March 5, 1935. C. LEDIN 1,993,408

PADLOCK

Filed May 4, 1929

Fig. 2

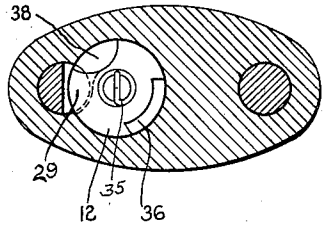


Fig. 4

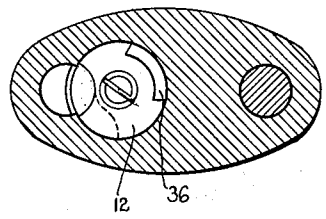


Fig. 1

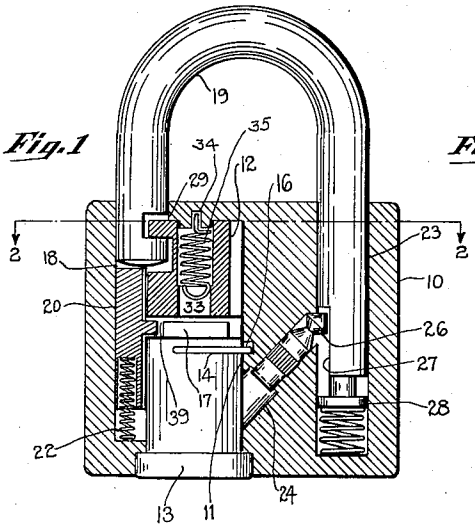


Fig 3

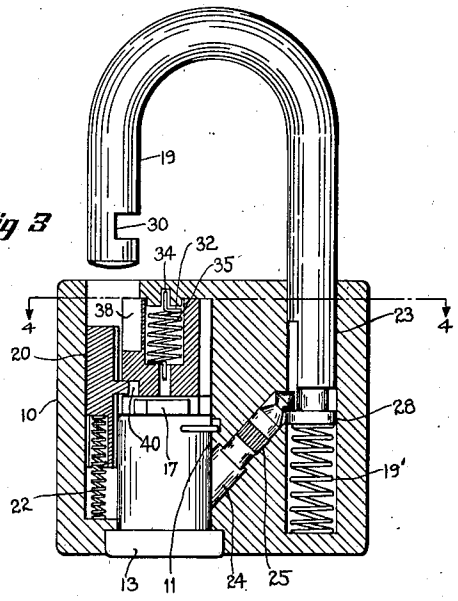


Fig. 5

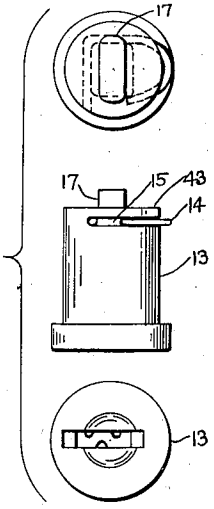


Fig. 8

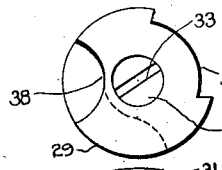


Fig. 7

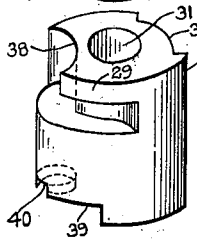


Fig. 6

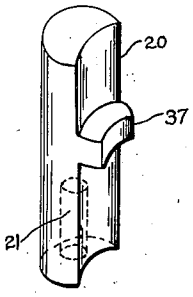
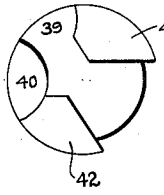


Fig. 9



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PADLOCK

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Application May 4, 1929, Serial No. 360,495

6 Claims. (Cl. 70—108)

This invention relates to padlocks, more especially padlocks of the type having a die cast casing and a cylinder plug adapted to control the internal locking mechanism.

One of the objects of this invention is to so design the padlock that the casing can be die cast completely in its finished form, without the necessity of any subsequent machining, drilling, or fabricating of any sort. Another object of the invention is to so design the locking mechanism that it may be inserted into the padlock casing with a minimum of effort and without the use of complicated assembly tools. A further object of the invention is to design a shackle retainer which is rendered inaccessible when the padlock mechanism is assembled.

For a more detailed and accurate description of my invention, I will refer to the drawing, wherein Fig. 1 is a section of my padlock showing the internal locking mechanism and the shackle retainer with the shackle in locked position. Fig. 2 is a section of Fig. 1 along the line 2—2 showing the relation of the padlock shackle to the locking bolt. Fig. 3 is a view similar to Fig. 1 showing the shackle in its released position. Fig. 4 is a view similar to Fig. 2 but along line 4—4 of Fig. 3. Fig. 5 is an end, side, and front view of the cylinder plug. Fig. 6 is a perspective view of my bolt controlling plunger. Fig. 7 is a perspective view of my locking bolt. Figs. 8 and 9 are respectively top and bottom mechanical views of the locking bolt.

Referring more particularly to the drawing, it will be observed that my padlock casing is equipped with a bore 11 which is adapted to contain a rotary shackle locking bolt 12 and the cylinder plug 13. The cylinder plug 13 is of the usual sliding tumbler type, but may be of any other desirable type, such as a warded plug. In the particular modification, this cylinder plug 13 is equipped with a wire retaining member 14 which is adapted to rest in a groove 15 of the plug. This retaining member 14 is adapted to spring into a slot 16 in the plug bore 11 to retain the plug within the bore after it has been inserted to its full extent. The plug is further equipped with a cam 17 which is adapted to actuate the rotary shackle bolt 12 in a manner to be described presently.

Leading into the plug bore 11 is a second bore 18 which is adapted to contain the nose of the padlock shackle 19 and the bolt controlling plunger 20. This bolt controlling plunger 20 is drilled at the point 21 for the accommodation of a spring 22 which is normally adapted to urge the plunger in an upward direction.

The padlock casing has still a third bore 23 which is adapted to contain the long leg of the padlock shackle 19. In order to retain the shackle within the padlock casing, I have equipped the casing with a communicating bore 24 which lies angularly between the two bores 11 and 23. Resting in this bore is a retaining bolt 25 equipped with an angular head 26 which is adapted to cooperate with a cut-away portion 27 of the shackle 19. The head of the bolt 26 is angular with respect to the bolt, so that it may rest in a substantially horizontal position and present a square surface to the protruding portion 28 of the shackle 19. It will be readily seen that when the padlock shackle is released at its nose, the shackle ejecting spring 19' will normally urge the same upward to the position of Fig. 3, so that the head 26 of the retainer bolt 25 will contact with the portion 28 to maintain the shackle within the casing.

For locking the shackle 19 within the casing, I employ a rotary locking bolt 12 shown more particularly in Figs. 7, 8 and 9. This rotary bolt is equipped with a locking nose 29 adapted to enter the cut-away portion 30 of the nose of the shackle. This bolt is drilled out to form a bore 31, this bore 31 cooperating with the upstanding lug 32 of the plug bore 11 to provide a bearing surface for the rotation of the bolt. The bottom of this bolt bore 31 is equipped with a slot 33 and the lug portion 32 is equipped with a similar slot 34. A spring 35 has its two ends resting respectively in these two slots 33, 34 in the lug and the bolt, and as will be readily seen, will be adapted to urge the bolt into a locking position when suitably compressed. The bolt 12 is further equipped with a cut-away portion 36 which is adapted to permit assembly of the bolt by avoiding an obstruction 37, on the bolt controlling plunger 20 whose utility will be explained later.

In order to liberate the padlock shackle 19, the bolt 12 is cut away at the point 38. It will be readily understood that when this cut-away portion is brought opposite the cut-away section 30 of the shackle, that that shackle will be released and be permitted to spring upward. In its operation the bolt will be controlled by the plunger 20 which has the outstanding lug 37 cooperating with the cut-out portions 39 and 40 of the bolt 12. When the bolt is in the locked position of Fig. 1 this outstanding portion 37 will be spring pressed against the section 39. When the bolt is rotated from the position of Fig. 1 to

the position of Fig. 2, the cut-out portion 40 will be brought opposite the lug 37 and that lug will spring upward into this section 40 to maintain the bolt in the position of Fig. 2 against the force of the spring 35.

In order to actuate the bolt 12, I provide the same with two upstanding lugs 41 and 42. These lugs are actuable by the cam 17 of the plug in order that the bolt may be rotated from a locking to an unlocking position. The configuration of these portions 41 and 42 is such however, that a lost motion is present between the plug and bolt and permits the plug to be returned to its locking position while the bolt is left in the unlocking position of Fig. 3. Moreover, by cutting away the plug for the upstanding portions 41 and 42, I am able to permit the bolt 12 to have a bearing on the top surface 43 of the plug 13. In this way, the upstanding lug 32 and the top portion 43 of the plug are adapted to act as bearings for the rotary locking bolt 12.

The operation of my invention is as follows: When the key is inserted into the plug 11, it rotates the same and by means of the cam 17 cooperating with the lugs 41 and 42, rotates the bolt 12 from the initial position of Fig. 1, wherein the nose 29 cooperates with the cut-away portion of the shackle 30, to the releasing position of Fig. 3. The shackle 19 will be sprung upwardly by its ejecting spring 19' but will be limited by the retaining member 25. The bolt controlling plunger 20 will also be projected by the spring 22 so that its lug 37 enters the cut-away portion 40 of the bolt. This lug 37, by cooperating with this cut-away portion 40 will maintain the bolt in an unlocking position while the plug is rotated back to its initial locked position, this backward rotation being possible on account of the lost motion existing between the cam and the lugs 41 and 42. When it is desired to lock the shackle, it is merely necessary to depress the same against the resistance of its spring 19'. The nose of the shackle when brought against the plunger 20, will act to depress the same and to move the lug 37 out of the cut-out portion 40 of the bolt. This will permit the bolt to rotate in a locking direction and bring its nose 29 into the cut-away portion 30 of the shackle to hold the same in its locked position.

While I have shown one modification of my padlock, and have described the same as being of die cast metal, it should be understood that I do not inted to be limited to the same, the scope of my invention being expressed in the following claims.

1. In a padlock, a casing having a shackle bore and a plug bore, said casing having an inclined passage leading from said plug bore to said shackle bore, a fixed retaining bolt adapted to be inserted into said passage from the plug bore, said bolt having a portion thereof projecting into the shackle bore, and a key plug insertable into said plug bore to render said bolt inaccessible.

2. In a padlock, a shackle, a fixed shackle retainer bolt mounted angularly but other than perpendicularly relatively to said shackle, a retaining head on said bolt cooperative with a retaining portion on the shackle, said head having a portion inclined to the axis of the retainer bolt to engage the retaining portion of the shackle, when said shackle is released for outward movement.

3. In a padlock, a casing having a combination shackle and plug bore, a key plug in said bore, a rotary shackle locking bolt super-imposed on said plug and resting thereon, whereby said bolt is retained and supported in said bore, said bolt being concentric with said plug and rotatable into shackle locking position, said bolt having a bore, a spring mounted in said bore and connected with the padlock casing to urge the bolt into locking position, and a lost motion connection between said bolt and plug for rotating said bolt against the action of said spring.

4. In a padlock, a casing having a combination shackle and plug bore, a key plug freely mounted in said bore, a rotary shackle locking bolt mounted in said bore and resting on the end of said plug whereby to be retained and supported in said bore, said bolt having a vertical bore, a spring in said bore fixed at one end to the upper surface of the plug bore and at the other end to the rotary bolt, said spring being adapted to urge said bolt into shackle locking position, and a connection between said bolt and plug for rotating said bolt against the action of said spring.

5. In a padlock having a combination bolt and plug bore, an abutment at the closed end of said bore, a rotary bolt having a bearing mounting on said abutment, a spring connected between said abutment and bolt for urging said bolt into locked position, a key plug insertible into said bore after said bolt and bearing against the end surface of said bolt to maintain the same in operative position relatively to the abutment and bore, operative means of connection between said bolt and plug whereby to operate said bolt, and means for retaining said plug in the padlock whereby to maintain the recited elements in operative association.

6. In a padlock having a combination bolt and plug bore, an abutment at the closed end of said bore, a rotary bolt having a bearing mounting on said abutment, said bolt having a bore with a groove in its end surface, a groove in said abutment, and a spiral spring having its opposite end portions resting in said grooves, for urging said bolt into a locking position.

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