Aaron

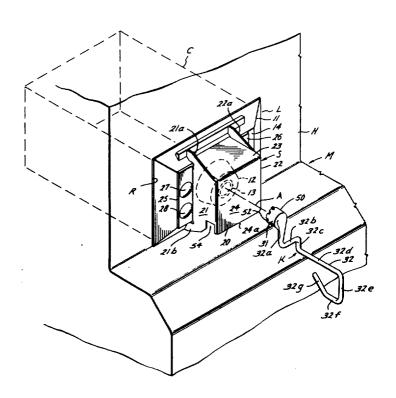
[45] Sept. 9, 1975

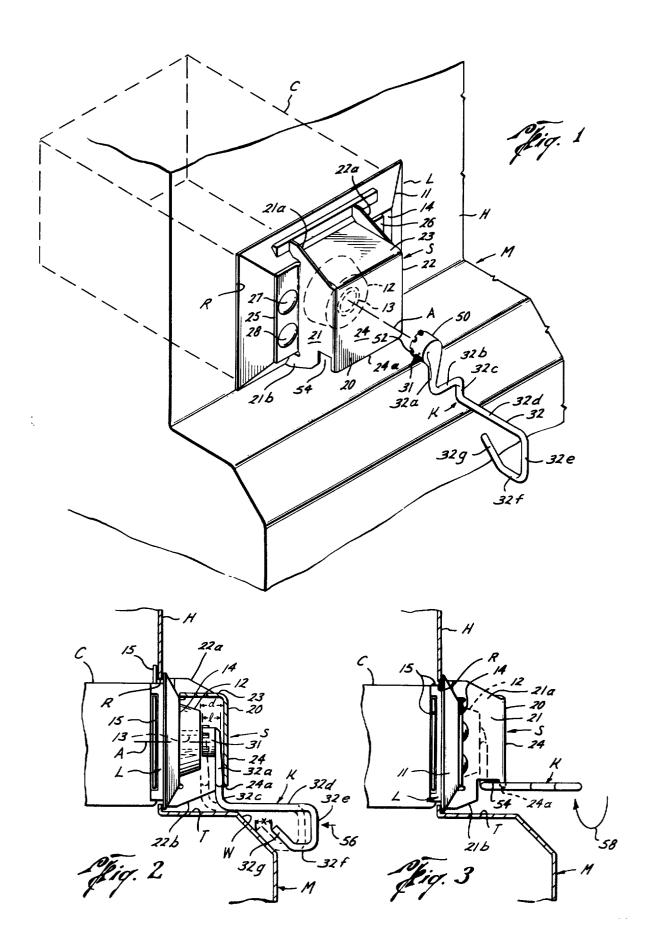
	[54]	COIN BOX LOCK PROTECTIVE DEVICE		
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	[21]	Appl. No.	444,123	
	[52] [51] [58]	Int. Cl. ²		
[56] References Cited UNITED STATES PATENTS				
	3,334,	501 8/19	67 Greenwald 70/423	
	3,343,	386 9/19	67 Hall 70/423	
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[57] ABSTRACT

A coin box lock protective device for use with a coin operated machine wherein a hollow lock shield is mounted with a coin box lock for substantially surrounding the lock head of the lock to provide limited access to the keyway of the lock, and a key means having a preselected shape for insertion into the keyway and for manipulation to operate the lock when desired while the hollow shield member substantially blocks lateral manipulation of picks or probes for unauthorized operation of the lock.

6 Claims, 3 Drawing Figures





COIN BOX LOCK PROTECTIVE DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention.

The present invention relates to coin box locks and 5 more particularly pertains to means to prevent or eliminate tampering or unauthorized operation and opening

2. Description of the Prior Art.

Coin boxes of coin operated machines such as wash- 10 ers and driers and/or vending machines are usually protected by tumbler-type key actuated locks to prevent unauthorized access to coins stored therein. However, the majority of coin box locks are unprotected and, since most coin operated machines are left unattended, 15 the present invention; the coin box locks are highly susceptible to unauthorized tampering or breakage by unscrupulous persons to gain access to the coins. Tumbler-type key actuated locks can usually be operated by inserting a pick or a probe into the keyway thereof and laterally manipulat- 20 ing it as vigorously as necessary to release the tumblers of the lock. The lock can then be easily turned to the open position for access to the coin box.

Various coin box lock protective devices have been provided in the past which are theoretically tamper- 25 coin box lock mounted to a coin box and disposed in proof. One such device is disclosed in U.S. Pat. No. 3,334,501 wherein a U-shaped bracket guard is mounted over the lock. However, advances in the art of picking locks appear to follow closely such known advances in the art of anti-tampering devices; and 30 therefore, the serious theft and vandalism problem has persisted.

Accordingly, it is a primary object of the present invention to provide a protective device for key actuated tumbler-type coin box locks that will prevent unautho- 35 rized operation thereof.

It is another object of the present invention to provide a protective device for key actuated coin box locks that sufficiently block manipulation of the lock for unautorized operation thereof.

It is yet another object of the present invention to provide a protective device for key actuated coin box locks that includes a protective shield member that substantially surrounds the lock head of a coin box lock and key means having a preselected shape for operating the lock when desirable while the lock shield substantially blocks manipulation of a member not having the preselected shape of the key for opening the lock.

Other objects and advantages of the present invention, if not set forth specifically herein, will become readily apparent from the following description of the invention and the drawings.

SUMMARY OF THE INVENTION

The present invention provides a new and improved lock protecting device that can be readily applied to coin box locks for use with coin operated machines wherein the lock head including a keyway of a key actuated lock is protected from unauthorized tampering. 60 The lock protective apparatus of the invention includes a hollow lock shield means mounted with the face of the lock for substantially covering the keyway and for limiting access to the keyway for enabling insertion and manipulation of a key means having a preselected shape for properly operating the lock. The lock shield means is disposed in spaced relationship to the lock head and keyway and substantially blocks manipulation

of a member such as a probe or pick that lacks the preselected shape of the key means for successfully operating the lock. The inventive device also includes a key means having the preselected shape which is comprised of a key actuating head member for operating the lock and means for inserting the actuating head through the limited access means of the lock shield means into the keyway for properly manipulating the actuating head to operate the lock.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmental, perspective view of a coin operated machine showing the coin box housed therein in phantom and illustrating a coin box lock embodying

FIG. 2 is a sectional view of the coin box lock mounted with the coin box in a receptacle of a coin operated machine embodying the present invention wherein the lock shield means is shown in cross-section and the key means is shown in alignment with the keyway of the coin box lock, as well as being shown, in phantom, inserted into the keyway for proper operation of the lock: and

FIG. 3 is a fragmental sectional view illustrating the a receptacle of a vending machine embodying the present invention showing the manipulation of the key means for properly operating the coin box lock.

DESCRIPTION OF THE PREFERRED **EMBODIMENT**

Referring to the drawings, there is shown in FIG. 1 a fragmental portion of a coin operated machine, generally M, having a housing or receptacle H which houses a coin actuator (not shown) and a coin box C, in phantom. Coin box C is mounted with a lock means, generally L, and is inserted through an opening R of the housing H.

The lock means L includes a lock body 11 which houses a tumbler-type key actuated lock (not shown). The lock means L further has a lock head 12 including a keyway 13 mounted substantially in the center of the face 14 of the lock body 11. As shown in FIGS. 2 and 3, when a proper key means is inserted into an annular keyway 13 and manipulated properly, the tumblertype key actuated lock (not shown) operates the latches 15 for securing the coin box C into the housing H of the coin operated machine M.

In accordance with the present invention, a lock protective shield means, generally designated S, is mounted with the lock body 11 to prevent or deter unauthorized manipulation or tampering with the coin box lock means L, particularly by providing limited access to the lock head 12 and keyway 13 of a probe or a pick. The lock protective shield means S also protects the lock head 12 and the keyway 13 from damage by blows thereto with a hammer or other tool. The lock shield means S, when mounted with the face 14 of the lock body 11, severely restricts access to the keyway 13, particularly axial access. As shown, the lock shield means S is of one-piece construction comprising a member 20 for substantially covering the lock head 12 and keyway 13 including a pair of opposing side barrier walls 21 and 22, an interconnecting front barrier wall 24, interconnected with the opposing side barrier walls 21 and 22 and an interconnecting top barrier wall 23 interconnected to the front barrier wall 24 and abutting

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the side barrier walls 21 and 22 and the lock face 14. The opposing side barrier walls 21 and 22 are respectively provided with offset flange portions 25 and 26 for fixedly attaching the shield means S to the face 14 in any desired manner, such as by welding, screw fasten- 5 ing, bradding, as shown at 27 and 28 and the like. Moreover, as shown, the opposing side walls 21 and 22 are provided with extended portions 21a and 22a, respectively, to prevent tampering with the top barrier wall with wedge-like tools. In accordance with this ar- 10 rangement, the front barrier wall 24 is disposed in front of the lock head 12 and keyway 13 in spaced relationship thereto to restrict axial access to the keyway 13 along the axis A. The lock shield means is designed so that only limited access is provided to the lock head 12 15 and the keyway 13 from the bottom thereof, which is defined by the bottom edges 21b and 22b, respectively, of the pair of opposing barrier side walls 21 and 22 and the edge 24a interconnecting front barrier wall 24, as shown.

Accordingly, in order to operate the coin box lock L to gain access to the coin box C without the removal of the lock shield means S, there is provided a key means, generally K, having a preselected shape. As shown, the key means K is comprised of a lock actuating head 31 25 which is mounted with a shaft 32 having a specifically arranged configuration for inserting the lock actuating head 31 between the lock head 12 and the front barrier wall 24 and axially into the annular keyway 13 along the axis A as shown in FIG. 2. The shaft 32 is further 30 specifically arranged for manipulating the actuating head 31 when it has been inserted into the annular keyway 13 for rotating the lock means L to an open position for coin box C removal, as shown in FIG. 3. Accordingly, the specific configuration of the key means 35 K, particularly the configuration of the shaft 32, allows authorized access to the coin box C without removal or movement of the lock shield means S while it covers the lock head 12.

As best shown in the drawings, the shaft 32 is 40mounted with the lock actuator head 31 and extends outwardly from the lock shield means S when the lock actuator head 31 is in axial alignment along the axis A for insertion into the keyway 13. The specific configuration or arrangement of the shaft 32 is provided by a plurality of offset portions intermediate the length of the shaft. As shown in the drawings, the shaft 32 is comprised of a first offset portion 32a mounted with the lock actuator head 31 and extending transversely from the axis A when the lock actuating head is in axial alignment with the keyway 13 (FIGS. 1 and 2). A second offset portion 32b is mounted with the first offset portion 32a and extends laterally therefrom. A third offset portion 32c, attached to the second offset portion 32b, extends laterally therefrom and is in parallel alignment with the first offset portion 32a. A fourth offset handle portion 32d is interconnected with the third offset portion 32c and extends laterally and outwardly therefrom in parallel alignment with the axial alignment of the lock actuating head 31 and the keyway 13 (FIGS. 1 and 2). The shaft 32 further includes, intermediate its length, a fifth offset handle portion 32e extending laterally from the fourth offset handle portion 32d in parallel alignment with the first and third offset 65 portions 32a and 32c. A sixth offset handle portion 32f extends laterally and inwardly therefrom in parallel alignment with the fourth offset portion 32d. A seventh

offset handle portion 32g extends laterally and upwardly approximately 45° therefrom towards the fourth offset handle portion 32d as shown.

The offset portions 32a, 32b, 32c, 32d, 32e, and 32f of the shaft 32 are preferably offset from each other, respectively, 90 degrees. Moreover, the first, second and third offset portions 32a, 32b and 32c have respective critical lengths such that the lock actuating head 31 can be inserted between the lock head 12 and the forward barrier wall 24 and inserted into keyway 13 along axis A. The respective lengths of the first, second and third offset portions 32a, 32b and 32c are also such that the key means K can be rotated when the lock actuator head 31 is inserted into the keyway 13 for operating the lock means L while the first, second and third offset portions 32a, 32b and 32c remain within the space between the lock face 14 and the forward barrier wall 24, as shown in FIG. 3, in phantom.

More particularly, the first and second offset portions 32a and 32b have respective lenths slightly less than the radial distance between the keyway axis A and the side barrier walls 21 and 22 to allow axial insertion and 90° axial rotation of the lock actuating head 31. The third offset portion 32c has a length such that, when combined with the length of the first offset portion 32a, it is slightly less than the critical distance between the axis A of the keyway 13 and the top T of the coin operated machine M. Moreover, the length of the third offset portion 32c is sufficient to retain the fourth offset handle portion outwardly from the lock shield means S as the key means K is rotated for opening the lock.

As shown in FIG. 2, the fourth, fifth, sixth and seventh offset handle portions 32d, 32e, 32f, and 32g have respective critical lengths and are offset from each other respectively to provide a limited inward movement of the key means K when the lock actuating head 31 has been inserted in axial alignment with the keyway 13 between the lock head 12 and the forward barrier wall 24. As shown in FIG. 2, the distance X between the seventh offset portion 32g of the shaft 32 and the angular wall W of the coin operated machine M must be equal to the axial movement necessary to register the lock actuating head 31 in the keyway 13.

In accordance with the present invention, the distance d between the lock head 12 and the forward barrier wall 24 of the lock shield means S is slightly in excess of the length 1 of the lock actuator head 31 of the key means K. With such an arrangement, there is sufficient space to allow the axial insertion of the lock actuator head 31 into the keyway 13 for authorized lock operation; yet, there is insufficient space to insert and laterally manipulate a pick or probe sufficiently to release the actuating tumblers of the lock means L. Accordingly, the size of the lock actuator head 31 is sufficiently small to be aligned in axial alignment with the keyway 13 and inserted therein.

In the embodiment shown, the keyway 13 has an annular shape for access to the tumblers of lock means L. Thus, it is preferred that the lock actuator head 31 be comprised of a hollow cylindrical lock body 50 having a diameter and wall thickness slightly smaller than the annular-shaped keyway 13 for complementary insertion therein. The cylindrical body 50 also includes tumbler actuator means 52 circumferentially mounted at one end of the cylindrical body which is mounted at its opposite end transversely with the first offset portion 32a of the shaft 32. The cylindrical body 50 has an axial

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length 1 slightly less than the distance d between the lock head 12 and the forward barrier wall 24 to provide proper axial alignment of the tumbler actuating means 52 with the keyway 13.

In order to provide proper rotation of the key member K for authorized opening of the tumbler-type lock of lock means L, the side barrier wall member 21 of the shield member S is preferably provided with a cut-out portion or slot 54 to allow the key means K proper axial movement. The cut-out portion 54 acts to receive the third offset portion 32c of the shaft 32 when the key means K is rotated clockwise, as shown in FIG. 3. Thus, the slot 54 and the shaft 32 interfit in complementary relationship to provide sufficient axial rotation of the key means K to operate the lock with the shield means 15 in the desired protective position.

STATEMENT OF OPERATION

When it is desired to remove the coin box C mounted with the lock means L from the housing H of the coin operated machine M, the key means K is inserted angularly between the top T of the coin operated machine M and the front barrier wall 24 of the shield means S, and then moved upwardly until the lock actuating head 31 thereof is in axial alignment with keyway 13 along the axis A, as shown in FIG. 2. The key means K is then pushed forward as shown by arrow 56 in FIG. 2 the distance X, until the seventh offset portion 32g abuts the wall W. The lock actuating head 31 registers with the keyway 13 whereby the tumbler actuator means 52 thereof actuates the tumblers of the lock means L. The lock actuating head 31 is then rotated clockwise 90 degrees by moving the fourth offset handle portion 32d of the shaft 32 upwardly in a semi-circular fashion as 35 shown by arrow 58 of FIG. 3 until the third offset portion 32c passes through the cut-out portion or slot 54 of the side barrier wall member 21. The lock means L is then fully operated with the latches 15 being moved to a recessed position as shown in FIG. 3, which allows 40 the coin box C to be removed from the opening R of the housing H.

It will be appreciated that the space or distance d between the lock head 12 and the hollow lock shield means S is barely sufficient to provide access for the 45 key means K having the described preselected shape. Thus, the lock shield means S sufficiently blocks lateral manipulation of any probe or like tampering device which is necessary to effect operation of the lock means L.

The foregoing disclosure and description of the invention are illustrative and explanatory thereof, and various changes in the size, shape and materials, as well as in the details of the illustrated construction, may be made without departing from the spirit of the invention.

We claim:

1. A coin box lock protection apparatus for a key actuated lock means having a lock head including a keyway comprising:

a hollow lock shield means adapted to be mounted with said lock means for substantially covering the lock head in spaced relationship thereto, said hollow lock shield means having means for providing limited access to the keyway of said lock head to enable passage of a key means having a preselected shape for operating the lock means when desired;

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a key means having a preselected shape for passing through said access means and for insertion into the keyway of said lock head, said key means including:

a lock actuating head member having lock tumbler actuating means and having a size slightly smaller than the space between said lock head and said hollow lock shield means to provide axial alignment of the lock actuating head member with the keyway and insertion therein, and

means mounted with said lock actuating head for inserting said lock actuating head through said limited access means of said lock shield means into the keyway of the lock head and for manipulating the lock actuating head to operate said lock means while said hollow lock shield means covers the lock head of said lock means in spaced relationship thereto sufficiently to substantially block manipulation of a member lacking the preselected shape of said key means for unauthorized lock means actuation, said means including:

a shaft mounted with said lock actuating head member and extending outwardly of said lock shield means with said lock actuating head in axial alignment with the keyway of said lock means said shaft including,

a first offset portion mounted with said lock actuating head member and extending transversely from the axis of said lock actuating head member:

a second offset portion intermediate the length of said shaft, said second offset portion extending laterally from said first offset portion;

a third offset portion intermediate the length of said shaft, said third offset portion extending laterally from said second offset portion in parallel alignment with said first offset portion; and

a fourth offset handle portion extending laterally and outwardly from said third offset portion and in parallel alignment with the axis of the lock actuating head member.

2. The coin box lock protection apparatus of claim 1 wherein said hollow lock shield means includes:

a pair of opposing side barrier wall members fixedly mounted to the face of said lock means and straddling the lock head thereof;

a forward barrier wall member interconnected between said opposing side barrier wall members, said forward barrier wall member being disposed in front of said lock head in spaced relationship thereto, the space between said lock head and said forward barrier wall being slightly in excess of the size of the lock actuating head of said key means; and

a top barrier wall member interconnected with said forward wall member and opposing side wall members whereby said first and second opposing side barrier wall members and the interconnected forward barrier wall member form said limited access means to said lock head, said limited access means having complementary form for insertion and manipulation of said key means having said preselected shape.

3. The coin box lock protection apparatus of claim 2 wherein the means for inserting and manipulating said actuating head of said key means includes interfitting

means complementary with the limited access means of said hollow lock shield means whereby said lock head can be inserted into the keyway of the lock means and manipulated to operate said lock means while said hollow lock shield means substantially covers the lock 5 head of said lock means.

4. The coin box lock protection apparatus of claim 1 wherein said offset portions of said shaft are disposed intermediate its length to sufficiently permit the lock actuating head member of said key means to be inserted through the limited access means, axially aligned and inserted into the keyway of the lock means and manipulated for operating said lock means whereby said shaft is moved upwardly in semi-circular fashion with the third offset portion interfitting complementary in a 15 slot of a barrier side wall member thereby providing axial rotation of said lock actuating head for actuating said lock means.

5. The coin box lock apparatus of claim 4 wherein said keyway of said lock head has an annular shape and 20 the lock actuating head member of said key means includes:

a hollow cylindrical body having a diameter slightly less than the outside diameter of said annular keyway and a cylindrical wall thickness slightly less 25 than the annular keyway for complementary insertion therein;

lock tumbler actuating means circumferentially mounted with one end of the cylindrical body for

actuating the lock tumblers of said lock means; said cylindrical lock body mounted at the opposing end thereof with said first offset portion of the shaft

of said key means; and

said cylindrical body having a length slightly less than the distance between said keyway and said forward barrier wall of said hollow lock shield means.

6. The coin box lock protection apparatus of claim 4 wherein said shaft includes:

a fifth offset handle portion intermediate the length of said shaft extending laterally from said fourth offset handle portion in parallel and outward alignment with said first and third offset portions;

a sixth offset handle portion intermediate the length of said shaft and extending laterally from said fifth offset handle portion in parallel and inward alignment with said fourth offset handle portion; and

a seventh offset handle portion extending laterally and upwardly approximately 45 degrees from said sixth offset handle portion towards said fourth offset handle portion,

said fourth, fifth, sixth and seventh offset portions having respective critical lengths such that the axial inward movement of the key means in axial alignment with the lock keyway is limited to the axial movement necessary to axially insert the lock activating head member into the keyway.

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