an inner flange 11 which obtains a snug fit upon the barrel 1, the remaining portion of the ring or tumbler being spaced from the barrel a distance corresponding to the end portions of the locking projections extending beyond the outer side of the barrel 1 when the shackle is in position. Each of the locking rings or rotary tumblers has its inner flange 11 formed at opposite points with notches 12 and 13 to register with the slots 4 and 5 in the sides of the barrel. The notch 12 is wide to correspond with the width of the slot 4 whereas the notch 13 is narrow to match the width of the slot 5. When the locking rings or rotary tumblers 10 are arranged in the predetermined position so as

to admit of placing the shackle in position or removing the same from the body of the lock the wide notches 12 are in line with and adjacent the wide slot 4 and the narrow notches 13 are in line and adjacent the narrow slot 5. The locking rings or rotary tumblers 10 are arranged upon the barrel with their flanged ends 11 facing in the same direction. These rings or tumblers are of like diameter which corresponds with the diameter of the flange 2 of the barrel and the outer wall of the end piece 6 so that the lock presents a uniform external diameter throughout its length. The outer wall of each locking ring or tumbler is formed with indicating marks to correspond with indications of the flange 2 and end piece 6 and the spaces between such marks are provided with any desired indicia.

As illustrated the outer walls or faces of the parts 2, 6 and 10 have letters impressed thereon or provided in any suitable way and when the locking rings or tumblers 10 are arranged in the predetermined position the letters may spell a word, thereby greatly facilitating the arrangement of the locking rings of the tumblers so as to bring the notches 12 and 13 thereof in line with the slots 4 and 5 of the barrel whereby the shackle may be easily placed in position or removed from the body of the lock.

The shackle is illustrated most clearly in Fig. 6 and comprises a spindle 14, head 15 at one end of the spindle and a plurality of opposed locking projections 16 and 17. The projections 16 and 17 have an opposite arrangement and are disposed so as to occupy the spaces between the inner flanges 11 of the locking rings or tumblers when the shackle is in position. The locking projections at the extremity of the spindle 14 are wider than the remaining projections so as to enter the notches 8 and 9 of the end piece 6 and thereby lock such end piece against rotation when the shackle is inserted into the body in locking position. The projections 17 are thicker than the projections 16 and correspond to the width of the slot 4 and the notches 12 of the locking rings or tumblers. The projections 16 are not as thick as the projections 17 and correspond to the width of the slot 5 and notches 13. It will thus be understood that when the locking rings or tumblers 10 are turned to bring their notches 12 and 13 in line with the slots 4 and 5 of the barrel it is necessary that the shackle be inserted with the projections 17 in line with the slot 4 and notches 12 otherwise it will be practically impossible to introduce the shackle into the

body. The same is true when it is required to remove the shackle it being essential that the locking rings or tumblers be moved to bring the wide and narrow notches 12 and 13 in register with the slots 4 and 5, respectively.

In order that the lock may present a symmetrical appearance the outer faces of the head 15 and end piece 6 are of like formation, each being convex and formed with an eye 18 to which the ends of a chain 19 or like fastening are attached. The chain 19 or like part is adapted to be passed about the object to be secured after which the shackle is slipped into the body of the lock and the locking rings or tumblers 10 turned to throw the notches thereof out of register with the projections 16 and 17, thereby securing the lock and preventing the withdrawal of the shackle until the locking rings or tumblers have been adjusted to the predetermined position to bring their notches in register with the corresponding slots of the barrel 1 when the shackle may be withdrawn, the locking projections passing through the registering slots and notches of the barrel and tumblers. When the shackle is removed the relationship of the locking rings or tumblers may be changed to admit of the combination being altered. The end piece 6 may be unscrewed from the threaded end 3 of the barrel after which the locking rings or tumblers may be slipped from off the barrel and replaced in different order. When the tumblers are in position upon the barrel they are held in place by means of the end piece 6. When the shackle is in locking position within the body of the lock the terminal projections 16 and 17 enter the notches 8 and 9 of the end piece, thereby preventing removal of such end piece.

Having thus described the invention what is claimed as new is:—

A permutation padlock comprising a barrel having longitudinal slots in its sides of different width, tumblers mounted upon the barrel and formed with notches of different width to register with the respective slots of the barrel and a shackle adapted to be inserted within the barrel and provided with locking projections of varying thickness to correspond with the varying widths of the slots of the barrel and notches of the tumblers.

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

CHARLES J. EVANS. [L. S.]

Witnesses:

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