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2,967,418

LOCK

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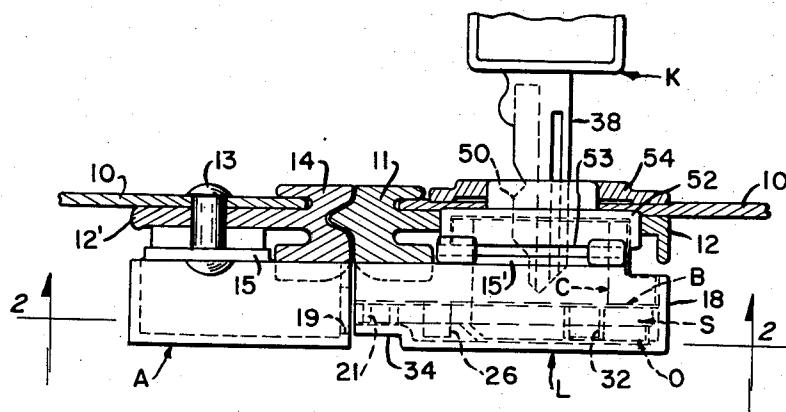


FIG. 1.

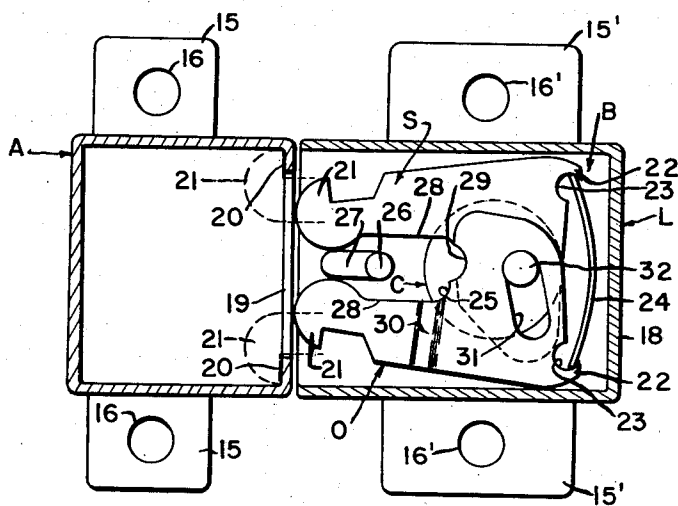


FIG. 2.

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2 Sheets-Sheet 2

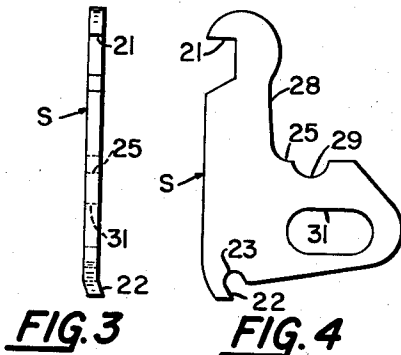
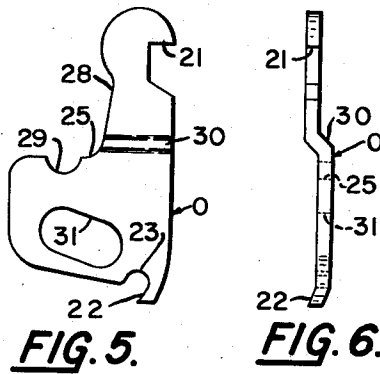
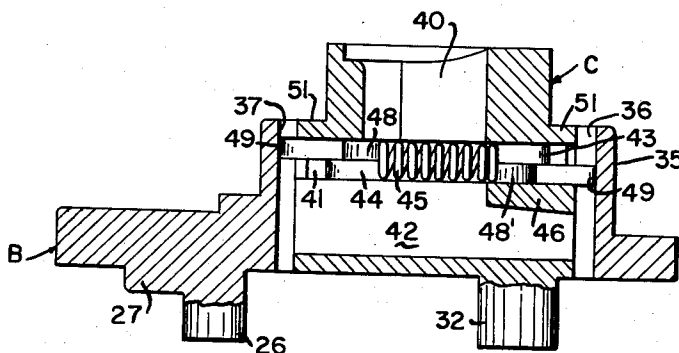


FIG. 7.

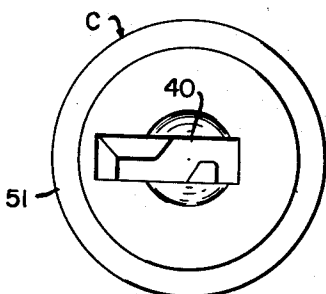


FIG. 8.

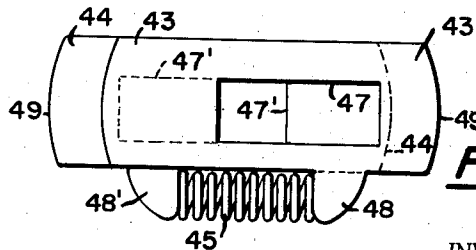


FIG. 9.

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LOCK

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7 Claims. (Cl. 70—71)

This invention relates to locks, and more particularly to key operated locks which are especially suitable for use in luggage cases and the like.

Among the objects of the present invention are to provide a novel lock; to provide such a lock which is particularly adapted to be utilized for luggage cases and the like; to provide such a lock which is relatively compact; to provide such a lock which is positive in action and will hold securely; to provide such a lock which is readily manipulated with a key; and to provide such a lock which may be readily made.

Additional objects and the novel features of this invention will become apparent from the description which follows, taken in connection with the accompanying drawings, in which:

Fig. 1 is a side elevation, on an enlarged scale, of a lock constructed in accordance with this invention installed in a luggage case, a portion of the luggage case being shown in section;

Fig. 2 is a transverse section taken along line 2—2 of Fig. 1;

Fig. 3 is a side view of a latch element forming a part of the lock of Fig. 1;

Fig. 4 is a plan view of the latch element of Fig. 3;

Fig. 5 is a plan view of another and offset latch element of the lock of Fig. 1;

Fig. 6 is a side view of the latch element of Fig. 5;

Fig. 7 is a longitudinal section, on an enlarged scale, of a lock cylinder and barrel of the lock of Fig. 1, showing also certain associated parts;

Fig. 8 is a top plan view of the lock cylinder of Fig. 7; and

Fig. 9 is a top plan view of a pair of tumblers and a coil spring which is associated therewith, shown also in Fig. 7.

A lock L constructed in accordance with this invention may, as in Fig. 1, be attached to one section of a luggage case having a wall 10 and a tongue strip 11 having a web 12 to which the lock L may be attached, as by rivets, with a catch A being attached, as by rivets 13, to a web 12' of a groove strip 14, the strips 11 and 14 being adapted to interfit around the confronting edges of the sections of the luggage case. As in Fig. 2, catch A may be provided with side flanges 15 having holes 16 for the rivets 13, while a housing 18 of the lock L may be provided with similar side flanges 15' provided with holes 16' for rivets similar to rivets 13. The catch A may be a box-shaped, open top structure, preferably formed of metal and provided in its inner wall with a slot 19 which extends for a distance less than the width of the catch, to provide front wall portions 20 at each side, adapted to be engaged by a hook 21 of a straight latch S and offset latch O of the lock, when the latter are moved to the dotted position of Fig. 2. Each of the latch elements S and O are provided with an angular ear 22 at the end opposite the hook 21, with an adjacent, preferably arcuate notch 23 for engagement by the respective opposite end of a leaf spring 24, which tends to hold the

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latch elements S and O together until forced apart by engagement of a cam surface 25 with a fixed pin 26 having a guide lug 27. During movement of the latch elements S and O towards the catch A, an inner edge 28 of each will move along fixed pin 26 and guide lug 27 until cam surfaces 25 reach pin 26, which will cause the latch elements to be spread apart until a notch 29 engages the fixed pin 26, in which position the hooks 21 will have engaged the respective front wall portions 20 of the catch A. Stated in another manner, spring 24 will prevent the latch elements S and O from moving apart, as inner edges 28 move along pin 26, until cam surfaces 25 reach pin 26, at which time the hooks 21 will have entered the slot 19, then the cam surfaces 25 will engage the fixed pin 26 to spread the hook ends of the latch element apart until the notches 29 engage the fixed pin 26. With the notches 29 thus in engagement with fixed pin 26, the latching elements S and O are held securely against disengagement from the catch A.

Each of the latch elements S and O may be similar but complementary in configuration, as shown in Figs. 3—6, the principal difference being an offset 30 in the latch element O, which permits the base portions of the latch elements to rest against each other, as in Fig. 1, and the hooks 21 to be disposed in the same plane. In addition to the parts described above, each of the latch elements may be provided with a slot 31 adapted, as in Fig. 2, to be engaged by a movable pin 32, which extends from a cylinder C, adapted to be turned by a key K of Fig. 1. Thus, when the movable pin 32 is rotated about the center of the cylinder with the cylinder being moved in a clockwise direction, as viewed in Fig. 2, or in a counter-clockwise direction as viewed from the top of the lock, i.e., the position of the key K, both of the latching elements will be moved towards the catch A and to the locked position. A reverse movement imparted to the cylinder C by the key K will move the latching elements back to the unlocked position, shown in full in Fig. 2. Housing 18 may be an open top, box-shaped structure having an open inner end, preferably formed of metal and having an offset 34 at its inner end, as in Fig. 1, to provide a guide for the movement of hooks 21 and latching elements S and O.

Fixed pin 26 and its guide lug 27 may depend from a barrel B, as in Fig. 7, the barrel B being generally rectangular to fit within the side walls of housing 18 and being provided with an upstanding cylindrical flange 35 in which cylinder C is rotatable, the flange 35 having axial slots 36 and 37 in diametrically opposed positions, for a purpose described later. Key K may be provided with a fluted stem 38, as in Fig. 1, while the cylinder C may be provided at its upper end with a vertical slot 40 having a configuration corresponding to the stem 38 of the key K, as in Fig. 8, and leading to a transverse slot 41, beneath which is a straight walled vertical slot 42. The slots 41 and 42 form together a T-slot, with the transverse slot 41 receiving a pair of tumblers 43 and 44 and a coil spring 45, while the vertical slot 42, which extends through the cylinder C except for a rib 46, receives the end of the stem 38 of the key K. The tumblers 43 and 44, as in Fig. 9, may be provided with a central slot 47 or 47' and an ear 48 or 48' at one side, between which the coil spring 45 presses in order to force the opposite end 49 of the tumblers into engagement with the slots 36 and 37 of the cylindrical flange 35 of barrel B, as shown in Fig. 7. However, when the key K is inserted through the vertical slot 40, it will pass through the slots 47 and 47' in the tumblers, while a projection 50 on the key, shown in Fig. 1, will move the tumbler 43 to a central position and the opposite edge of stem 38 will move tumbler 44 to a central position. As will be evident, with tumblers 43 and 44 in the position of Fig. 7, the

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cylinder C is locked to the barrel B and cannot rotate, thus holding the latch elements S and O in the withdrawn position of Fig. 2. However, when the key is inserted in the cylinder C and moves the tumblers 43 and 44 to a central position, the cylinder C then may be turned by the key, to rotate the movable pin 32 and move the latch elements S and O from the full to the indicated dotted position of Fig. 2. The slots 36 and 37 preferably have a width corresponding to the width of the ends 49 of tumblers 43 and 44, while the slot 41 in cylinder C is sufficiently wide to accommodate the ears 48 and 48' and coil spring 45. As will be evident, when the movable pin 32 is turned to a position 180° from the position shown in Fig. 2, the cylinder C will have been rotated through 180°, so that when the key is withdrawn from the lock, the coil spring 45 will then move the ends 49 of the tumblers into engagement with the opposite slots 37 and 36, respectively, thereby locking the cylinder in this position and concurrently locking the latching elements S and O in a position engaging the front wall portions 20 of the catch A. Of course, when the key is again inserted in the lock, it will again withdraw the tumblers 43 and 44 to a central position, after which the cylinder C may be rotated in the opposite direction, to unlock the lock, that is, to withdraw the latching elements S and O to the full position of Fig. 2.

The cylinder C may also be provided with a shoulder 51 for engagement by a cap 52, shown in Fig. 1, which may also be provided with lateral flanges 53 corresponding to flanges 15' of housing 18 and holes corresponding to the rivet holes 16'. Such holes in the lateral flanges 53 may be extruded so as to leave a ring around the edges, which may be staked to the corresponding hole 16', for assembly of the lock L prior to installation and leaving a hole for the attaching rivets. In addition, a bezel 54 may be attached to the outside of the case wall 10, as by the same rivets which attach the lock L to the case.

Housing 18 may be formed of suitable material, such as steel or aluminum, the catch A being conveniently formed of a similar material. The cylinder C and barrel B may be formed by casting a suitable rust-resistant material, such as a zinc alloy, machined and then brass plated, while the cap 52 may be formed from steel, then brass plated. The latch elements S and O, as well as the tumblers 43 and 44 and bezel 54, may be stamped from suitable material, such as brass, the key K also conveniently being made of brass. However, any other suitable materials may be used and other types of operations used in forming or shaping the various parts.

From the foregoing, it will be evident that a lock constructed in accordance with this invention fulfills to a marked degree the requirements and objects hereinbefore set forth. As will be evident, the parts are relatively few in number and relatively easy to produce, particularly on a production basis. Also, due to the fact that the cylinder is locked when the key is withdrawn after the lock is engaged, the latches will remain secure in locked position. Also, the leaf spring holds the latches together, except when forced apart by engagement of the cam surfaces with a fixed pin, so that the lock is readily engaged and disengaged.

While a specific embodiment of this invention has been illustrated and described, it will be understood that other embodiments may exist and various changes may be made therein, all without departing from the spirit and scope of this invention.

What is claimed is:

1. A lock for cooperation with a catch having spaced latch engaging portions, comprising a pair of latch elements each having a hook for engagement with the corresponding portion of said catch; a barrel having a cylindrical aperture therein and a depending fixed pin, each said latch element having a cam surface adapted to engage said fixed pin to move said latch elements apart so

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as to cause said hooks to engage said portions of said catch; a rotatable cylinder having a depending movable pin for moving said latch elements toward said catch, each said latch element having an elongated slot engaging said movable pin and said cylinder having an axial slot in the upper portion thereof having a configuration corresponding to a key and a generally T-shaped slot extending transversely and in communication with said first-named slot; a pair of tumblers movable in the head of said T-slot and each provided with a central aperture through which said key is movable and one edge of which is adapted to be engaged by said key to move said tumblers to a central position in said cylinder, said barrel aperture having an axial slot on each side thereof adapted to be engaged by the respective ends of said tumblers when projecting from said cylinder; and a spring within the head of said T-slot normally forcing an end of each tumbler into engagement with the corresponding axial slot in said barrel aperture.

2. A lock for attaching together the two halves of a luggage case or the like, comprising a catch adapted to be mounted on one half of said luggage case and having a front wall provided with a slot to provide latch engaging wall portions on either side of said slot; a pair of latch elements having complementary configurations and each provided with a hook adapted to engage said wall portions of said catch, a pin engaging edge adjacent said hook, an inclined cam edge adjacent said pin engaging edge and a notch adjacent said cam edge, each said latch element also being provided with a slot for engaging a movable pin and positioned so that movement of said movable pin will move said latch elements toward and away from said catch, and each said latch element having at a corner opposite said hook an angularly extending ear and an arcuate notch; a housing for said latch elements having an offset base portion and adapted to be mounted on the other half of said luggage case; a barrel within said housing and provided with a depending fixed pin adapted to be engaged by each said pin engaging edge, cam edge and pin notch, said latch elements being generally flat and the hook of one latch element being offset so that said latch elements may lie one on top of the other between said barrel and the base portion of said housing with said hooks lying in substantially the same plane; a movable pin engaging said latch element slots; and a leaf spring engaging the respective notches adjacent said ears of said latch elements, said leaf spring being adapted to hold said latch elements together until moved apart by engagement of said cam surfaces with said fixed pin.

3. In a lock for cooperation with a catch having spaced latch engaging portions, including a pair of latch elements, each having a hook for engagement with the corresponding portion of said catch, the improvement comprising a fixed pin; a cam surface on each said latch element and engageable with said pin for moving said latch elements laterally apart as said latch elements are moved toward said catch; a notch adjacent said cam surface on each said latch element for engaging said pin when said latch elements have been moved toward said catch and moved laterally by said cam surface into engagement with said catch; a rotatable pin for moving said latch elements toward and away from said catch; and an elongated slot in each latch element engageable simultaneously by said rotatable pin.

4. A lock for cooperation with a catch having spaced latch engaging portions, comprising a pair of latch elements each having a hook at one end for engagement with the corresponding portion of said catch and a base at the opposite end, said latch elements having facing edges provided with a cam surface for moving said latch elements laterally apart so as to cause said hooks to engage said portions of said catch and each said base being provided with an outer corner having an angular ear and an arcuate notch; a fixed pin engageable by said

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cam surfaces simultaneously; means for moving said latch elements toward said catch and thereby causing said latch elements to be moved laterally apart; and a leaf spring whose opposite ends engage the arcuate notch in the base of the respective latch element and urge said bases apart.

5. A lock for cooperation with a catch having spaced latch engaging portions, comprising a pair of generally flat latch elements each having a hook at one end for engagement with the corresponding portion of said catch 10 and at the opposite end a base, each said latch element having a cam surface on the edge facing the opposite latch element for moving said latch elements laterally apart so as to cause said hooks to engage said portions of said catch, the base of one latch element overlying 15 the base of the other latch element and the hook of one latch element being offset so that said hooks will lie in the same plane; a fixed pin engageable simultaneously by said cam surfaces; and means engageable with the base

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of each latch element simultaneously for moving said latch elements toward said catch.

6. A lock as defined in claim 5, wherein said means for moving said latch elements toward said catch includes a movable pin; and the base of each latch element is provided with a slot engaged by said movable pin.

7. A lock as defined in claim 6, wherein said movable pin is mounted on a rotatable cylinder operable by a key.

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