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SELF-OPERATED CHECKING LOCKER SYSTEM HAVING A SINGLE SLUG REJECTOR
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My invention relates to a self-operated checking system for baggage or the like having a plurality of lockers which can be individually locked and, more particularly, to a plurality of lockers having a single coin register and slug rejector unit for operating any of the lockers in the system.

Customer-operated checking systems have heretofore been provided employing a plurality of lockers which can be locked by the customer to secure his baggage by depositing a dime or quarter in a coin slot associated with the locker, then turning the key in the associated lock to lock the locker door, and removing the key. The property can be later retrieved by the customer with the key which he retains in his possession during the time his property is checked. It has been the practice heretofore to have a separate coin register and slug rejector associated with each individual locker in the system. This duplication has proved costly. In an effort to reduce the cost of such installation, the coin register and slug rejector have been made as cheaply as possible, with a resulting sacrifice in the accuracy and effectiveness of the slug rejector unit.

It is the general object of my invention to avoid and overcome the foregoing and other difficulties and objections to prior art practices by the provision of an improved locker system which is less expensive to manufacture and maintain, and which is substantially fool-proof in operation.

Another object of my invention is to provide a self-checking locker system for baggage or the like employing a plurality of lockers having a single coin register and slug rejector unit.

Another object of my invention is the provision of a locker system of lesser cost but greater efficiency and characterized by improved coin register and slug rejector mechanism.

The aforesaid objects of my invention, and other objects which will become apparent as the description proceeds, are achieved by providing a self-operated baggage checking apparatus comprising a plurality of lockers, a hinged door on each of the lockers, a lock associated with each locker for locking the locker door and adapted to be turned by a mating key to either a locked or unlocked position, a solenoid-operated door associated with each lock to secure the lock in unlocked position until energized, a reset switch operatively associated with the lock and adapted to be closed when the lock is turned through a position intermediate of the locked and unlocked positions, a slug rejector adapted to receive coins of a predetermined denomination, an electrical coin register switch associated with the slug rejector and adapted to be momentarily closed by the deposit of a coin of proper value therein, an electrical power source, a ratchet relay electrically connected in series with the power source, a single pole double-throw switch actuated by the ratchet relay to connect alternately the ratchet relay to the coin register switch and the reset switch, and a second relay switch actuated by the ratchet relay, the second relay switch connecting the solenoid lock detent to the power source on alternate cycles of the ratchet relay.

For a better understanding of my invention, reference should be had to the accompanying drawings, wherein:

Fig. 1 is a schematic diagram showing the electrical switching circuit and associated key-locks and lockers;

and

Fig. 2 is a modified form of the invention.

With specific reference to the form of the invention illustrated in Fig. 1, the numeral 10 indicates generally a locker or the like of which two are illustrated, although it is to be understood that the invention may be extended to include any number of such lockers.

The lockers are generally supported in panels of twenty or thirty by means of frames 12. Locker doors 14 are hingedly supported by spring hinges 16 which normally act to urge the locker doors into closed position, as shown in the figure. Mounted in the frames 12 adjacent the side of the locker doors 14 opposite the hinges 16 are the key locks, indicated generally at 18 and 19. The lock 18 is shown in the unlocked position with the key in place, while lock 19 is shown in the locked position with the key removed.

The lock 18 is operated by means of a key 20 which, when inserted in the lock and turned, rotates the plug 21 of the lock and the associated locking arm 22 as the key is turned to the locked position. The rotary locking arm 22 passes through the slot 26 provided in the frame 12, and engages the locker door 14 by means of the slot 24 therein.

Associated with the plug 21 of the lock is a solenoid detent assembly 28. The assembly includes a solenoid 29 and a detent 30 spring-loaded to engage with a shallow hole 31 in the plug 21 of the lock 18 to secure the lock in the unlocked position. When the solenoid 29 is energized, the detent 30 is disengaged from the plug 21 so that the lock can be turned to the locked position. The lock 18 is so arranged that the key 20 can only be removed from the lock when the lock is in the locked position. A lock-operated reset switch 27, associated with the lock 18, is so arranged and designed that the switch is momentarily closed with the initial movement of the barrel 21 from unlocked to locked position, but is otherwise open.

In operation, to latch the locker door 14 and remove the key 20 to secure property such as baggage or the like in the locker 10, it is necessary for a customer to first insert a dime or a quarter. To this end, a coin register 32, which is adapted to receive a coin of proper denomination, is provided and preferably is mounted on and centrally located in respect to the locker panel. The coin register 32 is of standard make and is designed and arranged to reject slugs, bent coins, or coins of improper denomination and return them to the customer. Coins accepted by the coin register 32 activate a switch 34 as they drop through into a collection box (not shown). A safety release magnet 33 is provided in conjunction with the coin register 32 and is so arranged that, whenever the magnet is non-energized, any coins deposited in the coin register 32 are directly returned to the customer. This insures return of the customer's money in the event of power failure of the apparatus.

The electrical circuit associated with the coin register switch 34 and the solenoid-detent assembly 28 includes a power source 36 of battery or other type which is connected in series through a solenoid 38 of a ratchet relay indicated generally at 40. Ratchet relay 40 is a fast-acting type of standard construction, such as Guardian relay series type S-125 D. C. The ratchet relay, when energized, rotates a cam 42 through an angle of 30 degrees, for example, the cam being coupled by means of a spring-pressed cam follower 44 to a pair of switches 46 and 48. The switches 46 and 48 are of the single-pole, double-throw type. Switch 46 alternately connects the
ratchet relay solenoid 38 to the reset switch 27 and the coin register switch 34 upon successive electrical impulses through the solenoid 38. The switch 48 alternately completes the circuit from the power source 36 to the magnetic safety release 33 or to the solenoid detent 28.

Every other electrical impulse through the solenoid 38 completes the electrical circuit from the power supply 36 through the solenoid and simultaneously closes a circuit from the power source 36 through the solenoid 38 to the reset switch 27. Coin register switch 34 and switch 46 are closed for a sufficient length of time to produce a pulse through relay 40 sufficient to advance the ratchet full a step.

The operation of the apparatus is as follows: Assuming that the cam 42 and associated switches 46 and 48 are in the position illustrated in Fig. 1, the customer places his baggage in any unlocked locker, for example, the locker having lock 18. Next the customer deposits the proper coin in the coin register 32, and the switch 34 is momentarily closed. This completes a circuit through the switch 46, connecting the solenoid 38 with the power source 36 and thereby actuating the ratchet relay 40.

This, in turn, advances the cam 42 to one of its high points with respect to follower 44, thereby moving the switch 48 to its upper or opposite position to complete the circuit through the solenoid detent 28. Thus, the solenoid detent 28 is energized from the electrical power source 36, thereby releasing the plunger 30 so that the customer can turn the key 20 into the locked position to secure the locker door 14, at which time the key 20 can be removed from the lock 28. The same movement of switch 48 to its opposite position de-energizes the safety release magnet 33 so that any additional coins deposited in the coin register 32, for example, by other customers before any of the locks are turned to complete the transaction, are immediately returned.

As the key 20 is turned in the lock, at a position intermediate the locked and unlocked position, the reset switch 27 is closed, completing a circuit through the switch 46 (which is in its uppermost position) and solenoid 38 with the power supply 36, so that the solenoid 38 is energized to move cam 42, whereby switches 46 and 48 are returned to their initial condition. The solenoid 38 is thus de-energized and the entire electrical circuit is returned to the Fig. 1 position, wherein it is prepared to serve the next customer in the same manner as just described.

The circuit is arranged so that all of the detent solenoids are connected in parallel as are the key-lock reset switches, so that any one of a number of lockers which are not in use are operated from the single coin register 32. It is to be understood, however, that as soon as the key 20 is turned in the lock to latch its associated locker, the lock plug associated with any other unused locker is immediately re-engaged by its associated solenoid-operated detent plunger by virtue of the resetting action of the lock switch 27 and associated circuit. Thus, although the solenoid detent on all lockers are actuated simultaneously when a coin is deposited in the coin register 32, as soon as the key 20 is turned to latch one locker, all the other lockers are again rendered inoperative until a subsequent coin is deposited.

The detent 30 of each solenoid detent assembly 28 only engages to secure the plug of its associated lock when the lock is in the unlocked position so that any locked locker can be unlocked by the customer to get his luggage back merely by inserting the proper key and unlatching the locker, no part of the electrical circuit coming into play in this operation.

The wiring diagram of Fig. 2 is an alternative schematic circuit in which the elements which are identical with elements of Fig. 1 are indicated by the same letters followed by the suffix a. In the modified circuit, the lock-operated reset switches 27 are connected in series. The reset switches are so designed and arranged that they are normally closed when the locks 18 associated with locker doors 14 are in either the locked or unlocked position, but are momentarily opened as the associated lock is turned from one position to the other.

The switches 27 connect the power source 36 to a relay 52, which in turn is connected through the coin register switch 34 and thence through the solenoids 28, which are all connected in parallel, back to the power source 36 to complete the circuit.

Because the coin register switch 34 is only momentarily closed when a coin is deposited, a normally open shunting switch 54, operated by the relay 52 and adapted to close when the relay is energized, is provided to maintain the circuit through solenoid-detent assemblies 28 until one of the reset switches 27 is opened. The relay 52, in addition, opens a normally closed switch 56 when energized to break the circuit through the safety release magnet 33 when the apparatus is in use. The switches 54 and 56 are biased to their normal positions by spring 60.

The operation of the modified circuit of Fig. 2 is believed evident from the above description. The function of the circuit in conjunction with a multi-locker system is the same as the circuit of Fig. 1.

From the above description, it will be recognized that the objects of the invention have been achieved by providing a locking system for self-checking of baggage parcels, or the like, including a plurality of such lockers which are coin-operated from a single coin register and slug rej ector unit. The advantages of such an arrangement are: less expensive to manufacture, simpler operation, reduced cost of service and maintenance, and, because a completely foolproof coin register and slug rej ector can be readily employed, an additional saving in operation is effected.

While in accordance with the patent statutes, certain best known embodiments of the invention have been illustrated and described, it is to be particularly understood that the invention is not limited thereto or thereby, but is defined in the appended claims.

What is claimed is:

1. A self-operated baggage checking apparatus or the like comprising a plurality of lockers, a hinged door on each of said lockers, a lock associated with each locker for locking the locker door and adapted to be turned by a mating key to either a locked or unlocked position, a detent associated with the lock to secure the lock in unlocked position, a solenoid assembly to operate said detent, a reset switch operatively associated with the lock and adapted to be actuated when a key is turned in the lock to de-energize said solenoid, a slug rej ector adapted to receive coins of predetermined characteristic, an electrical coin-register switch operatively associated with the slug rej ector and adapted to be actuated by the deposit of a coin of proper value in the slug rej ector, an electrical power source, a ratchet relay electrically connected in series with the power source, a single-pole, double-throw switch actuated by the relay to connect alternately the ratchet relay to the coin register switch and the reset switches, and a second relay switch actuated by the ratchet relay, the second relay switch connecting the detent solenoids to the power source of alternate cycles of the ratchet relay simultaneously with the closing of the coin register switch.

2. A self-operated baggage checking apparatus or the like comprising a plurality of lockers, a hinged door on each of said lockers, locking means associated with each locker for locking the locker door, releasable locking means adapted normally to secure said locking means in unlocked position, a reset switch operatively associated with the locking means, a slug rej ector adapted to receive coins of predetermined characteristic, an electrical coin-register switch operatively associated with the slug rej ector and adapted to be closed momentarily by the deposit of a coin of proper value in the slug rej ector, an electrical power source, a ratchet relay electrically connected in series with the power source, a single-pole, double-throw switch actuated by the relay to connect alternately the ratchet relay to the coin register switch and the reset switches, and a second relay switch actuated by the ratchet relay, the second relay switch connecting the detent solenoids to the power source of alternate cycles of the ratchet relay simultaneously with the closing of the coin register switch.
power source, a relay electrically connected in series with the power source, a first switch actuated by the relay to connect the relay to the coin-register switch and the reset switches, and a second relay switch actuated by the relay, the second relay switch adapted to release said releasable lock-securing means on alternate cycles of the relay simultaneously with the closing of the coin register switch.

A self-service locker system including a plurality of lockers, a door movably secured to each locker, a key-operated lock for locking each of said doors, releasable means at each lock individually engaging the locks for securing said locks in unlocked position, a single coin-operated means for collectively releasing said releasable means and permitting any of said doors to be locked, and means on one lock and operable by a locking movement thereof for reengaging said releasable means on all locks in unlocked position simultaneously with the locking of said one.

4. A self-service locker system including a plurality of lockers, a door movably secured to each locker, a key-operated lock for locking each of said doors, a releasable detent operatively associated with each lock for securing said locks in unlocked position, solenoid means for releasing the detent, a single coin-operated means for operating said solenoid means and permitting any of said doors to be locked, and means on one lock and operable by a locking movement thereof for reengaging said detent on all locks in unlocked position simultaneously with the locking of said one.

5. A self-service locker system including a plurality of lockers, a door hingedly secured to each locker, a key-operated lock for locking each of said doors, a solenoid-released detent operatively associated with each lock for securing said locks in unlocked position, a solenoid for releasing said detent, a single coin register and slug rector adapted to energize said detent solenoids for releasing said detents and permitting any of said doors to be locked, and means including a circuit closer at one lock and closeable by a locking movement thereof for reengaging said detents on all locks in unlocked position simultaneously with the locking of said one.

6. A self-service locker system including a plurality of lockers, a door movably secured to each locker, a key-operated lock for locking each of said doors, a solenoid-released detent operatively associated with each lock for securing said locks in unlocked position, a single coin register and slug rector adapted to energize said solenoid means for releasing said detents and permitting any of said doors to be locked, holding means for maintaining each door within its limit until one lock is locked, and means including parallel circuit closers on each of said locks and closeable by a locking movement of its lock thereof for reengaging said detents on all locks in unlocked position simultaneously with the locking of one.

7. A self-operated locker system including a plurality of lockers, a door hingedly secured to each locker, a lock associated with each door for locking the door, a solenoid-released detent operatively associated with each lock for securing the locks in unlocked position, a solenoid for releasing said detent, a single slug rector adapted to take coils of certain characteristics, a coin-operated switch associated with the slug rector, a relay connected to said switch and adapted to be energized by a coin deposited in the slug rector, said relay establishing a circuit whereby the detent solenoids are energized, a lock-operated reset switch associated with each lock and adapted to de-energize all detent solenoids simultaneously with the locking of one of the lockers.

8. A self-service baggage checking apparatus or the like comprising a plurality of lockers, a hinged door on each of said lockers, locking means associated with each lock and operable by a locking movement thereof for reengaging said locking means adapted normally to secure said locking means in unlocked position, a reset switch operatively associated with the locking means, a slug rector adapted to receive coins of predetermined characteristics, an electrical coin register switch operatively associated with the slug rector and adapted to be closed momentarily by the deposit of a coin in the slug rector, an electrical power source, said reset switches being connected in series with said power source, a relay in series with the reset switch and the coin register switch, a normally open relay operated switch connected in parallel with said coin register switch, said lock-securing means being connected in parallel with each other and in series with the coin register switch to complete the circuit back to the power supply.

9. A self-service locker checking system comprising a plurality of lockers, a door movably secured to each locker, a key operated lock for locking each of said doors, a releasable means individual to a lock therefor engaging the lock for securing said lock in unlocked position, a common coin operated mechanism adapted to release at least certain selected ones of said releasable means to permit the doors associated therewith to be locked.

10. A self-service locker checking system comprising a plurality of lockers, a door movably secured to each locker, a key operated lock for locking each of said doors, a releasable means individual to a lock therefor engaging the lock for securing said lock in unlocked position, a common coin operated mechanism adapted to release at least certain selected ones of said releasable means to permit the doors associated therewith to be locked, and means individual to a lock and operable by a locking movement thereof for re-engaging any of said certain releasable means in the unlocked position simultaneously with the locking of one of said locks.

11. In a locker checking system having a plurality of lockers, a door associated with each of said lockers and a key-operated lock associated with each of said doors, a combination of releasable means individual to a lock and adapted to secure the locks in unlocked position, a common coin-operated mechanism for releasing at least one selected releasable means to permit the locking of the door associated therewith, and means individual to each lock and operable by a locking movement thereof for re-engaging said releasable means when said lock is unlocked.

12. A self-service baggage checking apparatus or the like comprising a plurality of lockers, a hinged door on each of said lockers, a lock associated with each lock for locking the locker door and adapted to be turned by a mating key to either a locked or unlocked position, a solenoid-released detent associated with the lock to secure the lock in unlocked position, a solenoid adapted to be energized to release said detent, a reset switch operatively associated with the lock and adapted to be actuated when the key is turned in the lock to thereby de-energize said solenoid, a slug rector adapted to receive coins of predetermined characteristics, an electrical coin register switch operatively associated with the slug rector and adapted to be actuated by the deposit of a coin in the slug rector, said detent solenoids being connected in parallel with each other and in series with said coin register switch, a normally open relay operated switch connected in parallel with said coin register switch, an electrical power source, a relay connected in series with said coin register switch and said power source.

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