(No Model.)

J. BARON.

PERMUTATION PADLOCK.

No. 494,541. Patented Apr. 4, 1893.

Fig. 1.

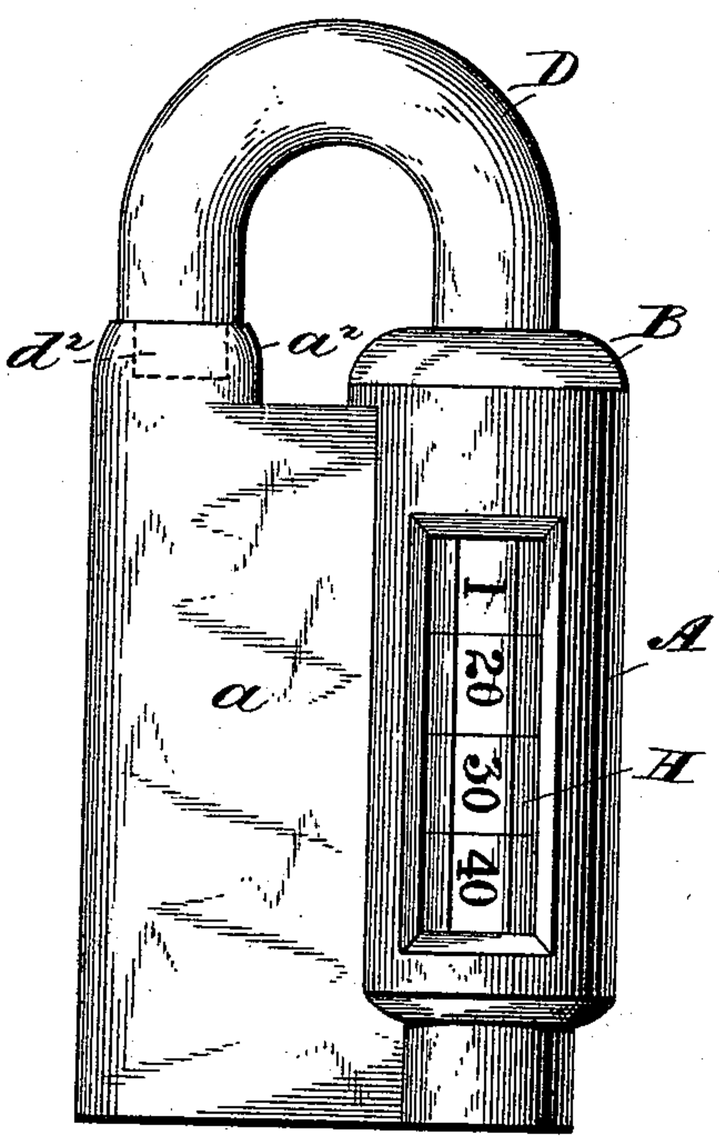


Fig. 2.

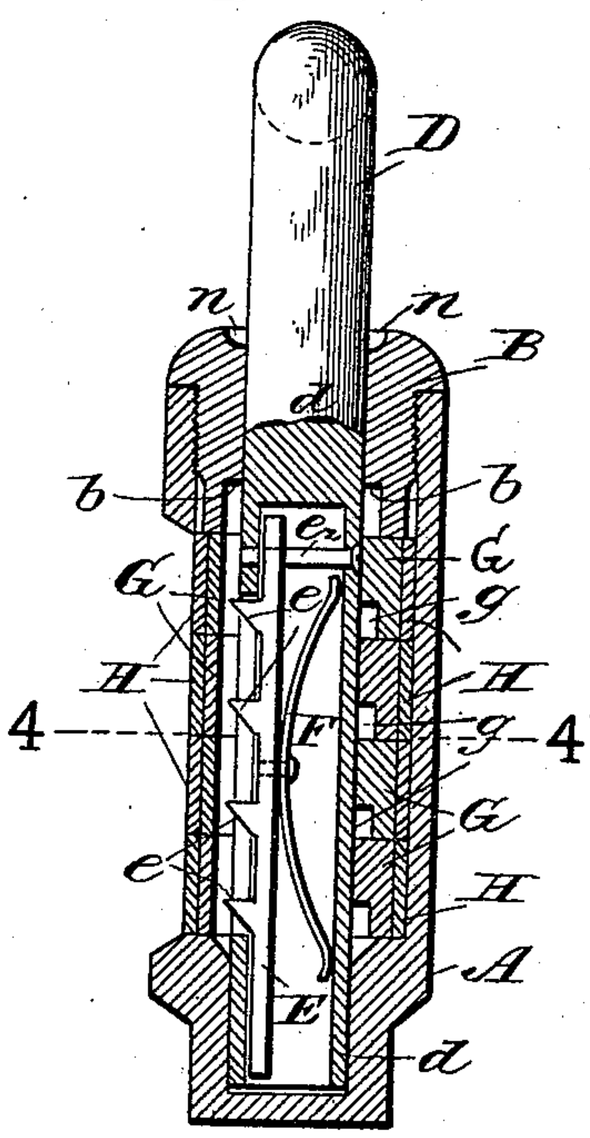


Fig. 3.

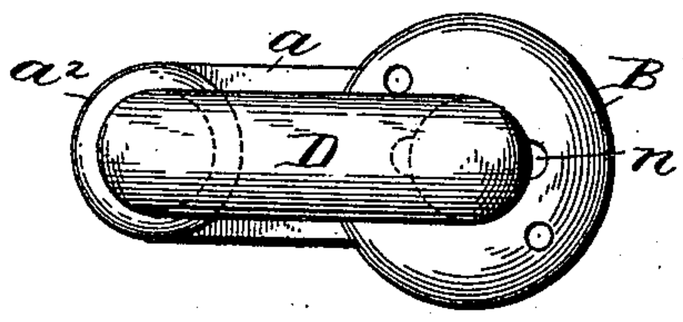


Fig. 4.

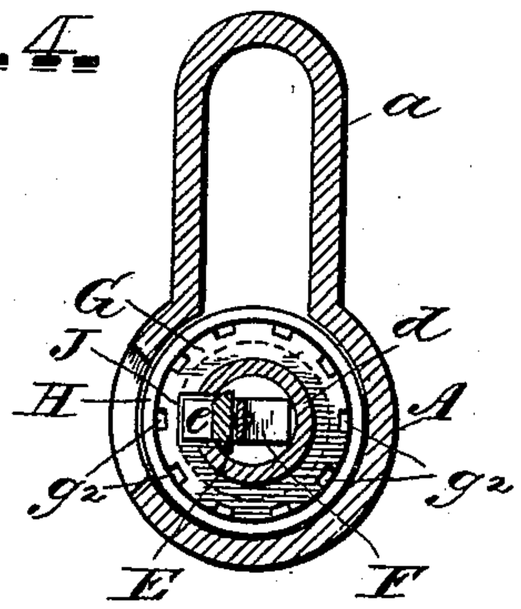


Fig. 5.

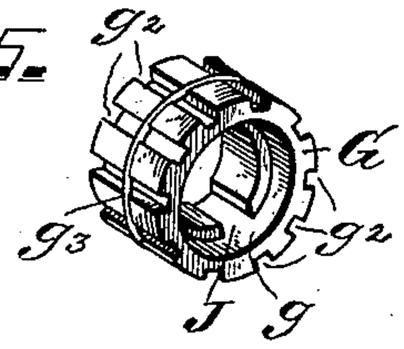
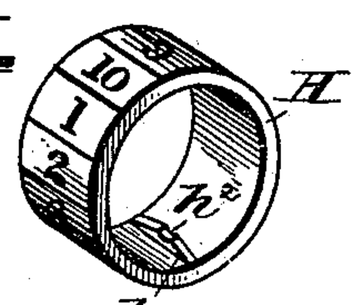


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN BARON, OF LINWOOD, OHIO.

PERMUTATION-PADLOCK.

SPECIFICATION forming part of Letters Patent No. 494,541, dated April 4, 1893.

Application filed November 2, 1892. Serial No. 450,713. (No model.)

To all whom it may concern:

Be it known that I, JOHN BARON, a citizen of the United States, residing at Linwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Padlocks, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to provide a combination padlock, so constructed as to admit of an approximately indefinite number of combinations being effected,—the construction being cheap of manufacture, durable and reliable in operation and readily taken apart when desired to change the combination, all of which will be apparent from the description hereinafter given.

In the accompanying drawings:—Figure 1, is a front or face elevation of a padlock embodying my invention. Fig. 2, is a central transverse vertical section of the padlock shown in Fig. 1. Fig. 3, is a top view of Fig. 1. Fig. 4, is a transverse section taken on dotted line 4, 4, of Fig. 2. Fig. 5, is a perspective view of one of the disks which go to make up each tumbler, said disk being removed from its sleeve; and, Fig. 6, is a perspective view of the sleeve which surrounds the disk shown in Fig. 5, said sleeve and disk combined constituting one of the tumblers, a series of which make up the combination lock, as will more fully hereinafter appear.

My improved padlock is preferably constructed as follows:

A, represents the body of the lock which is preferably circular in cross-section, as shown, said body portion having a lateral extension *a*, as more clearly shown in Figs. 1, 3 and 4. This body portion and extension are formed hollow, as shown. On the inner top portion of body A are cut screw-threads, on which a cap B is screwed, as shown in Fig. 2. This is the preferred mode of connecting said cap to the body portion, but I do not limit myself to said mode of connection. This cap B has a central opening through which the shank *d* of hasp D projects, as shown. The lower end portion of this shank engages in a contracted recess in the bottom of the body portion, on a line vertical with the opening in the cap B,—said opening and recess forming journals in which the shank of the hasp may rotate. The free end portion d^2 of the hasp is preferably slightly contracted, and, when locked, rests in an opening in the top of lug a^2, as shown.

That portion of shank *d*, which projects within the body portion A, is formed hollow as shown. In one side of this shank is formed a recess, through which the lugs *e* or strip E, project, the said strip being retained against the inner face of said shank by means of a flat spring F, or other elastic bearing material. The lugs *e* project through the said recess in the side of said shank, and out beyond its outer face, as shown, said lugs *e* acting as a lock for each of the tumblers (as will presently appear) which latter rotate on said shank.

To prevent longitudinal displacement of the strip E, it is preferred to retain the latter within the shank *d* by means of a pin e^2, which latter is passed through an opening near the top of said strip and secured at each end to said shank, as shown in Fig. 2, thus permitting said strip to move laterally on said pin.

Each of the tumblers, on the shank of the hasp, is made up of a disk G, and sleeve H, which latter is preferably of the same width as the former. Each disk G, is provided with a central opening through which the shank *d* projects, and an enlarged circular recess *g* (see Figs. 2 and 5) within which the lugs *e* engage and lock against the inner face of the disk within said annular recess. Each disk is also provided with a number of transverse grooves g^2 on its outer face, which grooves preferably correspond in number with the number of indicating numerals, or other characters, on the face of the sleeve H. On the inner face of said sleeve is a rib *h* which engages within one of the grooves g^2 on the disk, and in this manner said sleeve is retained on said disk in a non-rotatable position.

To prevent the sleeve H from too readily disengaging with its disk, when the latter is removed to change the combination, I have provided a spring wire g^3, which latter rests within a peripheral groove around the outer face of said disk, said wire being adapted to spring within a notch h^2 in the rib *h* of said sleeve, as the latter is slipped to place on the disk; and, in this manner said sleeve will not

readily drop from place when the tumbler is removed. Any other suitable packing or catch may be employed for retaining said sleeve to place, or if desired, said spring or catch may be dispensed with without interfering with the practical operation of the tumbler.

Each disk, G, is provided on its inner face, with a transverse groove J, which latter is sufficiently wide to permit the end portions of lugs *e* to pass through the same, and thus permit the hasp D to be pulled out and unlocked in the manner presently to be described.

The sleeve H, of each tumbler, is spaced off into any desired number, and indicated by some numeral or other indicating character. In the drawings I have illustrated my improved padlock as provided with four tumblers, the sleeves of which are each provided with ten indicating numerals; the first is provided with numerals from 1 to 10 inclusive; the second, from 11 to 20 inclusive; the third, from 21 to 30 inclusive and the fourth from 31 to 40 inclusive. When provided with ten indicating numerals, as shown, the disk is also provided with ten transverse grooves g^2, in order that the sleeve may be set on said disk with any desired numeral which is to go to make up the combination necessary to unlock the hasp.

When the combination is set for 1, 20, 30 and 40, as shown in Fig. 1, the sleeve of each tumbler must be set on its disk in such a manner as that each of said combination numerals will be placed directly over the groove J, in each disk; and, when thus set, as shown, the hasp D, shank *d* and lugs *e* are all free to be pulled outward,—said lugs passing through said grooves until the top lug strikes against the inner flanged portion or shoulder *b* of cap B, at which time the free end d^2 of the hasp is lifted out of its opening in lug a^2, and is unlocked, in which unlocked position the shank *d* of the hasp is free to rotate within the body portion A without removal therefrom.

It will thus be seen that the combination may be changed by simply changing the position of any one numeral on the sleeve H,—the numerals necessary to unlock the hasp being those that are directly over the groove J in each disk. The position of the lugs *e*, in Fig. 2, are shown on a line with said grooves, and ready to be unlocked; by simply rotating either of said tumblers, in either direction, the hasp is securely locked, as the lug *e* will engage in the annular recess *g* of the disk and lock against the inner face of said recess. In other words, all the tumblers must be so manipulated as that the groove J in each will be on a line with the points of lugs *e*, before the hasp can be unlocked.

It does not matter what position the tumblers are in when desired to lock the hasp, as each of the lugs *e* is beveled on its outer lower face; and, when the hasp is forced down, each lug *e* will strike the top of disk G, and be forced inward into the shank *d* until said lugs are lowered into contact with the annular recesses *g*, at which time the spring F will force the said lugs out to place therein, thus securely locking the hasp. It will be seen that the disks are free to rotate on the shank *d*, after being locked, in order that the tumblers may be rotated in either direction to set the required combination.

The shank *d* is preferably provided with one or more lugs *n*, which latter, when the hasp is forced to place and locked, engage within a corresponding recess in the top of cap B, and by this means it is impossible to unscrew said cap when the hasp is locked.

To unlock the hasp, simply rotate the tumblers (through the opening in body A) until the required and predetermined numerals are all in line, at which time the hasp is free to be drawn outward and unlocked.

To change the combination, all that is required is simply to unlock the hasp, in the manner set forth and unscrew the cap B, at which time the shank *d* and tumblers may be removed from the body A, and any numeral can then be readily changed by removing the sleeve H, and replacing it on the disk in such a manner as that a new numeral will be over the groove J. The changing of one numeral, on one tumbler, changes the whole combination. Having changed the combination, as desired, the tumblers are then placed over the shank *d* and the latter, with the tumblers thereon, is then inserted within the body portion and the cap again screwed to place.

The device as a whole is cheap of manufacture and simple in operation. It affords all the advantages of any combination lock, many of which are quite complicated and easily get out of order. The particular construction of the tumblers might be advantageously used in connection with combination locks of a construction other than that herein specifically set forth.

What I claim as new, and desire to secure by Letters Patent, is—

1. A padlock consisting of body portions A *a* hasp D having a shank *d* with yielding lugs *e* at one side thereof, said shank and lugs being located within the portion A in a rotatable position when unlocked, the end of said hasp engaging within an opening in lug a^2 when locked, and suitable tumblers having an internal groove J, said tumblers being mounted on said shank, and cap B for retaining said shank and tumblers within said body portion, substantially as set forth.

2. The body portion A *a*, hasp D having shank *d* with rotatable tumblers mounted thereon within portion A, said shank having yielding lugs at one side thereof, grooves J in said tumblers adapted to register with said lugs, and cap B secured to the top of portion A, said cap having an internal shoulder *b* against which the top lug *e* strikes when the hasp is unlocked, substantially as set forth.

3. The hasp having a shank *d* extending within the body portion A, the latter having a lateral extension *a*, the end of said hasp engaging within an opening in the top of said lateral extension when locked, said shank having yielding lugs at one side thereof, rotatable indicating tumblers mounted on said shank, the former having a transverse groove adapted to register with said yielding lugs on the latter, and a suitable cap for retaining said shank within its body portion in a rotatable position when the hasp is unlocked, as set forth.

4. The tumblers, each of which consists of a disk G having an internal transverse groove J and external grooves g^2, said disk having a central peripheral groove within which is secured a spring or catch g^3, and a sleeve H fitted over said disk, said sleeve having an internal rib *h* with a notch h^2 therein, as set forth.

5. In a padlock constructed and adapted to operate in the manner set forth, the tumblers mounted on the shank of the hasp, each of said tumblers consisting of a disk G and sleeve H fitted over said disk, the latter having a peripheral spring catch adapted to lock within said sleeve, as and for the purposes set forth.

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