Jan. 7, 1958 D. L. LUKENS 2,818,956

COIN CONTROLLED LOCK

Original Filed March 23, 1953 3 Sheets-Sheet 1

FIG. 1

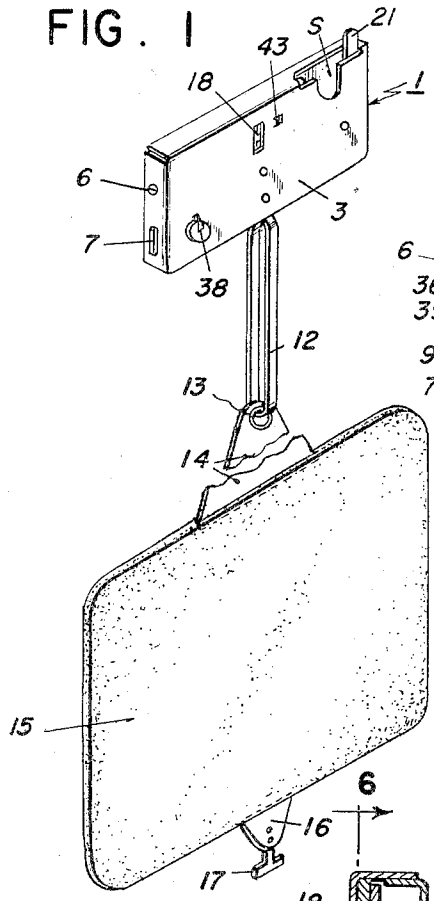


FIG. 2

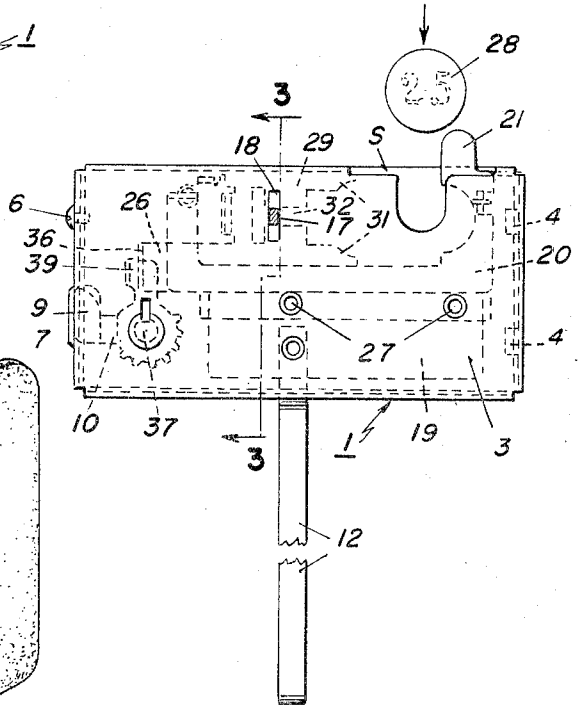


FIG. 3

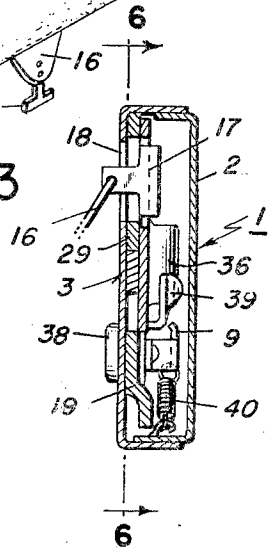
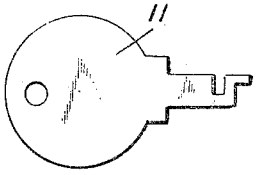


FIG. 4



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FIG. 5

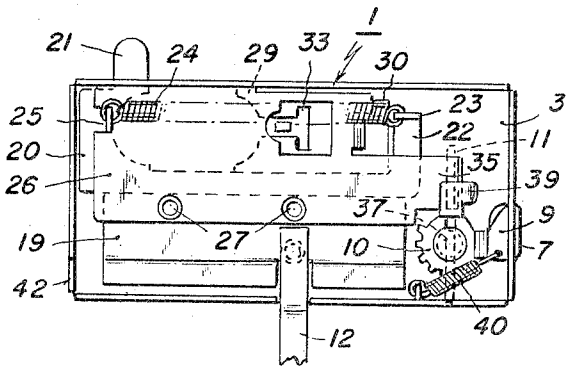


FIG. 6

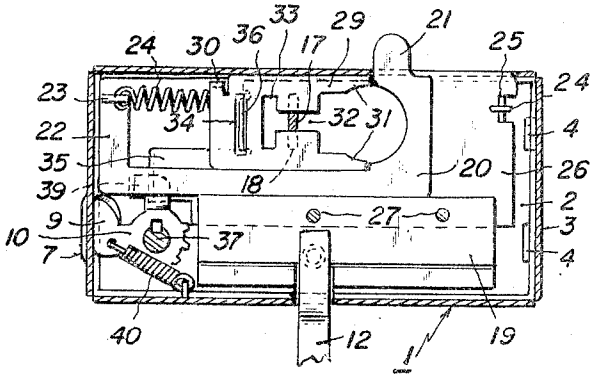


FIG. 8

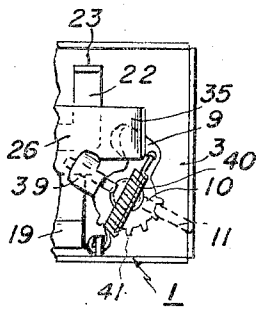
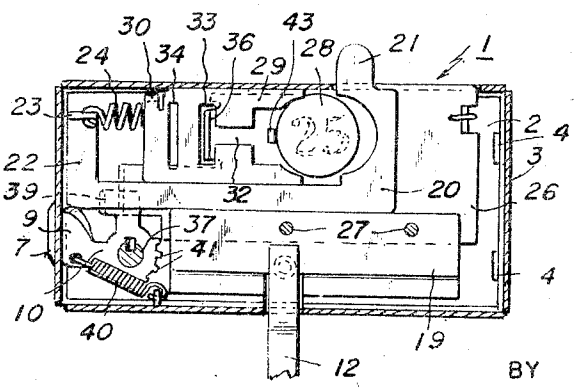


FIG. 7



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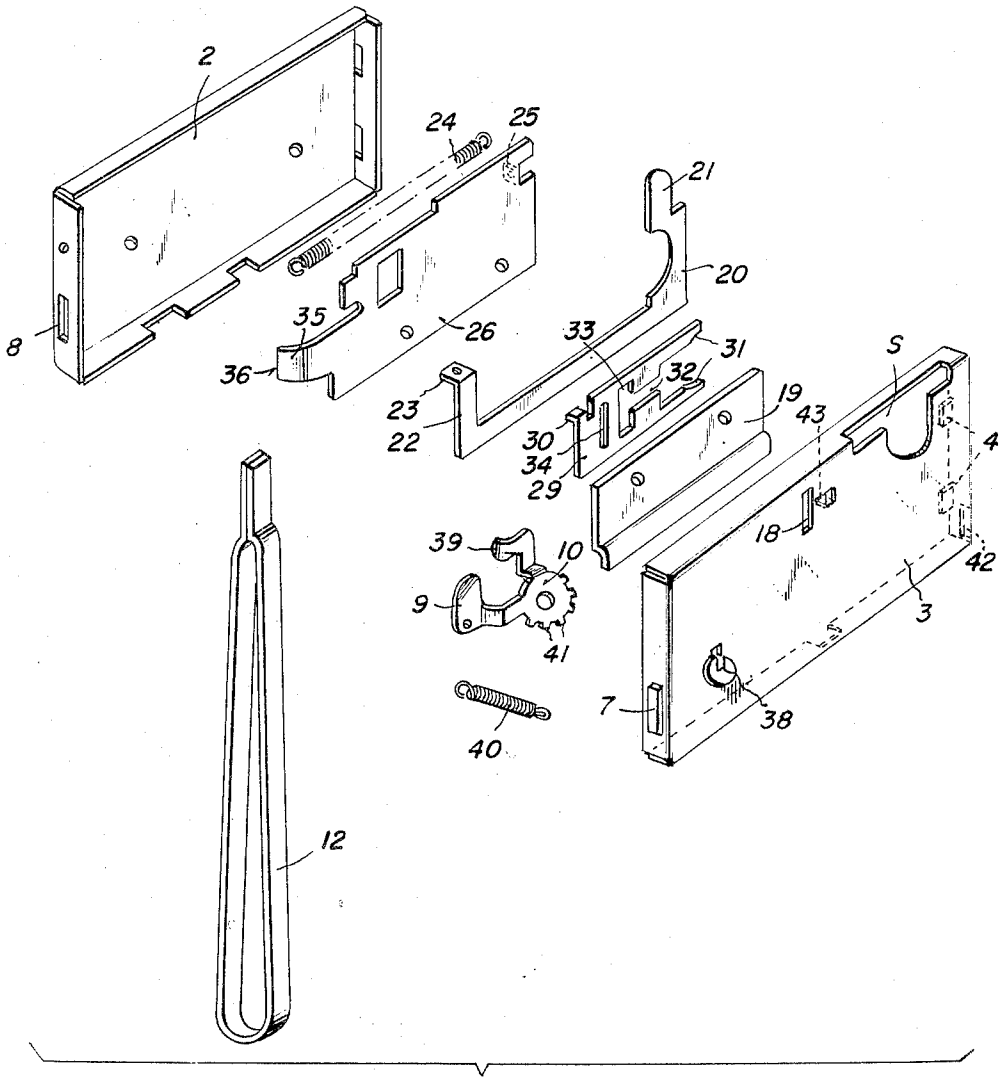


FIG. 9

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COIN CONTROLLED LOCK

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Original application March 23, 1953, Serial No. 344,151, now Patent No. 2,715,434, dated August 16, 1955. Divided and this application December 30, 1953, Serial No. 401,255

1 Claim. (Cl. 194—78)

The present application is a division of my copending application Serial No. 344,151, filed March 23, 1953, now Patent No. 2,715,434, disclosing and claiming a cushion seat attachment for stadium and similar seats in which a conventional hard surfaced seat is provided with a captive cushion pad normally locked in inoperative position on the under side of the seat and is made releasable for movement to operative position on the upper side of the seat by manipulation of a lock following insertion of a coin into the lock.

The present application is directed to the coin-controlled lock invention of that combination.

The principal object of the present invention is to provide a lock mechanism suitable for use to control movement of the cushion and adapted also to be used in other combinations with a member to be released on deposit of a coin with means for holding the coin for subsequent collection and resetting of the mechanism to locking of the member for reuse.

General objects of the invention are to provide a device of the character indicated which will be simple in construction, inexpensive to manufacture, durable in use, foolproof and certain in operation and proof against tampering and unauthorized withdrawal of a deposited coin.

Other objects and advantages will be apparent to those skilled in the art from the following description of the preferred form of embodiment depicted in the accompanying drawings in which:

Figure 1 is a perspective view of the device;

Fig. 2 is a front elevational view of the device enclosed in its casing, with certain of the interior mechanism in broken lines, showing the parts in normal locking position ready to be moved to unlocking position upon insertion of a coin;

Fig. 3 is a cross-sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a side elevational view of a type of key adapted to be used for releasing a deposited coin for collection;

Fig. 5 is rear elevational view of the casing, with the back plate of the casing removed, showing the enclosed mechanism in locked position;

Fig. 6 is a cross-sectional view, taken on the line 6—6 of Fig. 3, showing in front elevation the internal mechanism in locking position with the operating slide moved to the extreme limit possible when no coin has been inserted;

Fig. 7 is a similar view showing the slide moved to unlocking position through the medium of an inserted coin;

Fig. 8 is a detail elevational view showing operation of the key-controlled cam member to coin-releasing position; and

Fig. 9 is an exploded perspective view of the mechanism.

These views and the following description of them disclose the invention embodied in a form that has been reduced to practice and used successfully in combination with the seat and cushion attachment disclosed

and claimed in the copending application hereinabove identified, but it is to be understood that, within the spirit of the invention and the scope of the broader of the appended claims, the mechanism which forms the subject of this present application may be otherwise and differently embodied for use in the same combination or in other combinations for coin-controlling the release of any other kind of captive member, the openability of a receptacle, or for other related purposes.

In the drawings, the reference numeral 1 designates generally a casing, best made of two metal stampings comprising a back plate 2 and a front plate 3, each generally rectangular in shape and provided with perimetric right-angularly directed flanges so proportioned that the flange assembly of the rear plate nests within the flange assembly of the front plate to form a closed box-like housing.

The body of the back plate is adapted to be perforated for the reception of screws or the like (not shown) for affixing it more or less permanently to some stationary structure such as the seat bottom shown in my copending application, and the front plate is secured in covering relation to the back plate as by short lugs 4 turned in right-angularly from the lip of its flange at one end of its body and standing through corresponding slots 5 formed at the adjacent juncture of the back plate body and its flange at that same end of the casing. Connection of the two plates is completed at the opposite end of the casing by two means: a short machine screw 6 threaded through the nested flanges at that end, and a shallow internal socket formed in the front plate flange by indenting the metal thereof, as shown at 7, over a slot 8 in the adjacent back plate flange, so that a finger 9 of a pivoted cam device 10 (hereinafter to be described in detail) will project through the slot and into the socket when the mechanism, as will hereinafter be explained, is set in locked position. In this way the casing is incapable of being opened by mere removal of the screw 6 as long as the mechanism is set in locked position because penetration of the finger 9 through the slot 8 and into the socket 7 will cooperate with the interfitted lugs 4 and slots 5 to keep the casing closed. However, the casing can be opened at any time for inspection, repair or replacement of the internal mechanism by any authorized person possessed of the proper means for rotating the cam device 10, such as the key 11 of Fig. 4.

Assuming, for the purpose of illustrating one form of utility for the present invention, that the object to be kept captive by the device and to be locked in inoperative position by it and to be released by its for movement to operative position is a cushion pad such as is shown by the copending application, a retainer loop 12 is secured in the casing and projects from the bottom edge thereof through registering cutouts in the lower flanges of the casing plates. The loop is conveniently attached permanently to the casing by riveting one end portion to the front plate 2, with its other end portion overlying the riveted end, so that an eye 13 on the end of a tab 14 stitched to the cushion pad 15 may be inserted into the loop when the casing is opened. At the other end of the cushion pad is sewed another tab 16 carrying a lug or fitting 17 having a T-shaped head which is insertible into a keeper slot 18 in the front plate 3 of the casing. The arrangement is such that when the lug 17 is caught in this keeper slot the cushion 15 is held against appreciable movement relative to the seat bottom to which the casing is secured, but when the lug is withdrawn from the keeper slot the cushion can be pulled around the front edge of the seat with the eye 13 riding to the upper end of the loop 12, so that the cushion will be disposed in useful, operative position on the top surface of the seat with the tab 16 and lug 17 at the rear of the seat. Of course many other kinds of lockable and re-

leasable objects may be substituted for the cushion 15, as has been explained, to suit the invention to other and different uses.

The interior of the casing 1 is provided with mechanism for locking the lug 17 in the keeper slot 18, for rendering it releasable on insertion of a coin, for holding the coin thereafter, and for enabling the coin to be removed and the mechanism reset by an operator possessing the key 11. This mechanism is best mounted entirely on the front plate 3 and will now be described.

A lower or filler plate 19 is riveted to the inner surface of the front casing plate and has a straight top edge shoulder forming a slideway for the bottom edge of an operating slide plate 20. This operating slide is generally U-shaped in elevation, having at one end an upstanding handle 21 which projects through mating openings in the casing plate top flanges forming a slot S and having at its other end an upstanding shorter projection forming an arm 22 which terminates in an inturned ear 23 inside the casing and serving as an abutment for one end of a coil tension spring 24. The other end of this spring is secured in a similar ear 25 of a thin plate 26 of resilient metal such as brass or bronze which overlies the filler plate 19 and is secured to the front plate of the casing by the same rivets, such as those shown at 27, which mount the plate 19, so that the plate 26 serves to keep the operating slide 20 in position for sliding movement on the upper edge of the filler plate, with the tension of the spring 24 biasing the slide 20 to a position in which its handle 21 stands at that end of the slot S which is nearer the adjacent end of the casing, thus leaving open the major portion of the slot S. This is the position of the slide 20 shown in Figs. 1, 2 and 5, in which it will be noted that sufficient length of the slot S is open to admit a coin of predetermined size, e. g., the quarter 28.

Also mounted in the space between the body of the casing front plate 3 and the thin plate 26, and maintained in that space by the thin plate and its rivets 27, is a locking plate or bolt 29 whose straight lower edge rests on the upper surface of that portion of the operating slide 20 which forms the bight of its U-shape. This bolt 29 is shorter than the bight of the slide so that it is movable along the slide, and it has a height extending substantially to the upper flange of the front casing plate 3.

The bolt 29 is quite flat except for a small ear 30 inturned from its upper edges at its end opposite the operating slide handle 21 which serves as a stop impinging against the adjacent edge of the fixed thin plate 26 to limit sliding movement of the bolt toward the handle 21. The bolt is movable in that direction by thrust of the arm 22 of the operating slide under the influence of the spring 24, as shown in Fig. 5, which is the same influence that urges the handle 21 to its position fully opening the slot S.

The locking plate or bolt 29 is of special shape. Its end edge adjacent the handle 21 of the operating slide 20 is formed with a pair of spaced parallel fingers 31 having their inner margins concaved for reception of the coin 28, and the opposing surface of the handle 21 is similarly indented. Inwardly of these fingers the bolt 29 is longitudinally slotted along its substantially median line, as shown at 32, and this slot terminates inwardly in a transverse enlargement slot 33. Still further inwardly the bolt has another transverse slot 34, but this slot is unconnected with the communicating slots 33 and 32, being separated from the slot 33 by the solid material of the bolt plate. These details of the shape of the bolt are best shown in Figs. 6, 7 and 9.

Reverting now to the thin plate 26, it will be recalled that this plate is affixed to the filler plate 19 by the rivets 27 to hold the elements 20 and 29 slidably in the space between it and the body of the front casing plate 3. These rivets are located back from the end of the thin plate which is opposite the handle 21 and the end portion of the plate which is adjacent the arm 22, of the operating slide 20 is extended over and beyond the arm. Since the thin plate

is made of resilient metal, and because its projecting free end portion is extended some distance beyond the nearer rivet, this extension can be flexed or sprung inwardly, away from the body of the front casing plate 3, against the inherent tendency of its spring material to lie in the same plane of its riveted main body.

The extreme free end of the extension of the thin plate 26 is curved toward the inside of the casing, to provide the lip shown at 35, and this same end of the thin plate is indented above the level of the curved lip 35 and is there oppositely bent to form a catch 36.

With the several parts shaped and formed as described, and proportioned and assembled in the relationship shown in the drawings, it will be evident that the bolt 29 is movable to several positions relative to the keeper slot 18 in the front casing plate 3.

In one such position, shown in Fig. 6, the longitudinal slot 32 will overlie the keeper slot 18, and in this position of the parts the catch 36 on the thin plate 26 will be seated in the transverse slot 34 of the bolt 29 to hold the parts in this relation. This may be called the normal locked position of the mechanism. It will be evident that if the T-shaped head of the lug or fitting 17 be caught beneath the margins of the longitudinal slot 32, the lug and the object to which it is attached will be locked in place. In this normal locked position of the parts the spring 24 will bias the operating slide 20 to the extreme right hand limit of its range of movement as viewed in Fig. 6. In Fig. 6 the slide is shown moved as far to the left as is possible under the circumstances there depicted, and it will be noted that this is ineffective to free the lug 17 from the slot 32 because movement of the operating slide leftward to the extent that would be required to accomplish release of the lug is prevented by the handle 21 reaching the left hand limit of its movement permitted by the slot S. And movement of the bolt 29 in the opposite direction, to align the transverse slot 33 with the keeper slot 18, which would free the lug 17, is prevented by engagement of the catch 36 in the slot 34.

In a second position of the parts, shown in Fig. 7, the bolt 29 is shifted sufficiently to the left, as viewed in that figure, to move the right hand end of the slot 32 leftward beyond the keeper slot 18 so that the lug or fitting 18 can be withdrawn through the wide opening between the fingers 31 and through the keeper slot. As will be observed in Fig. 7, it is possible to move the bolt 29 to this position when a coin 28 has been inserted through the slot S and dropped into the pocket comprising the space between the fingers 31 of the bolt 29 and the opposed face of the handle 21. The interposed width of the coin thus enables movement of the handle to its leftward limits to increase the shift of the bolt 29 beyond the limit possible without the presence of the coin, as shown in Fig. 6. It will be recognized that shift of the bolt to the Fig. 7 position is not impeded by the catch 36 because the direction in which this catch is bent and the resilience of the thin plate 26 permit the plate to flex sufficiently for the catch to slip out of the slot 34 as the bolt 29 moves under thrust from the handle 21 acting through the coin 28.

Thus the lug or fitting 17 can be released from its keeper slot 18 through the medium of a coin inserted through the slot S, and it will be noted that when the bolt 29 is moved to the lug-releasing position of Fig. 7 the bolt will be held in this lug-releasing position by snapping of the catch 36 into the other transverse slot 33 of the bolt. This fixing of the bolt holds its left hand end, as seen in Fig. 7, at a position where it will stand in the way of the arm 22 of the operating slide 20 and prevent movement of that slide far enough to the right to open enough of the slot S to permit the coin 28 to be withdrawn through the slot. Thus the coin is kept pocketed in the casing 1 and the keeper slot 18 is kept in uncovered, open position.

A third position is possible for the bolt **29**. In this position the bolt is shifted sufficiently farther to the right than its position shown in Fig. 6 so that the transverse slot **33** overlies the keeper slot **18** and the catch **36** bears against the face of the bolt between the slot **34** and the adjacent end of the bolt. It will be recognized that the bolt will be shifted to this third position automatically by action of the arm **22** against its adjacent end, acting by pull of the spring **24**, if the catch be lifted from the slot **34**, and it will be noted that in this relation of the parts the operating slide also is at its extreme right hand limit, as viewed in Figs. 6 and 7, so that the handle **21** opens enough of the slot S to permit removal through the slot of any coin that may be positioned in the pocket between the handle and the fingers **31**, as shown in Fig. 7. It will be evident also that after removal of any such contained coin the handle **21** may be pushed to the left until it bears against the ends of the fingers **31** and moves the bolt **29** to the position shown in Fig. 6. This, it will be recalled, is the first or normal locked position of the mechanism, in which the keeper slot **18** is covered by the longitudinal slot **32** of the bolt **29**, so that, if the lug **17** had been inserted through the slots **18** and **33** when they were in register in the third position of the parts, restoration to the first position would lock the lug, with its T-head caught behind the longitudinal slot **32**, as shown in Fig. 6.

To manipulate the spring plate **26** through the movements that have just been explained, the mechanism includes the cam device **10** controlled by the removable key **11**, which have heretofore been mentioned. This cam device is pivoted at **31** to the casing front plate **3** to rotate through about 90 degrees under control of the key **11** when inserted through a keyhole **38** in the front plate. In addition to the finger **9**, the cam device is provided with a second finger **39**, right-angularly related to the finger **9**. Both fingers are offset from the inner surface of the casing front plate **3**, and the fingers are oppositely bent to provide an inwardly directed cam on the finger **39** and an outwardly directed finger on the cam **9**. Both of these fingers are engageable with the inwardly curved end **35** of the thin plate **26**, but they are set to rub opposite surfaces of that curved end. A short coil spring **40** is anchored in tension between the finger **9** and an abutment on the lower flange of the front casing plate **3** to swing with the cam device past dead center when the device is rotated and thus hold the device in either of its terminal positions, with either the finger **39** engaged with the outer surface of the end **35** of the spring plate **26** or the finger **9** engaged with the inner surface of that curved end. Hence the key **11**, fitted into the keyhole **38**, must be employed to turn the cam device from either of its two terminal positions to the other.

The normal position of the cam device is that shown in Figs. 5, 6, and 7, where the finger **39** is holding the free end **35** of the spring plate **26** down and tending to seat the catch **36** in the slot **34** (Fig. 6) or in the slot **33** (Fig. 7). At the same time the finger **9** extends through the slot **8** and into the socket **7** to insure maintenance of the casing plates **2** and **3** in closed relation, as has been explained. This is the position of the cam device at all times except when an authorized operator is using the key **11** to remove a deposited coin and reset the mechanism to locking position.

When the key **11** is turned in the keyhole **38**, clockwise as viewed in Fig. 1, the cam device turns counterclockwise as viewed in Fig. 5 through and beyond the position shown in Fig. 8 until the finger **39** uncovers the free end **35** of the spring plate and the finger **9** slides behind that free end and flexes it inwardly to lift the catch **36** from the slot **34** or **33** in which it may have been seated. The spring **24** then contracts and pulls the operating slide **20** to its right hand limit as viewed in Fig. 6 to open the slot S and permit removal of any coin that has been deposited. At the same time the slot **33** is registered with the keeper

slot **18**, so that the lug **17** may be inserted through these two slots. Then the key may be turned counterclockwise as viewed in Fig. 1 so that rotation of the cam device will remove the finger **9** from behind the free end **35** of the spring plate and bring the finger **39** into pressing relation thereon. The handle **21** can then be pushed to the right as viewed in Fig. 6 to slide the operating slide **20** in that direction so as to cover the keeper slot **18** with the longitudinal slot **32** of the bolt **29**, at which time the catch **36** seats in the slot **34** to lock the lug **17** in the slot **32**. Thus the coin pocket is emptied and the mechanism is restored to its original condition with the lug locked and ready for release on deposit of another coin.

It will be noted that the hub of the cam device is peripherally toothed as shown at **41** and the filler plate **19** is offset along its lower edge from the plane of the casing front plate **3** in alignment with an opening **42** in the lower end portion of the opposite end flange of the casing front plate. This constitutes means for operating the cam device in an emergency without the key **11** or if the key should become broken in the keyhole **38**. In such case the cam device can be rotated by inserting a rack bar (not shown) through the opening **42** and pushing it in engagement with the teeth **41**.

In order to keep the bolt **29** from being slid beyond its proper unlocking position upon deposit of some spurious coin or object, a small lug **43** may be struck inward from the casing front plate **3** to abut the coin in the position where it has caused the bolt **29** to move to full opening position, as shown in Fig. 7.

It is believed that the mode of operation of the device will be clear from the foregoing description. However, it may be stated briefly that, when used in connection with a captive seat cushion as proposed by my above identified copending application, the use is as follows:

With the cushion locked the mechanism is in the position shown in Fig. 5. A patron may then insert a coin and move the operating handle **21** to the position shown in Fig. 7 to release the lug **17** which will free the cushion for disposition in operative position on the top surface of the seat to which the casing **1** is secured. The coin remains caught in its pocket because the catch **36** has become seated in the slot **34** which prevents movement of the handle far enough in the slot S to open enough of that slot to pass the coin. This same seating of the catch holds the bolt in unlocking position, with the slot **18** uncovered by the wide opening between the fingers **31**. At the end of the occasion for using the cushion an attendant provided with a key **11** turns the cam device **10** to spring the plate **26**, whereupon the handle **21** snaps to position fully opening the slot S and aligning the slots **18** and **33**. The attendant removes the coin, restores the cushion to inoperative position beneath the seat, inserts the lug **17** through the aligned slots **18** and **33** and turns the key **11** counterclockwise as viewed in Fig. 1. He then slides the operating handle **21** to the left in Fig. 1, which shifts the operating slide **29** to its locking position of Fig. 6, where it is held by seating of the catch **36** in the slot **34**. The device is then ready for reuse.

All the parts are made of metal, most of them being conveniently and inexpensively formed by stamping operations. The mechanism is to a large degree and for all practical purposes tamperproof. The casing cannot be opened without the key **11**, even upon removal of the screw **6**, because the key is required to swing the cam device finger **9** out of the socket **7**. However, with the finger rotated out of the socket, and with the screw **6** removed, the front casing plate **3** with all the mechanism mounted on it may be detached from the rear casing plate **1** for replacement, repair, or storage with the captive cushion or other object which it has served to mount and lock. This latter feature is of particular advantage in stadiums and other public places where occupancy is seasonal. In such installations, which are commonly outdoors, the front plates and attached cushions may be

readily removed at the end of a season, leaving only the back plates attached to the seats. After off-season protected storage the front plates and attached cushions may be reinstalled with a minimum of effort and expense.

I claim:

A coin-controlled lock comprising a casing having an opening for reception of a lug to be locked to the casing and having a coin-admitting slot, a bolt movably mounted in the casing and having spaced portions selectively registrable with the opening for respectively holding and releasing a lug inserted therein, an operating member of elongated U-shape slideable in the casing having the bolt slideably mounted on its bottom and having front and rear arms upstanding from its bottom beyond the respective ends of the bolt, said front arm projecting through one end portion of the slot for actuation manually toward the other end portion of the slot to slide the operating member and having a portion within the casing opposed to the adjacent end of the bolt requiring interposition of a coin of predetermined size in order for movement of the operating member toward the bolt to slide the bolt to a position bringing a releasing portion thereof into register with the lug-receiving opening in the casing so as to release the lug, and means holding the bolt in said position, the opposite end of the bolt when so held being engageable by the rear arm of the operating member to prevent movement of the bolt and operating member sufficiently toward the first named end portion of the slot to cause the front arm of the operating member to clear enough of the length of the slot to permit removal of the coin through the slot.

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