No. 648,226. Patented Apr. 24, 1900.

W. J. ATKINSON.

PADLOCK.

(Application filed Oct. 23, 1899.)

(No Model.)

Fig. 1.

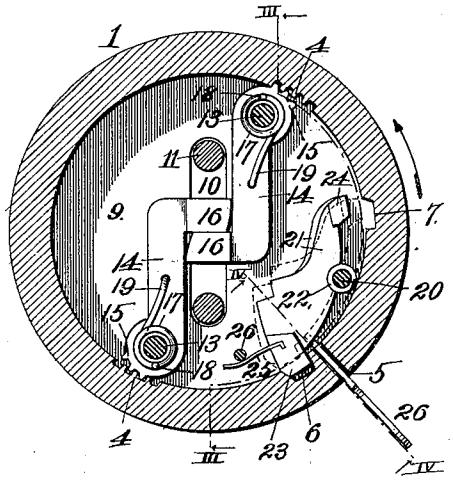


Fig. 2.

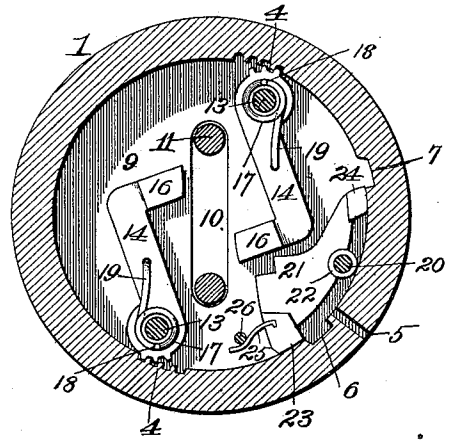


Fig. 3.

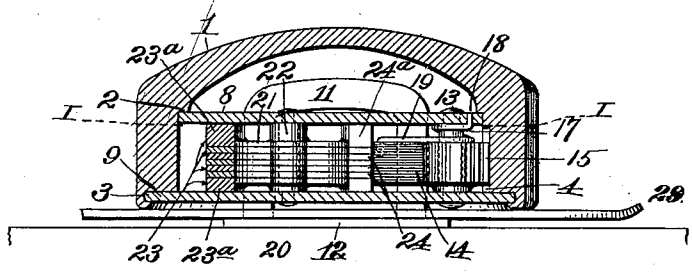
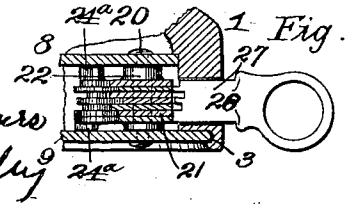


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM J. ATKINSON, OF KANSAS CITY, MISSOURI.

PADLOCK.

SPECIFICATION forming part of Letters Patent No. 648,226, dated April 24, 1900.

Application filed October 23, 1899. Serial No. 734,500. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. ATKINSON, of Kansas City, Jackson county, Missouri, have invented a new and useful Padlock, of which the following is a specification.

My invention relates to padlocks; and my object is to produce a lock of this character which by completely enveloping the staple prevents the insertion of a bar to break or twist the staple out of place, which cannot be unlocked without the proper key, and which combines cheapness of manufacture with simplicity, strength, durability, and compactness of construction.

With this object in view the invention consists in certain novel and peculiar features of construction and combinations of parts, as will be hereinafter described and claimed, and in order that the invention may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 is a section taken on the line I I of Fig. 3 with the key inserted, but not unlocked. Fig. 2 is a similar view unlocked, the key being omitted. Fig. 3 is an irregular section taken on the line III III of Fig. 1. Fig. 4 is a section taken on the line IV IV of Fig. 1.

Referring now to the drawings in detail, 1 designates the casing of the lock, the same being preferably in the form of a cylindrical cap and provided with an internal shoulder 2 and a groove 3. This groove in practice is formed by flanging inward the extreme end of the casing, the latter being constructed of malleable iron or other ductile metal that these purposes may be easily achieved. The casing is provided internally with the diametrically-opposite rack-teeth 4 and at a point between said teeth with a keyhole 5. At opposite sides of said keyhole it is also provided with the internal cavities 6 and 7.

8 designates a circular plate fitting in the casing against shoulder 2, and 9 a similar but larger plate which is secured in the groove 3, formed by flanging inward the end of the casing. The plates 8 and 9 are provided with similar elongated openings or slots 10, through which may freely pass the staple 11, projecting from the plate 12, secured to a barn or other building, the hasp 29 being slipped over the staple in the customary manner before the lock is fitted on the latter, as will be readily understood, the proportion of the parts being such that there shall be practically no play of the hasp between plate 12 and the lock-casing, as shown in Fig. 3, in order to prevent access to the legs of the staple with a pry, saw, or other implement. Securely connecting plates 8 and 9 at diametrically-opposite points and near the rack-teeth 4 of the casing is a pair of rivets 13, and pivoted upon said rivets between said plates and adapted to simultaneously swing in opposite directions is a pair of levers provided with concentric teeth 15, engaging rack-teeth 4, and at their free ends with laterally-projecting arms 16, the arms 16 of one lever projecting toward the opposite lever and when the padlock is locked projecting through the staple from opposite sides and bridging the elongated openings or slots 10 and bearing against the adjacent faces of the plates 8 and 9 to render the lock as strong as possible.

17 designates a stiff coil-spring encircling each rivet 13 and having one end, as at 18, anchored reliably to plate 8 by engaging an opening therein and its opposite end secured reliably to the lever about midway its length, as at 19. The tendency of these springs is to throw the locking-levers from the position shown in Fig. 1 to the unlocked position shown in Fig. 2 by rotating the casing in the direction indicated by the arrow and through the instrumentality of said mutually-engaging teeth. To prevent the springs from thus unlocking the padlock, I provide a construction as follows: 20 designates a rivet connecting plates 8 and 9 near the periphery of the former and at a suitable point between the keyhole 5 and cavity 7. 21 designates a series of tumblers which are pivoted upon the rivet 20 between plates 8 and 9, the upper and lower tumblers being increased in thickness, as at 22, so as to fit snugly between the plates and be maintained in their proper planes, all of the tumblers of course operating in a plane parallel with the plates 8 and 9. These tumblers project past the keyhole 5 and are provided with lugs 23, simultaneously engaging the cavity 6 in the wall of the casing when the padlock is locked. At their opposite ends the tumblers are provided with similar lugs 24, which by collectively or in

any other manner entering the cavity 7 as the lugs 23 are withdrawn from cavity 6 prevent the springs 17 rotating the casing and thereby unlocking the padlock.

In order that it shall be necessary to employ a special key to properly operate the tumblers and permit the padlock to be unlocked, said tumblers are provided with individual springs 25, bearing against the post or rivet 26, connecting the plates and holding the lugs 23 of their respective tumblers yieldingly in engagement with the cavity 6. The arrangement of the tumblers is such that their edges adapted for contact with the end of the key 27 are flush or even. This is not true of the outer edges of their lugs 23 and 24, which project outwardly irregular distances, as shown in Fig. 1. When the padlock is locked, the tumbler 21 which has its lug 23 projecting farthest into the cavity 6 has its lug 24 terminating the greatest distance from the cavity 7, while the tumbler having its lug 23 projecting the shortest distance into cavity 6 has its lug 24 nearest the cavity 7, the remaining tumblers being arranged accordingly—that is to say, having their lugs 23 projecting into the cavity 6 distances within the extremes represented by the lugs of the tumblers specifically referred to and their lugs 24 occupying intermediate positions between those of lugs 24 of said specifically-referred-to tumblers. By this arrangement it will be understood that the insertion of a square-end key through keyhole 5 will come in contact with and simultaneously move all of the tumblers, and consequently will throw the lug 24 nearest the cavity 7 into said cavity, thereby preventing the rotation of the casing and the unlocking of the padlock before the lug 23 projecting deepest into the cavity 6 is totally withdrawn from said cavity. On the other hand, a person cannot by inserting a wafer of wax determine the form of the key employed, as under the pressure of the wax all of the tumblers will move. Again, should a person collectively insert a series of independent wires he will be unable to unlock the padlock, because said wires will come in contact with the flush surfaces of the tumblers, and when operated one or more of the lugs 24 will engage the cavity 7 before the lug 23 projecting deepest into cavity 6 is totally withdrawn therefrom.

To prevent a person with a straight-end key from opening locks controlled by tumblers of this character, all of the tumblers have been arranged with their faces or edges which are adapted for engagement by the key irregularly, so as to cause one tumbler to lock before all of the others are unlocked; but this arrangement has been shown to be defective and the lock picked by a series of independent wires collectively inserted through the keyhole, each wire being shoved inward until it touched its particular tumbler. When this had been accomplished, the operator had the duplicate of the proper key and all that was necessary was to shove inward and unlock the tumblers.

With my arrangement it will be seen that it is absolutely necessary to avoid operating all of the tumblers in unison under the preliminary pressure of the key, and this can be only avoided, owing to the flush surfaces of the tumblers, by having the proper key, as will be seen by reference to Fig. 4. With the proper key in hand the tumblers are successively operated, commencing with the one having the lug 23 projecting deepest in the cavity 6, until the outer edges of the lugs 23 and all of the lugs 24 are flush or even, this being accomplished before the tumbler having the lug 23 projecting the shortest distance into the cavity 6 and the lug 24 nearest the cavity 7 is operated, said lug 23, however, projecting into the cavity 6 a distance slightly less than that between cavity 7 and lug 24, in order that said lugs 23, under the continued inward pressure of the key, shall be totally disengaged from cavity 6 before the lugs 24 can enter the cavity 7. To render this operation still more reliable, however, the key is provided with a shoulder 28, which by striking against the outer side of the casing prevents the tumblers from being operated too far and possibly causing their lugs 24 to enter cavity 7 and prevent the unlocking of the padlock under the action of the spring 17. It will thus be noticed that this shoulder 28 of the key is of some importance, as, assuming that a person had gotten an impression of the ward end of the key and had prepared a series of wires correspondingly, there would still be danger of the tumblers turning too far, unless the inward movement of the wires was arrested at the proper point, as will be readily understood. As soon as the tumblers have been turned to inoperative position by the key the springs 17, being now unopposed, throw the levers to the inoperative or unlocked position shown in Fig. 2, and through said mutually-engaging teeth rotate the casing at the same time to the position shown in said Fig. 2, the lugs 23 of the tumblers being held by their springs 25 against the wall of the casing in a position to reënter the cavity 6 when properly alined therewith. With the parts in the position shown in Fig. 2 the padlock can be withdrawn easily from the staple 11 in order to permit the hasp 29 to be detached therefrom and the door (not shown) opened. To resecure the door, the hasp is reëngaged with the staple and the padlock again slipped upon the staple to the position shown in Fig. 3. The operator by simply turning the casing in a direction opposite to that indicated by the arrow, Fig. 1, through the engaging teeth, causes the levers and the casing to reassume the position shown in Fig. 1, said parts being locked in this position by the reëngagement of lugs 23 with cavity 6, as will be readily understood.

From the above description it will be apparent that I have produced a padlock which

embodies the features of advantage enumerated as desirable in the statement of invention, and it is to be understood that while I have illustrated and described the preferred embodiment of my invention I reserve the right to make such changes in the form, detailed construction, arrangement, or proportion of parts as properly fall within the spirit and scope of the invention.

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

1. A padlock comprising a slotted plate, a casing inclosing and journaled on said plate, a locking-bolt pivoted to said plate and bridging its slot and geared to said casing, a spring anchored at one end and at the other engaging said bolt and tending to cause the latter to withdraw and leave the slot unbridged, and means to prevent the withdrawal of said bolt by locking the casing against rotatable action, substantially as described.

2. A padlock, comprising a slotted plate, a casing inclosing and journaled on said plate and provided with a cavity and a keyhole, a locking-bolt pivoted to said plate and bridging its slot and geared to said casing, a spring anchored at one end and at the other engaging the bolt and tending to cause the latter to withdraw and leave the slot unbridged, a tumbler pivoted to the plate and provided with a lug engaging one of the casing-cavities when the padlock is locked and adapted to be withdrawn from said cavity to permit the spring to withdraw the locking-bolt from its position bridging said slot, substantially as described.

3. In a padlock, the combination of a slotted plate to receive a staple, a rotatable casing mounted on said plate, a locking-bolt mounted on said plate and geared to said casing, and a plurality of tumblers pivoted to said plate and provided at one end with lugs projecting different lengths, and their opposite ends terminating at different distances from their axis of movement, and having key-contact surfaces normally flush or even, substantially as described.

4. A padlock, comprising a slotted plate, a casing inclosing and journaled on said plate and provided with a pair of cavities and a keyhole, a locking-bolt pivoted to said plate and bridging its slot and geared to the casing; said locking-bolt having a tendency to withdraw and leave the slot unbridged, and a plurality of tumblers pivoted to said plate and provided at one end with lugs projecting different distances into one of said cavities, and with lugs at their opposite ends occupying positions at varying distances from the other casing-cavity, substantially as and for the purpose described.

5. A padlock, comprising a slotted plate, a casing inclosing and journaled on said plate and provided with a pair of cavities and a keyhole, a locking-bolt pivoted to said plate and bridging its slot and geared to the casing; said locking-bolt having a tendency to withdraw and leave the slot unbridged, a plurality of tumblers pivoted to said plate and provided at one end with lugs projecting different distances into one of said cavities, and with lugs at their opposite ends occupying positions at varying distances from the other casing-cavity, and having their key-contact surfaces flush or even, substantially as and for the purpose described.

6. A padlock, comprising a slotted plate, a casing inclosing and journaled on said plate, a locking-bolt pivoted to said plate and bridging its slot, and connected to said casing, a spring anchored at one end to said plate and secured at its movable end to said bolt, a tumbler to maintain said bolt against the resistance of said spring in its position bridging said slot, and means to trip said tumbler and permit said spring to withdraw the bolt to an inoperative position, and rotate said casing, substantially as described.

7. A padlock, comprising a slotted plate, a casing inclosing and journaled on said plate, and provided with internal rack-teeth, a locking-bolt pivoted to said plate, and bridging its slot, and provided with concentric teeth engaging the teeth of the casing, a spring anchored at one end to said plate and secured at its movable end to said bolt, a tumbler to maintain said bolt against the resistance of said spring in its position bridging said slot, and means to trip said tumbler and permit said spring to withdraw the bolt to an inoperative position, and rotate said casing, substantially as described.

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

WILLIAM J. ATKINSON.

Witnesses:
H. C. RODGERS,
W. R. KIRK.