May 20, 1969 H. GREENWALD 3,444,712

LOCK AND IMPROVED GUARD THEREFOR

Filed March 3, 1967

FIG. 1

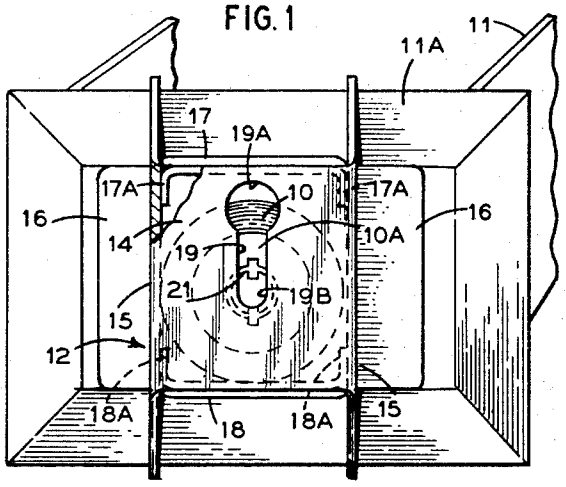


FIG. 2

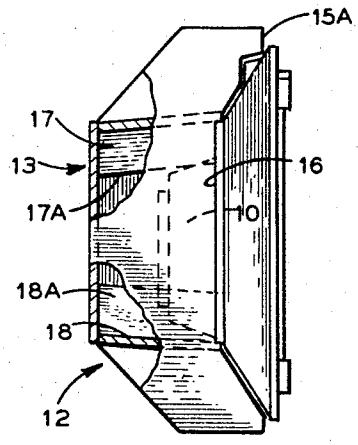


FIG. 6

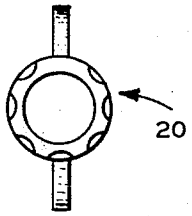


FIG. 3

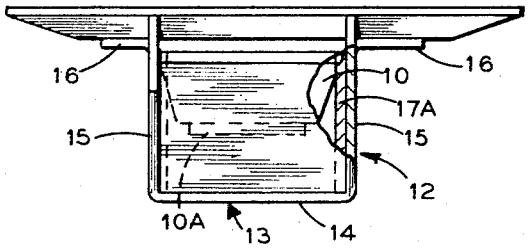


FIG. 5

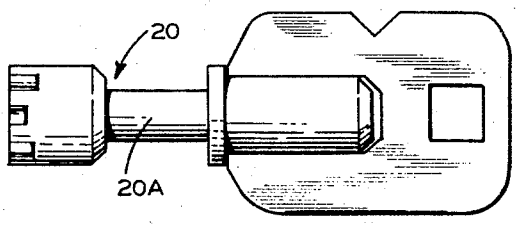
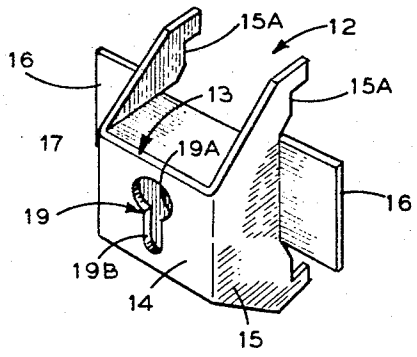


FIG. 4



INVENTOR.
Harry Greenwald
BY
Irving Reidman
ATTORNEY

United States Patent Office 3,444,712
Patented May 20, 1969

3,444,712

LOCK AND IMPROVED GUARD THEREFOR

Harry Greenwald, Whitestone, N.Y., assignor of one-third each to Louis Walf, and Harry Silberglait, Brooklyn, N.Y.

Filed Mar. 3, 1967, Ser. No. 620,333
Int. Cl. E05b 17/16
U.S. Cl. 70—423 1 Claim

ABSTRACT OF THE DISCLOSURE

This invention is directed to a lock and guard therefor in which the front of the guard is spaced from the face of the lock. The front of the guard has formed therein a key-shaped opening for receiving the key to operate the lock. The shape of the opening is such as to permit only an authorized or properly shaped key to be fitted to the keyway of the lock.

This invention relates in general to a lock and a protective guard therefor to deter unauthorized tampering with the lock, and more specifically to a lock device and complementary protective guard therefor constructed and arranged so as to permit only an authorized and complementary key to be fitted to the keyway of the lock and guard protecting the lock.

The lock and protective guard therefor in accordance with this invention are particularly adapted for securing, for example, the coin boxes of a coin-operated machine and the like. Generally the coin boxes of such coin-operated machines are secured by a tumbler-type lock, the face portion of which is generally disposed so as to be readily accessible from an exterior portion of the machine. The coin boxes of such machines are usually received in an opening formed in the casing of the machine and in position to receive the coins deposited into the coin slot of the machine.

Because such coin-vending or coin-operated machines are frequently left unattended, the coin boxes of such machines constitute a continuing target for would-be thieves and vandals. It has thus been the experience of the operators of such coin-operated machines that many unscrupulous people constantly attempt to pick and/or tamper with the lock in an effort to obtain unauthorized access to the coins deposited in the box secured thereby, and that the loss and/or damages resulting from such acts constitute a serious and continuing problem to such operators. Even if the attempted theft fails, the face of the exposed lock is generally damaged beyond repair and/or the lock is rendered totally inoperative. In such an event the lock must be removed and replaced, thereby increasing substantially the cost of maintenance and/or repair.

In picking tumbler locks of the type utilized in such coin-operated machines, the thieves and/or would-be vandals have also developed a technique of picking the locks with a specially designed pick or tool which requires for its successful operation that it be axially aligned with the keyway of the lock. Another means which has been employed by unauthorized personnel in gaining illegal access to the coin box has been by drilling through the face of the lock. To effectively drill through the lock, it is also essential that the drill bit be axially aligned with the face of the lock. If for some reason the act of gaining access to the coin box is incomplete or interrupted for some reason, the drilling of the face of the lock nevertheless invariably damages the lock beyond repair.

It is therefore an object of this invention to provide a guard specifically constructed to protect the face of a lock

which will obstruct axial alignment of a lock pick or drill bit with the key-way of the lock.

It is another object of this invention to provide a lock and a protective device or guard therefor in the form of a bent U-shaped member which can be attached or fixed in position across the face of the lock so as to prohibit axial alignment of any key and/or lock pick or other tool not specifically designed to complement or operate the lock so protected.

It is another object to provide a guard which can be secured to the panel in which the lock is disposed, and which is specifically constructed and arranged so as to be utilized in conjunction with a key means that is specifically constructed to complement the structure of the guard, and in which alignment of the key with the keyway in the face of the lock can be attained only with an authorized key.

Another object of this invention is to provide a lock having an improved guard means arranged to protect the face of the lock and which guard and key are provided with complementary shapes so as to effect the alignment of only the proper key with the keyway of the lock.

Another object of this invention is to provide a protective device for protecting the face of the lock that is relatively simple in construction, can be readily fabricated, and which is positive in operation.

Still another object of this invention is to provide a protective lock device which can be readily fitted to existing locks.

The foregoing objects and other features and advantages of this invention are readily attained by a protective device which can be readily applied to the tumbler locks of the type constructed for securing a coin box in the cabinet or frame of a coin-operated machine. Essentially the structure of a tumbler lock utilized for securing such coin boxes comprises a tubular housing which terminates in a face plate having formed therein a keyway for receiving the key by which the lock can be operated. Generally, the faces of such locks are disposed in a panel portion or front wall portion of the coin box which the lock is adapted to secure.

In accordance with this invention a unique protective device in the form of a guard is secured to the panel in which the lock is disposed. The guard is constructed to circumscribe and protect the face portion of the lock. Essentially the guard comprises a U-shaped member having a front portion and integrally formed opposed end or side portions for spacing the front portion of the guard from the face of the lock. The end edges of the end or side portions are specifically contoured to complement the contour or panel in which the lock is located. To further secure the guard into position, the end or side portions are provided with laterally bent flanges arranged to abut against the panel on either side of the lock. Cover pieces are disposed between the opposed end or side portions to provide a top and bottom for the guard to complete the protection of the lock. The front portion of the guard is provided with a key-shaped opening in which the enlarged portion of the opening is eccentrically disposed with respect to the keyway of the lock, and the reduced portion is formed with an end configuration shaped to complement the shank of an authorized key means constructed to operate the lock. The arrangement is such that the peripheral or circumferential end of the reduced portion of the opening complements the shank portion of the key inserted into the opening of the guard so that it can then be placed into alignment with respect to the keyway of the lock.

Locks of the type generally securing the coin boxes of such coin-operated machines have a circular keyway adapted to receive the head end of a circular key, the latter being provided with longitudinally extending

grooves circumferentially spaced about the outer periphery of the circular end of the key for effecting the setting or positioning of the lock tumblers, such as described in Serial No. 469,601 filed July 6, 1965 and now U.S. Patent 3,339,384. Accordingly, the arrangement of the guard device with respect to the face of the lock is such that a key in initially passing through the opening formed in the front of the guard must necessarily be first eccentrically positioned relative to the keyway of the lock, and subsequently lowered to accommodate the shank portion of the key to the reduced portion of the opening for effecting proper alignment of the key with the keyway in the lock. Accordingly, unless the shank portion of the key is properly shaped to complement the shape of the reduced end portion of the opening formed in the guard device, proper alignment of the key with the keyway of the lock is not rendered possible.

A feature of this invention therefore resides in the provision of a relatively simply constructed guard device which can be readily attached to a panel in which a tumbler lock is disposed so as to protect the lock against unauthorized access and/or tampering.

Another feature of this invention is to provide an improved protective device or guard for a lock which has a key-receiving opening formed in the front portion thereof, which is particularly shaped so as to allow only a proper or authorized key to align with the keyway of the lock.

Other features and advantages will become more readily apparent when considered in view of the drawings and specification in which:

FIG. 1 illustrates a front elevation view of the protective device of the instant invention as applied to a tumbler lock adapted to secure a coin box of a coin vending machine.

FIG. 2 is an end view of the assembly of FIG. 1, having portions thereof broken away.

FIG. 3 is a top plan view of FIG. 1.

FIG. 4 is a perspective view of the guard device of FIGS. 1 through 3.

FIG. 5 is a side view of a key adapted to complement the guard device of FIGS. 1 through 4.

FIG. 6 is a left end view of the key of FIG. 5.

Referring to the drawings, there is shown in FIG. 1 a tumbler type lock **10** of the type generally utilized in securing the coin box **11** of a coin-operated machine or vending machine, which is not illustrated. Essentially the coin box **11** comprises a drawer which can be readily inserted through an opening formed in the wall portion or cabinet of a coin-operated machine. Generally the front panel **11A** of the coin box **11** is adapted to fit against the wall portion of a machine so as to form a part thereof. Disposed in the panel or front wall **11A** of the coin box **11** is the tumbler lock **12** for latching and unlatching the coin box **11** to the frame or cabinet of the coin-operated machine. Such locks may comprise a tumbler lock of the type disclosed in a co-pending Serial No. 469,601 filed July 6, 1965 and now U.S. Patent 3,339,384.

A protective device or guard **12** is provided to protect the lock **10** against damage by would-be vandals and/or thieves, and also to deter unauthorized access to the coin box **11** and/or otherwise prevent the defacing of the lock **10** by those who attempt to gain unauthorized access to the coins deposited therein.

As shown, the protective guard **12** of the present invention comprises a U-shaped member **13** formed of a suitable blank of flat material such as steel, hardened steel and the like, having a front portion **14** and a pair of integrally connected end or side portions **15**. The ends or sides **15** each have their respective free edges **15A** contoured to complement the contour of the panel **11A** in which the lock **10** is disposed. As best seen in FIGS. 1 through 4, the respective end portions **15** are each provided with an outwardly and laterally bent flange **16** which in the operative position is adapted to abut against the panel **11A** in which the lock is disposed. Accordingly, suitable fastening means, as for example, spot-welding, screws, rivets and the like, secure the flange portions **16** of the guard **12** to the panel **11A**.

As best seen in FIGS. 1 through 3 the guard **12** is fitted to the panel **11A** in which the lock is disposed so that the laterally turned flanges **16** are disposed on either side of the lock, and the free edges **15A** of the opposed end portions **15** are contoured to abut against the panel **11A**. Top and bottom cross pieces **17** and **18** are disposed in spaced relationship between the opposed end portions **15** of the guard. As shown, the top and bottom pieces **17** and **18** each comprise a U-shaped member in which the opposed turned end portions **17A** and **18A** thereof are suitably secured to the inside portions of the respective end portions **15** of the guard, as by welding and/or by other suitably fastening means. When the guard **12** is applied to the panel **11A** in which the lock is disposed, it will be noted that the configuration of the guard device **12** is such that the face portion **10A** of the lock **10** is completely enclosed and that the front portion **14** of the guard is spaced from the face **10A** of the lock **10**.

In accordance with this invention the front portion **14** of the guard is provided with a uniquely shaped opening **19** for receiving the key **20** by which the lock **10** may be operated between its latched and unlatched positions. As shown, the opening **19** is defined as a key-shaped opening in which the enlarged portion **19A** thereof which permits the initial insertion of the key **20** through the front portion **14** of the guard, is eccentrically disposed with respect to the keyway **21** of the lock as best seen in FIG. 1. The reduced portion **19B** of the key-shaped opening **19**, in communication with the enlarged portion **19A** thereof, is arranged so as to be in axial alignment with the keyway **21** and its functions to effect the alignment of a proper key **20** to the keyway **21** of the lock.

Consequently, upon initial insertion of any key or tool through the opening **19** formed in the front portion **14** of the guard, the key or tool is eccentrically disposed with respect to the keyway of the lock. Accordingly, alignment of the key with respect to the keyway of the lock can only be rendered possible if the shank portion of the key is specifically constructed and/or shaped so as to complement the shape and size of reduced portion **19B** of opening **19**, which portion allows alignment of the proper key with the keyway **21** of the lock. Therefore, it is to be noted that the axis of the aligning portion **19B** of the opening **19** formed in the front portion **14** of the guard is concentrically disposed with respect to the axis of the keyway **21**. It will thus be noted that the shank portion of the key must be specifically shaped to complement the shape and size of the aligning portion or reduced portion **19B** of the key-shaped opening **19** formed in the front **14** of the protective guard.

While the end portion of the reduced portion **19B** of the opening **19** is illustrated as being an arcuate portion of a circle, it will be readily understood that the end portion of the opening **19** may assume any geometric shape or contour. Accordingly, the shank portion **20A** of a key, which is specifically adapted to mate with the keyway **21** of the lock, must likewise be formed with a complementary geometric shape so that there is a proper mating of the key shank **20A** to the outline or contour of the key opening **19**, formed in the front **14** of the protective device so as to effect the necessary alignment of the key **20** with the keyway **21**.

From the foregoing description it will be readily apparent that unless the key **20** is specifically shaped to complement the key opening **19** formed in the face portion of the protective device, alignment of the key **20** with respect to the keyway **21** of the lock is rendered impossible. Therefore, would-be vandals and/or burglars

utilizing a known type of picking device and/or other means for burglarizing such locks, cannot successfully operate on the locks protected with a guard device, for the reason that such tools are not likely to be provided with the necessary complementary shapes to effect proper alignment thereof with the keyway **21** of the lock. For this reason, such lock picks and/or would-be burglarizing tools are rendered useless on locks protected as herein described, and thereby any unauthorized tampering with such locks is greatly detered.

It will be noted that the specific proportions of the opening **19** formed in the front **14** of the guard **12** can be varied so that numerous variations and combinations of different sizes and shapes are rendered possible to further deter any standardization of lock picks and/or other burglarizing devices. Also, it is to be noted that the various combinations afforded by the lock **10** and guard **12** therefor herein described further allow for an even greater number of possible lock combinations, as the original number of combinations previously possible by the various possible tumbler settings can now be increased by the number of combinations possible by the various complementary shapes afforded between the shape of the opening **19** and the complementary shape of the key shank.

While the instant invention has been described and illustrated with respect to a particular embodiment thereof, it will be readily appreciated and understood that variations and modifications may be made without departing from the spirit or scope of the invention.

What is claimed is:

1. In combination:

a security lock having a face portion disposed substantially in the plane of a panel,

said lock having a circular keyway formed in the face portion thereof,

means defining a guard for circumscribing the face of said lock, and

a key means adapted to be received in the keyway of said lock,

said key means having a cylindrically shaped head adapted to fit in said keyway, a shank connected to said head end and turnhandle connected to the other end of said shank,

said guard comprising an integrally formed U-shaped

plate member having a front portion and a pair of connected end portions,

each of said end portions having contoured edges adapted to complement the shape of said panel for spacing said front portion from the face portion of said lock,

said end portions include the laterally bent flanges adapted to abut against the surface of said panel,

said front portion having a key-shaped opening formed therein, said opening having an enlarged end portion and a reduced end portion,

said enlarged end portion being eccentrically disposed with respect to the keyway of said lock and said reduced end portion being disposed concentrically relative to the keyway of the lock,

said enlarged portion of said opening being adapted to receive the head of said key eccentrically of said keyway,

and the shank of said key being adapted to be received into reduced portion of said opening,

said shaft and the reduced end portion of said opening having complementary shapes so that when a proper key is disposed in said opening, the head of the key is disposed in axial alignment with the keyway of the lock,

and cross pieces extending between the opposed end portions to form a top and bottom portion for said guard,

each of said cross pieces including a U-shaped member having the opposed ends of which are secured between the end portions of said guard and said top and bottom portions extending between the front portion of said guard and said panel in substantially parallel planes.

References Cited

UNITED STATES PATENTS

1,004,758	10/1911	Ebbert	70—427
1,110,963	9/1914	Robinson	70—454
3,343,386	9/1967	Hall	70—423

MARVIN A. CHAMPION, *Primary Examiner.*

ROBERT L. WOLFE, *Assistant Examiner.*

U.S. Cl. X.R.

70—454

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3 444 712 Dated May 20, 1969

Inventor(s) Harry Greenwald

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, in the title change the name of the assignee, "Louis Walf," to read ---Louis Wolff--

SIGNED AND
SEALED
MAY 26 1970

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents