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J. SLAN

3,169,788

LOCK

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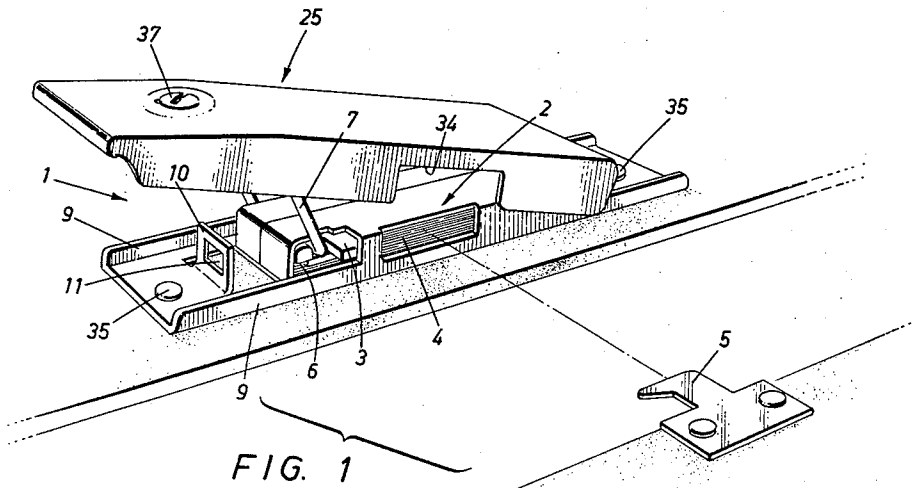


FIG. 1

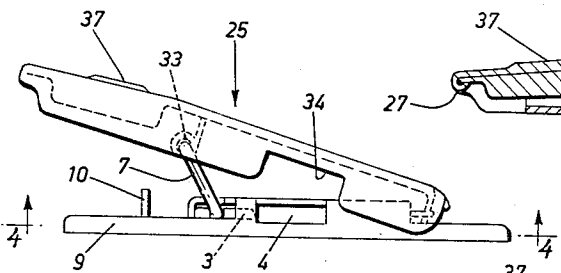


FIG. 2

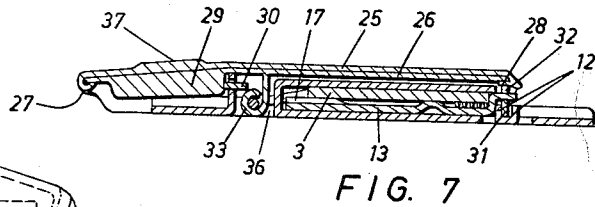


FIG. 3

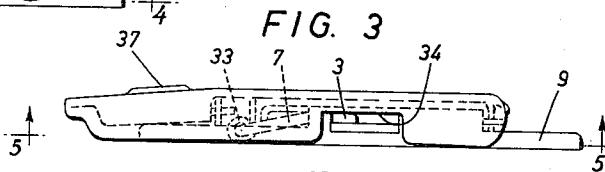


FIG. 4

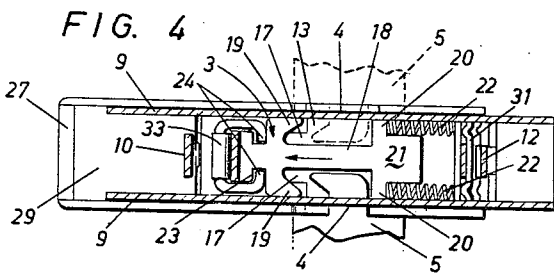


FIG. 5

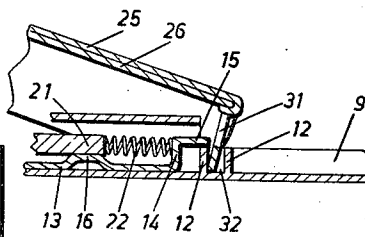


FIG. 6

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This invention relates to improvements in locks and more particularly locks of the type providing a lever controlled main locking action and a secondary, usually key operated, locking action to maintain the lever in the locked position. While it will be appreciated that locks according to the invention will have wide application they are particularly suitable for use with luggage where the main locking action is utilized to lock the luggage case sections together in the closed position and a key locking action is utilized to prevent unauthorized opening of the luggage piece.

The principal object of the invention is to provide a simple, efficient, entirely self-contained lock which can be simply and easily mounted on one of the parts to be closed for cooperation with a locking keeper or tongue mounted on the other part to be closed.

Another important object is to provide a lock of the aforesaid type which will entirely eliminate the need for rivets or other similar fastenings. In this connection it is an object to make a simple, strong and efficient lock entirely from interlocking stampings.

Again it is an important object to provide a lock which will accept the cooperating locking tongue or keeper from opposite sides so that the same simple locking structure will serve as both a left and right hand lock where two locks are employed, as for example, in a luggage piece.

Again it is an important object to not only enable the lock to be made of simple inexpensive stampings but to enable such stampings to be very readily assembled to enhance manufacture and facilitate mounting on the part to which the lock is to be attached.

Still another object is to provide a lock which is not only entirely self-contained but which is very compact and neat in appearance.

Still another important object is to provide a lock which will have a positive snap action and will securely interlock with its cooperating tongue or keeper to bar any accidental separation of the locked parts, such as the opposing sections of a luggage piece.

The principal feature of the invention resides in forming one stamping into a housing to receive and contain a spring actuated sliding catch, and providing a lever member for operating the sliding catch against its operating spring means, and providing a novel interconnecting means between the housing and lever for effecting hinging of the latter relative to the housing without requiring any hinge pin or other conventional hinging means, the lever being connected to the sliding catch by means of a linkage whereby hinging of the lever relative to the housing effects movement of the catch between the locked and unlocked positions.

In this connection according to the invention the lever is provided with a downturned slotted flange at one end and the housing is provided with spaced stops to receive such flange, and a spring operated floating plate mounted in the housing is formed with a projection arranged to project through the slot of the lever flange and extend across above the housing stops to lock the lever to the housing and to provide the aforementioned hinge connection.

Further according to the invention the spring means acting on the sliding catch is utilized to also act on the floating plate to resiliently urge the projection thereof through the lever flange slot, the arrangement being such

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that the lever can be quickly hingedly attached to or removed from the housing on assembly or disassembly by operating the floating plate against the action of the spring means until the lock is mounted in position at which time access to the floating plate can readily be barred.

Another important feature resides in utilizing the floating plate as a guide for the sliding catch.

Still another important feature resides in forming the lock housing as a symmetrical structure to provide access openings on both sides thereof to receive the cooperating tongue or keeper either from the left or right, and also in forming the sliding catch as a symmetrical structure whereby it coacts with the tongue or keeper introduced either from the right or left.

Again it is an important feature to provide a fixed catch integral with the housing and mounting a key operated bar or bolt on the lever whereby with the lever swung to the locked position to slide the sliding catch to the locked position to engage the keeper, introduced either from the left or right, the key operated bolt can be actuated to engage the fixed catch to maintain the parts in the locked position against unauthorized opening.

Again it is a feature to form the lever as a channel to swing down from an inclined unlocked position to a locked position substantially flush with and overlying and enclosing the housing. In this connection it is a feature to provide an overcenter action in the lever-linkage-sliding catch arrangement whereby the lever moves between the locked and unlocked positions with a snap action.

These and other objects and features will become apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a perspective view of a lock constructed in accordance with the invention and showing it with the locking lever in the raised or unlocked position ready to receive a cooperating locking tongue;

FIGURE 2 is a side elevation of the lock in FIGURE 1 with certain of the parts normally hidden by the locking lever being shown in dotted line;

FIGURE 3 is a view similar to FIGURE 2 but showing the lever in the down or locked position;

FIGURE 4 is a transverse sectional view taken on the lines 4-4 of FIGURE 2;

FIGURE 5 is a transverse sectional view taken on the lines 5-5 of FIGURE 3;

FIGURE 6 is an enlarged fragmented mid-vertical sectional view taken on the lines 6-6 of FIGURE 5; and

FIGURE 7 is a longitudinal mid-vertical sectional view of the lock when the lever is in the down or locked position.

With reference to the drawings, the lock is formed according to the invention entirely of stampings, one of the stampings comprising a longitudinal housing 1 shaped and bent to provide a chamber 2 to house a locking catch 3 while providing at opposite sides of the housing access openings 4 to receive a cooperating locking tongue 5 from either side thereof, and to provide openings 6 through which a link 7 attached to the locking catch 3 may operate.

The stamping forming the housing 1 is also shaped to provide reinforcing side flanges 9 and has struck up therefrom adjacent one end a lug 10 having a slot 11 therein adapted to form a fixed latch member as herein-after more fully described. Also struck up from the housing stamping 1 adjacent the opposite end are a pair of spaced lugs or stops 12 whose purpose will hereinafter appear.

Mounted within the chamber portion 2 of the housing 1 is a floating plate 13, as seen in FIGURES 4 and 5 and probably best seen in FIGURES 6 and 7. The plate 13 is formed adjacent one end, which may be considered the

rear of the housing, with an upstanding shoulder 14 from which projects a tongue 15 which is adapted to extend over the spaced lugs 12 of the housing as shown in FIGURE 7. The floating plate 13 is also provided with a boss 16 adjacent to the shoulder 14 as shown in FIGURE 6 and with upwardly bent wings 17 adjacent the other end as shown in FIGURE 7 and FIGURES 4 and 5. These wings 17 and boss 16 form spaced bearing supports to slidably support the locking catch 3 and elevate same to enable the over-center locking action hereinafter described to be achieved.

It will be understood that the housing 1 is symmetrical about a longitudinal centre line to receive co-operating locking tongues 5 from either side so that the lock may be either a left-hand or a right-hand lock without change. Similarly, the locking catch 3 as best seen in FIGURES 4 and 5 is formed symmetrical about a longitudinal centre line and comprises a central elongated body portion 18 provided adjacent one end with a pair of laterally extending hook portions 19 which are adapted to selectively engage with a locking tongue 5 projected into the housing through the access openings 4 from either side thereof. The catch body 18 adjacent to the end opposite the hooks 19 is provided with lateral wings 20 projecting on opposite sides of a wider central portion 21. The wings 20 define shoulders on opposite sides of the central portion 21 between which shoulders and the shoulder 14 of the floating plate 13 are arranged a pair of springs 22 guided and separated by the central portion 21 of the locking catch. The springs 22 serve two functions. They act in one direction on the locking catch 3 through the wings 20 to force the catch to the left, as seen in the drawings, to clear the hook portions 19 from the access openings 4 to allow entry of the locking tongue 5 from either side of the housing. At the same time, the reaction of the springs 22 in the opposite direction urges the floating plate 13 to the right to force the tongue 15 thereof across the top of the spaced lugs 12.

The locking catch 3 at the end opposite to the wings 20 is provided with notches 23 which are adapted to receive the ends of the link 7 which is formed as an elongated rectangular C. These ends 24 of the link 7 project through the housing openings 6 and into the notches 23 and by means of the link, the locking catch 3 can be moved from the unlocked position of FIGURE 4 clear of the housing access openings 4 against the action of the springs 22 to the locked position of FIGURE 5 in locking engagement with a locking tongue 5 introduced selectively through one of the housing access openings 4.

The means for operating the catch 3 comprises a lever generally designated at 25 which again is formed of a stamping bent to a general channel formation. A second stamping 26 is secured within the channel of the lever 25 with portions of the lever stamping 25 at the ends thereof being turned over as at 27 and 28 to hold the stamping 26. The stamping 26 is formed to provide a housing 29 in which is mounted a conventional key-operated bolt or locking bar 30 adapted to co-operate with the keeper lug 10 of the housing 1, the details of the key operation of the bolt 30 being conventional and omitted from the drawings.

The stamping 26 adjacent what may be termed the rear or hinged end of the lever 25 is turned down in a flange 31 which flange is provided with a slot 32.

As best seen in FIGURE 6, the lever 25 is assembled to the housing 1 by introducing the flange 31 between the spaced fixed lugs or stops 12 struck up from the housing. This assembly can be accomplished by pushing the tongue 15 of the floating plate 13 to the left, as shown in FIGURE 6, against the springs 22 to clear the stops 12. Upon introducing the flange 31 between the stops and releasing the tongue 15, the floating plate 13 will move to the right under action of the springs 22 to project the tongue 15 through the slot 32 in the flange 31 to lock the lever 25 to the housing while at the same time allowing a

hinging movement of the lever relative to the housing so that the lever can move from the unlocked or unlatched position of FIGURES 1 and 2 to the locked position of FIGURES 3 and 7.

The stamping 26 is also formed to provide a rolled hinged barrel 33 within which is hinged the central portion of the C-shaped link 7.

The lever 25 has the sides thereof notched as at 34 which notches register with the access openings 4 formed in the housing when the lever is swung to the latched or locked position of FIGURE 3. Otherwise, the channel form of the lever in the latched position encloses and hides the housing 1.

In operation, with the lever 25 in the inclined or unlatched position of FIGURE 1 and secured to one of the parts to be locked as for example, one section of a luggage case, by means of suitable fasteners 35 extending through suitable openings in the housing 1, the other member to be fastened, for instance, the other section of a luggage case carrying the locking tongue 5 can be brought into position to introduce the locking tongue through one of the access openings 4 in the housing 1. At this time, the springs 22 will maintain the locking catch 3 clear of the access openings 4 and will serve to hold the lever 25 in the inclined position through the link 7.

Upon introducing the locking tongue 5 into the housing 1 through one of the selected access openings 4, the lever 25 can be then forced downwardly and, through the connection between the link 7 and the locking catch 3, the locking catch will be slid to the right as seen in FIGURE 5 against the action of the springs 22 while being guided and supported by the floating plate bearing portions 16 and 17 until one of the hooks 19 interlocks with the locking tongue 5 depending on which side the locking tongue has been inserted.

As seen in FIGURES 1 and 7, the housing 1 is provided with a cut-out portion 36 to receive the hinge barrel 33 of the lever, the arrangement being such that the hinged portion of the link 7 is brought below the link ends 24 engaged in the notches 23 so that an overcentre snap-action is provided as the lever 25 moves from the inclined unlatched position of FIGURE 1 to the locked or latched position of FIGURE 7 in which the lever is substantially parallel to the housing 1. Thus, to release the lever from the locked position, a force is required to overcome the action of the springs 22 to move the link 7 past the overcentre position to the lever unlocked side thereof.

With the lever in the locked position of FIGURE 7, the locking bolt 30 may be actuated by means of a key introduced through a keyhole 37 to engage the bolt 30 with the fixed keeper 10 to prevent unauthorized opening of the lock.

It will be understood that no rivets, hinge pins or any other means providing for any difficult or complicated assembly operations are required in the lock and the lock is formed entirely of stampings with the lever and housing being quickly and easily assembled and disassembled as required, as illustrated particularly in FIGURE 6.

In this connection, it will be appreciated that the housing 1 with the lever 25 removed may be secured to the part to be fastened as by rivets 35 without difficulty since the lever otherwise would block free access to the rivets. Following mounting of the housing the lever can then be quickly secured to the housing. After assembly arrangement can be readily made to bar access to the floating plate 13 if desired by the addition of any suitable protecting member (not shown), but it will be appreciated that with the lever in the locked position the springs 22 will be sufficiently compressed that the plate 13 cannot be moved sufficiently to release the lever.

While a specific embodiment of the invention has been particularly described and illustrated, it will be understood that various modifications in the detail and arrangement of the parts may be made without departing from the spirit of the invention or scope of the appended claims.

What I claim is:

1. In a lock structure, a housing, a catch slidably mounted in said housing, a lever having a depending portion at one end formed with a slot therein, stop means formed on said housing for locating said depending portion, spring operated means carried by said housing and projecting through said slot to hold said lever end to said housing for hinging movement, and a linkage connected between said lever and sliding catch, said housing having a first opening on one side thereof and a second opening on a side opposed to said first side, said catch being substantially symmetrical about a centre line to engage and release a locking tongue introduced through one of said openings.

2. In a lock structure a housing having an opening therein adapted to receive a locking tongue, a spring operated catch slidably mounted in said housing for movement relative to said housing opening whereby said catch is adapted to lock with and release a locking tongue introduced into said opening, a lever member having at one end a depending portion formed with a slot therein, spaced stop means formed on said housing receiving said depending portion therebetween, a spring operated member carried by said housing and having a projecting portion resiliently projecting through the slot of said depending lever portion and overlying said spaced stop means whereby said projecting portion and stop means releasably secure said lever to said housing for hinging movement relative thereto, and a linkage provided between said lever member and said catch whereby hinging movement of said lever is adapted to move said catch between positions adapted to lock with and release a locking tongue introduced through said housing opening.

3. A lock structure as claimed in claim 2 in which said spring operated catch and said spring operated member are operated by the same spring means.

4. A lock structure as claimed in claim 2 in which said spring operated member comprises a floating plate slidably mounted in said housing beneath said catch and said plate is provided with raised portions forming spaced guide bearings for said catch.

5. A lock structure as claimed in claim 2 in which said housing is provided with openings on opposite sides thereof and is adapted to receive a locking tongue from either side, and said catch is symmetrical about a centre line to engage and release a locking tongue introduced through either of said openings.

6. A lock as claimed in claim 2 in which said housing has a fixed latch member projecting therefrom and provided with a slot therein, and said lever is provided with a key operated bolt to engage in the slot in said fixed latch member with said lever swung to lock said sliding latch.

7. A lock structure comprising an elongated housing having symmetrically disposed access openings on opposite sides thereof adapted to receive a locking tongue from either side and provided adjacent one end with spaced upstanding stop lugs, a floating plate mounted in said housing and having a shoulder at one end formed with a projecting tongue, adapted to project above said spaced lugs, a latch member slidably mounted in said housing to slide on said floating plate, said latch member being

formed symmetrical with respect to a longitudinal centre line to provide at opposite sides of the housing locking hook portions and spaced longitudinally therefrom shoulder means, spring means disposed between said latch member shoulder means and the shoulder of said floating plate, the arrangement being such that said spring means act to urge separation of said latch member and floating plate longitudinally of said housing to urge said plate tongue in one direction over said lugs and to urge said latch member hook portions in the opposite direction clear of said housing openings to allow entry of a locking tongue into either of said openings, a lever having a depending portion located between said lugs and having a slot therein to receive the tongue of said floating plate whereby said lever is releasably secured to said housing for hinged movement between a position inclined relative to said housing and a position substantially parallel to said housing, and a linkage between said lever and said sliding latch member, said housing having openings to receive and accommodate the movement of said linkage, said lever being in said inclined position when said latch member is in a position with its hook portions clear of said access openings to allow entry of a locking tongue, said lever on being swung to said parallel position shifting said latch member against said spring means and relative to said access openings to bring said latch member hook portions into locking engagement with a locking tongue introduced into one of said access openings and to increase the spring force urging the tongue of said floating plate across said housing lugs.

8. A lock as claimed in claim 7 in which said floating plate is provided with raised bearing portions providing sliding support for said sliding latch.

9. A lock as claimed in claim 7 in which said lever and linkage provide an overcentre snap action in moving between said lever inclined and lever parallel positions.

10. A lock as claimed in claim 7 in which said lever is of channel form and encloses said housing when moved to the parallel position.

11. A lock as claimed in claim 7 in which separate key operated locking means are provided between said housing and lever and operative when said lever has been swung to said parallel position.

12. A lock as claimed in claim 7 in which said housing is provided with a fixed keeper having a slot therein and said lever is provided with a key operated bolt adapted to be projected through said slot in said fixed housing keeper with said lever swung to said parallel position.

13. A lock as claimed in claim 7 in which said linkage comprises a generally rectangular C-shaped member pivoted intermediately of its ends to said lever, and said latch is formed with notches in the opposite sides thereof to receive the ends of said C.

14. A lock as claimed in claim 13 in which said housing is formed to overlie the ends of said C member and hold same assembled with said sliding latch.

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