

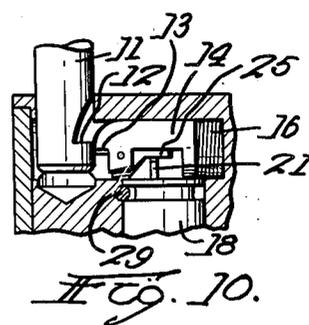
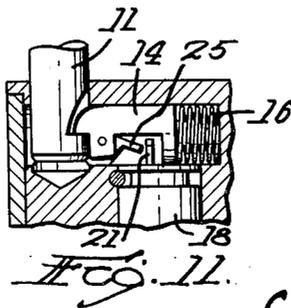
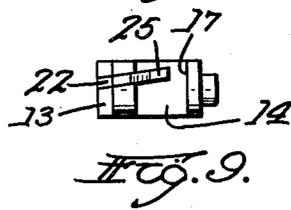
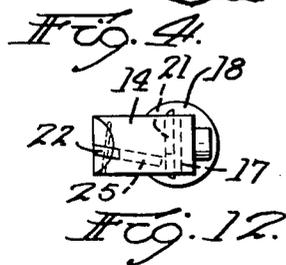
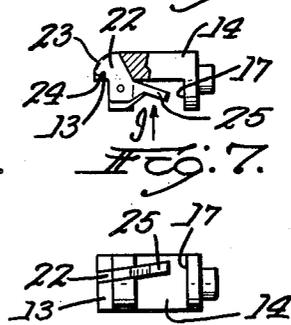
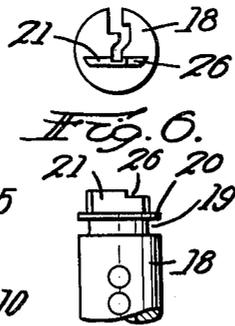
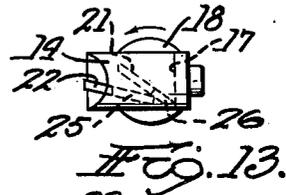
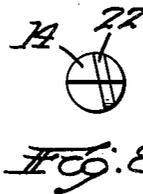
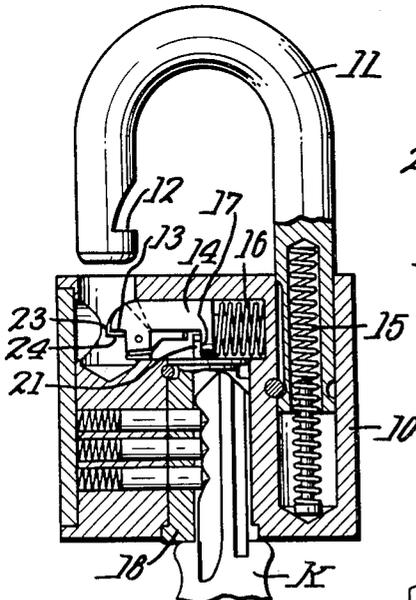
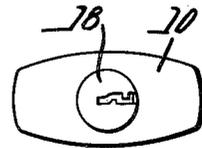
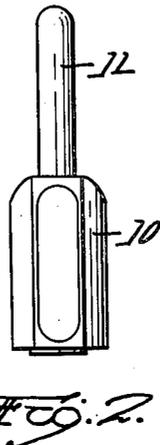
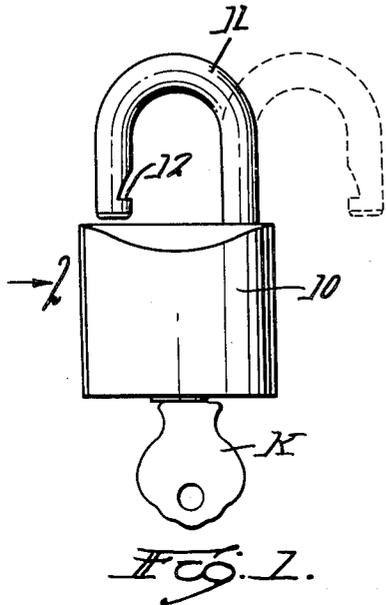
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K. WALZ

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PADLOCK

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# UNITED STATES PATENT OFFICE

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## PADLOCK

Application filed November 11, 1932. Serial No. 642,261.

The principal object of this invention is to provide means in a padlock for preventing its being jarred into an unlocked condition; to provide a locking bolt with means which will act to prevent the said locking bolt from being retracted by jarring or otherwise manipulating the padlock or the shackle thereof; to provide a latch or lever for these purposes in such a form and position that when the shackle is pressed inwardly to force the locking bolt back, it will move the latch into a position so that the bolt will be free to move back but when the shackle, after reaching locking position, is forced outwardly by its spring, that action will swing the lever to such position that it is in registration with and will engage the projection on the lock plug to prevent positively the locking bolt from being withdrawn until the lock plug is turned by the key to such position as to allow this lever to move by it, and to provide the means for locking the padlock bolt in a simple inexpensive form that is not likely to get out of order in use.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing, in which

Fig. 1 is a side view of a padlock, open and constructed in accordance with this invention;

Fig. 2 is an edge view of the same;

Fig. 3 is a bottom plan view;

Fig. 4 is a side view on enlarged scale of the lock in the same position as shown in Fig. 1, with the parts in section on a longitudinal plane;

Fig. 5 is a front view of the locking plug and its projection;

Fig. 6 is a plan of the same;

Fig. 7 is a side view of the locking bolt with its lever;

Fig. 8 is an end view thereof;

Fig. 9 is a bottom plan of the same as indicated by the arrow in Fig. 7;

Fig. 10 is a sectional view similar to that shown in Fig. 4 but showing the shackle pressed downwardly and just on the point of allowing the locking bolt to spring into locking position;

Fig. 11 is a similar view showing the locking of the padlock completed;

Fig. 12 is a plan of the locking bolt and the lock plug assembled and in locking position, and

Fig. 13 is a similar plan showing the plug turned to unlocked position.

Padlocks of the ordinary type are capable of being jarred open. This can be done at the present time with almost all makes of extruded padlocks and others in which the bolt operates horizontally in the padlock case. Usually, in order to do this, a piece of string is tied around the shackle and pulled. At the same time the handle of a mallet or piece of hard wood is struck on the side of the shackle. This gives the whole lock a jar and sometimes throws the bolt back enough so that the pull on the shackle with the string will open the lock. Sometimes this can be done with one blow but usually it is necessary to hit it several times.

The present invention is worked out for the purpose of preventing the bolt being retracted by a jar, as indicated above. For this purpose the padlock case 10 is provided with the usual U-shaped shackle 11 having a transverse surface 12 at the end against which a horizontal surface 13 on the lock bolt 14 engages to lock the lock as shown in Fig. 11. A spring 15 constantly tends to force the shackle outwardly into unlocked position. The shackle preferably is arranged to turn on the axis of its long leg. Behind the bolt 14 is the usual spring 16 for the usual purpose and the bolt is provided with a shoulder 17 as usual.

The locking part of the padlock may be of any desired kind and one is shown having a plug 18 adapted to be operated by a key as indicated. On the top of this plug, which is cylindrical, is a circular groove or neck 19, a circular integral projection 20 and a longitudinal chordal projection 21 at the upper end which engages the shoulder 17 when turned with the key in the lock, as shown in Fig. 13. A pin or the like 29 extends into the groove 19 to hold the plug in the casing.

In the locked position of the bolt 14 shown in Fig. 4 the projection 21 is located against

the shoulder 17 and parallel with it. Now with the key inserted as shown, if the plug is turned, the projection 21 will be turned with it and will push the shoulder 17 back and therefore the whole bolt 14. The same position is shown in Fig. 11 with the shackle actually locked.

Under ordinary circumstances, with the parts in the locked position shown in Fig. 11 and with the key out, the jarring above mentioned would be apt to force the bolt 14 back and there is no opposition to this except the spring 16. In this case a lever 22 is pivoted to the bolt 14 in a slot cut therein. This lever is located on the bolt in a slightly inclined position, as indicated in Figs. 9 and 12 and it has a rounded surface 23 at the front which, when in the position shown in Figs. 10 and 11, projects beyond the corresponding round surface of the end of the bolt 14. It also has a flat surface 24 which constitutes a shoulder and is provided with an opposite end 25 which constitutes the stopping means.

Now in operation, assuming the lock to be in the condition shown in Fig. 4 but with the key removed, the shackle can be pressed down against the opposition of the spring 15. The first effect of this is for the bottom of the shackle to engage the surface 23 and move the end 25 up into the position shown in Fig. 10. Further pressing of the shackle down forces the bolt back.

It will be seen that in the position shown in Fig. 10, the end 25 of the latch is in horizontal position above the level of a notch 26 in the top of the projection 21. Therefore, this projection furnishes no opposition to this action. The parts are now in the position shown in Fig. 10 and a slight further depression of the shackle brings the surface 12 below the complimentary horizontal surface on the bolt so that the spring 16 is free to move the bolt forward into locking position, as shown in Fig. 11, but so far the lever 22 is not moved from the position shown in Fig. 10 and if the parts were left in that position the bolt could be jarred into unlocking condition. However, upon release of the shackle by the fingers, the spring 15 moves it back and it engages the now downwardly projecting surface 24 on the lever 22 and swings that lever about its pivot, bringing the end 25 down into the position shown in Fig. 11.

Now it will be seen that in that position if the plug is not turned the bolt cannot be jarred back because this end 25 of the lever engages the projection 21, or nearly engages it, and constitutes a positive stop against the displacement of the bolt.

In Figs. 12 and 13 the positions of the locking plug are shown to explain the action above described. In Fig. 12 the parts are in the same position as in Figs. 4 and 11 and the projection 21 extends transversely to the long

dimension of the bolt 14 and to its direction of motion. Now, when the plug 18 is turned to unlock the padlock, the projection 21 is turned to an angular position and that removes any obstacle to the unlocking of the lock.

It will be seen that this arrangement adds very little to the expense of the lock, necessitating only one additional feature, namely the lever 22 and that it provides a positive stop to the unlocking of the padlock by the exercise of a vibration or jarring action to force the bolt back into unlocking position. This invention is applicable to padlocks and other locks that can be vibrated or jarred.

Although I have illustrated and described only one form of the invention I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited in this respect otherwise than as set forth in the claims but what I do claim is:

1. In a lock, the combination with a casing, of a lock plug in the casing having a projection, a lock bolt in the casing against which said projection bears, whereby the turning of the plug will withdraw the bolt from locking position, and means for engaging said projection and positively preventing the withdrawal of the bolt when the lock is locked.

2. In a padlock, the combination with a casing and shackle, of a lock plug in the casing having an eccentric projection thereon, a bolt in the casing having a shoulder against which said projection bears, whereby the turning of the plug will withdraw the bolt from locking position by the action of the projection on said shoulder, and means for engaging said projection and positively preventing the withdrawal of the bolt when the projection is in a normal locked position.

3. In a padlock, the combination of a casing, a cylindrical locking plug therein adapted to turn on its own axis and adapted to be actuated by a key, said plug having a projection extending from the end and located out of central position, a bolt located transverse to the axis of the plug and having a shoulder adapted to be engaged by the projection for unlocking it when the plug is turned, a spring for holding the bolt yieldingly in locking position, a shackle mounted on the casing, a spring for normally forcing the shackle outwardly, the shackle having a surface adapted to be engaged by the bolt for locking it, and means between the bolt and the projection constituting a positive stop to prevent the withdrawal of the bolt when the plug is in locking position.

4. In a lock, the combination of an oscillatable locking plug having a projection mounted on the end thereof, a bolt movable transversely to the axis of the locking plug,

a spring for holding the bolt in locking position, and a lever carried by the bolt and adapted to be turned into two positions, in one of which the end of the lever passes over said projection and in the other of which it is in position to engage said projection and prevent the bolt from being withdrawn from locking position when the projection is in normal locked position.

5. In a lock, the combination of an oscillatable locking plug having a projection located at the end thereof, a bolt movable transversely to the direction of the axis of the plug and having a locking end provided with a flat surface and a curved surface, a lever pivoted on the bolt and having an end projecting toward said projection, the opposite end of the lever having a flat surface adapted to project below the corresponding flat surface on the bolt, and a shackle having a flat surface for engaging the flat surface on the bolt and adapted to engage the corresponding flat surface on the lever to swing the first named end of the lever into a position to engage said projection.

6. In a lock, the combination of an oscillatable locking plug having a projection extending from the end and constituting a non-central chord, a locking bolt movable transversely to the axis of the plug, and a lever pivoted on said bolt and extending toward the edge of said projection, which edge is provided with a notch at the top over which the end of the lever projects when the opposite end of the lever is forced down, whereby when the lock is locked and the bolt moved outwardly, said lever will be turned thereby to bring the first named end below said notch where it constitutes a positive means for preventing the bolt from being withdrawn, said projection being so located as to turn out of the way of said lever when the plug is turned to unlock the lock.

7. In a lock, the combination with an oscillatable locking plug having a projection at its end extending outwardly therefrom, a locking bolt, said projection constituting means for moving the bolt to unlocked position, said bolt having a flat lower surface at the locking end and a convex upper surface, a lever mounted on said bolt and having corresponding flat and convex surfaces, the convex surface of the lever projecting slightly beyond the convex surface of the bolt, and a shackle having a locking notch comprising a flat surface adapted to engage the two flat surfaces.

8. In a padlock, the combination with an oscillatable locking plug having a projection at its end extending outwardly therefrom, a locking bolt, said projection constituting means for moving the bolt to unlocked position, said bolt having a flat lower surface at the locking end and a convex upper surface, a lever mounted in said bolt and hav-

ing corresponding flat and convex surfaces, the convex surface of the lever projecting slightly beyond the convex surface of the bolt, a shackle having a locking notch comprising a flat surface adapted to engage the two flat surfaces, said surfaces being so related to each other that when the shackle is forced inwardly its end will first engage the slightly projecting convex surfaces on the lever and swing the inner end of the latter upwardly toward the bottom of the bolt so as to be in position to pass over said projection and the complete insertion of the shackle will cause the bolt and lever to move backwardly, still in the same relative position, until the shackle is moved in far enough to allow the flat surfaces on the bolt and lever to pass over the flat surface on the shackle, and a spring for forcing the shackle back after it has reached locking position, whereby the flat surface on the shackle will then engage the now downwardly projecting flat surface on the lever and force the inner end of the lever down into a position registering with said projection.

In testimony whereof I have hereunto affixed my signature.

KARL WALZ.

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