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SECURITY LOCKING DEVICE

George I. Ratner, East Orange, N.J., assignor to Automatic Close & Lock Corporation, East Orange, N.J.
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ABSTRACT OF THE DISCLOSURE

In a receptacle including a security control device for protecting valuables in closure means which is adapted to be moved between open and closed positions with respect to the receptacle, the security control device has a spring biased traveler mounted on a track on the receptacle which traveler pushes the closure means towards its closed position, and locking ratchet and cooperating pawl elements, one of which is mounted on the receptacle and the other of which is secured to the closure means for movement therewith. The ratchet and pawl elements are urged into engagement with each other to hold the closure means against movement to its open position with respect to the receptacle while allowing movement of the closure means towards its closed position when released by the operator.

This invention relates to security control devices for receptacles, and more particularly to a locking system for drawers, doors and the like which give or preclude access to cash or other valuable articles or documents within the receptacle.

It is well known that cash drawers do not fully protect against armed robbers when there is a clerk or teller in charge of the drawer because in the course of the hold-up the clerk is usually subjected to fear for his life; and, in general, banks and other business concerns warn their employees not to risk such holdups. It is necessary therefore, that the drawer be closed and locked automatically to prevent admittance thereto.

Security control devices have been proposed in the past to protect cash drawers and the like and provide means for closing the drawer and latching it closed against bandits or unauthorized personnel who may wish to open the drawer for purposes of theft. Such devices have been relatively complicated and the closing and locking thereof generally have involved the necessity of complex electrical circuits or pressure fluid systems. Often these prior art devices are concerned with the protection of bank tellers and the cash in their custody and so have included complex additional systems to maintain the cash drawer in an open position so as to avoid lost motion and repeatedly opening and closing of the drawer for each normal transaction. The drawers in such a system automatically close when the latching system holding the drawer open is released, as when the release mechanism is actuated by a push bottom switch either electrically, hydraulically, or mechanically. However, for storage of greater amounts of money, and for use in drawers where repeated transactions do not take place, it is often dangerous to leave the drawers open or in a condition to be opened by unauthorized persons.

Accordingly, it is an object of the present invention to automatically retract and lock a drawer in a receptacle.

It is another object of the invention to provide a mechanism by which drawers can be closed and locked by merely releasing the drawer.

It is a further object of the invention to prohibit opening of a closure member from any position to which the closure had previously been retracted.

In accordance with an aspect of this invention, a security control device for a drawer in a receptacle in-

cludes a traveler mounted on a track adjacent the drawer which traveler is preloaded so that it will engage the drawer and push it to a closed position. A spring biased pawl is mounted on the drawer and a locking ratchet element having the abrupt locking faces thereof faced in the direction of closing movement of the drawer is mounted on the receptacle in position for engagement with the latch, so that movement of the drawer to its open position is prevented by this engagement, whereas movement of the drawer to its closed position under the influence of the traveler is permitted. A key-operated release member is provided for releasing the pawl from engagement with the ratchet element, so that the drawer may be opened when desired. A fail safe device is also provided to release the pawl in the event of failure of the key mechanism to insure that the drawer may be opened, thus avoiding the necessity of damaging the receptacle to gain admission thereto.

Applicant's invention is adapted for use in increasing the security of existing cash drawers or similar equipment in banks and mercantile establishments and also replacing such equipment when it has failed or worn out. The receptacles and drawers generally have a long life expectancy and are formed of relatively strong materials so that it often occurs that the safety control elements therein fail or become obsolete before the receptacles themselves. Accordingly, there is a large demand for conversion of the existing equipment to supplement or increase the security thereof. Applicant's device is suitable for improving the security of existing equipment as well as for conveniently being built into new equipment. The elements of applicant's equipment are conveniently mounted within existing equipment receptacles and closures to provide security therefore. The key for operating the release mechanism would normally be held by the teller, but with the knowledge that the drawer would be locked, requiring the use of the key to unlock each time. However, the key could instead be retained by a bank officer, offering dual control to the access of the valuables. If a bank officer alone retains the key, the drawer could not be opened by a teller under threats of a bandit.

The above and other objects, features and advantages of this invention, will be apparent in the following detailed description of an illustrative embodiment of the invention which is to be read in connection with the accompanying drawings wherein:

FIG. 1 is an exploded perspective view from beneath showing a security control device of the type in which the present invention may be employed;

FIG. 2 is a perspective view of the pawl mechanism of the present invention mounted on the closure means;

FIG. 3 is a perspective view showing the releasing mechanism for the pawl; and

FIG. 4 is a sectional view taken on line 4—4 of FIG. 2.

Referring to the drawing in detail, and initially to FIG. 1 thereof, it will be seen that a security control device 10 of a type in which the present invention may be employed generally comprises a preloaded traveler mechanism 12 adapted to engage closure means 14 to urge the closure means towards its closed position at the rear of the receptacle 15, and a locking ratchet pawl mechanism 16 which holds closure means 14 against movement to its open position from any position to which it had previously been withdrawn. It is noted, that while closure means 14 is illustrated in the drawings as a drawer, it is contemplated that the present invention may be used in conjunction with other closure means, such as a door or means for closing other security receptacles.

Drawer 14 is slidably mounted in receptacle or cabinet 15 on rollers, or other antifriction devices as is customary in office equipment, and is provided with a handle 20 on

its front panel 22. An extension 24, formed of sheet metal or the like, is secured to the rear wall 26 of the drawer 14 and is positioned for operative engagement with traveler 12 as more fully described hereinafter. Plate 28 is secured to top wall 30 of receptacle 14 and includes a downwardly extending dovetail track 32 on which traveler mechanism 12 is mounted. Traveler 12 includes block 34 having a dovetail groove 36 therein which is complementary to track 32 and which provides slidable mounting of traveler assembly 12 on the track 32. A pair of depending extensions 38 are mounted on opposite sides of block 34 and extend into the path of travel of drawer 14 and extension 24. In the ends of extensions 38, respectively are bolts 40 which extend beyond traveler 12 to abut against drawer 14 or a part attached to it, e.g. extension 24 or preferably to engage in slots 112 for positive interconnection.

Traveler 12 is biased towards the rear 42 of cabinet 15 by spring mechanism 44. In this embodiment, mechanism 44 includes coil 46 of thin spring steel ribbon 48, e.g. a strip about .020 inch thick which is secured at its inner end to spool 50 and wound thereon by its own inherent coiling tendency. Brackets 52, secured to plate 28, provide support for the arbor of spool 50. The opposite end 53 of spring 48, runs along the lower surface of track 32 and is secured, in any convenient manner, to traveler 12 and thus continuously urges traveler 12 towards the rear of the receptacle. Accordingly, traveler 12 is held in engagement with extension 24 of drawer 14, and under the influence of spring 48, urges the drawer towards its closed position.

At its closed position and at any other position along the path of travel, drawer 14 is locked against opening by ratchet and pawl mechanism 16. Plate 28 is provided with depending locking ratchet teeth 56 formed along its lower edge. Teeth 56 have abrupt locking faces 58 faced in the direction of closing movement of drawer 14, so that engagement of pawl 60 on drawer 14 with locking surfaces 58 prevents outward movement of drawer 14 against the bias of spring 48.

Pawl 60 and the mounting system therefor are more clearly illustrated in FIG. 2, wherein it is seen that the pawl 60 is mounted in channel member 62. Member 62 is mounted on leg 64 of angle extension 24 through an intermediary connecting block 66 or the like. This block 66 defines a space 68 between leg 70 of channel 62 and leg 64. Space 68 is adapted to receive side 72 of drawer 14. In mounting channel 62 in this manner, a minimum amount of the space available within receptacle 15 is used. For clarity, side 72 and traveler 12 are shown in FIG. 2 in dash-dot outline.

Channel 62 is provided with cutout portions 74 in its legs 70, 75, which cutouts are adapted to receive pawl 60 and guide the pawl for movement therealong. Pawl 60 is urged towards its upper position by spring 76 which is secured at one end 78 to bight portion 80 of channel 62 and at its other end 82 engages the cutout portion 84 of the pawl. Thus, it is seen that, as traveler 12 pushes drawer 14 towards the rear of the receptacle, pawl 60 is depressed by the sloping faces 86 of teeth 56 to permit rearward movement of the drawer. However, since spring 76 continuously urges pawl 60 towards its upper position, any attempt to open drawer 14, as by moving it forwardly, would be prevented by the engagement of pawl 60 with the abrupt or locking faces 58 of the teeth 56. This locking action will occur at any position of the drawer, due to the elongated character of ratchet member 54.

To permit opening of drawer 14, when desired, pawl release mechanism 90 is provided along side 72 of drawer 14. Release mechanism 90 includes lock mechanism 92 secured in front wall 22 of drawer 14, which lock mechanism is adapted to rotate cam 94 in a counterclockwise direction, as seen in FIG. 3, when the proper key is inserted and turned therein. Lock 92 is, in the preferred

embodiment, adapted for manual operation at the locus of the drawer by the teller or other authorized personnel. Preferably it is contemplated that only a single authorized person retain control of the key and this person may be someone other than the teller or any other person likely to be approached by bandits. Thus, the drawer could not be under the teller's control and could not be opened during a robbery.

Release mechanism 90 includes control rod 96 rotatably mounted on side 72 of drawer 14, which rod is adapted to be rotated in a clockwise direction upon rotation of cam arm 94. Rod 96 includes lever arm 98 which is spring biased by spring 100 in a counterclockwise direction. Arm 98 is held in a horizontal position in the closed position of the drawer by engagement with pin 102 on arm 94. When arm 94 is rotated by actuation of lock 92, pin 102 is moved downwardly, as seen in FIG. 3, and urges arm 98 and thus rod 96 in a generally clockwise direction. Forward end 104 of rod 96 includes flat extension 106 which is seated in the base of cutout 84 in pawl 60. This configuration is seen more clearly in FIG. 4, wherein the latching position of pawl 60 is shown in solid lines and the release position thereof is shown in dash-dot lines. When rod 96 and thus extension 106 are rotated in a clockwise direction, edge 108 of extension 106 is urged against base 110 of cutout 84 and pushes pawl 60 downwardly against the action of spring 76. In this manner pawl 60 is removed from engagement with the adjacent face 58 of ratchet 54 so that drawer 14 may be moved to its open position. The drawer is moved to this open position against the pull of spring 48 which tends to bias it closed. When the drawer is released, for example when the teller removes his hand from handle 20, the drawer is thereby automatically returned to its closed position. When released, the key will return to a vertical position and may even pop out of lock 92. In either case, pawl 60 engages teeth 56 (unless the key is manually held in a rotated position) thereby ensuring that the drawer would immediately lock upon closing. Moreover, if the drawer were grasped or caught before it was fully closed, it would be held in the position it had achieved by the engagement of pawl 60 and ratchet 52 so that it could not be pulled open again.

The security control device of the present invention is conveniently installed in existing drawers and cabinets, as the various components thereof, that is, plate 28 and angle 24 are conveniently bolted or welded to the cabinet enclosure means and drawer respectively. Pawl mechanisms 16 and extension 24 may be conveniently assembled to drawer 14 outside the cabinet while plate 28 and traveler mechanism 12 are secured to the top portion of the cabinet. The drawer is then inserted within the cabinet with the traveler 12 at the front of track 32, so that extension 24 may be moved below the traveler mechanism 12 and then be raised up behind into engagement therewith. While as previously described, bolts 40 may be in mere abutment with extension 24, it is preferred that extensions 24 be provided with slots 112 therein through which the bolts 40 may be extended to assure positive engagement of the traveler with the drawer. Even if not affixed, the traveler 12 will normally be kept butted in contact against the extension 24 by the spring 44. The stopping location of drawer 14 with proper engagement of pawl 60 and teeth 56 is accomplished by careful installation of base assembly 28 in the prescribed position. Bolts 40 may be made adjustable to ensure proper longitudinal positioning of traveler 12 relative to the extension 24, but normally this is not required. Bolts 40 engagement in slots 112 assures a correct interaction between pawl 60 and teeth 56.

Referring again to FIG. 1, a fail safe mechanism 120 is provided on plate 28 in order to insure that drawer 14 may be opened in the event that lock 92 or any of the other components of release mechanism 90 should fail or that the keys are lost. As seen therein, plate 28 is pro-

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vided with a downwardly extending right angle guide track 122 which extends longitudinally along plate 28 adjacent ratchet 54. Seated on the horizontally extending leg 124 of track 122, is a generally L-shaped cam member 126, which may be stored either at the front or rear ends of track 122. Downwardly extending leg 128 of cam 126 has a pair of angularly related cam surfaces 132 and 134 respectively, which are adapted to engage pawl 60 and depress the pawl to move it out of engagement with teeth 56 of ratchet 54.

The operation of cam 126 is controlled by a rod 130 (FIG. 3) which is adapted to be inserted through a small aperture 135 in front wall 22 of drawer 14. The inner end 137 of rod 130 is adapted to be threadably engaged in threaded hole 139 in forward end of leg 128 of cam 126. Accordingly, should the releasing mechanism 90 fail in some way, drawer 14 may still be opened by inserting rod 130 through wall 22 into engagement with cam 126 and pushing or pulling the cam along track 122 until it engages and depresses pawl 160. Thereafter, the drawer may be moved forward to its open position while pawl 60 is held in its lower position by cam 126.

It is sometimes desirable to allow access to the front of the drawer, even if the drawer as a whole has been locked by our device. A stop 140 is provided for this purpose. As shown in dotted lines in FIG. 1, stop 140 may be a Phillips head screw engaged in a threaded hole 141 adjacent track 32. Thus, the screw when in position blocks track 32 and thus traveler 12 and limits the rearward movement of the drawer 14 under the influence of spring 48. Accordingly, if drawer 14 is provided with front and rear compartments, a bandit, or a clerk under threats of a bandit can get a hand into the front compartment of drawer 14 and take out money which it may contain. However, the rear compartment of the drawer is inaccessible and the drawer is held in that position by engagement of pawl 60 with ratchet 56 so that it may not be opened further. This may also help in some holdups by permitting the bandit, or teller under stress, to take out whatever funds are exposed in the front of the drawer and thus satisfy the bandit's demands for money. When this is not desired, bolt 140 can be removed and traveler 12 in drawer 14 may then move the full length of track 32 to the fully closed position of the drawer 14.

Although an illustrative embodiment of the present invention has been described herein with reference to the accompanying drawings, it is to be understood that the invention is not limited to that precise embodiment, and that various changes and modifications may be effected therein by one skilled in the art without departing from the scope or spirit of this invention.

What is claimed is:

1. A security control device for protecting valuables in a receptacle having closure means adapted to be moved between opened and closed positions, said device comprising locking ratchet and cooperating pawl elements, one of said elements being secured to said receptacle and the other of said elements being secured to said closure means for movement therewith, means for urging said elements into engagement with each other to hold said closure means against movement to its open position with respect to said receptacle while allowing movement of said closure means towards its closed position with respect to said receptacle along a predetermined path, said ratchet element having locking teeth with the locking faces thereof faced in the direction of closing movement of said closure means whereby engagement of said pawl element with one of said faces holds said closure against movement in the opening direction, a track mounted on said receptacle adjacent said closure means, a traveler mounted for movement along said track for engagement with said receptacle, and drive means for urging said traveler into engagement with said closure and to the limit of its travel in the closing direction whereby said closure means is moved to its closed position.

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2. A security control device as defined in claim 1 including means for releasing engagement of said pawl and said ratchet to permit said closure means to be moved to its open position.

3. A security control device as defined in claim 2 wherein said ratchet is mounted on said receptacle and said pawl is mounted on said closure means.

4. A security control device as defined in claim 3 wherein said closure means comprises a drawer, said ratchet being mounted on said receptacle in spaced parallel relation adjacent one side of said drawer and said pawl being mounted on said one side.

5. A security control device as defined in claim 4 wherein said means for urging said ratchet and pawl elements into engagement comprises a spring operatively engaged with said pawl and urging said pawl into contact with said ratchet.

6. A security control device as defined in claim 5 wherein said releasing means comprises an elongated member rotatably mounted on said drawer, said elongated member being operably engaged at one end with said pawl, and means for selectively rotating said elongated member whereby said pawl is moved against the action of said spring and out of engagement with said ratchet.

7. A security control device as defined in claim 6 including another means for releasing said pawl, independently of the first mentioned releasing means.

8. A security device as defined in claim 7 wherein said other releasing means comprises cam means slidably mounted in said receptacle adjacent said ratchet and means for selectively engaging said cam means with said pawl to move said pawl against the action of said spring and out of engagement with said ratchet whereby said closure means is freed for movement to its open position.

9. A security device as defined in claim 6 wherein said drive means comprises a return spring.

10. A security control device for protecting valuables in a receptacle having closure means relatively moveable with respect to the receptacle and adapted to close the receptacle against theft of its contents or to permit opening for normal use, said device comprising a track mounted on said receptacle adjacent said closure means, a traveler mounted on said track in a path obstructed by said closure means when it is between its open and closed positions, drive means for urging said traveler to the limit of its travel in the closing direction, said traveler abutting said closure means and pushing said closure means towards the closed position, locking ratchet and cooperating pawl elements, one of said elements being connected to said receptacle and the other of said elements being operatively connected to said closure means for movement therewith, and means for urging said elements into engagement with each other to hold said closure means against movement to its open position.

11. A securing device for protecting valuables in a receptacle having a drawer adapted to be moved between opened and closed positions, said device comprising locking ratchet and cooperating pawl elements, one of said elements being secured to said receptacle and the other of said elements being secured to said drawer for movement therewith, means for urging said elements into engagement with each other to hold said drawer against movement to its open position with respect to said receptacle while allowing movement of said drawer towards its closed position with respect to said receptacle, said ratchet element having locking teeth with the locking faces thereof faced in the direction of closing movement of said closure means whereby engagement of said pawl element with one of said faces holds said closure against movement in the opening direction, and means for releasing engagement of said pawl and ratchet to permit said drawer to be moved towards its opened position, said releasing means including an elongated member rotatably mounted on one of said receptacle or drawer and operatively engaged with said pawl, and means for selectively

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rotating said elongated member to move said pawl against the action of said urging means out of engagement with said ratchet.

12. A security control device as defined in claim 11 wherein said ratchet is mounted on said receptacle and said pawl and releasing means are mounted on said drawer. 5

13. A securing control device as defined in claim 12 wherein said ratchet is mounted on said receptacle in spaced parallel relation adjacent one side of said drawer and said pawl is mounted on said one side. 10

14. A security control device as defined in claim 13 wherein said means for urging said ratchet and pawl elements into engagement comprises a spring operatively engaged with said pawl and urging said pawl into contact with said ratchet. 15

15. A security device as defined in claim 13 including means for releasing said pawl independently of the first mentioned releasing means and comprising cam means slidably mounted in said receptacle adjacent said ratchet and means for selectively engaging said cam means with 20

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said pawl to move said pawl against the action of said urging means and out of engagement with said ratchet whereby said closure means is freed for movement to its open position.

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JAMES T. McCALL, Primary Examiner

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