(No Model.)

B. A. SANDERSON.

PERMUTATION PADLOCK.

No. 495,840. Patented Apr. 18, 1893.

Fig. 1.

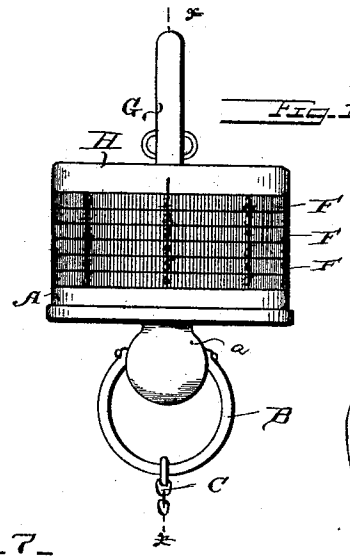


Fig. 6.

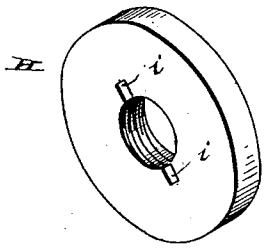


Fig. 4.

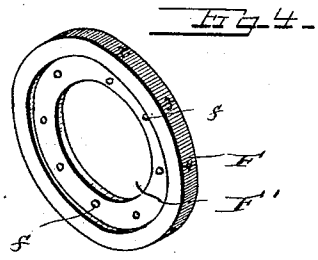


Fig. 7.

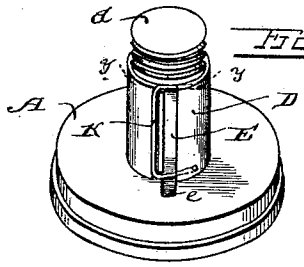


Fig. 2.

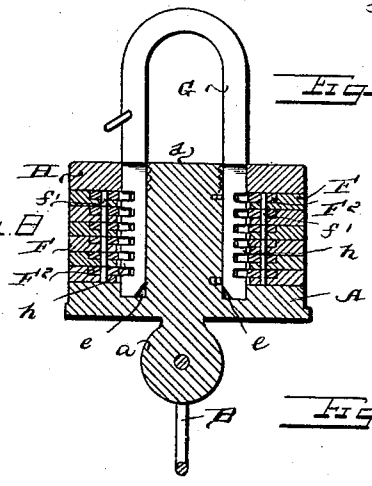


Fig. 5.

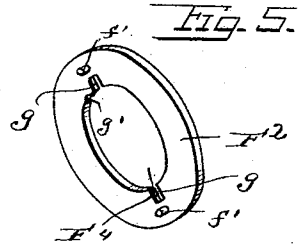


Fig. 8.

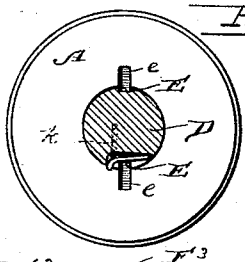


Fig. 9.

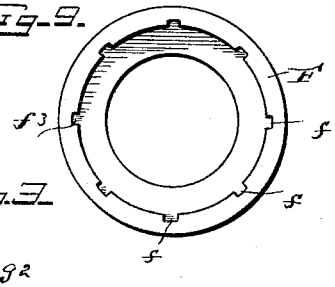


Fig. 10.

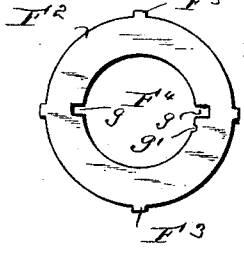
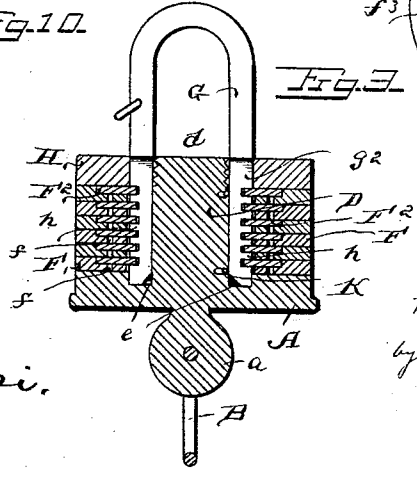


Fig. 3.



Witnesses:

Jesse Hellis

Phil. Masi.

Inventor.

B. A. Sanderson

by E. W. Anderson

his Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

BENJAMIN A. SANDERSON, OF SAN MARCOS, TEXAS.

PERMUTATION-PADLOCK.

SPECIFICATION forming part of Letters Patent No. 495,840, dated April 18, 1893.

Application filed June 29, 1892. Serial No. 438,359. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN A. SANDERSON, a citizen of the United States, and a resident of San Marcos, in the county of Hays and State of Texas, have invented certain new and useful Improvements in Combination-Padlocks; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation. Fig. 2 is a section on the line *x*—*x*, Fig. 1. Fig. 3 is a section on the line *x*—*x*, Fig. 1 with tumbler turned. Fig. 4 is a persective of rim F of the tumbler. Fig. 5 is a perspective of the inside ring of the tumbler. Fig. 6 is a perspective of the cylindrical cap. Fig. 7 is a perspective of the base of the plug. Fig. 8 is a section on the line *y*—*y*, Fig. 7. Fig. 9 is a detail plan view of the outer rim or section of one of the compound tumblers. Fig. 10 is a plan of the modified form of the inside ring of the tumbler.

This invention has relation to certain new and useful improvements in combination padlocks, the object being to provide a lock of this character of simple construction, and yet so arranged as to provide an efficient safeguard against its being operated by parties not having the right to do so, and not in possession of the combination. The lock is applicable to watch charms, bracelet locks, valises, trunks, bicycles, tool chests, writing desks, store rooms, and other articles, and places.

Referring to the accompanying drawings, the letter A designates the cylindric base plate of the lock, the outer surface of which is formed with a central stem or projection *a*, in which is loosely pivoted a ring or loop B to which is attached one end of the chain C.

The opposite face of the base has a central cylindric plug D, reduced and screw-threaded at its outer end *d*, and formed with diametrically opposite longitudinal grooves E in its sides, said grooves extending slightly into the base where they join the radial grooves *e*, *e*, therein.

F, F, &c., designate the tumblers, which are of compound construction. Each of said tumblers comprises a disk F, having a central perforation F′, which fits loosely around the plug D, below its reduced threaded portion. The upper face of the disk is hollowed out around this perforation to receive a second and smaller disk F^2, which seats flush therein. Extending through the cut-away portion of the disk F are a circular series of small perforations *f*, and the smaller disk is retained in place by one or more small pins *f′* on its under face, which engage any of said perforations. Or, as shown in Figs. 9 and 10, the smaller disk may have a series of peripheral projections F^3, which are received in radial slots f^3, in the marginal edge of the cut-away portion in the larger disk. The smaller disk also has a central perforation F^4, which is of less diameter than the perforation F′. Leading outwardly from this central perforation, at diametrically opposite points, are slots *g*, *g*, and also a smaller slot *g′*.

G is the bow or staple of the lock, to which the other end of the chain C is attached. The side arms g^2 of this staple or bow are constructed to enter the grooves E, E, in the sides of the plug, and on the outer edges of these arms are located a series of bits *h*, which are designed to work through the radial slots *g* in the disks F^2, and through the perforation in the larger disks.

H designates the cylindric cap or head piece of the lock, having a central threaded perforation for engagement with the threaded end *d* of the plug, upon which it is secured in order to retain the disks in place. This cap or head piece also has radial slots *i* to permit the passage therethrough of the staple and its bits. It will be apparent that when the staple is inserted in the lock, it cannot be withdrawn until all the smaller disks F^2 are brought into position to align their notches *g* with the notches *i* in the cap or head. On the periphery of each larger disk is a series of numbers or marks, which must be brought into predetermined relation to each other in order to effect the alignment of the slots.

In order to change the combination of the lock, one or more of the smaller disks are

lifted from their seats, and the relative positions of the larger and smaller disks changed. It will therefore be seen that the lock is capable of being set to a large number of different combinations and this number may be still further enlarged by varying the relative positions of the numbers on the peripheries of the larger disks, so that the order of said disks on the plug may be changed, thus effecting a change in the combination without changing the relative positions of the two disks of each or any tumbler. The edge portions of the disks between the numbers or marks may be milled in order to render their operation by the fingers more convenient. It is obvious that the cap or head piece cannot be unscrewed, as long as the staple remains locked.

In order that the tumblers may be held in position to receive the staple, when the latter is withdrawn from the lock, and thereby avoid the necessity of working the combination to effect the locking, a lock is provided for said tumblers. Said lock comprises an angular catch slide K, having its ends loosely seated in apertures in the plug D, and its bow portion seating in a groove in the periphery thereof, but normally held beyond the periphery by a small spring *k*. As long as the staple is in place however, its engagement with this slide forces it back into its seat in the plug, and the tumblers are free to turn. When the staple is withdrawn, the slide is released and is pressed by its spring into engagement with the small notches *g'* in the tumblers, thereby locking the latter, and preventing their turning. Additional tumblers may also be furnished with every lock, said additional tumblers having a different arrangement of numbers or marks thereon, so that by substituting one or more of these, the limits of the combination are farther extended. Different locks may also be made to work on different sets of combinations. The perforations F' are sufficiently large to permit the disks to rotate past the bits of the staple. The entire device may be made of small size.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. In a combination padlock, the combination with a central grooved plug, of a series of tumbler disks arranged to rotate on said plug, said disks having the radial slots therein, and means whereby said disks are locked with their slots in alignment when the staple is withdrawn, and released when said staple is inserted, substantially as specified.

2. In a combination padlock, the combination with the base piece having a cylindrical grooved plug, and a spring slide or catch having a seat in said plug, of a series of compound tumbler disks formed with radial slots and with notches, and a staple designed to enter the grooves of the plug, and having bits arranged to work in said radial slots, said staple being arranged to operate said catch or slide, substantially as specified.

3. In a combination padlock, the combination with a base, having the cylindric grooved plug, of the tumblers working on said plug, said tumblers consisting each of two disks, one fitting within the other, and capable of different relative adjustments, the inner disks having radial slots therein, the bow or staple having bits arranged to engage said slots, and means whereby said disks are locked with their slots in alignment when said bow or staple is withdrawn, substantially as specified.

4. In a combination padlock, a tumbler formed of two disks, the larger of said disks having a hollowed portion receiving the smaller disk, registering central perforations of different diameters in said disks, and means for changing the relative position of the two disks, the smaller of said disks having therein radial slots, one to engage with a lock or catch, and the others receiving the bits on the staple or bow, substantially as specified.

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

BENJAMIN A. SANDERSON.

Witnesses:
ERNEST RICHARDSON,
R. H. WOOTTON.