

970,481.

Patented Sept. 20, 1910.

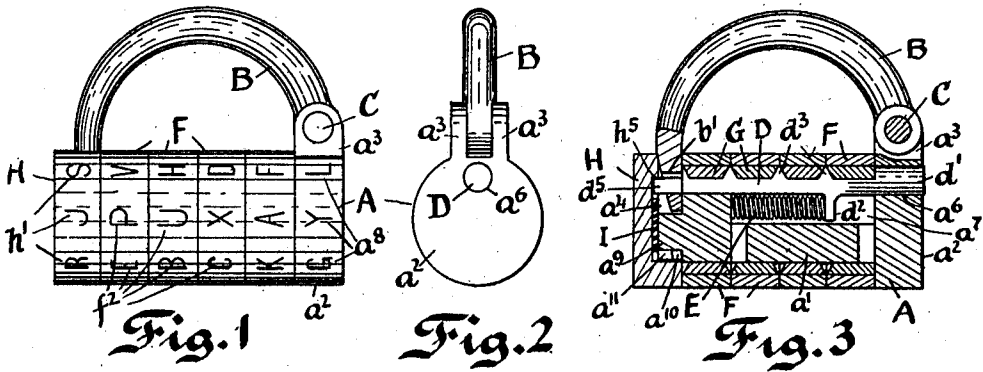


Fig. 1

Fig. 2

Fig. 3

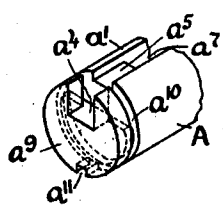


Fig. 6

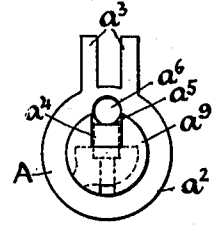


Fig. 5

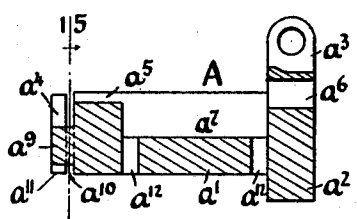


Fig. 4

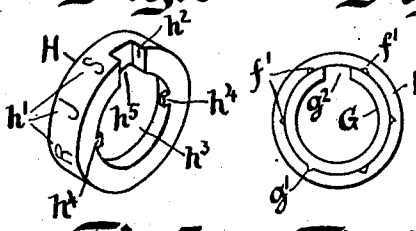


Fig. 7

Fig. 8

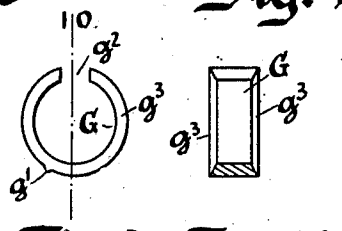


Fig. 9

Fig. 10

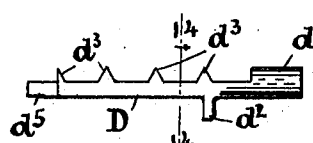


Fig. 11

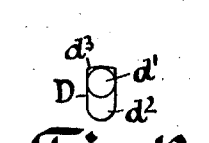


Fig. 12

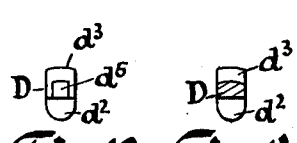


Fig. 13

Fig. 14



Fig. 15

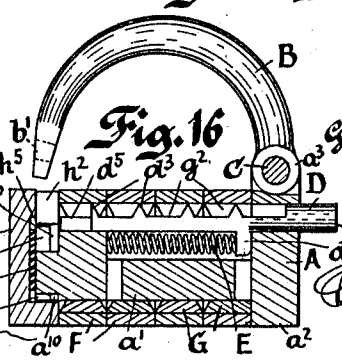


Fig. 16

Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE W. EDDY, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO GEORGE ANTON STROHHAECCKER, OF MILWAUKEE, WISCONSIN.

KEYLESS PADLOCK.

970,481.

Specification of Letters Patent. Patented Sept. 20, 1910.

Application filed December 16, 1909. Serial No. 533,454.

To all whom it may concern:

Be it known that I, GEORGE W. EDDY, of Milwaukee, Wisconsin, have invented a Keyless Padlock, of which the following is a specification.

This invention relates to padlocks of the keyless or so-called "combination" type wherein the bolt is held in locked position by a plurality of annular tumblers which require to be set to certain definite positions before releasing the bolt.

The object of my invention is to produce a padlock of this character which cannot be picked by fumbling or otherwise ascertaining by the sense of touch when any of the tumblers is in releasing position; the tumblers of which can be readily shifted so as to change the combination; which shall be especially strong and simple with a minimum of operating parts; which shall occupy a minimum of space; and which can be manufactured at a low cost.

With these and other objects in view as will appear hereinafter my lock comprises in its essential elements a body or core recessed at one side longitudinally and carrying a pivot-pin on which the shackle is mounted; a sliding bolt which moves in the longitudinal recess of said body or core; a spring carried in a spring-chamber or recess in the body or core and acting to throw the pin into releasing position; a plurality of annular tumblers each made in two parts with means for shifting their relative position; and a cap which is secured over the end of the body or core and holds the tumblers in position, and which can be readily detached when the lock is open but is irremovably fixed upon the body or core when the lock is closed.

For the better understanding of my invention I have illustrated the same in the accompanying drawings, which show the most improved form thereof and wherein—

Figure 1 is a side elevation and Fig. 2 an end elevation of the padlock in locked position; Fig. 3 is a longitudinal section of the same, the shackle being shown in partial elevation; Fig. 4 is a longitudinal section through the body or core; Fig. 5 is an end elevation thereof from the left-hand end of Fig. 4; Fig. 6 is a perspective view of the left-hand end of said body or core; Fig. 7 is a perspective of the cap; Fig. 8 is a side elevation of one of the tumblers; Fig. 9 is a

similar view of the inner member thereof; Fig. 10 is a transverse section thereof on the plane 10; Fig. 11 is a side elevation of the bolt; Fig. 12 is an end view thereof from the right-hand end of Fig. 11; Fig. 13 is an end elevation from the left-hand end thereof; Fig. 14 is a transverse section thereof on the plane 14 of Fig. 11; Fig. 15 is a transverse section of the core and cap on the plane 15, and Fig. 16 is a longitudinal section through the lock in unlocked position.

The same reference letter or numeral refers to the same part in each figure.

The body A is formed with a cylindrical portion a' and flattened cylindrical head a^2 , at one side of which head are a pair of upstanding ears a^3 , in which is riveted a pin C forming the pivot of the shackle B which has a slot b^1 on the other end, this end being received in a notch a^4 in the corresponding end of the body A. The body A is grooved longitudinally on the same side as the shackle as shown at a^5 , the groove being adapted to receive the bolt D and being continued in a hole a^6 through the head a^2 in which the head d' of the bolt moves, which head lies flush with the outer surface of the head a^2 when the lock is closed, so that there is no way of fumbling it in an attempt to pick the lock. Immediately below the groove a^5 is a further recess a^7 which receives a coiled compression-spring E, the latter abutting at one end upon the left-hand end or recess of the spring-chamber a^7 and its opposite end upon a lug d^2 projecting from the under side of the bolt; so that said spring acts to throw the bolt out into the position shown in Fig. 16, releasing the shackle, whenever the tumblers are set in their respective releasing positions. The bolt is held in locked position by means of a plurality of annular tumblers each consisting of two parts F, G, one within the other, turning upon the cylindrical portion a' of the body A, and these two parts F, G are provided with means for setting them in various relative positions, such means as here shown consisting of a projecting snug g' upon the outer periphery of the member G adapted to fit in any one of a number of grooves f' upon the inner face of the outer ring F. The latter is provided upon its outer face with letters, numbers, or other like designations f^2 , which are used in the usual manner for reference to indicate when

the tumbler is set to the proper releasing position, one or more similar reference characters a^8 , h^7 being marked at intervals upon the head a^2 and the cap H which holds the tumblers in place upon the shank a' of the core. It will be observed that the inner member G of each tumbler is only a partial ring, being in the form of a band the two ends of which approach one another so as to leave an open space g^2 , and coating with these openings g^2 are a plurality of lugs d^3 upon the upper side of the bolt D, which are of substantially the same or slightly less width than the openings g^2 , so that when the opening g^2 of each tumbler is set in register with the corresponding lug d^3 the bolt is released and thrust back by the spring E. In order to enable the tumblers to revolve and lock the bolt when it is closed, the edges of each inner member G are chamfered obliquely as shown at g^3 , or otherwise cut away to correspond with the shape of the lugs d^3 which may of course assume different forms and are made triangular as shown in the drawing. The member G may have a certain resiliency causing it to cling tightly to the member F and preventing it from falling out accidentally when the tumblers are removed for inspection.

The cap H fits over the end a^9 of the core which projects beyond the tumblers and, as aforesaid, is notched at a^4 to receive the end of the shackle, and said cap is also notched out at h^2 to permit the end of the shackle to enter the notch a^4 . The construction of this cap and the manner in which it can be promptly removed and replaced enables the tumblers to be slid off and the combination altered, is a peculiarly advantageous feature of my invention. The end a^9 of the core is grooved annularly as shown at a^{10} , but this groove as shown in Fig. 15 does not extend completely around. A notch a^{11} directly opposite the notch a^4 connects the groove with the outer face of the end a^9 , and the cap H, which is hollowed out concentrically at h^3 , is provided with a pair of small inwardly projecting snugs h^4 fitting in the groove a^{10} and one of which enters said groove through the notch a^{11} , the other entering through the notch a^4 . When, therefore, the shackle is closed, its engagement with the notch h^2 prevents the cap from being rotated, and the latter is held in place by the engagement of the lugs h^4 with the sides of the groove a^{10} ; but when the shackle B is opened, the cap H can be readily rotated through one right angle and then withdrawn as soon as one of the snugs h^4 registers with the notch a^{11} . It will be seen, therefore, that when the lock is opened, the tumblers can be slid off and the combination altered and all parts of the lock inspected with the greatest facility, but when the lock is locked this is an impossibility. To hold the cap frictionally in

place and prevent it from becoming accidentally rotated or displaced when the lock is open, it is preferable to provide a cushion at the bottom of the recess h^3 , which may take the form of a plate I of yielding material such as rubber, corrugated metal, etc.; and for a greater strength and security the cap is further recessed at h^5 opposite the end d^5 of the bolt, which after passing through the slot b^1 of the shackle enters the recess h^5 and is thus held at both sides of the shackle and prevented from becoming bent if violence should be used to burst the shackle open. The shank a' of the body A is preferably perforated by one or more apertures a^{12} which act as drain-holes for the spring-chamber a^7 and prevent water from accumulating therein.

While I have hereinabove shown the most improved form of my invention, I wish it understood that not all of the features are essential thereto or necessarily made in the exact form shown, but various changes and modifications in the constructions as herein shown may be made without departing from the spirit of my invention, and I wish it understood therefore that the latter is not otherwise limited than by the scope of my claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A padlock comprising, in combination, a body or core, a shackle, a plurality of tumblers mounted and adapted to rotate on said body or core, the latter having a fixed head at one end holding said tumblers in place, a bolt sliding within said core and adapted to engage said shackle, said bolt having devices which are engaged by the respective tumblers, and a cap detachably mounted upon the end of said body or core opposite the head thereof and maintaining said tumblers in position, said cap having one or more inwardly projecting lugs and said body or core having an annular groove engaging said lugs and also one or more notches between said groove and the end face of the core with which said lugs on the cap are adapted to register in removing or replacing said cap; said cap having further a notch receiving the end of the shackle in its closed position and preventing the cap from being rotated.

2. A padlock of the type described comprising a body having a cylindrical shank, a plurality of tumblers mounted and adapted to rotate on said shank, each of said tumblers having a recess on its inner face, said body having a head at one end adapted to retain said tumblers, a longitudinal groove and a spring-chamber in said shank, and a perforation in said head forming a continuation of said groove, a bolt sliding in said groove and perforation and having a head

adapted to lie flush with the outer side of said head when the lock is closed, said bolt having further a lug on its lower surface projecting into said spring-chamber and a plurality of lugs on its upper surface adapted to be detained by their respective tumblers, and a spring contained in said spring-chamber abutting against said lug on the lower side of said bolt and adapted to move the latter into releasing position.

3. A padlock of the type described comprising a body having a cylindrical shank, a plurality of tumblers mounted and adapted to rotate on said shank, each of said tumblers having a recess in its inner face, said body having a head at one end adapted to retain said tumblers, a longitudinal groove and a spring-chamber in said shank, and a perforation in said head forming a continuation of said groove, a bolt sliding in said groove and perforation and having a head adapted to lie flush with the outer side of said head when the lock is closed, said bolt having further a lug on its lower surface projecting into said spring-chamber and a plurality of lugs on its upper surface adapted to be detained by their respective tumblers, a spring contained in said spring-chamber abutting against said lug on the lower side of the said bolt and adapted to move the latter into releasing position and a cap mounted on the end of said body opposite the head thereof.

4. A padlock of the type described comprising a body having a cylindrical shank, a plurality of tumblers mounted and adapted to rotate on said shank, each of said tumblers having a recess in its inner face, said body having a head at one end adapted to retain said tumblers, a longitudinal groove and a spring-chamber in said shank, and a perforation in said head forming a continuation of said groove, a bolt sliding in said groove and perforation and having a head adapted to lie flush with the outer side of said head when the lock is closed, said bolt having further a lug on its lower surface projecting into said spring-chamber and a plurality of lugs on its upper surface adapted to be detained by their respective tumblers, a spring contained in said spring-chamber abutting against said lug on the lower side of said bolt and adapted to move the latter into releasing position, said bolt having further a cylindrical end extending beyond the tumblers and provided with an annular groove, a recess on its upper side adapted to receive the end of the shackle, and a notch on its lower side connecting said groove with the outer face, and a cap having a concentric recess adapted to fit over said end of the body and having further a pair of inwardly projecting snugs adapted to register respectively with said recess and notch and to engage said annular groove

when said cap has been rotated; said cap having further a notch on one side thereof engaged by the end of the shackle when closed preventing the cap from being rotated while the shackle is in this position.

5. A padlock comprising a body or core having a cylindrical shank and an enlarged head at one end thereof, a shackle engaging said body, a plurality of tumblers mounted and rotating on said shank, each tumbler comprising two annular elements one within the other and having means for engaging them in various relations to one another, the inner member having an opening at one side and the outer member being provided with reference characters around its circumference, said body or core having a longitudinal groove in the upper side of the shank thereof and a perforation in the head thereof, a bolt sliding in said groove and perforation and having a head adapted when in locked position to lie flush with the outer face of the head of said body or core, said bolt having further a plurality of projections upon its upper face adapted to be detained by the margins of the respective tumblers and to be released when they register with the openings in the inner members of the respective tumblers, said shackle having a slot which is engaged by the end of said bolt, said body or core having an end opposite said head which projects beyond said tumblers and is annularly grooved, and provided with a recess on its upper side adapted to receive said shackle, and a cap having a concentric recess adapted to receive the end of said body, a recess on its upper side adapted to receive said shackle which in closed position engages it and prevents it from rotating, and an inwardly extending projection on the margin of said concentric recess which engages said annular groove on the end of the body.

6. A padlock comprising a body or core having a cylindrical shank and an enlarged head at one end thereof, a shackle engaging said body, a plurality of tumblers mounted and rotating on said shank, each tumbler comprising two annular elements one within the other and having means for engaging them in various relations to one another; the inner member having an opening at one side and the outer member being provided with reference characters around its circumference, said body or core having a longitudinal groove in the upper side of the shank thereof and a perforation in the head thereof, a bolt sliding in said groove and perforation and having a head adapted, when in locked position, to lie flush with the outer face of the head of said body or core, said bolt having a plurality of projections upon its upper face adapted to be detained by the margins of the respective tumblers and to be released when they register with

the openings in the inner members of the
 respective tumblers, said shackle having a
 slot which is engaged by the end of said
 bolt, said body or core having an end oppo-
 5 site said head which projects beyond said
 tumblers and is annularly grooved and pro-
 vided with a recess on its upper side adapt-
 ed to receive said shackle, and a cap having
 a concentric recess adapted to receive the
 10 end of said body, a recess on its upper side
 adapted to receive said shackle which in
 closed position engages it and prevents it
 from rotating; and an inwardly extending
 projection on the margin of said concentric

recess which engages said annular groove on 15
 the end of the body, said body or shank
 having a spring-chamber immediately be-
 low said bolt, and a spring mounted within
 said chamber and acting on said bolt to
 move it into releasing position. 20

In witness whereof I have hereunto set
 my hand this seventh day of December,
 1909.

GEORGE W. EDDY.

Witnesses:

GEORGE W. COLLES,
 W. K. BLACKBURN.