

Nov. 15, 1938.

C. E. HABRAM ET AL

2,136,435

PADLOCK

Filed Sept. 9, 1937

2 Sheets-Sheet 1

FIG. 1

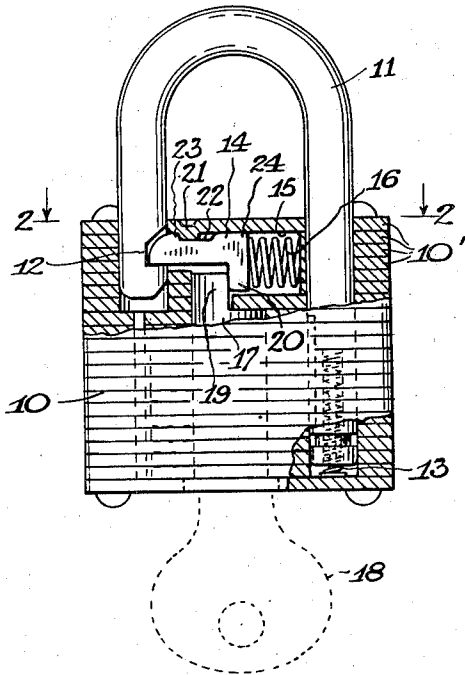


FIG. 2

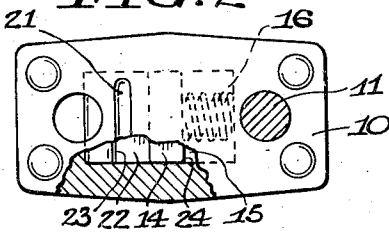


FIG. 7

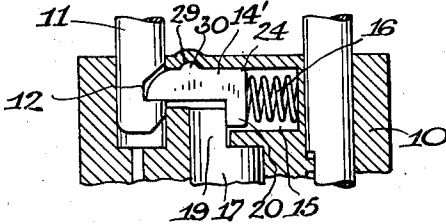


FIG. 4

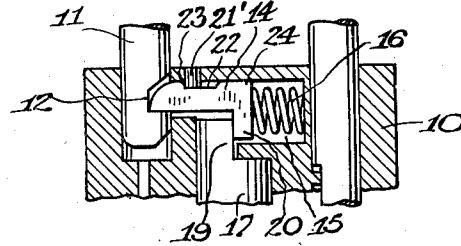


FIG. 5

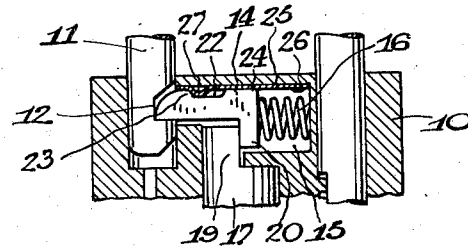


FIG. 6

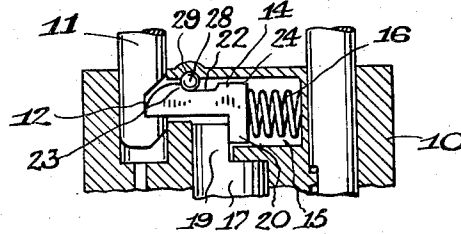


FIG. 8

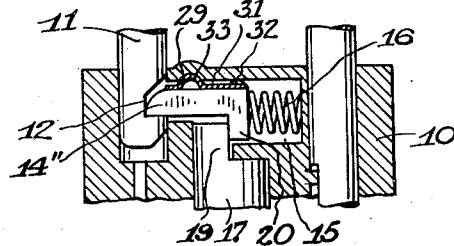
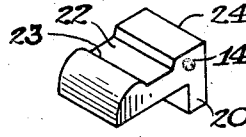


FIG. 3



WITNESSES

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2 Sheets-Sheet 2

FIG. 9

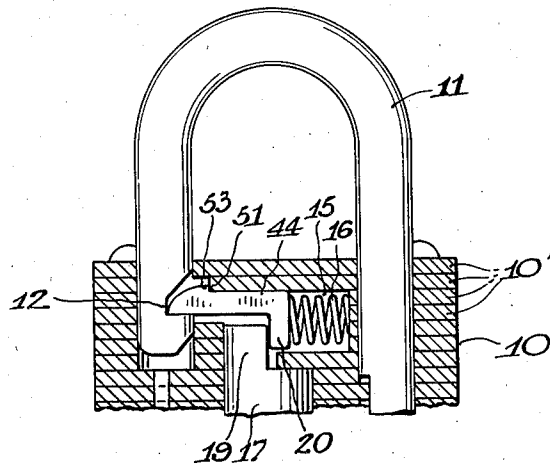
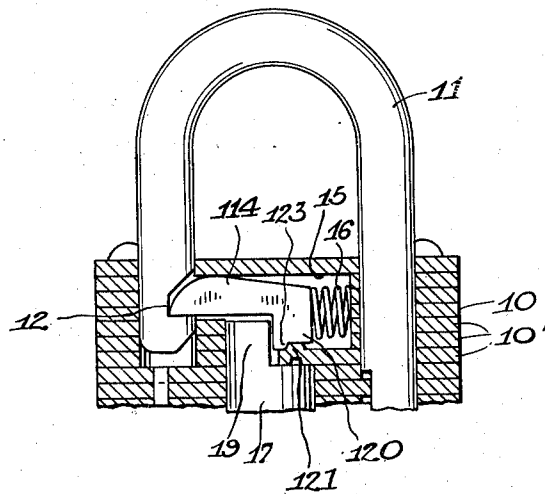


FIG. 10



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PADLOCK

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Application September 9, 1937, Serial No. 162,960

11 Claims. (Cl. 70—38)

The invention relates to locks and more particularly to padlocks.

It has been found possible for unauthorized persons to open a padlock of the type having a spring-pressed locking bolt by skilful hammering, tapping, pulling and other manipulation of the padlock and its shackle, such manipulation causing the locking bolt to be jarred or vibrated out of locking position.

It is an object of the present invention to provide an improved padlock embodying simple but effective means for preventing unlocking movement of the locking bolt by hammering and other unauthorized manipulation of the padlock.

Another object of the invention is to provide a padlock in which the means for resisting the unauthorized unlocking movement of the bolt will not interfere with the retraction of the bolt by the lock mechanism.

The invention further consists in the several features hereinafter described and claimed.

Certain embodiments of the invention are illustrated in the accompanying drawings, wherein

Fig. 1 is a side view of a padlock constructed in accordance with the invention, parts being broken away and parts being shown in section, and the shackle being shown in locked position;

Fig. 2 is a sectional view taken generally along the line 2—2 of Fig. 1, parts being broken away and parts being shown in section, on a different plane, and the shackle being open;

Fig. 3 is a detail perspective view of a locking bolt for the padlock;

Figs. 4, 5, 6, 7, and 8 are sectional views of padlocks embodying different modified forms of the invention, and

Figs. 9 and 10 are similar sectional views of padlocks embodying still other modified forms of the invention.

In these drawings, 10 designates a lock case which is apertured to receive a shackle 11 of any suitable construction. By way of example, the shackle is here indicated to be of the slidable type, one leg being secured in the case for longitudinal movement and also for rotation, and the other leg having a locking notch 12. If desired, the shackle may be urged to open position by the usual spring 13 engaging the long leg of the shackle.

In that form of the invention shown in Figs. 1 to 3, the lock case is indicated to be of the laminated type comprising a stack of metal plates 10' which are riveted or otherwise rigidly secured together, the plates being suitably apertured to form the interior spaces or chambers of the case.

The shackle notch 12 receives therein the beveled nose of a shiftable locking member or bolt 14 mounted and loosely guided in a cavity 15 formed in the lock case, the bolt being urged to locking position by a spring 16. The bolt 14 is retractable by any suitable locking mechanism mounted in the case. In the present instance, the locking mechanism is shown to be of the type having a rotatably mounted lock barrel 17 operated by a key 18, the barrel having a shouldered or cut-away semi-cylindrical inner end 19 which is engageable with a lug 20 formed on the bolt to retract the bolt. The advancing travel of the bolt may be limited in various ways, as by its engagement with an end wall of the cavity 15.

In order to prevent retraction of the bolt by blows on the lock case, the bolt when in locking position has an interengaging connection with an adjacent part of the case. A shoulder-forming rib 21 is pressed or otherwise formed on the substantially flat upper end wall of the lock case to project into the bolt-guiding cavity 15 of the case, and extends transversely of the direction of movement of the bolt. The rib 21 is conveniently formed on one of the plates 10' before it is assembled into the case-forming stack. The rib enters a recess 22 formed transversely in the top wall of the bolt and is engageable with a shoulder 23 defining the end of the recess adjacent the nose of the bolt. The bolt has a heel 24 on which it may pivot, if desired.

With the shackle urged outwardly, either by the spring 13 or by manual tension on the shackle, or both, the shoulder 23 of the bolt is near or in engagement with the rib 21 of the case, as seen in Fig. 1, thus preventing unauthorized persons from jarring the bolt out of locking position by hammering or tapping on the case or shackle.

In operation, when it is desired to unlock the padlock, the key 18 is inserted into the lock barrel and is turned in either direction, the barrel projection 19 moving the bolt lug 20 and causing retraction of the bolt. The bolt-guiding cavity 15 in the case is sufficiently deep to permit the nose of the bolt to move under the rib 21, the shackle being movable inwardly from normal locking position to allow release of the blocking shoulders and retraction of the bolt. In its retraction the bolt is released from the rib by tilting movement or cam action, or both. The shackle moves to open position under urge of the spring 13. To lock the padlock, the notched leg of the shackle is reentered into the case. On its entering movement, the beveled end of the shackle leg forces the bolt back against the action of the spring 16 and

downwardly away from the rib 21, the bolt eventually snapping into the shackle notch 12.

In the modified form of padlock shown in Fig. 4, the case is provided with one or more driven or riveted pins or pegs 21' in place of the rib 21 of the device of Fig. 1. This construction may be used in lock cases of various types and is suitable for a lock case of the solid type.

In the modified form of device shown in Fig. 5, a resilient metal plate or leaf spring 25 is riveted at 26 or otherwise secured to the upper wall of the bolt-guiding cavity and carries a transversely extending shoulder-forming bead or rib 27 which enters the bolt recess 22 and serves the same purpose as the rib 21 of Fig. 1. The resilient plate presses down on the bolt, so as to urge the rib 27 into the bolt recess 22.

In the modified form of padlock shown in Fig. 6, a blocking member 28, such as a ball or roller, projects into the bolt recess 22 and also into a shoulder-forming pocket 29 in the top wall of the bolt-guiding cavity, the pocket being pressed or otherwise formed in the case.

In the modified form of device shown in Fig. 7, a bolt 14' carries a transverse shoulder-forming top rib 30 which enters a shoulder-forming pocket 29 in the top wall of the bolt-guiding cavity, the pocket being pressed or otherwise formed in the case. This is a reversal of the relation shown in Fig. 1.

In the form of padlock shown in Fig. 8, a resilient metal plate or leaf spring 31 is riveted at 32 or otherwise secured to the top face of a bolt 14'', the plate having a shoulder-forming hump or rib 33 which enters a shoulder-forming pocket 29 in the top wall of the bolt-guiding cavity, the pocket being pressed or otherwise formed in the case. The resilient plate presses upwardly so as to urge the rib 33 into the pocket 29.

In the form of the invention illustrated in Fig. 9, one of the plates 16', forming the upper wall of the cavity 15, is apertured or cut away to present a shoulder 51 in place of the rib 21 of the device of Fig. 1, thus avoiding the necessity for pressing or upsetting the plate. The shoulder 51 cooperates with a shoulder 53 on a spring-pressed bolt 44.

In the modified form of device shown in Fig. 10, the spring-pressed bolt 114 has its lug 120 provided with a shoulder 123 to engage a shoulder-forming rib 121 pressed or otherwise formed on one of the interior plates or laminations 10' defining the bottom wall of a bolt-guiding cavity 15. When the locked shackle is urged upwardly, the bolt pivotally bears at an intermediate point on the top wall of the cavity, causing the shouldered lug 120 to be pressed downward for maintaining the blocking shoulders 121 and 123 in juxtaposition. The rotatable lock barrel 19, however, is capable of releasing the blocking engagement when retracting the bolt.

The several modified forms of padlocks are otherwise the same as the padlock of Fig. 1, and operate in the same manner.

While the invention is particularly suitable for locks of the laminated case type, it is also applicable to locks having cases of solid, shell, or other construction. The padlocks here shown are key-operated and have slidable shackles, but the invention is also adapted for use with other types of padlocks, such as permutation padlocks and padlocks with pivoted shackles.

What we claim as new and desire to secure by Letters Patent is:

1. In a padlock, the combination of a lock case, a shiftably mounted shackle, and a spring-pressed

bolt in said case engageable with said shackle to lock said shackle, said case and bolt having shoulders releasably engageable with each other to resist jarring of said bolt from locking position, and said shackle when moved inwardly from normal locking position permitting release of said shoulders and retraction of said bolt.

2. In a padlock, the combination of a lock case member, a shiftably mounted shackle, and a bolt member in said case member spring-pressed to locking position and engageable with said shackle to lock said shackle, one of said members having a shoulder, and a spring carried by the other member and having a shoulder engageable with said first-named shoulder to resist jarring of said bolt from locking position, said spring urging said shoulders into operative position, and said shackle when moved inwardly from normal locking position permitting release of said shoulders and retraction of said bolt.

3. In a padlock, the combination of a lock case having a cavity with an inner wall presenting a rib, a shiftably mounted shackle, and a longitudinally and laterally movable spring-pressed bolt in said case engageable with said shackle to lock said shackle and bearing against said wall to resist outward movement of said shackle, said bolt having a shoulder rigid therewith and releasably engageable with said rib to resist jarring of said bolt from locking position.

4. In a padlock, the combination of a lock case, a shiftably mounted shackle, and a spring-pressed bolt in said case engageable with said shackle to lock said shackle, said case having guide surfaces for said bolt permitting movement of said bolt in a direction transverse and parallel to the shackle movement, said case and bolt having a blocking connection resisting jarring of said bolt from locking position when said shackle is under outward urge, said shackle when moved inwardly permitting release of said blocking connection and retraction of said bolt.

5. In a padlock, the combination of a shouldered lock case, a shiftably mounted shackle, a shouldered spring-pressed bolt in said case to lock said shackle, and a blocking member interposed between said case and bolt and releasably engageable with the shouldered portions thereof to resist jarring of said bolt from locking position, said shackle when moved inwardly from normal locking position permitting release of said blocking member and retraction of said bolt.

6. In a padlock, the combination of a lock case, a shiftably mounted shackle, a longitudinally and laterally movable spring-pressed bolt in said case to lock said shackle, blocking means at the side of said bolt toward the outer portion of said shackle to resist jarring of said bolt from locking position, and lock mechanism at the other side of said bolt for laterally moving said bolt to release said blocking means and for thereafter retracting said bolt, said blocking means being distinct from said lock mechanism.

7. In a padlock, the combination of a lock case, a shiftably mounted shackle, a spring-pressed bolt in said case to lock said shackle and having a shoulder, and a spring carried by said case and having a blocking shoulder engageable with said bolt shoulder to resist jarring of said bolt from locking position, said shackle when moved inwardly from normal locking position permitting release of said bolt shoulder from said spring shoulder.

8. In a padlock, the combination of a lock case, a shiftably mounted shackle, a spring-pressed

bolt slidably and pivotally mounted in said case and lockingly engageable with said shackle, blocking means at one side of said bolt to resist jarring of said bolt from locking position, and lock mechanism at the other side of said bolt for tilting said bolt to unblock the same and for thereafter sliding said bolt to release said shackle, said blocking means being distinct from said lock mechanism.

9. In a padlock, the combination of a lock case comprising a plurality of plates secured together in laminated relation, a shiftably mounted shackle, and a spring-pressed bolt in said case to lock said shackle, one of said plates having a shoulder, and said bolt having a shoulder releasably engageable with said plate shoulder to resist jarring of said bolt from locking position.

10. In a padlock, the combination of a lock case having a cavity and a plate forming a wall of said cavity, a shiftably mounted shackle, and a longitudinally and laterally movable spring-pressed bolt in said cavity to lock said shackle and bearing against said plate to resist outward movement

of said shackle, said plate and bolt having shoulders rigid therewith releasably engageable with each other to resist jarring of said bolt from locking position.

11. In a padlock, the combination of a lock case having a cavity with an inner wall presenting a shoulder, a shiftably mounted shackle cooperating with said case, said shouldered wall being at the side of said cavity toward the outer portion of said shackle, and a longitudinally and laterally movable spring-pressed bolt in said case engageable with said shackle to lock said shackle and bearing against said inner wall to resist outward movement of said shackle, said bolt having a shoulder releasably engageable with said case shoulder to resist jarring of said bolt from locking position, and the inward movement of said shackle from normal locking position permitting release and retraction of said bolt.

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