March 22, 1966 C. N. MOORE 3,241,647

COIN-OPERATED BOWLING-SHOE RENTING APPARATUS

Filed July 27, 1964 4 Sheets-Sheet 1

Fig. 1.

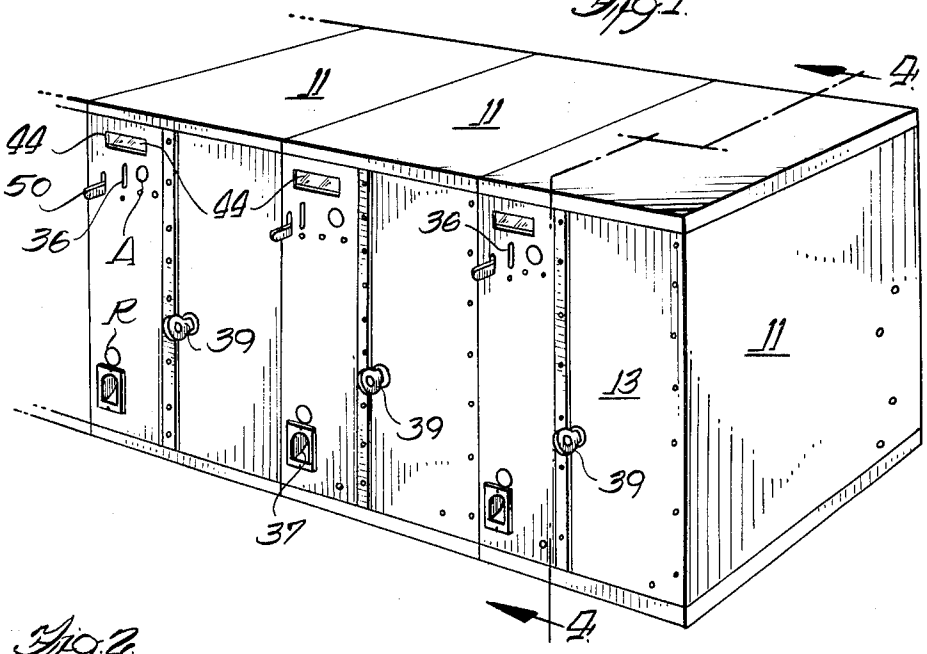


Fig. 2.

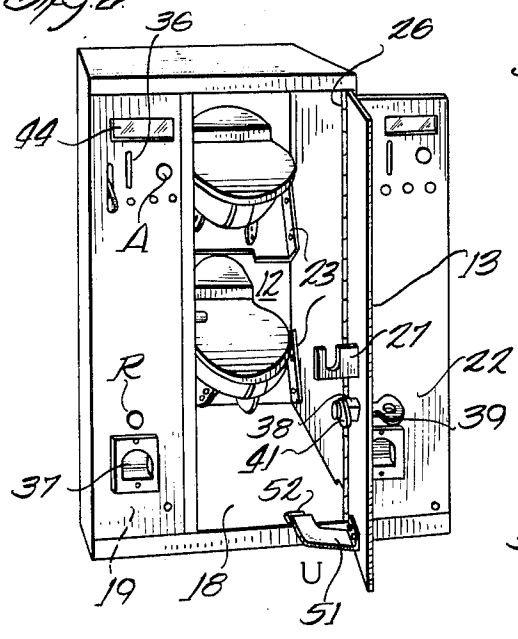
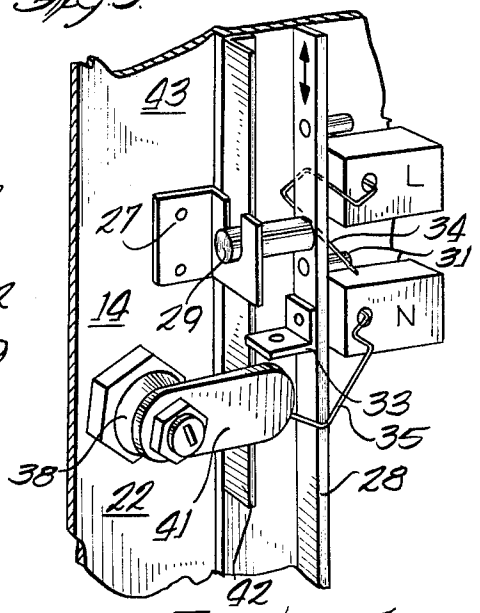


Fig. 3.



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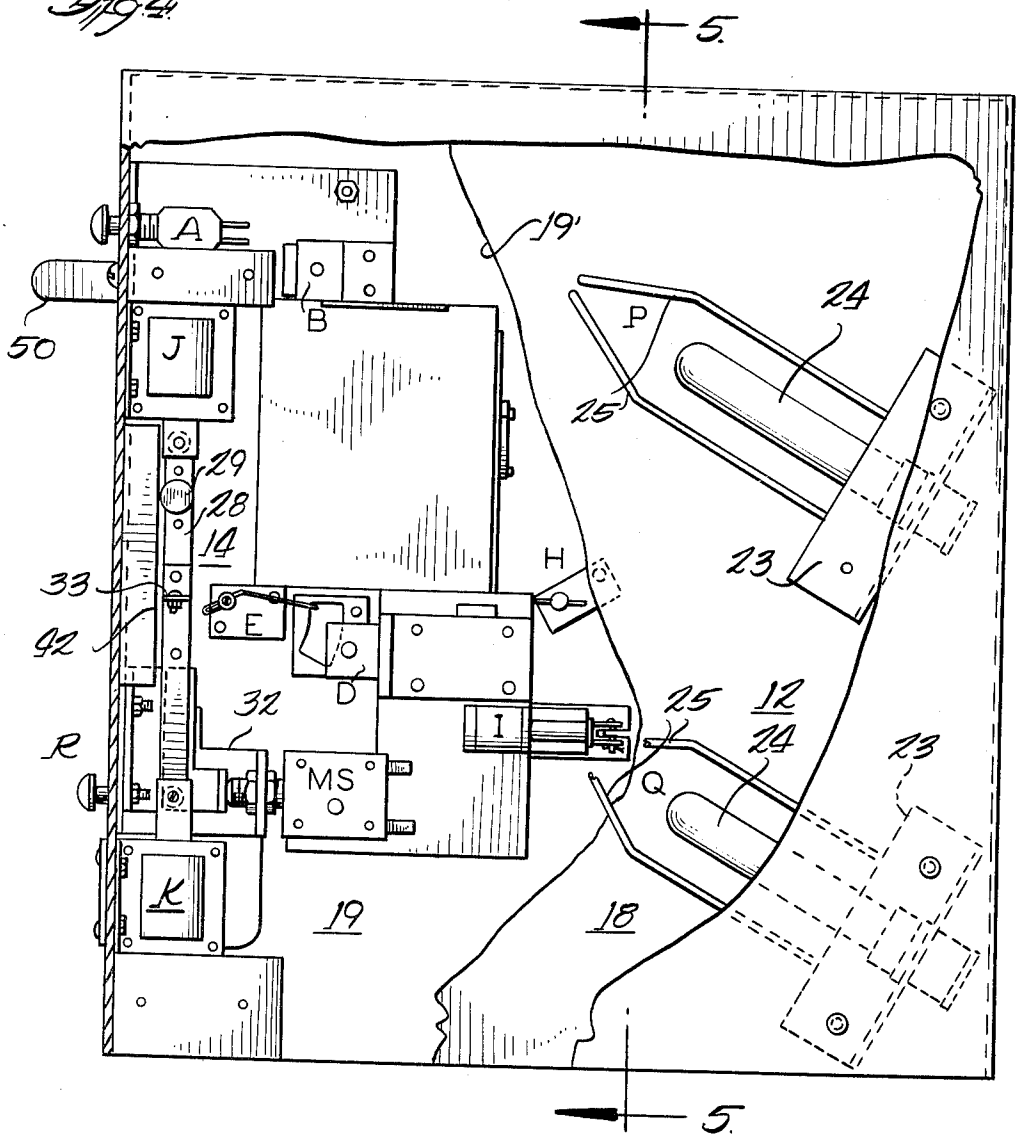
March 22, 1966 C. N. MOORE 3,241,647

COIN-OPERATED BOWLING-SHOE RENTING APPARATUS

Filed July 27, 1964

4 Sheets-Sheet 2

Fig. 4



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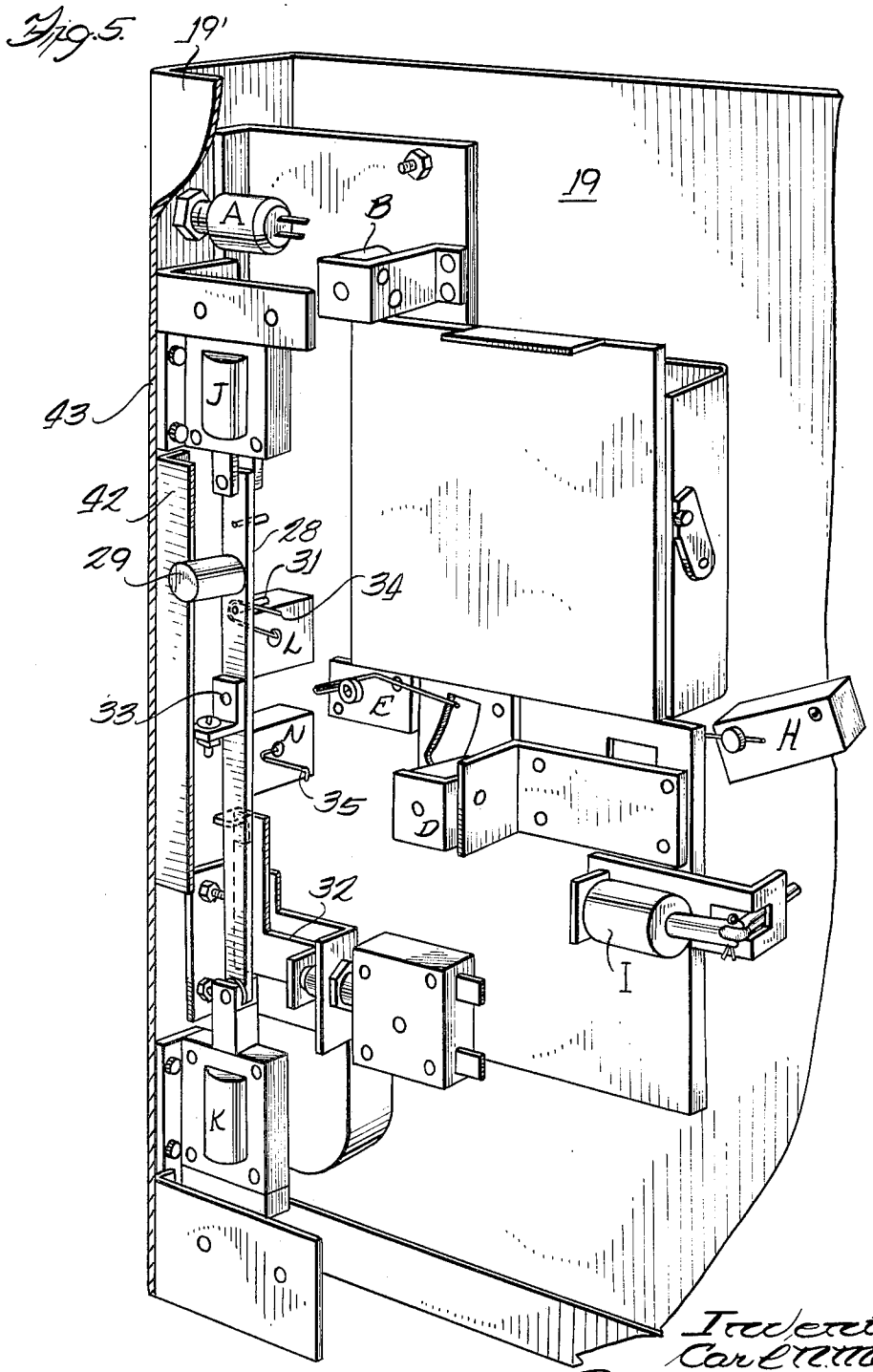
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March 22, 1966 C. N. MOORE 3,241,647

COIN-OPERATED BOWLING-SHOE RENTING APPARATUS

Filed July 27, 1964 4 Sheets-Sheet 3

Fig. 5.



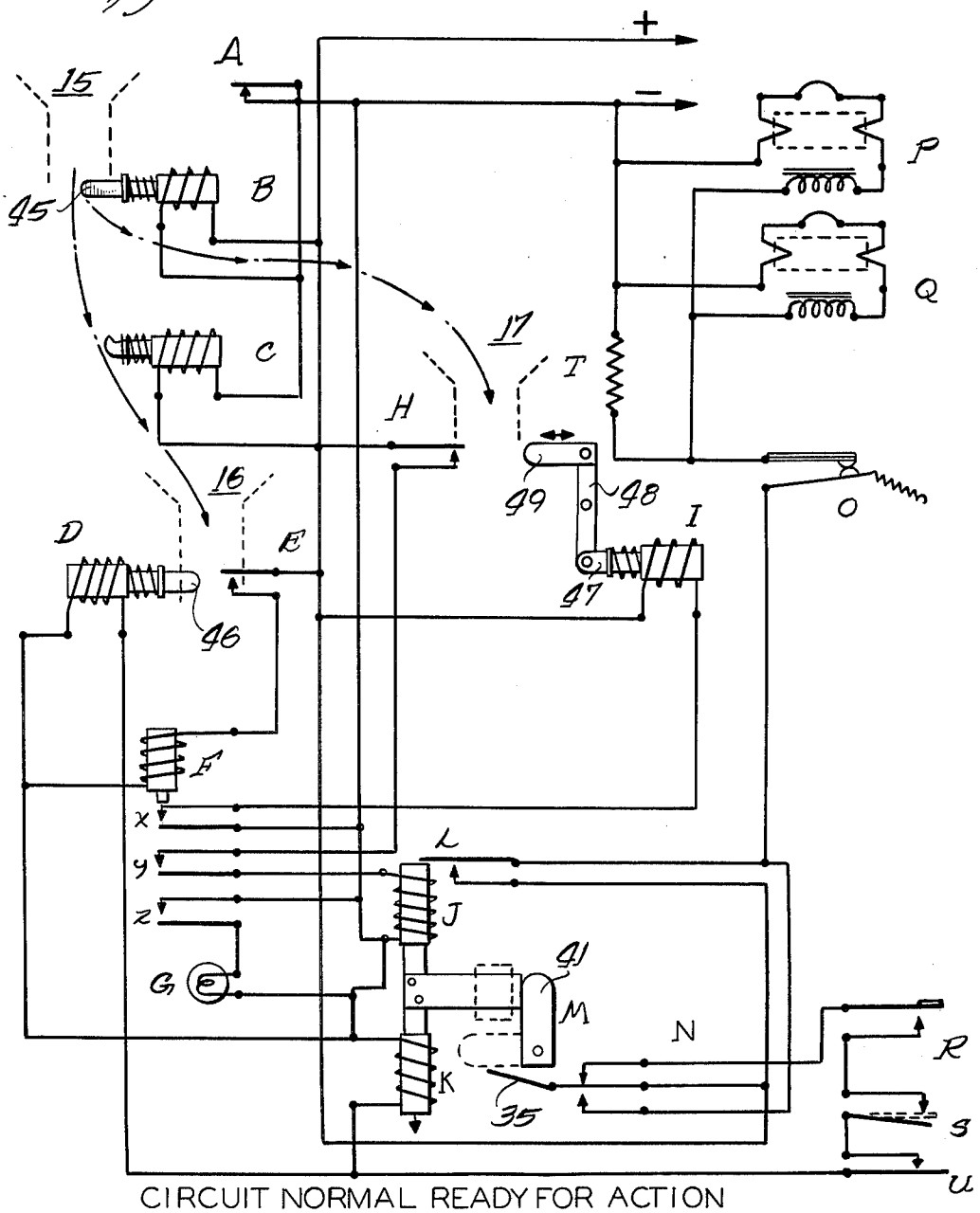
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COIN-OPERATED BOWLING-SHOE RENTING APPARATUS

Filed July 27, 1964 4 Sheets-Sheet 4

Fig. 6.



CIRCUIT NORMAL READY FOR ACTION

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3,241,647

Patented Mar. 22, 1966

3,241,647

COIN-OPERATED BOWLING-SHOE RENTING APPARATUS

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Filed July 27, 1964, Ser. No. 385,337
8 Claims. (Cl. 194—10)

In bowling alleys where a special type shoe has to be worn by participants, shoes are made available to patrons for temporary use. Currently, it is the practice for the management to have available a considerable supply of shoes, in a wide range of sizes. As a rule the various sizes of shoes are kept in open compartments and an attendant is required to be on hand for the dispensing and returning of the shoes. If any sterilization of such shoes is undertaken it has to be done, generally, at a time when there is no likely demand for the shoes. Moreover, the sterilization has to be done with equipment at some remote place from that where the shoes are available for use.

The main objects of this invention are; to provide an improved coin-operated apparatus for making bowling-shoes available to patrons not having their own; to provide an improved apparatus of this kind for sterilizing the shoes during the time they are stored in the apparatus subject to being demanded for use; to provide an improved association of electrical units in an electrical circuit for a door-latching mechanism controlling access to each pair of shoes; to provide an improved arrangement of a shoe-sterilizing facility for each pair of shoes in the apparatus for automatic operation following each replacement of each pair of shoes; to provide an improved form of coin-controlled means for activating the latching mechanism, requiring the successive insertion of two coins, one of which coins is finally retained in the apparatus as compensation for the use of the shoes, and the other of which coins is held in escrow subject to return to the patron upon the proper replacing of the rented shoes in sterilizing position in the apparatus; to provide an improved manual key-operated door-locking device from which the key is removable upon closing the door following the removal of the pair of rent-shoes and is subsequently reinsertable into the device to permit reopening the door to replace the rented shoes whereupon the second closing of the door releases the door-latching mechanism locking in the key in the cylinder until a subsequent rental cycle is started; and to provide an improved apparatus of this kind of such simple construction as to make the manufacture thereof comparatively economical and its use highly-appealing to the management and patrons of bowling alleys.

In the adaptation shown in the accompanying drawings:

FIGURE 1 is a perspective view of a series of juxtaposed cabinets each equipped with a shoe storage-sterilizing facility and coin-controlled door-latching mechanism and supplemental key-locking device constructed in accordance with this invention;

FIG. 2 is a perspective view of one of the cabinets with the door in open position to show the shoe positioning and sterilizing facility;

FIG. 3 is an enlarged, fragmentary perspective from inside the cabinet showing the door-latching mechanism and locking device;

FIG. 4 is a partly-sectional, partly-broken-away front-to-rear view of parts of the door-latching control mechanism as viewed from the plane of the line 4—4 of FIG. 1;

FIG. 5 is a somewhat enlarged, rear perspective view of what is shown in FIG. 4; and

FIG. 6 is a schema of the electrical circuitry with its various electrical units and devices.

The essential concept of this invention involves a bank of cabinets each of which racks a pair of bowling shoes on a sterilizing facility and mounts a normally-latched door the opening of which is controlled by a double coin deposit mechanism functioning to temporarily retain the coins in separate locations to permit the opening of the door for removal of a pair of shoes for temporary use, the subsequent proper re-racking of which shoes will effect a return of one of the coins following the relocking of the door.

A bowling-shoe renting apparatus embodying the foregoing concept comprises a bank of cabinets **11** each of which racks a pair of shoes on a sterilizing facility **12** access to which shoes is obtained through a door **13** normally secured closed by a latching mechanism **14** all of which is controlled by a series of electrically-operated units A through U, resulting from the successive insertion of two coins into a receiving chute **15** for successive transfer to the respective temporary holding chutes **16** and **17** pending the return and proper re-racking of the rented shoes on the sterilizing facility **12** and the closing of the door **13**.

The cabinets **11** are of more or less conventional structure divided into two compartments **18** and **19** by a partition **19'**. The larger compartment **18** houses the shoe-sterilizing facility **12** accessible through the door **13** which mounts a supplemental manual key-locking device **22**. The shallower compartment **19** houses most of the door-latching mechanism **14** and the circuitry involving the electrically-operated units A to U, and the associated chutes **15**, **16** and **17**.

The shoe-sterilizing facility **12** includes a pair of the shoe-positioning racks **23** each with a juxtaposed germicidal lamp **24**. These racks **23** are in the form of flanged plates which span the compartment **18** transversely in a rearward upwardly-inclined position. Each lamp **24** is fixed on the respective rack **23** to extend normally upwardly forward therefrom within a pair of bimetal arms **25**, the functioning of which will be explained presently.

The door **13** is attached to the cabinet by a piano hinge **26**. It mounts on its inner face a recessed lug **27** and the key-actuated locking device **22**. The lug **27** forms a part of locking the coin-controlled door-latching mechanism **14**.

The door-latching mechanism **14** comprises a bar **28** spanning and attached at its opposite ends to solenoids J and K and mounts a locking pin **29**, a switch-tripping pin **31**, an L-shaped trip arm **32** (FIG. 4) and a stop bracket **33**. With the opposite shifting of the bar **28**, by the alternating action of the solenoids J and K, the pin **29** moves into and out of the recessed lug **27** for latching and unlatching the door **13**. Such movement of the bar **28** also causes the switch pin **31** to control the functioning of the switch L through the action of the finger **34** (FIGS. 3 and 5). Such shifting of the bar **28** also moves the stop bracket **33** into and out of position for control of the key-locking device **22**, as will be explained presently.

The chutes **15**, **16** and **17** are arranged in the cabinet compartment **19**. The chute **15** is hereinafter referred to as the "deposit" chute and registers with a slot **36** on the front of the cabinet **11** for the reception of the coins. The chutes **16** and **17**, hereinafter respectively designated "collector" and "escrow" chutes, are located at suitable spaced positions in the cabinet compartment **19**. Coin-travel channels (not shown) connect the deposit chute with the two other chutes, as indicated by the broken lines

in FIG. 6. Also, coin travel channels connect the collector chute **16** with a coin receptacle in the cabinet (not shown) and the escrow chute **17** with a cup **37** located exteriorly of the cabinet **11** (FIGS. 1 and 2).

The key-locking device **22** (FIGS. 2 and 3) is provided solely for the purpose of locking the door **13** during the time a pair of rented shoes is out of the cabinet, presumably in use. Obviously, the coin-controlled latching-mechanism **14** has been retracted, by the insertion of the two coins. It will remain so, pending the return of the shoes and their proper replacement on the sterilizing facility **12**. During such absence of the rented shoes, the patron's shoes would be in position on the sterilizing facility **12**. This device **22** comprises a conventional tumbler cylinder **38** fixed on the door **13** adjacently below the recessed door-latching lug **27**. The cylinder **38** is limited to turning only ninety degrees in the direction indicated by the arrow in FIG. 3. This would be in a clockwise direction to the patron facing the cabinet. Moreover, this locking device **22** is structured so that a key **39** can be removed from the cylinder **38**—and reinserted therein—only when a locking arm **41**, fixed on the cylinder **38**, is in a vertical position to which it is initially shifted, after the retraction of the coin-controlled locking mechanism **14**, to permit opening of the door **13** for access to the rented shoes.

The arm **41**, fixed on the inner end of the cylinder **38**, is of a length to extend horizontally across the inwardly-exposed edge of an angle plate **42**, fixed on the inner face of the panel **43** that closes the front of the compartment **19**. In this horizontal position, the arm **41** is prevented from being shifted out of contact with the plate **42** except when the locking bar **28** is elevated to retract the door-latching mechanism **14**, for reasons that will be explained presently.

The cabinet panel **43**, for the compartment **19**, has formed therein the coin slot **36** and supports the return-coin cup **37**, coin-controlling switches A and R and mounts a neon lamp **44** and a coin-rejector lever **50**. The neon lamp **44** is arranged for activation during the time that a pair of rent-shoes is out of the cabinet. The coin-rejector lever **50** is manually operable to return to the depositor thereof, a bent coin or slug, in the event such should have been inserted into the slot **36**. The rejector mechanism forms no part of this invention, it being a commercial item.

The electrically-operated devices, indicated in the FIG. 5 schema, which are put into coordinated functional relationship, by the insertion of two coins, comprises the following:

(A) A double-pole, single throw, momentary-contact switch which actuates the later-described solenoid B and relay C.

(B) A solenoid for holding the coins in the "deposit" chute until released by the switch A.

(C) A relay, part of the rejector unit, which is actuated by the switch A to by-pass the first coin to the collector chute.

(D) A solenoid that holds the first coin until completion of the renting cycle whereupon it is actuated by the switch R.

(E) A normally-open switch, comprising a part of the rejector unit, closed by the first coin and actuates the holding relay F. It is released at the completion of the renting cycle when the solenoid D is activated.

(F) A single-throw 3-pole relay actuated by the switch E. Contacts *x* actuate the "escrow" solenoid I. Contacts *y* actuate the release solenoid J. Contacts *z* close the pilot light circuit.

(G) Neon pilot light which remains lit until renting cycle is completed.

(H) A snap-action switch operated by the second coin when deposited in the "escrow" chute.

(I) A solenoid which holds the coin in the "escrow" chute.

(J) A solenoid activated to elevate the locking bar **28**.

(K) A solenoid activated to lower the locking bar **28**.

(L) A snap switch for germicidal lamp lock-out.

(M) Manual lock (**22**) operated by removal key (**39**).

(N) A snap-switch for lock and lamp control.

(O) A bi-metal switch for germicidal lamp control.

(P) and (Q) Germicidal lamp starters, sockets and ballasts.

(R) Single-pole, single-throw switch with momentary contact to release solenoid D and switch E to actuate door-latching solenoid K, and also release solenoid I.

(S) Snap-switch actuated when shoes are placed on shoe rack to restore circuit to functioning status.

(T) Load-resistance for timing bi-metal switch O.

(U) Snap-switch for opening and restoring lock-out.

The herein-described apparatus operates as follows:

Two coins, of the same denomination, are required for successive insertion into the coin slot **36** at the front of the cabinet **11**. (FIG. 2.) The first coin enters the chute **15** and contacts the armature **45** of the solenoid B where descent of the coin is temporarly arrested pending the activation of the switch A. The activation of the switch A effects the retraction of the armature **45** of the solenoid B. Thereupon the first coin, is released by the relay C to pass on to the collector chute **16** where it is arrested by the armature **46** of the solenoid D. The first coin is held in this chute **16** until the rented shoes are returned to the racks **23** and the door **13** finally closed, as later will be explained more fully.

Co-incidentally with such arresting of the first coin in the solenoid D, the closing of the switch E results in the energizing of the holding relay F for sequential activation of the switches *x*, *y* and *z*. The switch F*x* is closed to activate the solenoid I to effect the retraction of the armature **47** of the solenoid and cause the rocker-arm **48** to shift the stop **49** across the escrow chute **17**. The second coin then is inserted into the coin slot **36** the descent of which is arrested by the armature **45** of the solenoid B pending the second activation of the switch A as just explained about the first coin. However, the closing of the switch E, by contact of the first coin, also opens the circuit to the solenoid C, thereby inactivating that solenoid upon the second depression of the switch A, following the insertion of the second coin in the slot **36**. Hence, the second coin is diverted to the escrow chute **17** where it is retained by the stop **49** until the rented shoes have been properly re-racked, following the use thereof, and the closing of the door **13**, as will be explained presently.

The closing of the switch H permits the closed switch F*y* to complete the circuit to the solenoid J and thereby effect the raising of the bar **28**. Such upward movement of the bar **28** retracts the pin **29** from the recess in the door-locking lug **27**. This elevation of the bar **28** also opens the switch L which opens the circuit to the germicidal lamps **24**. At the same time the elevation of the bar **28** retracts the stop **33** from the path of the key-operated arm **41** to permit turning of the cylinder **38** by the key **39** and thereby move the arm **41** out from behind the plate **42** and into a vertical position.

This permits opening the door **13** for access to the rented shoes and the placing of the patron's shoes on the sterilizing racks. Thereupon, the immediate closing of the door **13**, and the turning of the key **39**, to return the arm **41** behind the bar **42**, not only locks the door **13** but causes the arm **41** to contact the switch N to effect the sterilization of the patron's shoes, if properly positioned on the racks **23**.

The switch F*z* closes the circuit to the pilot light G thereby signaling the existence of a rental cycle for that particular cabinet **11**.

When the door **13** is opened the curved plate **51** fixed on the lower end of the door adjacent the hinge **26** also shifts outwardly closing switch U by riding on and de-

pressing the pushbutton portion **52** of said switch and thereby locking out the circuit to make the coin return switch R, the light switch N and the electric door locking mechanism completely ineffective. When the door is closed the plate **13** shifts off of the pushbutton portion **52** thereby restoring the circuit to recondition the circuit.

The arrested postion of the second coin in the escrow chute **17** activates the switch H to complete the circuit to the just-described pilot light.

The door **13** of the cabinet **11** being opened, the patron may remove the pair of rentable shoes from the racks **23** and permit the placing of his own shoes on the rack **23**, pending the return of the rented shoes, and thusly, effect the sterilizing of the patron's shoes. Incidentally, the opening of the door **13** effects the retraction of the switch U which opens the circuit to the germicidal lamps **24** pending the subsequent closing of the door **13**.

Upon closing the door **13**, following this exchange of shoes, and turning the key cylinder **38** to "lock" position, the arm **41** is swung back around behind the plate **42**. The key **39** then may be withdrawn from the cylinder **38** and retained by the patron as evidence that he has obtained the shoes from a particular cabinet **11** and to permit him to return to that cabinet **11** for replacing the rented shoes and retrieving his own shoes.

Upon returning to the cabinet, for this exchange of shoes, the patron inserts the key **39** into the cylinder **38** and turns the same to swing the arm **41** upwardly out of contact behind the plate **42**. The door **13** then may be opened to permit access to the patron's shoes and the replacement of the rented shoes. It is imperative that the replaced shoes be properly set on the racks **23**, otherwise the circuitry will not be operatively restored to permit the return of the escrow coin.

Upon properly replacing the rented shoes on the racks **23** and closing the door **13** several sequences occur in the circuitry. The switch R is depressed to energize the solenoid D whereupon the armature **46** is retracted to permit the discharge of the first coin into a container in the cabinet **11**, as compensation for the patron's use of the shoes. Also, the snap switch S is closed to complete the circuit to the germicidal lamps P and Q, upon a subsequent closing of the door **13**. The closing of the door **13** and the subsequent closing of the switch U to effect the energization of the solenoid K. This causes the lowering of the bar **28** and reseating of the pin **29** in the recessed door lug **27**. Also, the lowering of the bar **28** shifts the stop **33** into the path of the cylinder arm **41** to thereby prevent actuation of the device **22**.

The release of the coin from the deposit chute **16** opens the switch E. This breaks the circuit to the solenoid I thereby effecting the retraction of the stop **49** and releasing the second coin from the escrow chute **17**. This coin, thereupon, drops into the cup **37** where it may be retrieved by the patron.

It will be understood that details of the construction shown may be altered or omitted without departing from the spirit of the invention as defined by the following claims.

I claim:

1. A sport-shoe renting apparatus comprising, a cabinet, a rack in the cabinet for the support of a pair of sport shoes, a door on the cabinet shiftable into and out of closed position, door-latching mechanism, coin-activated electrical units for controlling the door-latching mechanism to permit access to the shoes and the relatching of the door following the replacement of the rented shoes on the rack, said coin-activated electrical units including means for holding two successively-inserted coins in separate temporary positions in the cabinet, means activated by the coins in their holding positions for retracting the door-latching mechanism to permit opening of the door for the removal of the shoes, other means activated by the replacement of the shoes on the rack for releasing the door-latching mechanism upon the closing of the door and also effecting the release of the two coins, one for discharge into the cabinet and the other for discharge exteriorly of the cabinet for return to the depositor of the coins, and a manual key-operated locking arm mounted on the door to permit storage of personal shoes and locking the door in the interim during the use of rented shoes.

2. A sport-shoe renting apparatus as set forth in claim **1**, wherein a germicidal facility is juxtaposed to the rack, and a time-controlled accessory activates the germicidal facility upon the relatching of the door following the replacement of the shoes on the rack.

3. A sport-shoe renting apparatus as set forth in claim **1**, wherein a pilot light exteriorly of the cabinet is activated by the position of the door-latching mechanism during the period the coins are in their holding positions to indicate the rent shoes are removed from the cabinet.

4. A sport-shoe renting apparatus as set forth in claim **1**, wherein a door-locking arm seating a manually removable key is mounted on the door for shifting into and out of door-locking position during the retraction of the electrically-operated door-latching mechanism.

5. A sport-shoe renting apparatus comprising,

(a) a cabinet mounting a hinged door for swinging into and out of closed position,

(b) door-latching mechanism having electrically-operated units for shifting the mechanism into and out of door-latching position,

(c) a rack fixed in the cabinet for positioning a pair of shoes,

(d) germicidal lamps juxtaposed to the rack for sterilizing the rack-positioned shoes,

(e) coin-receiving chute arranged in the cabinet for the reception of coins inserted through an exteriorly-open slot in the cabinet,

(f) a pair of supplemental coin-arresting chutes arranged in the cabinet in spaced relationship to the coin-receiving chutes,

each for the temporary reception of one of two coins successively inserted into the coin-receiving chute,

(g) electrically-activated units interposed between the coin-receiving chute and the supplemental coin chutes,

for directing into the respective supplemental coin-chutes two coins successively inserted into the coin-receiving chute,

(h) other electrically-activated units arranged adjacent the respective coin chutes for holding the coins temporarily in the respective chutes,

(i) switch means

juxtaposed to the respective supplemental coin chutes,

activated by the reception of coins in the respective supplemental chutes,

for retracting the latching mechanism to permit opening of the door for access to the shoes,

(j) other switch means

juxtaposed to the shoe rack for activation by the replacing of the shoes on the rack and

releasing the door latching mechanism from retracted position upon closing of the door, and

releasing the coins from their supplemental chutes, one for discharge into the cabinet the other for discharge exteriorly of the cabinet, and

(k) electrical circuitry

connecting the electrically-operated units and the switch means with a source of electricity.

6. A sport-shoe renting apparatus as set forth in claim **5** which includes

(l) a door-locking arm shiftable on the door and seating a manually removable key positionable to lock the door during the retraction of the electrically-operated door-latching mechanism.

7. A sport-shoe renting apparatus as set forth in claim 6 which includes switch means for activating the germicidal lamps when the patron's shoes are placed on the rack during the period the sport shoes are removed.

8. A sport-shoe renting apparatus as set forth in claim 5 which includes

(m) a pilot light

exteriorly of the cabinet activated during the period the coins are in their supplemental coin-arresting chutes,

to indicate a renting cycle.

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