ABSTRACT OF THE DISCLOSURE

For providing means by which the pin tumbler cylinder mechanism can be removed and changed in a laminated padlock without assembling the entire lock or case, and without removing the case rivets, the lowermost plate or laminating of the padlock body or case is arranged with a swing gate tab housing which normally holds one end portion of a swing gate flatly against said lowermost plate to retain the tumbler pin cylinder in its proper position within the lock body, the other end portion of the swing gate being normally engaged by a retainer screw which is accessible for engagement by a tool inserted into the short shackle leg opening in the padlock body only when the shackle is unlocked and swung clear of its body opening. Thus, the swing gate may be pivoted in one tab within the housing in the bottom plate, free of the lower end of the pin tumbler cylinder and the latter can be slid out of the lock body for replacement. When a new cylinder is inserted the procedure is reversed and the swing gate is secured in position against the case bottom plate to securely retain the cylinder within the body or case in functioning position.

BACKGROUND OF THE INVENTION

Field of the invention

By forming a laminated padlock with a removable key-actuated cylinder mechanism the owner of the padlock or a blacksmith may, for security reasons, change the key, remove the cylinder mechanism to repair the same, convert one or a group of padslocks to a "keyed alike" or "master keyed" setup, replace the cylinder in the laminated padlock with another cylinder providing for a key change, or perform work on the laminated padlock which involves a change or repair of the cylinder mechanism, without otherwise disturbing or disassembling the other components of the padlock.

The users of padlocks have long been confronted with situations wherein a disgruntled employee or an unauthorized person obtains control of the key to a padlock or a master key for a series of padlocks, or has a duplicate key made surreptitiously, so that he is then able, at his convenience, to open the padlock or padlocks unobserved by the owner, to gain entry and steal the property in the building, compartment, or cabinet controlled by the padlock. In other instances, it may be desirable that a padlock in question be controlled by the same key as that used for the entrance door of an office, factory, or other building, in which case it is necessary to remove the present cylinder from the padlock and insert into the padlock body a new cylinder of a key change such that one key will operate the desired locks. In other instances, for security purposes, a padlock owner may wish to change the cylinder in one or more of his padlocks to prevent outsiders from gaining entry into the compartment controlled by the lock. Again, there may be a situation where, with a group of a large number of padlocks which are keyed differently, the users may elect to have such series of padlocks keyed alike in order that all cylinders thereof will have the same key change and be operated by the same key. In all of the contingencies mentioned it is necessary to remove from the padlock or padlocks the cylinder or cylinders and to replace them with such cylinders as will accomplish the desired purposes. All of such contingencies are conveniently provided for by the present improved laminated padlock with removable cylinder mechanism.

Description of the prior art

Padlock manufacturers have been developing structures to accomplish the aforementioned objectives by incorporating in padlocks what are known as removable core or cylinder mechanisms. This is possible only with respect to padlocks wherein the body or case portions are die cast or of extruded metal. Mention might be made of known patents for the above stated purposes applicable only to die cast or extruded padlock bodies, and these include patents to Torrone et al. No. 3,254,516, Dyson et al. No. 2,489,484, Patiquin No. 3,172,279, Dies No. 3,187,525, among others. Applicant is not aware of any prior patents wherein a laminated padlock is formed with a removable cylinder mechanism because it would normally require the removal of all of the plate-connecting rivets in a laminated padlock to disassemble the body or case, or the cutting off of the rivet heads to permit removal of the bottom plate of the padlock body so as to remove the cylinder mechanism. These procedures require difficult disassembly operations and ultimately the lock body will fall apart and cannot be reassembled.

SUMMARY OF THE INVENTION

Pursuant to the present invention of the cylinder mechanism may be removed and changed in the laminated padlock without disassembling the entire lock or case, and the structure of the present invention is such that it is merely necessary to unlock the padlock's shackle and turn it to expose the case opening for the short shackle leg whereby a tool may be inserted thereinto to engage and release a screw which normally retains in position over the bottom plate of the padlock body a swing gate, which is then permitted to be pivotally swung and removed, providing access for the removal of the pin tumbler cylinder.

A more specific object of the invention is to provide in a laminated padlock body a swing gate engaged with the lowermost plate of the body by means of a tab removably inserted into a housing or recess therefor in the bottom plate of the case, with the swing gate being normally retained in its cylinder-holding position by a releasable retainer screw.

A still further object of the invention is to provide a laminated padlock with a removable cylinder mechanism which does not affect the appearance or functioning of the padlock, which is relatively inexpensive, is simple to manipulate, which greatly enhances the safety features and convenience of the laminated padlock to which it is applied, and which is otherwise particularly well suited for the purposes described.

BRIEF DESCRIPTION OF THE DRAWING

In the accompanying drawing, wherein the same reference characters designate the same or similar parts in all of the views:

FIG. 1 is a front view of a laminated padlock with the shackle in its locked position and with portions of the body or case broken away and in section to show structural details;

FIG. 2 is a sectional view taken approximately along the line 2—2 of FIG. 1;
FIG. 3 is a side view of the detachable swing gate for the bottom of the padlock body, removed from the body, and showing associated therewith a retainer screw;

FIG. 4 is a fragmentary side view of the lower end portion of a laminated padlock body after the retainer screw has been released from the swing gate and the latter has been pivoted toward its removed, tumbler cylinder releasing position; and

FIG. 5 is a fragmentary view of the lower end of a laminated padlock case showing the swing gate completely detached and the partial removal of the pin tumbler cylinder.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now more particularly to the drawing, it will appear that the body or case of a padlock is indicated generally by the numeral 8, and the same is formed of a plurality of superimposed laminations or plates 9 held together by rivets 10. The padlock includes the usual inverted U-shaped reciprocatable shackle 11 which is shown in FIG. 1 with its short leg 12 in locked condition within the shackle recess 13 therefor. Within the padlock body 8, housed within a cavity therefor, there is a removable key-actuated pin tumbler cylinder assembly 14 having a key-receiving slot 15 therein.

The lowermost lamination 9' of the padlock body 8 is formed, adjacent the cylinder cavity therein, with an outwardly offset flange 16 which provides thereabove a housing or recess for the tab end portion 17 of a plate-like swing gate 18. The intermediate portion of the latter is formed with a circular opening 19 therein to afford key access to the key slot 15 in the cylinder 14 when the swing gate is in its normal operative position shown in FIG. 1. However, the circular opening is shouldered and of a size that the pin cylinder cannot slip therethrough but is retained by the swing gate in the position illustrated. An end face portion of the swing gate 18 opposite its tab 17 is provided with an upwardly internally threaded recessed boss 20. When the swing gate is applied to the lowermost plate or lamination 9' of the case body the swing gate tab 17 extends within the housing formed by the flange 16 and the swing gate is held to the padlock body in its cylinder-retaining position by means of a headed screw 21 which can be applied through the body opening for the shackle leg 12 when the shackle is released with the shackle leg 12 swung away from its body opening. The screw can be inserted downwardly into the shackle leg opening and applied to the screw 21 to thread its lower shank portion into the swing gate boss 20 so that the condition of FIG. 1 attains after the shackle 11 has been locked in position. In this condition access to and removal of the swing gate 18 is impossible.

However, should it be desired to obtain access to the pin tumbler cylinder 14 for the purpose of removing it from the case body for replacement or repairs, it is merely necessary to apply a key to the cylinder 14 and release the shackle, following which the short leg of the shackle is swung away from its body opening. Then, upon applying a tool through the body case opening to the screw 21, the screw may be unthreaded relative to the swing gate boss 20 and removed therefrom. Then, the swing gate may be swung downwardly in the manner shown in FIG. 4, with its tab 17 pivoting within the housing above the lamination flange 16 and the swing gate may be completely detached therefrom as shown in FIG. 5. Thereafter it is a simple matter to slide the pin tumbler cylinder 14 through the opening in the lower portion of the padlock body 8 and completely remove it from the padlock body for inspection, repairs or replacement. The assembly into the padlock body of the repaired or substituted cylinder is accomplished in the reverse manner, and after the swing gate 18 is replaced and secured in holding position, as shown in FIG. 1, the padlock is fully assembled and operative and may include a changed cylinder which will require a different key for its operation.

From the foregoing description it will be apparent that the invention, applicable to a laminated padlock, provides an arrangement whereby the pin tumbler cylinder mechanism may be easily removed from the laminated padlock body for change or repairs. This is accomplished without in any way mutilating the padlock body and does not require the removal of rivets or other permanent components. With the arrangement disclosed, the owner of the padlock or a locksmith may for any reason easily remove the cylinder mechanism and replace it by another cylinder having a different key so that one or a group of padlocks may be provided with a "master key" setup. Also, in the event that an unauthorized person may be in possession of the key to the padlock under consideration, the cylinder therein can be changed to be controlled by another key to prevent unauthorized access to the compartment or enclosure controlled by the padlock.

The laminated padlock with removable cylinder mechanism does not affect the operation or appearance of the padlock, is easily associated with the laminated body of the padlock, is relatively inexpensive, and is well adapted for the purposes described.

What I claim is:

1. In a shackle-equipped padlock having a body formed of a plurality of superimposed secured together laminations, the body having cavities therein which open through end portions of the body, a pin tumbler cylinder removably housed within one of the body cavities, a retainer gate applied to an end lamination of the body and which, in its operative position, restricts the end of the body cavity which houses the cylinder to retain the cylinder in place, and means for releasably securing the gate to said end lamination.

2. The shackle-equipped padlock of claim 1 wherein the last-mentioned means includes a shaft disengageable tab and housing means between an inner end portion of the retainer gate and an end lamination of the body.

3. The shackle-equipped padlock of claim 1 wherein the last-mentioned means include a retainer screw housed within another of the body cavities releasably engaging the outer end portion of the retainer gate.

4. The shackle-equipped padlock of claim 1 wherein the body cavities include a cavity for the pin tumbler cylinder which opens through the bottom end lamination of the body and a shackle leg cavity which opens through the top end lamination of the body.

5. The shackle-equipped padlock of claim 4 wherein the means for releasably securing the gate to said end lamination includes detachable tab and housing means between an inner end portion of the retainer gate and the bottom end lamination of the body together with a retainer screw housed within the shackle leg cavity releasably engaging the outer end portion of the retainer gate, tool access to the retainer screw being afforded when the shackle is released with its leg removed from and swung clear of said shackle leg cavity.

6. The shackle-equipped padlock of claim 1 wherein the outer end portion of the retainer gate is formed with an internally threaded socket and the means for releasably securing the gate to said end lamination includes a retainer screw housed within another of the body cavities with its shank in threaded engagement with said gate socket.

7. A laminated padlock body having shackle leg openings therein and a cavity wherein is slidably, removably housed a pin tumbler cylinder, said cavity opening through the bottom lamination of the body, the improvement which comprises: a swing gate normally underlying the bottom plate of the body to restrict said cavity opening and to retain the cylinder in position within the body, and means within a body shackle leg opening and in releasable engagement with said swing gate.
8. The laminated padlock body recited in claim 7 wherein, when the means in engagement with said swing gate is released, the swing gate may be removed from the bottom lamination to free said cavity opening and permit removal of the pin tumblers.

9. The laminated padlock body recited in claim 7 wherein the swing gate is formed at one end with a tab releasably engaging a housing therefor in the bottom plate of the body and the means within a body shackle leg opening in releasably engagement with said swing gate is a screw operable by a tool when said shackle leg opening is free of a shackle leg.