Oct. 28, 1930. J. H. SHAW 1,779,716

PADLOCK

Filed Nov. 8, 1928

Fig. 1.

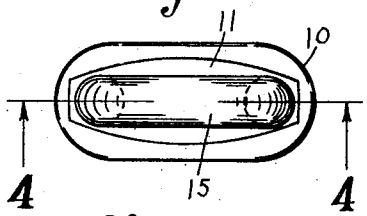


Fig. 2.

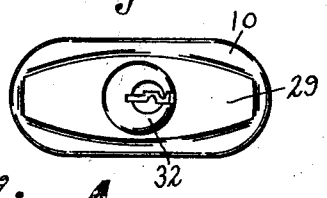


Fig. 3.

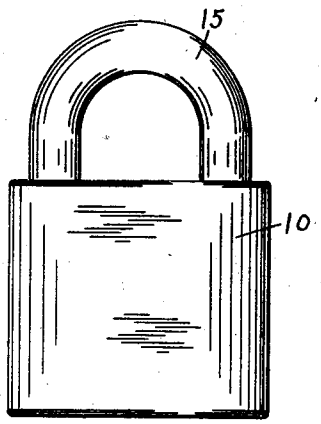


Fig. 4.

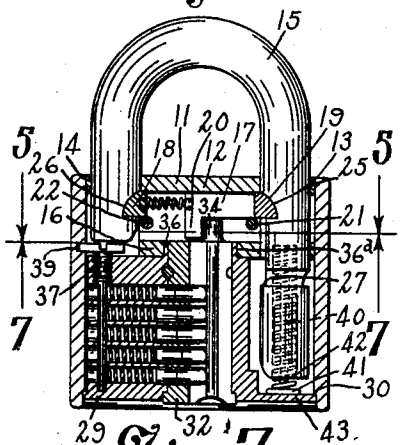


Fig. 5.

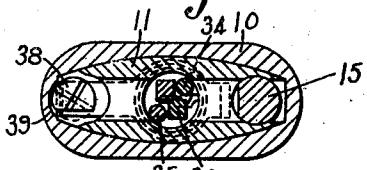


Fig. 6.

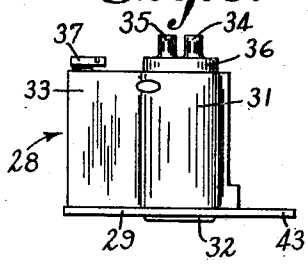
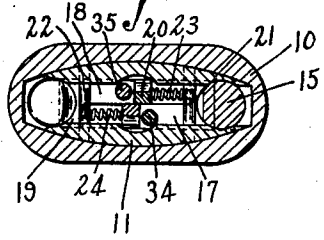


Fig. 7.



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UNITED STATES PATENT OFFICE

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PADLOCK

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This invention relates to padlocks, and more especially to a padlock so constructed that that part of the locking mechanism which comprises the key barrel and tumblers may be removed from the case of the lock, as a unit, and a new unit inserted therefor, so as to effect a key change conveniently and economically.

In connection with the use of padlocks, it often becomes desirable on account of the loss or theft of a key, to change the lock for another which requires a different key. In such a case, it has often been necessary to completely discard the original lock and buy a new one. This is, of course, a relatively expensive matter and in the present construction I have provided a padlock in which a key change may be effected in a much more economical manner.

In order to effect this end, I have provided a padlock, from the case of which the key receiving member and the tumblers may be readily removed from the case when the shackle is in unlocked position, but its removal is rendered impossible when the shackle is in operative lock position.

One object of my invention is to provide a padlock wherein the locking mechanism may be placed in and removed from the case as a unit.

A further object of my invention is to provide a detachable unit for padlocks, which unit is designed to comprise the key barrel and tumblers, and means for detachably securing said unit within the case of the padlock, which means will be inaccessible to permit removal of the lock when the shackle is in locked position.

Another object of my invention is the provision of a padlock of the character described, which may be economically manufactured without sacrificing any of the advantages of convenience and security which such a lock should possess.

To these and other ends, the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a top plan view of the lock, embodying my invention;

Fig. 2 is a bottom plan view of the lock;

Fig. 3 is a side elevational view;

Fig. 4 is a sectional view on line 4—4 of Fig. 1, the lock shackle, however, being shown in elevation;

Fig. 5 is a sectional view on line 5—5 of Fig. 4;

Fig. 6 is an elevational view of the key barrel and tumbler unit, which is removable from the case of the padlock, and

Fig. 7 is a sectional view on line 7—7 of Fig. 4.

The preferred embodiment of my invention which I have selected to illustrate and describe, comprises a lock case 10, which in this instance, consists merely of a hollow shell having an opening of oblong shape extending completely therethrough, although it will be understood that such a through opening is not necessarily essential in all aspects of the invention. In the upper part of this opening there is inserted within the shell, a housing 11. This housing is formed in cross section to accurately fit the opening through the casing, and comprises a top plate 12, which is solid except for the openings 13 and 14, designed to receive the legs of the shackle 15. This housing is also provided with a lower plate 16, and between the upper and lower plates is provided with a pocket or cavity within which locking bolts 17 and 18 are mounted. These bolts are reciprocable horizontally, as shown in Fig. 4 of the drawings, and each comprises a body portion having a relatively broad head 19 at one end, and an operating downwardly projecting lug 20 at the other end, designed to be engaged by parts upon the key barrel, as will be more fully described hereinafter. The body portions of these bolts slide upon pins 21 and 22, so that they may be held in proper position against the upper plate 12. In order that they may be normally urged to locked position, springs 23 and 24 are arranged to act against the rear ends of the bolts and force them outwardly. In each case, the spring which acts upon the rear end of one bolt, reacts upon the head of the other bolt, so that a compact and simple

arrangement is provided, which tends at all times to keep the bolts in protracted positions, or in positions where the heads 19 engage within the recesses 25 and 26 in the legs of the shackle.

The longer leg of the shackle is provided with a shoulder 27 which will be engaged by the bolt head 19, to prevent the complete removal of the shackle from the lock.

In Fig. 6 is shown the unit 28, containing the locking mechanism which may be removable and insertable bodily into the padlock case. This is, of course, inserted from the lower end and is provided with a lower plate or base 29 which fits snugly into the opening through the case and against a narrow shoulder 30 so that the plate 29 is substantially flush with the lower edge of the casing 10. This unit comprises a cylindrical casing 31, containing the key plug or barrel 32, and having a pin tumbler extension 33, which contains pin tumblers of the usual type in the present embodiment. Upon the upper end of the key barrel are provided pins 34 and 35, designed to engage with the lugs 20 to retract the bolts 17 and 18 when the key barrel is turned.

The cylindrical case 31 is provided with a slightly reduced extension 36, which fits snugly into an opening 36ª in the lower plate 16 of the housing 11, so as to definitely locate and position the unit 28 in the lock case with respect to the locking bolts 17 and 18.

In the upper end of the pin tumbler extension is mounted a threaded screw 37, provided with a cam-shaped or mutilated head 38, shown more especially in Fig. 5, which head is designed, when turned in one position to enter a slot 39 in the side of the lock case immediately below the shorter leg of the shackle. It will be apparent from an inspection of Fig. 5 that when this screw is rotated so that the straight or cut away edge is toward the adjacent side of the lock case, the screw head will not be engaged in the slot 39, and the unit containing the locking mechanism may then be removed from the case.

The longer leg of the shackle is provided with a bore in which is mounted a spring 40 reacting against the head 41 of a pin 42, which the spring surrounds. The head 41 of this pin in turn rests against the extension 43 of the plate 29, so that when the parts are assembled and the locking bolts 17 and 18 withdrawn, this spring will serve to urge the shackle upwardly until its shorter leg is disengaged from the opening 14.

The operation of my improved structure is as follows. It will, of course be obvious that when the parts are in the position shown in Fig. 4, and the proper key is inserted in the key barrel 32, this barrel may be rotated and during such rotation the pins 34 and 35 will contact with the lugs 20 upon the lock bolts 17 and 18, and withdraw these bolts from the recesses 25 and 26 in the shackle. The shackle will then be forced upwardly by the spring 40 until the shorter end clears the upper plate 12 of the housing 11, and the shackle may then be rotated in the usual way so that the lock may be disengaged from a hasp or the like with which it may be used. In this open position of the parts, the head 19 of the locking bolt 17 will engage the shoulder 27 on the shackle to prevent the complete removal of the latter.

When the parts are in this position a screw driver may be inserted through the shackle opening 14 and the screw 37 turned until its head is disengaged from the slot 39. The unit 28 may then be freely withdrawn from the lock, as it is held in place solely by this screw. It is, of course, located in the lock by means of the snug fit of the extension 36 in the opening of the lower plate 16 of the housing 11, but the extension is freely withdrawable from this opening when permitted a straight downward movement, as shown in Fig. 4, as is the case when the screw head is disengaged from the recess 39. The engagement of the extension 36 in the opening of the plate 16, serves, however, to prevent any tilting of the unit 28, which might allow this unit to be removed whether or not the screw head is disengaged from the slot.

When the screw has been turned to the proper position and the unit 28 removed from the lock, a similar unit requiring a different key may then be placed in the lock case and the screw upon it turned to engage the slot. It will be seen, therefore, that the removal of the tumbler unit and the replacing of another similar unit, is done in an extremely simple and expeditious manner.

It will also be obvious that the screw head 39 is inaccessible when the shackle is in locked position, so that when the lock is in use it will be impossible for the tumbler unit to be removed and the lock forced in this manner. It is apparent, however, that with the shackle in unlocked position the tumbler unit may be removed by the extremely simple operation of turning the screw 38 a partial turn with the screw-driver, which completely releases this unit.

While I have shown and described a preferred embodiment of my invention, it will be understood that it is not to be limited to all the details shown, but is capable of modification and variation, within the spirit of the invention and within the scope of the appended claims.

What I claim is:

1. A padlock comprising a casing and a shackle, a tumbler mechanism insertable into and removable as a unit from said casing, means to secure said unit within the casing, said means being inaccessible when the shackle is in locked position, and means in-

dependent of said unit for securing the shackle to the casing when the former is in open position.

2. A padlock having a casing, and a shackle received in openings in the casing, locking mechanism removably mounted in the casing, means for securing said mechanism in place, said means being accessible for release of the locking mechanism through one of the shackle openings, and means independent of said removable locking mechanism for securing the shackle to the casing when the former is in open position.

3. A padlock comprising a casing, locking mechanism insertable into one end of said casing, means accessible through an opening in the other end of the casing to effect release of said mechanism, a shackle, means independent of said insertable locking mechanism for securing the shackle to the casing when the former is in unlocked position.

4. In a padlock, a casing provided with shackle receiving openings, a key barrel, and tumbler mechanism insertable into and removable from said casing as a unit, means for securing said unit in place within the casing, said means being releasable through one of the shackle receiving openings, and means independent of said insertable mechanism for securing the shackle to the casing when the former is in open position.

5. In a padlock, a casing, a shackle received in openings in the casing, bolt mechanism to secure said shackle in place, bolt operating means comprising a key barrel, and controlling tumblers therefor insertable as a unit within the casing, and means disposed below one end of the shackle for releasably holding said bolt operating means in place, said bolt mechanism engaging the shackle when the latter is unlocked to secure it to the casing.

6. A padlock comprising a casing and a shackle received in openings therein, a unitary locking mechanism insertable into and removable from said casing, co-engaging means on the wall of the casing and on the locking mechanism to hold the latter in place, said means comprising a recess in the wall of the casing, and a member mounted on the locking mechanism and movable into said recess, a plate in the casing, and inter-engaging means provided on said plate and locking mechanism to position the latter in the casing.

7. A padlock comprising a casing and a shackle received in openings therein, a unitary locking mechanism insertable into and removable from said casing, co-engaging means on the wall of the casing and on the locking mechanism to hold the latter in place, said means comprising a recess in the wall of the casing and a member rotatably mounted on the locking mechanism and having a cam-shaped portion to enter said recess, a plate in the casing, and inter-engaging means on said locking mechanism and plate to cooperate with said co-engaging means.

8. A padlock comprising a casing and a shackle received in openings therein, a unitary locking mechanism insertable into and removable from said casing, co-engaging means on the wall of the casing and on the locking mechanism to hold the latter in place, said means comprising a recess in the wall of the casing and a member rotatably mounted on the locking mechanism and having a cam-shaped portion to enter said recess, said member being accessible through one of the shackle openings, and means in the casing to engage said locking mechanism and prevent disengagement of said rotatably mounted member from said recess.

9. A padlock, comprising a casing having an opening therethrough, a bolt mechanism positioned in one end of said opening, a lock mechanism insertable through the other end of said opeing, a shackle, said bolt mechanism comprising a bolt adapted to engage the shackle, means to secure said locking mechanism in place, said means being positioned below one end of the shackle and said bolt mechanism, and said lock mechanism having inter-engaging parts whereby the former is operated by the latter.

10. A padlock, comprising a casing having an opening therethrough, a bolt mechanism positioned in one end of said opening, a lock mechanism insertable through the other end of said opening, a shackle, said bolt mechanism comprising a bolt adapted to engage the shackle, means to secure said locking mechanism in place, said means being positioned below one end of the shackle and said bolt mechanism, and said lock mechanism having inter-engaging parts whereby the former is operated by the latter, said bolt mechanism being provided with an opening, and said lock mechanism being provided with a part fitting in said opening to position one mechanism with respect to the other.

11. A padlock, comprising a casing having an opening therethrough, a bolt mechanism insertable into one end of said opening, said mechanism comprising a housing, and a bolt movably mounted therein, said housing having shackle receiving openings in its outer face, and locking mechanism insertable into the other end of the casing, and means to secure said lock mechanism in place comprising inter-engaging parts on said casing and said lock mechanism, and other inter-engaging parts on said housing and said lock mechanism

In witness whereof, I have hereunto set my hand this 30th day of October, 1928.

JOHN H. SHAW.