(No Model.) 2 Sheets—Sheet 1.

A. W. BRODE.

PERMUTATION PADLOCK.

No. 598,974. Patented Feb. 15, 1898.

Fig. 1.

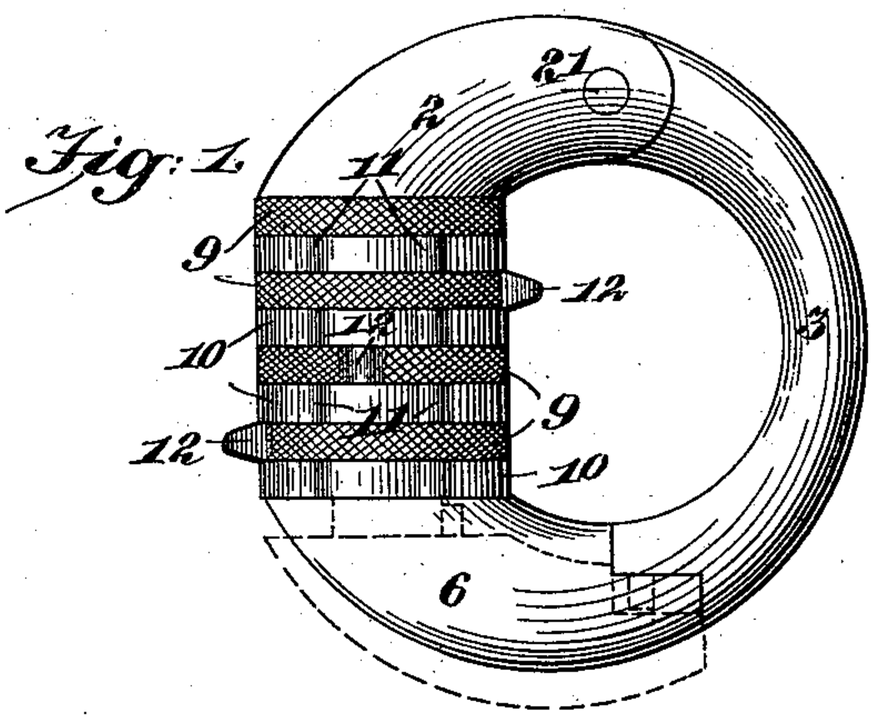


Fig. 2.

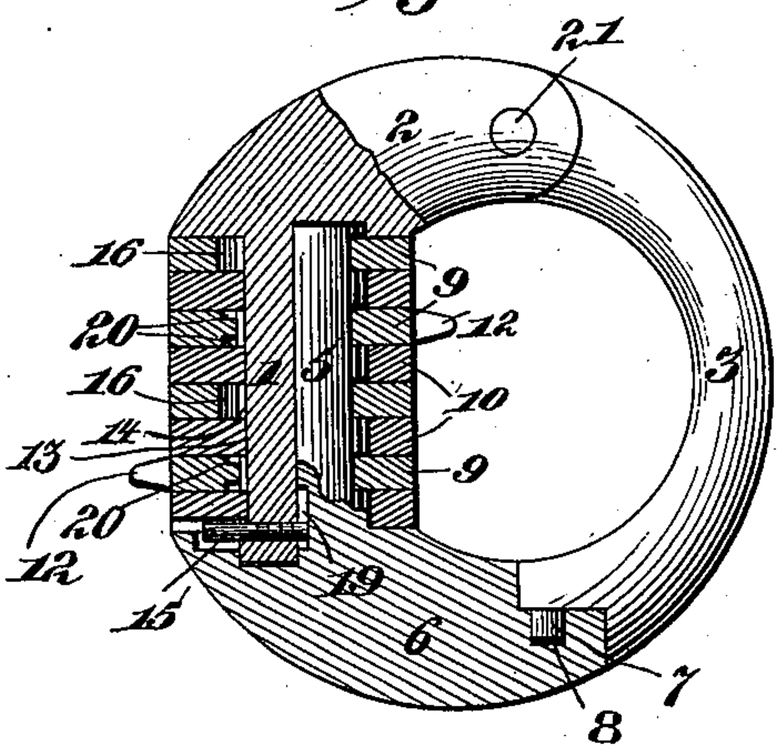


Fig. 3.

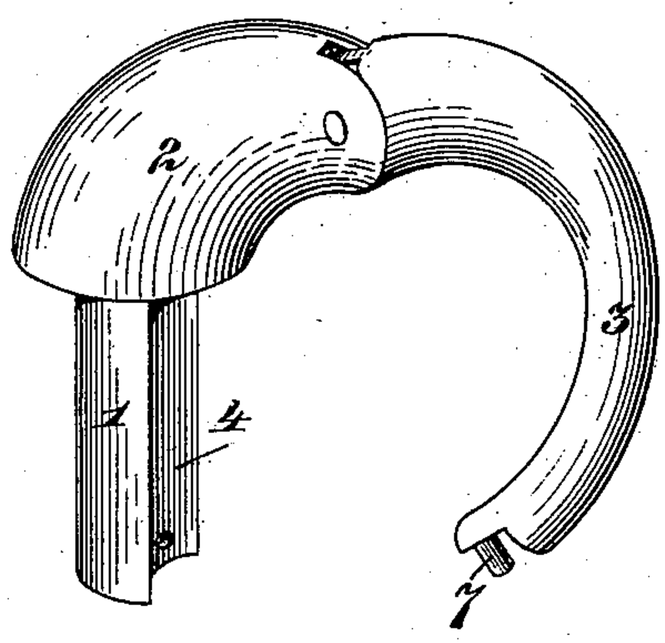


Fig. 4.

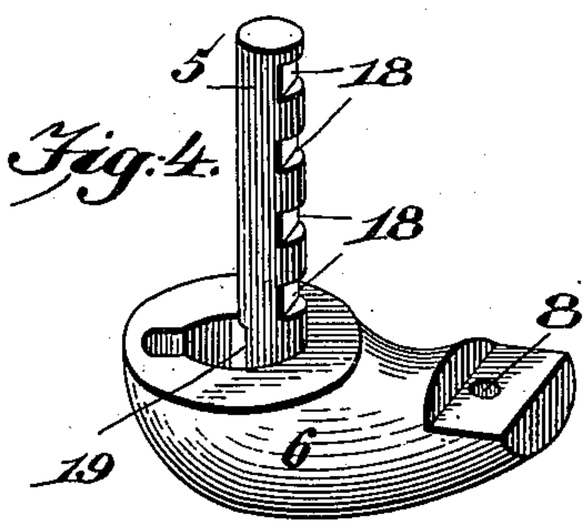
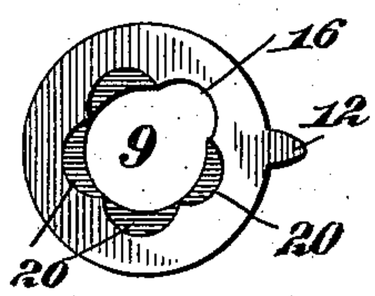


Fig. 5.



Inventor

Arthur W. Brode,

Witnesses

H. G. Dieterich

C. E. Hoyle

By his Attorneys,

C. A. Snow & Co.

(No Model.) 2 Sheets—Sheet 2.

A. W. BRODE.

PERMUTATION PADLOCK.

No. 598,974. Patented Feb. 15, 1898.

Fig: 6.

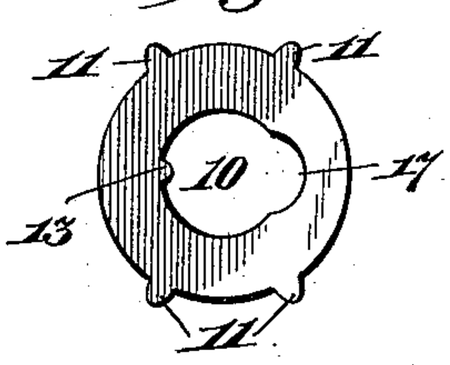


Fig: 7.

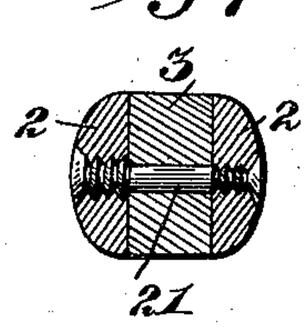


Fig: 8.

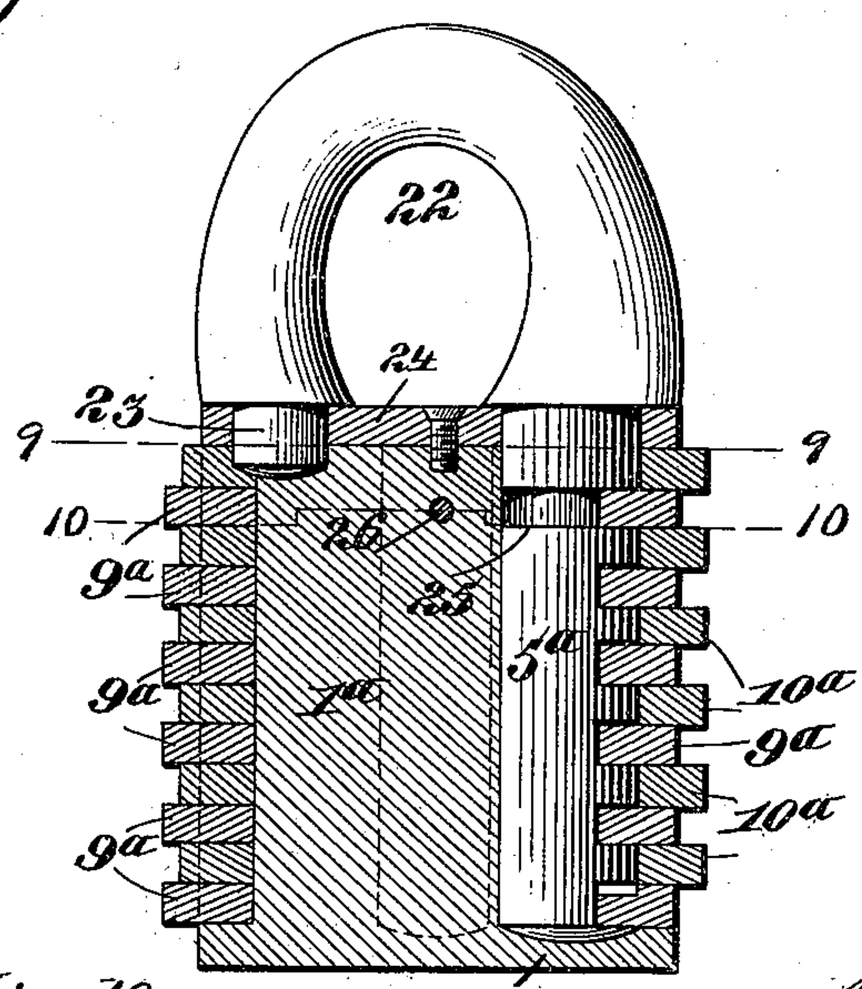


Fig: 10.

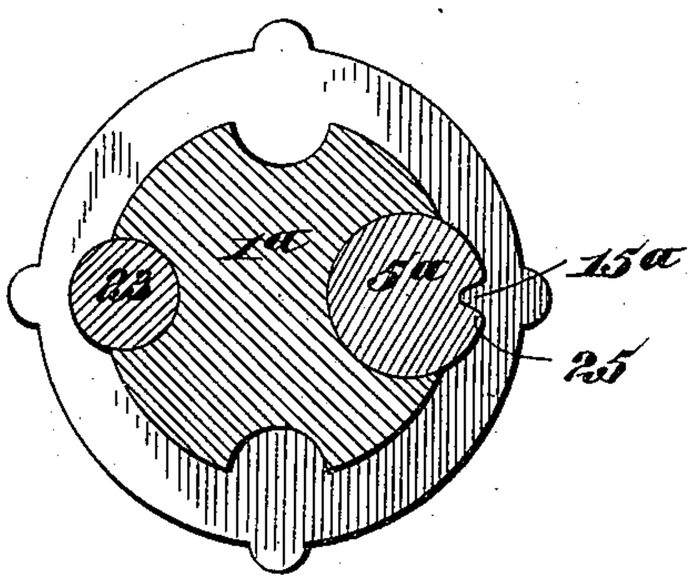
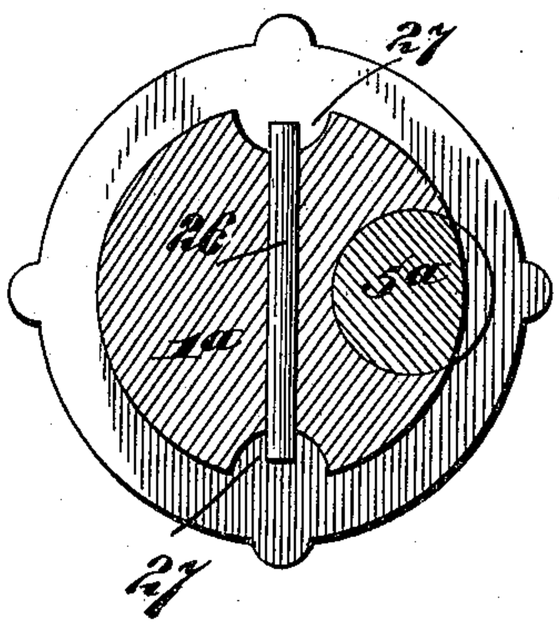


Fig: 9



Inventor

Arthur W. Brode

Witnesses

H. G. Dieterich

D. E. Hoyle

By *his* Attorneys;

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UNITED STATES PATENT OFFICE.

ARTHUR WILLIS BRODE, OF DOWNER'S GROVE, ILLINOIS, ASSIGNOR OF ONE-FIFTH TO MARON W. NEWCOMB, OF SAME PLACE.

PERMUTATION-PADLOCK.

SPECIFICATION forming part of Letters Patent No. 598,974, dated February 15, 1898.

Application filed November 24, 1896. Serial No. 613,314. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR WILLIS BRODE, a citizen of the United States, residing at Downer's Grove, in the county of Du Page and State of Illinois, have invented a new and useful Permutation-Padlock, of which the following is a specification.

My invention relates to locks, and particularly to permutation-padlocks, the objects in view being to provide a simple and inexpensive device capable of a plurality of combinations whereby the difficulty of manipulating the same when the combination is unknown is increased, and to provide a lock of this class in which the parts are detachable to allow of altering the relative positions thereof to vary the combination and renew the members when broken or injured.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a view of a lock constructed in accordance with my invention. Fig. 2 is a central section of the same. Fig. 3 is a detached view of the core and shackle-arm. Fig. 4 is a similar view of the shackle-pin and head. Fig. 5 is a detached detail view of one of the tumblers. Fig. 6 is a similar view of one of the spacing-rings. Fig. 7 is a detail sectional view of the joint between the core-head and shackle-arm. Fig. 8 is a vertical section of a modified form of the lock wherein a sliding shackle is employed. Fig. 9 is a transverse sectional view on the line 9 9 of Fig. 8. Fig. 10 is a transverse section on the line 10 10 of Fig. 8 to show the means for securing the uppermost spacing-ring in place.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

In the construction illustrated in Figs. 1 to 7, inclusive, 1 designates a core provided at one end with a preferably integral head 2, to which is pivoted a shackle-arm 3, said core being provided at one side with a groove or half-bearing 4 for the reception of the shackle-pin 5. This shackle-pin carries a head 6, constructed to interlock with the free end of the shackle-arm and secure the latter against swinging movement when the shackle-pin is in its normal or locked position. In the construction illustrated the extremities of the head 6 and shackle-arm are rabbeted, and one is provided with a projection or stud 7 to fit in a depression or socket 8 in the other.

Mounted for rotary adjustment upon the core is a series of spaced tumblers 9, between which are interposed spacing-rings 10, said spacing-rings being preferably provided with exterior peripheral studs 11, while the tumblers are provided with finger-holes 12 to facilitate the adjustment thereof, said studs 11 serving as indicators by which the tumblers may be adjusted in manipulating the lock. The spacing-rings are held from rotary movement upon the core by means of ears 13, projecting into a guide-groove 14 in the side of the core opposite to the groove or shackle-pin bearing, and the terminal spacing-ring adjacent to the free end of the shackle-arm is held from axial displacement by means of a removable pin 15, preferably threaded into a suitable opening in the core.

Both tumblers and spacing-rings are provided with notches, respectively numbered 16 and 17, of which the former are permanently in registration with the groove or shackle-pin bearing, while the latter are adapted to be arranged either in or out of registration, as it is desired to release or lock the shackle-pin, said shackle-pin being provided with notches 18, adapted to be arranged in the planes, respectively, of the tumblers for engagement by the inner peripheries thereof when the notches of the tumblers are out of registration with the shackle-pin bearing.

An axial or longitudinal movement of the shackle-pin is necessary in order to disengage the interlocking extremities of the shackle-arm and the head of the shackle-pin, but it is desirable to prevent the entire withdrawal of the shackle-pin, except when necessary to disconnect the members of the lock. Hence to limit the longitudinal movement of the shackle-pin it is necessary to employ a stop, and in the construction illustrated I utilize the above-described securing-pin 15, which is extended to engage a shoulder 19 on the back of the shackle-pin.

In order to add to the difficulty of manip-

ulating the lock and make it practically impossible for the same to be operated when the combination is unknown, I provide the tumblers with one or more false notches 20, which are not extended wholly through the tumblers, but consist simply of depressions or indentations which are adapted, when arranged in the plane of the shackle-pin, to allow a slight axial movement thereof, but which are of insufficient depth to allow disengagement of the shackle-arm.

As a further means of preventing tampering with the lock I preferably employ a pivot-pin 21 at the joint between the shackle-arm and the core-head, which is threaded into place and is then swaged terminally, as shown in Fig. 7. The threads prevent the pin from being displaced axially by striking the extremity thereof.

In the construction illustrated in Figs. 8 to 10, inclusive, the same relative arrangement of core 1^a, having a head 2^a, shackle-pin 5^a, tumblers 9^a, and spacing-rings 10^a, is employed as above described. The shackle-loop 22 is extended from the extremity of the shackle-pin and preferably terminates in a stud 23, which fits in an auxiliary socket near the opposite side of the core. In this form of the improved lock I also employ a cap-plate 24, and as it is necessary to turn the shackle-pin in order to swing the shackle-loop in the act of disengaging the latter from any object I employ a stop 15^a for engaging a shoulder 25 on the shackle-pin. This shoulder extends entirely around the pin, as indicated in Fig. 8. Furthermore, in this modified construction of lock I employ a securing-pin 26, which extends transversely through a suitable opening in the core and terminally engages inwardly-extending ears 27 on the spacing-rings, said securing-pin being disposed to engage the spacing-ring contiguous to and below the uppermost tumbler.

From the above description it will be seen that the false notches which are arranged in the tumblers are disposed in both sides thereof, and that otherwise the tumblers are made symmetrical, whereby they are reversible to change the combination, the projecting points or markers upon the exterior surfaces of the spacing-rings being preferably arranged in alinement when the parts of the lock are assembled to serve as guides for the fingers of the operator, whereby the lock may be manipulated in darkness. Furthermore, the projections on the spacing-rings may be arranged in any desired relative positions, those in the drawings being shown in pairs at opposite sides of the rings.

The advantage of the plurality of studs on the spacing-rings resides in the fact that they serve to indicate to the operator the proper positions of the contiguous tumblers, said tumblers being interchangeable, and hence requiring different studs to indicate their positions according to the relative arrangement of said tumblers.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. In a lock, the combination with a core having a shackle-pin bearing, and a shackle-pin provided with transverse notches, of a plurality of alternately-disposed rotatable tumblers and fixed spacing-rings, the tumblers being interchangeable and provided respectively with means for engaging the shackle-pin, and also with projecting exterior finger-holds, and the spacing-rings being provided with a plurality of spaced projecting studs forming indicating points or markers for the contiguous tumblers, substantially as specified.

2. In a lock, the combination with a core having a shackle-pin bearing, and a shackle-pin provided with transverse notches, of a plurality of alternately-arranged tumblers and spacing-rings having exterior projections for alinement, said tumblers being reversible to change the combination and having means to engage the shackle-pin, substantially as specified.

3. In a lock, the combination with a core having a shackle-pin bearing, and a shackle-pin provided with transverse notches, of a plurality of alternately-disposed rotatable tumblers and fixed spacing-rings, the tumblers being reversible and provided with notches to register with said bearing and also provided in both side surfaces with false notches or depressions of less depth than the tumblers, substantially as specified.

4. In a lock, the combination with a core having a shackle-pin bearing, and alternately-arranged tumblers and spacing-rings mounted upon the core, said tumblers being provided with notches registering with said bearing, of a shackle-pin provided with transverse notches for engagement by the tumblers, a securing-pin arranged in the core contiguous to one of the terminal spacing-rings to hold the latter in place, and a shoulder on the shackle-pin in the path of which the extremity of said securing-pin is arranged, to limit the axial movement of the shackle-pin, substantially as specified.

5. In a lock, the combination of a core provided with an integral head 2 and having a shackle-pin bearing parallel with its axis, rotatable tumblers fitted upon the core and provided with notches to register with said shackle-pin bearing, a shackle-pin fitted for axial movement in said bearing and provided at the opposite end from said core-head 2 with a shackle-pin head 6, said heads being extended laterally in a common direction from the core, means for limiting the axial movement of the shackle-pin, and a shackle-arm pivotally mounted upon the core-head and having an interlocking connection with the

shackle-pin head, adapted to be engaged and disengaged by the axial movement of the shackle-pin, substantially as specified.

6. In a lock, the combination of a core provided with an integral head 2 and having a shackle-pin bearing parallel with its axis, rotatable tumblers fitted upon the core and provided with notches to register with said shackle-pin bearing, a shackle-pin fitted for axial movement in said bearing and provided at the opposite end from said core-head 2 with a shackle-pin head 6, said heads being extended laterally in a common direction from the core, removable means for limiting the axial movement of the shackle-pin, and adapted to be exposed for removal when the shackle-pin is extended, and to be concealed thereby when the shackle-pin is in its normal position, and a shackle-arm pivotally mounted upon the core-head and having an interlocking connection with the shackle-pin head, adapted to be engaged and disengaged by the axial movement of the shackle-pin, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ARTHUR WILLIS BRODE.

Witnesses:
D. G. GRAHAM,
JAMES C. DIXON.