United States Patent [19]

Yorisue et al.

[11] **3,917,046**

[45] **Nov. 4, 1975**

[54] **RENTAL LOCKER SYSTEM**

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[73] Assignee: **Glory Kogyo Kabushiki Kaisha,** Japan

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[63] Continuation of Ser. No. 197,068, Nov. 9, 1971, abandoned.

[30] **Foreign Application Priority Data**

Nov. 10, 1970 Japan 45-98903

[52] **U.S. Cl.** ..... **194/9 T;** 194/51

[51] **Int. Cl.²** **G07F 17/12**

[58] **Field of Search** ..... 194/9 T, 51, 54, 59, 65, 194/92

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[57] **ABSTRACT**

In a rental locker system of the type rendered lockable with a key by dropping a required number of coins into a coin inlet and later unlockable with the same key; improvement comprising a mechanism causing impossibility of locking operation until coins of a required number are completely dropped into a coin inlet, an indication means adapted to shift indication marks to a mark corresponding to a required number of coins in response to dropping of the coins, and another mechanism including a timer means and adapted, in response to operation of said timer means, to cause impossibility of unlocking and shifting of the indication mark to a mark corresponding to more required number of coins in the case when a predetermined unit length of time corresponding to one rental unit has lapsed. Means adapted to exchange number of coins required for locker use-unit is described in connection with embodiments thereof.

3 Claims, 8 Drawing Figures

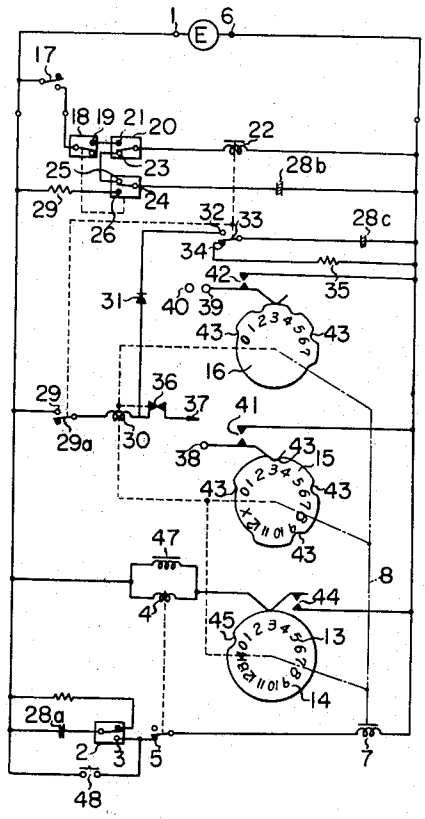


FIG. 1

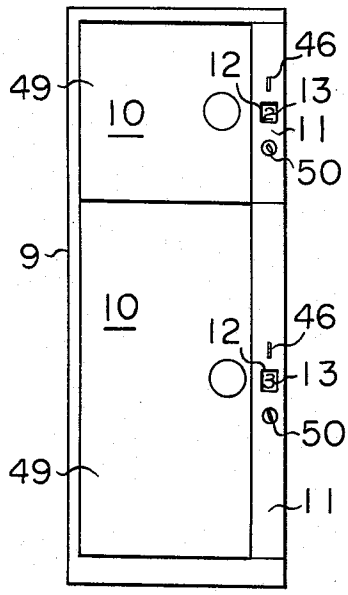
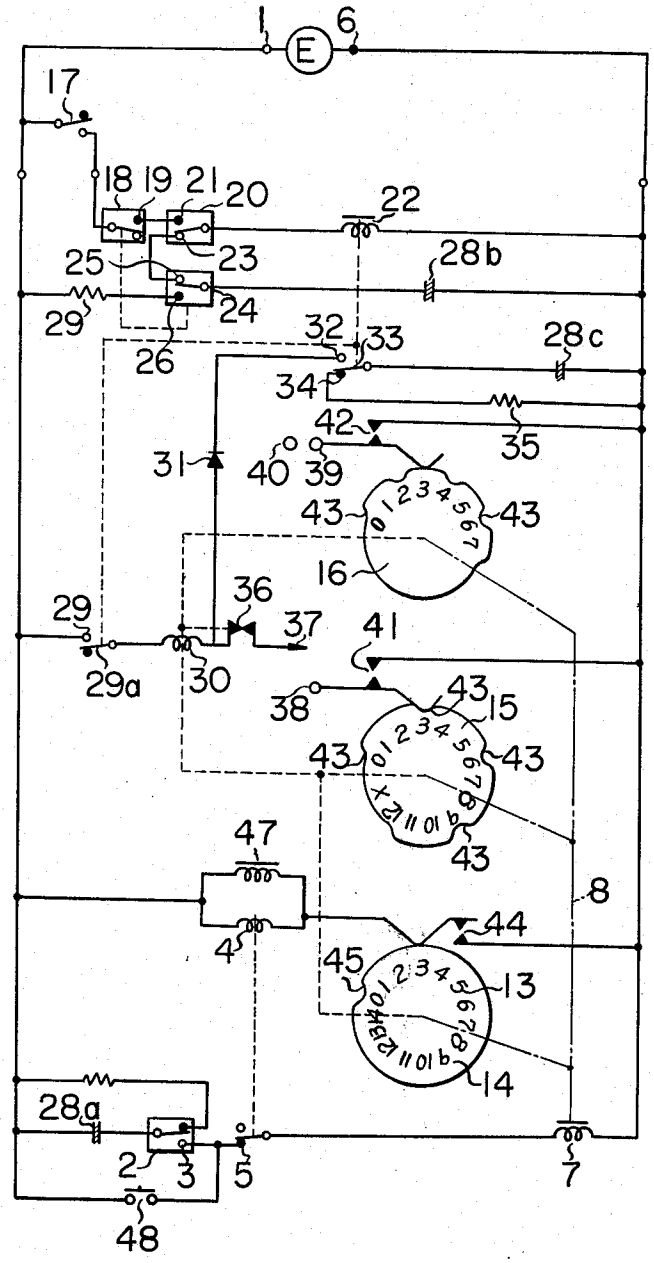


FIG. 2

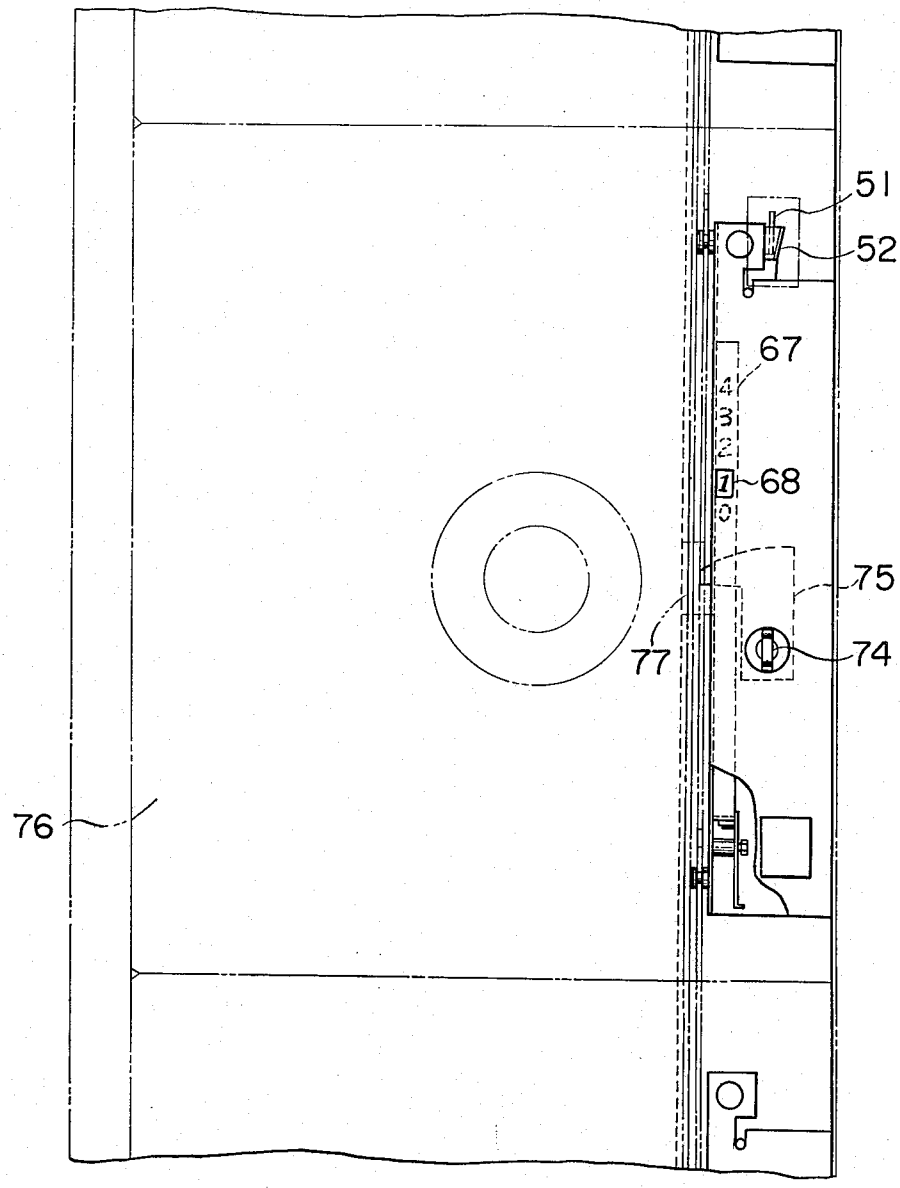


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FIG. 3

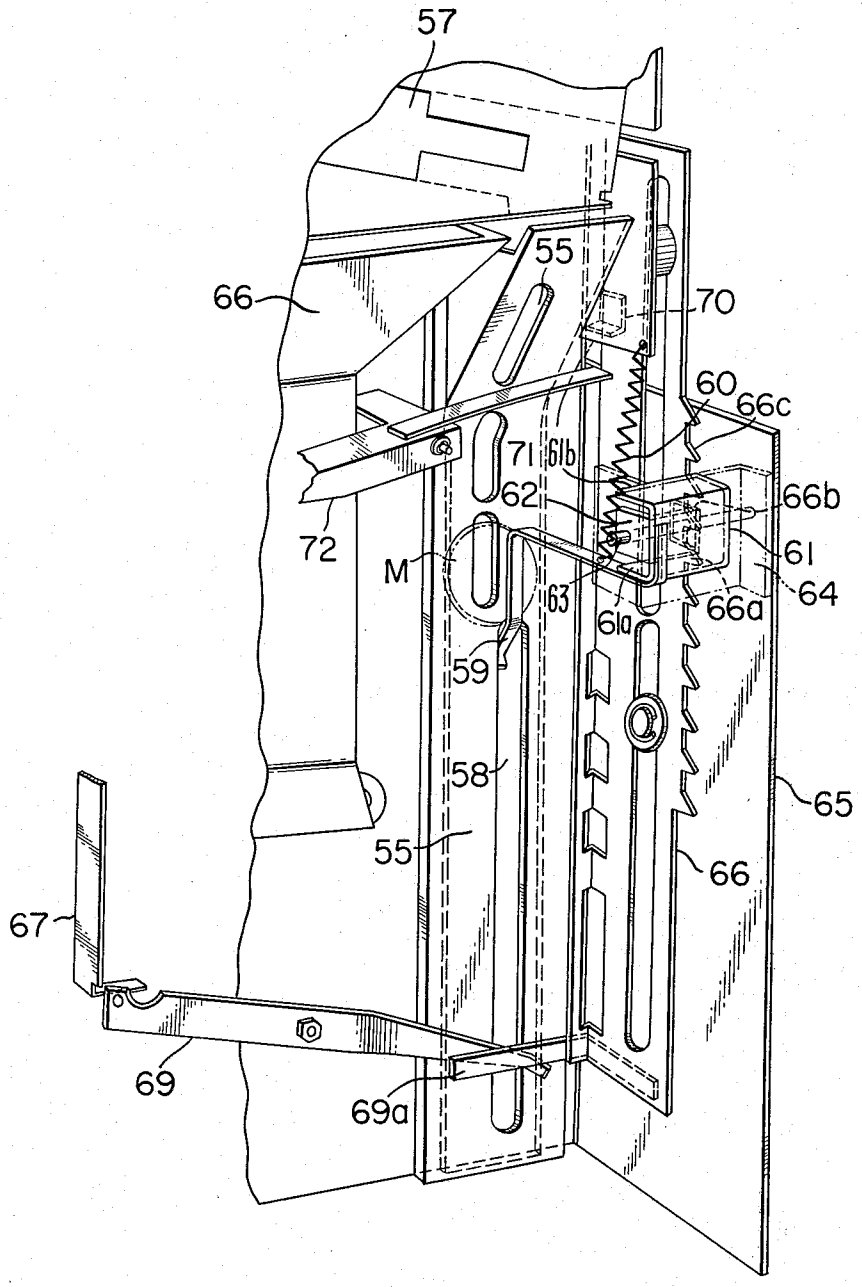


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FIG. 4

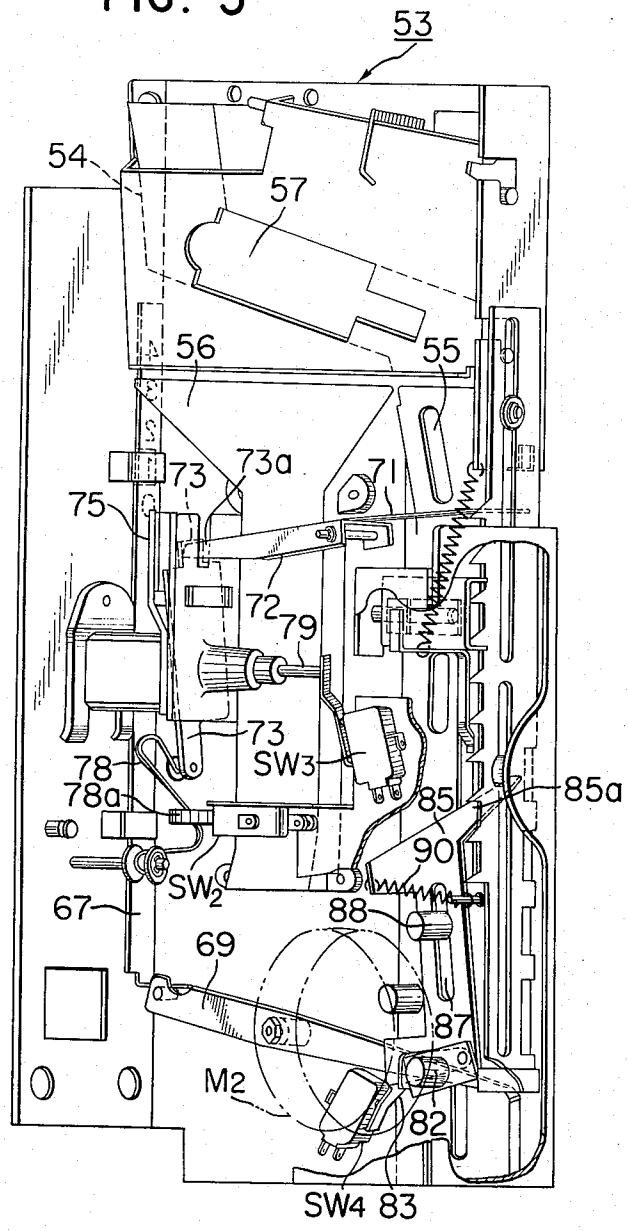


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FIG. 5



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FIG. 7



FIG. 8

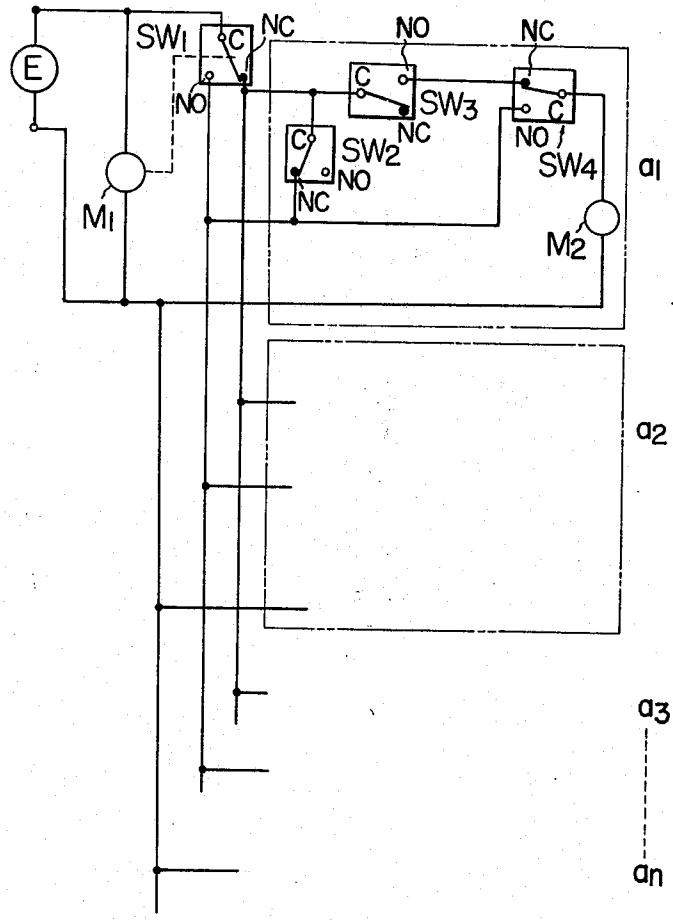
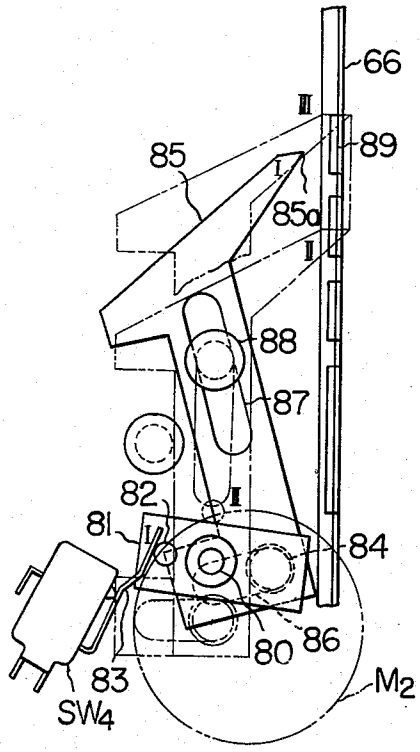


FIG. 6



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RENTAL LOCKER SYSTEM

This is a continuation, of application Ser. No. 197,068, filed Nov. 9, 1971.

BACKGROUND OF THE INVENTION

This invention relates to lockers, and in particular to a coin-operated rental locker system.

In most locker units available heretofore, several compartments for individual storage use in each unit have been rented at a uniform fee, that is, by the same number of coins. Recently, however, there has been developed a locker unit having compartments of different capacities, with different fees charged for their use.

Further, when a locker compartment has been used in excess of a predetermined length of time, it has been usual that the compartment is automatically made openable only when an additionally required number of coins have been dropped into its coin inlet. When the rental fee for the unit length of time is high, a large number of coins of the same denomination are usually required to unlock the compartment, especially when it has been used in excess of the unit length of time. The possible confusion which may be experienced by the user in such an instance mentioned above will be greatly relieved if the additonally required number of coins is clearly exhibited on the compartment.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a rental locker system whereby the number of coins required for use per unit length of time are exhibited on respective compartments of the locker unit.

Another object of the invention is to provide a rental locker system whereby the numerals exhibited on the respective compartments of the locker unit and adapted to indicate the numbers of coins required for their use are correspondingly decreased as the required coins are successively dropped into the coin inlets, the compartments being locked or unlocked only when all the coins corresponding to the required number have been dropped.

Another object of the invention is to provide a rental locker system whereby the number of coins required for use of each compartment is automatically re-exhibited when the compartment has been unlocked after use.

A further object of the invention is to provide a rental locker system whereby, when each compartment of the locker unit has been used in excess of a unit length of time, an additional number of coins required for unlocking the compartment is automatically exhibited.

The above stated and various other objects and advantages of the present invention will become more apparent and understandable as the following description proceeds, with reference made to the attached drawings showing, by way of example only, preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a front elevation of a rental locker unit constructed in accordance with the concepts of the present invention;

FIG. 2 is a circuit diagram showing an embodiment of the invention;

FIG. 3 is a front elevation of another embodiment of the invention;

FIG. 4 is a perspective view showing, in detail, coin guide passage, movable saw plate and the like of the embodiment shown in FIG. 3;

FIG. 5 is a perspective view showing, in detail, lock piece, lock lever, stop plate, push-up plate, and the like of the embodiment shown in FIG. 3;

FIG. 6 is a side view of the push-up plate placed at various positions, of the embodiment shown in FIGS. 3, 4 and 5;

FIG. 7 shows locus of the push-up plate shown in FIG. 6; and

FIG. 8 is a circuit diagram showing connections of the switches used in the embodiment shown in FIGS. 3, 4, 5 and 6.

DETAILED DESCRIPTION

Referring now to both FIGS. 1 and 2 of the accompanying drawings, one terminal 1 of a power source E is connected to a switch 2 through a capacitor 28*a*, said switch 2 being operated by the drop of a coin into a coin inlet. The switch 2 includes a normally open contact 3 which is connected to an electromagnet 7 via a normally closed contact 5 of a relay 4, the electromagnet 7 being connected to another terminal 6 of the power source E. Upon energization of this electromagnet, a shaft 8 shown schematically by chain line is rotated clockwise as viewed in FIG. 2 by a known mechanism. In this case, the switch 2 is restored just after passing of one piece of the coin through the coin passage, so that the shaft 8 is rotated by one step per coin drop. The shaft 8 is operatively connected to an indication cam 14 adapted to exhibit a rental fee, as indicated by reference numeral 13, through a window 12 provided at a locking portion 11 for each compartment 10 of the overall locker unit 9. The shaft 8 is also operatively connected to a plurality of, two in this embodiment, control cams 15 and 16 which are adapted for selection of rental fees per unit length of time, as hereinafter described in greater detail.

Connected in series between the power source terminals 1 and 6 are a time switch 17 which is closed upon lapse of a predetermined unit length of time, a switch 18 operated by insertion and removal of a key into and out of the locking means of each compartment 10, a switch 20 operated upon operation of the locking means, and a relay 22. The switch 18 includes a normally open contact 19 which is opened while the key is inserted into the locking means, while the switch 20 includes a normally open contact 21 and a normally closed contact 23, said former contact 21 being opened while the locking means is unlocked and said latter contact 23 being closed while the locking means is unlocked. This normally closed contact 23 is connected to a normally open contact 25 of a switch 24 operated by insertion and removal of the key, said contact 25 being closed upon insertion of the key. The switch 24 also includes a normally open contact 26 which is opened while the key is inserted and which is connected to the power source terminal 1 via a resistance 27. On the other hand, the switch 24 is connected to the power source terminal 6 via a capacitor 28*b*.

A normally open contact 29 provided to the relay 22 is connected, on the one hand, to the power source terminal 1 and, on the other hand, to an electromagnet 30 through a movable contact piece 29*a* provided to the

relay 22, said electromagnet 30 being adapted to impart counterclockwise rotation, as viewd in FIG. 2, to the aforesaid shaft 8. The electromagnet 30 is connected through a diode 31 to a normally open contact 32 provided to the relay 22, a movable contact 33 of said relay 22 being connected to the power source terminal 6 via a capacitor 28*c*. A normally closed contact 34 of the relay 22 also is connected to the power source terminal 6 via a resistor 35. The aforesaid electromagnet 30 is further connected to a switch 36 which is operated upon energizarion and deenergization of the former.

A plug 37 connected to the switch 36 is to be connected to a selected one of jacks 38, 39 and 40. The jack 38 is connected to the power source terminal 6 via a switch 41 operated by the contact cam 15, whereas the jack 39 is connected to the same power source terminal via a switch 42 operated by the control cam 16. The contour of the control cam 15 has notches 43 on numeral 0 and on every third of the other numerals marked successively thereupon in order to open the switch 41 at such notches. The contour of the control cam 16 also has notches 43 to open the switch 42 on numeral 0 and on every second of the other numerals similarly marked thereupon.

The aforesaid relay 4 is connected, on the one hand, to the power source terminal 1 and, on the other hand, to the power source terminal 6 via a switch 44 operated by the indication cam 14 having a notch 45 only on numeral 0 marked thereupon. Connected in parallel with the relay 4 is an electromagnet 47 which opens and closes the coin inlets 46 of the locking portions 11 and which also controls the operation of the locking means in accordance with the prior art. A test switch 48 may be connected in parallel with the switch 2.

If, in the locker system of the above described construction, three coins are required to rent one of the compartments 10 for a unit length of time, the machine is adjusted so that when: the plug 37 is connected to the jack 38, the numeral 3 marked on the cam 14 is exhibited through the window 12. Since then the switch 44 is opened, the electromagnet 47 keeps the coin inlet 46 open and the locking means unoperable by known mechanisms. The normally closed contact 5 of the relay 4 is kept closed. The door 49 of the compartment 10 is then opened and the first coin dropped into the coin inlet 46, whereupon the normally open contact 3 of the switch 2 is closed to form the circuit including the switch 2, the normally closed contact 5 of the relay 4, and the electromagnet 7. The thus-energized electromagnet 7 sets the shaft 8 in rotation, so that the cams 14, 15 and 16 are turned clockwise through an angle corresponding to a spacing between two adjoining numerals marked thereupon. Thus the numeral 2 is exhibited through the window 12. Upon injection of the second coin, the numeral 1 is shown through the window 12 through the same procedure, and the numeral 0 is similarly shown upon injection of the third coin.

The switch 44 is now closed, whereas the switch 41 is opened. Upon closure of the switch 44, the electromagnet 47 is energized so that the coin inlet 46 is closed while the locking means of the compartment 10 is made lockable. Since the relay 4 is also energized by the closure of the switch 44, the normally closed contact 5 is opened. Articles to be stored are now put into the compartment 10, which is then locked with the key inserted into a keyhole 50. By this locking operation, the normally open contact 21 of the switch 20 is closed. By the succeeding detachment of the key out of the keyhole 50, the normally open contact 19 of the switch 18 and the normally open contact 26 of the switch 24 are both closed. Hence, the circuit including the resistor 27, the switch 24, and the capacitor 28*a* is completed, whereby said capacitor is stored with electrical energy.

For unlocking the compartment 10 within the unit length of time, the key need be simply turned in the keyhole 50, then the numeral 0 is exhibited through the window 12. In this instance, upon insertion of the key into the keyhole 50, the normally open contact 25 of the switch 24 is closed while the normally open contact 19 of the switch 18 is opened. By the succeeding turn of the key, the normally closed contact 23 of the switch 20 is closed, so that the circuit including the relay 22, the switches 20 and 24, and the capacitor 28*a* is completed. The electrical energy previously stored in the capacitor 28*a* is discharged to operate the relay 22 for several seconds.

By this temporary operation of the relay 22, the normally open contact 29 provided thereto is closed, as is the normally open contact 32. Hence, the circuit including the normally open contact 29, the electromagnet 30, the diode 31, the normally open contact 32, and the capacitor 28*c* is completed. Since then the electromagnet 30 is energized, the shaft 8 is rotated counterclockwise, and the switch 36 is opened. By the rotation of the shaft 8, the cams 14, 15 and 16 are turned, and the switch 41 is closed by the cam 15. When the capacitor 28*c* is completely charged, the electromagnet 30 is no longer energized, and the switch 36 is again closed. Thereupon, the circuit including the normally open contact 29, the electromagnet 30, the switch 36, the plug 37, the jack 38, and the switch 41 is completed. By such energization and de-energization of the electromagnet 30 and the resultant switching operation of the switch 36, the cam 15 is turned until the switch 41 is opened on the numeral 3 marked on the cam. The electromagnet 30 is then de-energized, and the shaft 8 is stopped.

Since the cam 14 also is turned by the rotation of the shaft 8, the numeral 3 marked thereupon is shown through the window 12. When this cam 14 has been turned from the position of the numeral 0, the switch 44 is opened, the electromagnet 47 is de-energized, and the coin inlet 46 is opened. By simultaneous de-energization of the relay 4, the normally closed contact 5 is closed to make the locker compartment ready for further use.

In event the compartment 10 has been used in excess of the unit length of time, the time switch 17 is closed, and the relay 22 is energized. The electromagnet 30 also is energized through the procedure described in the foregoing, so that the shaft 8 is rotated counterclockwise. The cams 14, 15 and 16 are turned until the cam 14 attains the condition illustrated in FIG. 2, where the switch 44 is opened. By the de-energization of the electromagnet 47, the coin inlet 46 is opened. The unlocking of the closed door 49 is now impossible by use of the key only. By succeedingly dropping the number of coins shown through the window 12, the electromagnet 7 operates to turn the cams 14, 15 and 16 counterclockwise through the procedure described already, in such a manner that the numeral exhibited through the window 12 is decreased each time the coin

is dropped. As the numeral 0 appears on the window, the switch **44** is closed, so that the electromagnet **47** is energized to close the coin inlet **46.** The locker door can now be unlocked with the key.

When the compartment **10** has been used twice the unit length of time, the time switch **17** operates to turn the cam **14** until the numeral **6** marked thereupon is shown through the window **12.** The compartment is then unlockable unless six coins are dropped into its coin inlet **46.** When the compartment has been unlocked with the key after dropping the required six coins and thus causing the numeral 0 to be exhibited through the window **12,** the cam **14** is turned counterclockwise until the numeral 3 is shown. The compartment is now ready for further use.

The plug **37** is connected to the jack **39** in case two coins are needed for a unit length of time, and to the jack **40** in case one coin is needed. The operations of the rental locker system in these cases follow suit after the above described case in which three coins are needed for the unit length of time.

Although detailed structure of the mechanism of the abovementioned embodiment is not shown; said structure will be easily understood for the person skilled in the art from the detailed structure of the second embodiment shown in FIGS. **3** to **8.**

Referring to another embodiment shown in FIGS. **3** to **7,** the invention will be described hereinafter in connection with a practical structure adapted to a case where the locker is used by only one coin.

Referring to FIG. **3** showing a front view of a rental locker of non-used state, when one coin is put into a coin inlet **51,** the coin is received in reception mouth **52** and then is sent into a coin selecting device **53** such as shown in FIG. **5.** In this device **53,** the received coin passes through a coin passage **54** and is sent into a coin drop path **55,** said passage **54** being provided with a recessed aperture **57** adapted to drop a coin of a small diameter. If the coin is improper, it is dropped into an incorrect-coin dropping passage **56** provided under the passage **54.**

I. Deposit operation by a depositary

Upon putting of one correct coin M into the coin inlet **51,** said coin is sent into the passage **55** and pushes an actuating lever **59** against the force of a spring **60,** the end part of said lever **59** being projected into said passage **55** through an elongated hole **58,** whereby said coin is dropped into a coin receiving box not shown and provided at the lower end of said passage **55.**

The actuating lever **59** is fixed to a catch plate **61** fixed to a bracket **62** which in turn is pivoted at a pivotal shaft **63.** The shaft **63** is pivotally supported by a support plate **64** which in turn is fixed to a machine frame **65,** so that when the lever **59** is pushed by the coin M, the catch plate **61** is rocked around the shaft **63,** whereby the engaged part **61***a* of the catch plate **61** is detached from a tooth **66***a* of a movable saw plate **66,** thus causing the plate **66** to drop. On the other hand, since a catch portion **61***b* of the catch plate **61** is advanced toward the movable saw plate **66** owing to said locking of the lever **59,** the upper surface of the catch portion **61***b* is caused to engage with the other tooth **66***c* of the plate **66,** and upon disengagement of the coin from the actuating lever **69,** the catch plate **61** is restored to its original position by means of the spring **60,** whereby a tooth **66***b* of the saw plate **66** is brought in engagement with the catch portion **61***a* of the catch plate **61.** The provision of the catch portions **61***a* and **61***b* ensures that the teeth **66***a*, **66***b* . . . are fed one by one in successive order during lowering of the saw plate **66.**

When the tooth **66***b* is brought in engagement with the catch portion **61***a*, indication at a window of an indication plate **67** (FIG. **3** and FIG. **4**) is shifted from 1 to 0. This indication-shift is carried out by downward movement of the movable saw plate **66,** because said downward movement causes a push-up movement of the indication plate **67** through a lever **69** and a catch piece **69***a* fixed to the saw plate **66.** Furthermore, referring to FIGS. **4** and **5,** when the movable saw plate **66** is lowered, by one tooth pitch, a stop plate **72** having a catch piece **71** is locked by a catch plate **70** fixed to said plate **66,** whereby as clearly shown in FIG. **5,** the stop plate **72** is retracted from a recess **73***a* of a lock lever **73** fixed to an inner cylinder which is fitted in a lock cylinder. When the retraction of the stop plate **72** is completed, a key **74** (FIG. **3**) becomes rotatable. In this state, when the key **74** is turned, a lock piece **75** fixed to the inner cylinder is inserted together with the lock lever **73** into a recess **77** formed in a locker door **76,** thus causing locking.

When this locking motion is caused by turning the key **74,** as shown in FIG. **5,** a switch SW_2 is pushed through its lever **78***a* by means of a spring **78** which is fixed to the lock lever **73,** thus causing detection of opening and closing of the key **74.**

When the key **74** is drawn off by the depositary, a reciprocating bar **79** having been pushed by the key **74** is retracted toward the lock by the action of a spring not shown, thereby to operate a switch SW_3.

Referring to FIG. **6,** as described later in connection with FIG. **8,** a motor M_2 is rotated by the action of the switches SW_2 and SW_3, whereby a switch SW_4 is changed over by means of a pin **82** fixed to a rotary plate **81** which in turn is supported by the motor shaft **80,** thus causing the motor M_2 to stop. At this state, the pin **82** is transferred to chain line position from solid line position and stops at said former position because of stopping of the motor M_2. A pin **84** attached to the other portion of the rotary plate **81** is freely engaged in an elongated hole **86** of a push-up plate **85,** and a pin **88** attached to the locker frame not shown is freely engaged in another elongated hole **87** provided at central portion of the push-up plate **85,** so that upon completion of the movement of the pin **82** from the solid line position to the chain line position the plate **85** is transferred from a first position (I) (solid line) to a second position (II) (chain line). At this position (II), the plate **85** is inserted into a recess **89** of the movable saw plate **66,** whereby said plate **85** stops at said second position, thus causing the plate **66** to stop and therefore producing a 0 indication on the indication window **68** (FIG. **3**). In this state, if the length of time during which indication 0 is maintained is within a predetermined date hours of a use-unit adapted to advance a date, it is possible to open the door **76** by means of the key **74.**

That is, when the key **74** is inserted, the reciprocating bar **79** is pushed thereby to operate the switch SW_3. On the other hand, by rotation of the key **74** the lock lever **73** is rotated toward the position shown in FIG. **5,** whereby the spring **78** attached to the lower end of said lock lever **73** and being in a state pushed on the lever **78***a* of the switch SW_2 is retracted from said lever **78***a*, thus exchanging over the switch SW_2. Furthermore, the

switch SW_4 shown in FIG. **6** is maintained at its exchanged state, because the pin **82** does not push the lever **83**, so that the motor M_2 is rotated again in the exchanged states of the switches SW_2, SW_3 and SW_4, whereby the push plate **85** is elevated from the second position (II) to the third position (III) so as to push up the movable saw plate **66**, thereby to shift the tooth **66***a* between the catch portions **61***a* and **61***b*, whereby the push-up plate **85** is restored from the third position (III) to the first position (I) due to action of a spring **90** and retracts from the recess **89**, thus causing engagement of the tooth **66***a* and catch portion **61***a*. Owing to these movements, the lever **69** is lowered due to self-weight of the indication plate **67**, whereby the right side end of the lever **69** engages a catch piece **69***a* attached to a lower end of the movable saw plate **66**. Then, the locker is maintained at this non-used state, in which the indication is shifted from 1 to 0. After lapse of the predetermined date hours of the use-unit, the motor M_2 is rotated by means of a timer not shown, whereby the push-up plate **85** is moved from the position (II) to the position (I) through the position (III) thereby to push up the movable saw plate **66**, thus exchanging the indication from 0 to 1.

Furthermore, in this use state, upon lapse of doubled date hours of the use-unit, the motor M_3 operates in the same manner as mentioned above thereby to shift the indication from 1 to 2. When the depositary intends to release the locker, unlocked state can be easily obtained by putting in coins of a required number corresponding to the indication numeral into the coin inlet. FIG. **7** shows movable locus of the catch projection **85***a* of the push-up plate **85**.

Referring to FIG. **8**, electrical circuit of the second embodiment shown in FIGS. **3** to **6** will be described in the following.

Each of date feeding controllers a_1, a_2, a_3 . . . a_n is connected to a date feeding timer motor M_1 timer of which is not shown, said controllers being provided at side portion of the locker door **76** as shown in FIG. **3**.

I. State in which the locker is not used

The motors M_1 and M_2 are stopped and the switches SW_1, SW_2, SW_3 and SW_4 take the positions shown in FIG. **8**.

II. State under use within a unit length of time corresponding to hours of a use-unit, for example, within 24 hours

Locking operation

When coins of a required number, in this example, one coin is put into the inlet **51**, the lock lever **73** is released and the key **74** is brought in rotatable state. At this state, the indication is shifted from 1 to 0.

By turning the key, the switch SW_2 is switched over from its contact Nc to another contact No, thereby to open the circuit of the switch SW_2.

Then, upon pulling-off the key, the switch SW_3 is switched over from its contact Nc to another contact No, whereby the circuit ($E \rightarrow SW_1c \rightarrow SW_1Nc \rightarrow SW_3c \rightarrow SW_3No \rightarrow SW_4Nc \rightarrow SW_4c \rightarrow M_2 \rightarrow E$) of the motor M_2 is closed, thus causing rotation of the motor M_2.

Upon rotation of the motor M_2, the pin **82** causes release of the lever **83** of the switch SW_4, whereby the switch SW_4 is switched over from its contact Nc to another contact No and the motor M_2 stops at the position (II) in FIG. **6**. At this state, the indication corresponds to 0.

Unlocking operation

When the key is put in, the switch SW_3 is switched over from its contact No to another contact Nc and then when the key is turned, the switch SW_2 is switched over from the contact No to Nc and since the switch SW_4 is in detached state from the pin **82**, contact No of said switch SW_4 is in closed state. Accordingly, the circuit ($E \rightarrow SW_2c \rightarrow SW_2Nc \rightarrow SW_4No \rightarrow SW_4c \rightarrow M_2 \rightarrow E$) is closed, whereby the motor M_2 is rotated and the indication is shifted from 0 to 1. At this state, the lock lever **73** unified with the lock piece which is rotated by the key is locked at its opening state.

By the rotation of the motor M_2, movable contact of the switch SW_4 is pushed up by the pin **82**, whereby the SW_4 is switched over from the contact No to Nc and the motor M_2 is stopped.

III. Date feeding is carried out when use-time exceeds a predetermined time length of the use-unit

Locking operation is same as the above-mentioned item (II). After locking operation mentioned above, the motor M_1 is operated by a timer which is not shown and common to the date feeding controllers a_1, a_2, . . . a_n, whereby the date feeding switch SW_1 in operated. By operation of the switch SW_1, the motor M_1 is caused to rotate after lapse of a predetermined time length of the use-unit, for example, after lapse 0 a.m. For example, let it be assumed that the controller a_1 is operated.

At this case, the timer operates in accordance with control of the controller a_1, thereby to rotate the motor M_1. By this rotation of the motor M_1, the switch SW_1 is switched over from the contact Nc to the contact No. At the locking time, contacts SW_2c and SW_2No, SW_3c and SW_3No, and SW_4c and SW_4No are, respectively closed, as described before. Accordingly, upon switch-over of the switch SW_1 from SW_1Nc to SW_1No, the circuit ($E \rightarrow SW_1c \rightarrow SW_1No \rightarrow SW_4No \rightarrow SW_4c \rightarrow M_2 \rightarrow E$) is closed, whereby the motor M_2 is rotated until the time when the pin **82** pushes up the lever **83** of the switch SW_4. By this rotation of the motor M_2, the indication is shifted from 0 to 1 and on the other hand, the switch SW_4 is switched over from the contact No to the contact Nc, whereby the motor M_2 is stopped. After stop of the motor M_2, the switch SW_1 is switched over from its contact No to another contact Nc by means of rotation of the motor M_1. When the switch SW_1 is switched over from the contact No to the contact Nc, the following circuit is established.

$E \rightarrow SW_1 (c - Nc) \rightarrow SW_3 (c - No) \rightarrow SW_4 (Nc - o) \rightarrow M_2 \rightarrow E$

As a result, the switch SW_4 is switched over from the contact Nc to the contact No, whereby the motor M_2 is stopped. Similarly, if a predetermined time length of the use-unit from said switch-over of the switch SW_1 has lapsed, the indication is shifted from 1 to 2. The switch SW_4 is stopping, as similar to case of switching from 0 to 1, in the state where the switch SW_4 is switched from the contact c to the contact No.

Unlocking operation

When coins of a required number corresponding to the indication are put into the coin inlet, the indication is shifted from 1 to 0, thus causing possibility of unlocking. The operation is same as that described in the above item (II).

In the above-mentioned example, it is assumed that ratio of the distance corresponding to one step lowering of the movable saw plate **66** and the distance corresponding to one step elevation of said plate **66** caused

by one revolution of the motor M_2 is taken as 1:1 in the case when one coin is put into the locker machine. However, by changing the ratio mentioned above to, for instance, 1:2, use of one time can be made possible by putting two coins. Accordingly, the required number of coins to be put at a time can be varied by changing the ratio mentioned above.

Although the rental locker system of the present invention has been shown and described in the foregoing in terms of a preferred embodiment, it will be easy for those in the art to device many modifications, substitutions, and changes thereof. The invention, therefore, is not intended to be restricted by the exact showings of the drawings and the description thereof but is considered to include other examples coming within the proper scope and fair meaning of the appended claims.

We claim:

1. A rental locker system which is rendered lockable with a locker key after dropping an indicated required number of coins into a coin inlet slot of the system and unlockable with the same key during a predetermined period of time thereafter, said system comprising:

locking means operatively responsive to the insertion of the locker key therein for locking and unlocking the system;

preventing means operatively associated with said locking means for preventing locking and unlocking thereof by the locker key;

electrically operable releasing means for releasing said preventing means and thus permitting locking and unlocking of said locking means;

first cam means having a plurality of indicator marks for indicating at an indicating window of the system that mark of said plurality of marks chosen to represent the required number of coins which permit locking and unlocking of said locking means;

second cam means rotatably associated with said first cam means for positioning at least said that mark at the indicating window of the system;

first electric driving means operatively associated with said first and second cam means for simultaneous rotation thereof in a first direction;

first detecting means operatively responsive to the dropping of coins into the coin inlet slot of the system and for actuably causing said first electric driving means to correspondingly rotate said first and second cam means in said first direction whereby when the locker system in an unused state is to be engaged by a user successive ones of said indication marks are obtainable at the indicating window until a completion mark is obtained thereat indicating that no more coins are necessary whereupon said preventing means is released by said releasing means and said locking means may be locked;

second electric driving means operatively associated with said first and second cam means for simultaneous rotation thereof in a second direction;

locking and unlocking detecting switching means for detecting locking and unlocking movements of said locking means and operating to cause said second electric driving means to rotate said first and second cam means in said second direction whereby when a user of the system unlocks said locking means within said predetermined period of time said that mark reappears at the indication window;

switching means responsive to the lapse of time and operatively associated with said locking and unlocking means and said second electric driving means, whereby if the user of the system does not unlock said locking means within said predetermined period of time, said switching means actuably operates to cause said first and second cams to be rotated in said second direction by said second electric drive means so that successive multiples of said that mark appear at the indicating window after the lapse of each further successive ones of said predetermined periods of time and said preventing means prevents unlocking of said locking means until the user deposits a number of coins in the coin inlet slot of the system represented by the final multiple mark reached in the indicating window.

2. A rental locker system of the type as claimed in claim **1**, in which said locking detecting means and unlocking detecting means are, respectively, composed of a detection switch for detecting the turning of the key in said locking means and a detection switch for detecting insertion and withdrawal of the key.

3. A rental locker system which is rendered lockable with a locker key after dropping an indicated required amount of coins into a coin inlet slot of the system and unlockable with the same key during a predetermined period of time thereafter, which system comprises:

locking means operatively responsive to lock and unlock the system with the locker key;

preventing means operatively associated with said locking means for preventing unlocking and locking thereof with the locker key;

releasing means for releasing said preventing means and allowing the locker key to lock and unlock the system;

indicator means having a plurality of indicator marks for indicating at an indicating window of the system that mark of said plurality of marks chosen to represent the required amount of coins necessary to be dropped in the slot to permit locking and unlocking of said locking means;

a saw-toothed plate means having a connecting lever connected to said indicator means for moving said indicator means in stepped movements so that successive ones of said indicator marks are obtainable at the indicating window;

coin detecting lever means for detecting the dropping of a coin into the inlet slot of the system and operating to cause successive ones of said stepped movements of said saw-toothed plate means in a first direction each time a dropped coin is detected thereby until a completion mark appears at the indicating window indicating that no more coins are necessary and said preventing means is released by said releasing means and the system is lockable;

detecting means for detecting locking and unlocking movements of said locking means;

time-switching means operatively responsive to the lapse of time and operatively associated with said detecting means;

electric driving means operatively associated with said detecting means and said time-switching means and having a member operably movable thereby and engageable with said saw-toothed plate means to move same in successive ones of said stepped movements in a second direction so that when the locker system in an unused state is to be engaged by a user, the required amount of

coins indicated by said that mark in the indicating window are dropped into the inlet slot of the sytem until said completion mark appears at the indicating window and the system is lockable by said locking means which is detected by said detecting means whereupon said electric driving means is ready for moving said member to engage said saw-toothed plate means, and if the system is unlocked within said predetermined period of time, said detecting means detects such a movement and said electric driving means operates to cause said member to move said saw-tooth plate means in said second direction until said that mark reappears at the indication window and the system is ready for use by a further user thereof, but should the system not be unlocked within said predetermined period of time, said time-switching means actuably operates said electric driving means to cause said member to move said saw-tooth plate means in said second direction so that successive multiples of said that mark appear at the indicating window after the lapse of each further successive ones of said predetermined periods of time and said preventing means prevents unlocking of said locking means until the user deposits an amount of coins in the coin inlet slot of the system represented by the final multiple mark attained in the indicating window.

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