Sept. 24, 1935. H. E. RILEY 2,015,411

MONEY COLLECTOR FOR AUTOMATIC REFRIGERATORS, ETC

Filed Dec. 11, 1931 3 Sheets-Sheet 1

Fig. 1.

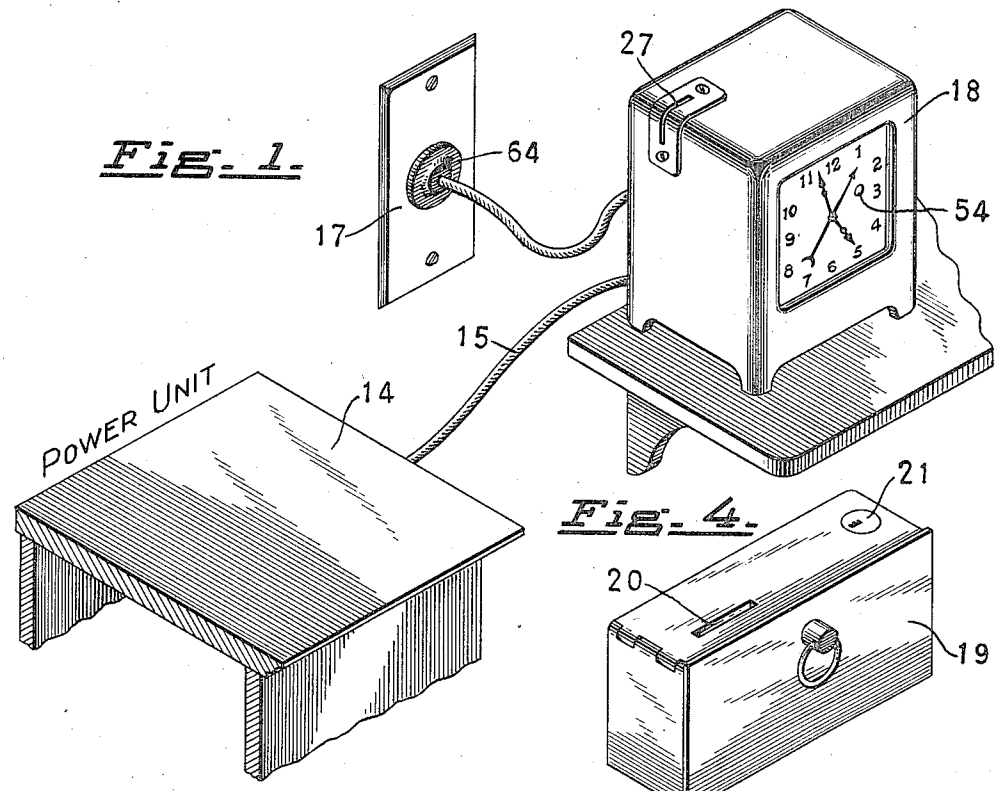


Fig. 4.

Fig. 2.

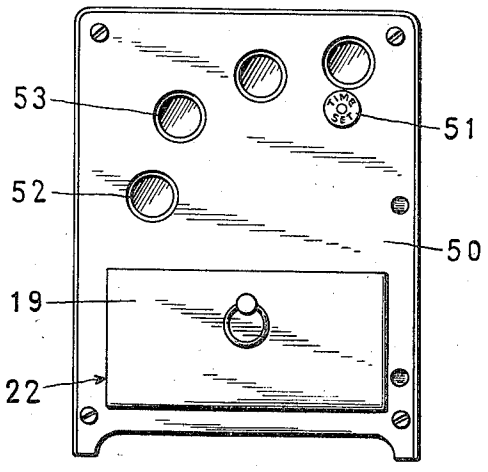
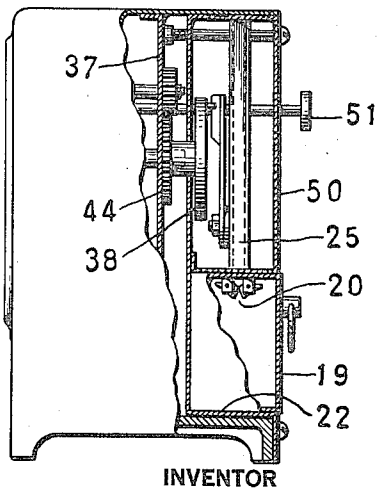


Fig. 3.



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Fig. 5.

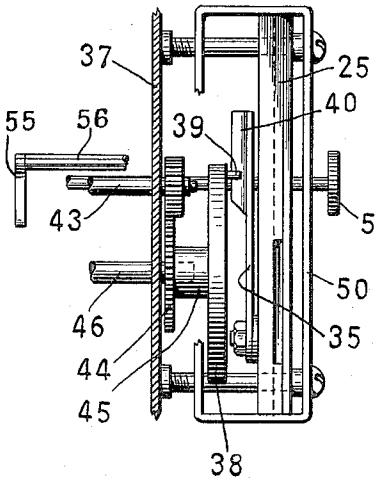


Fig. 6.

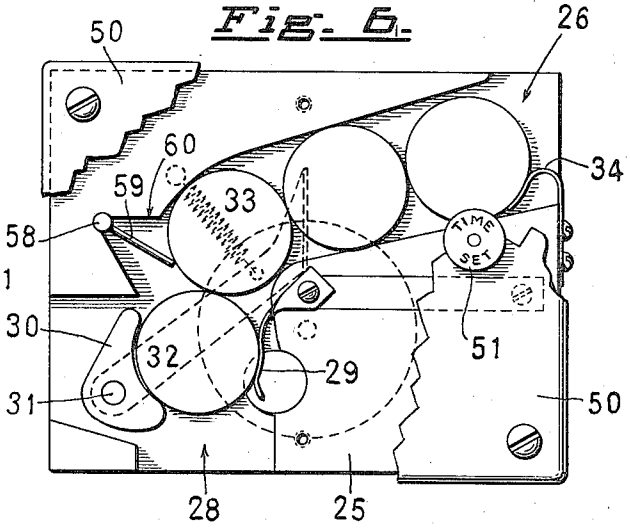
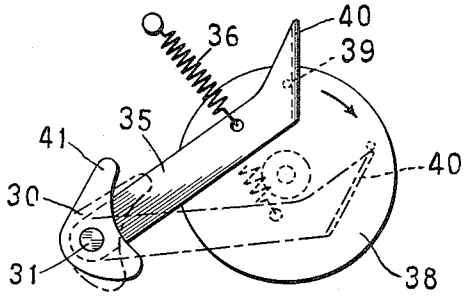


Fig. 7.



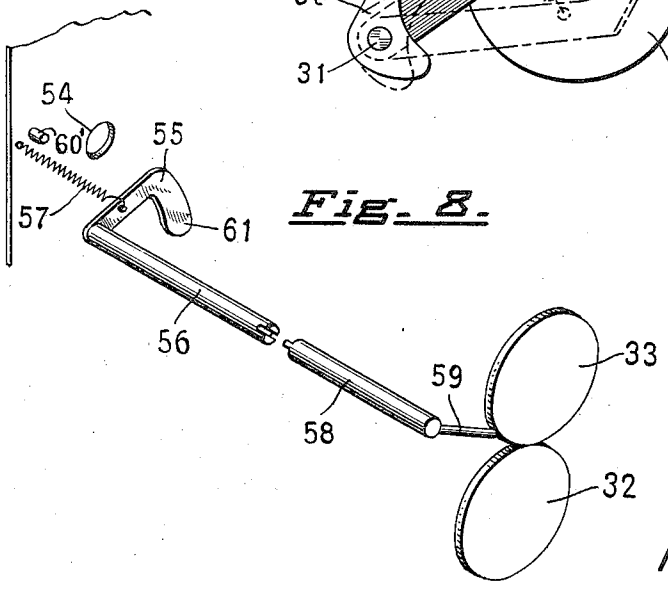


Fig. 8.

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Fig. 9.

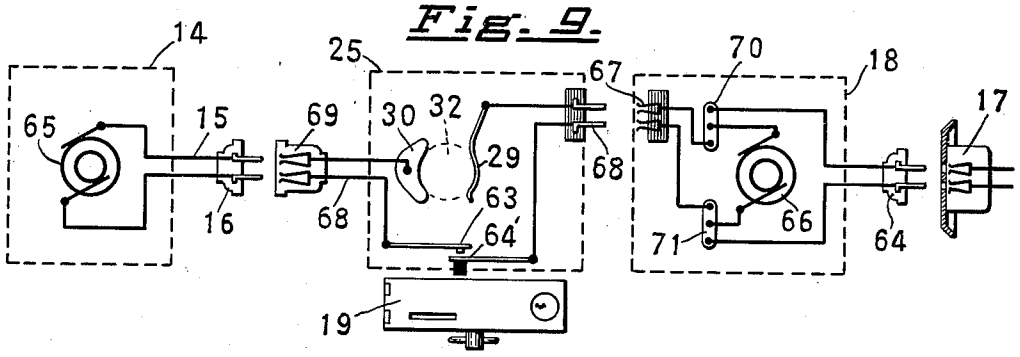


Fig. 10.

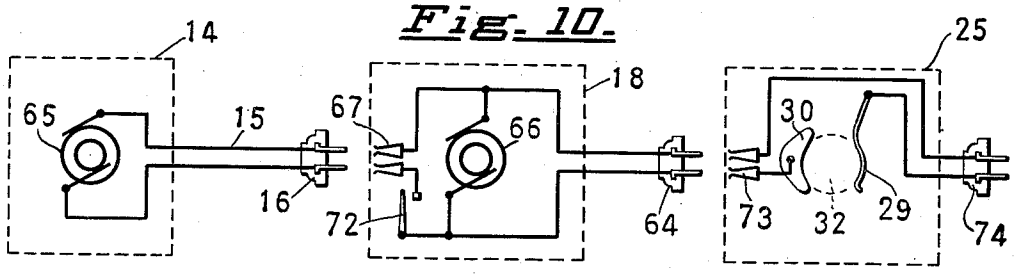


Fig. 11.

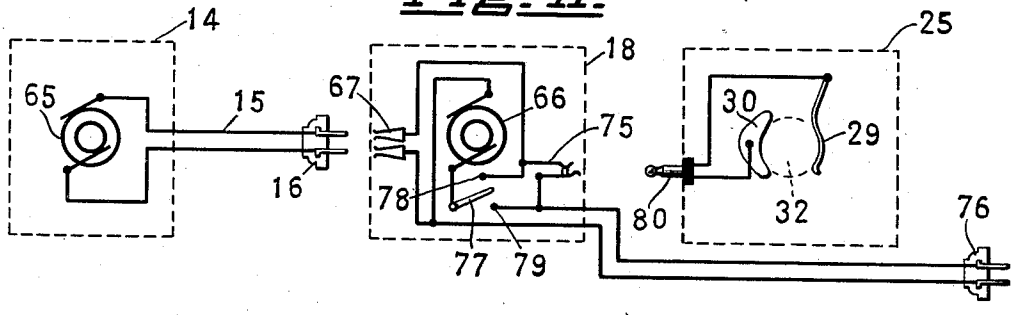
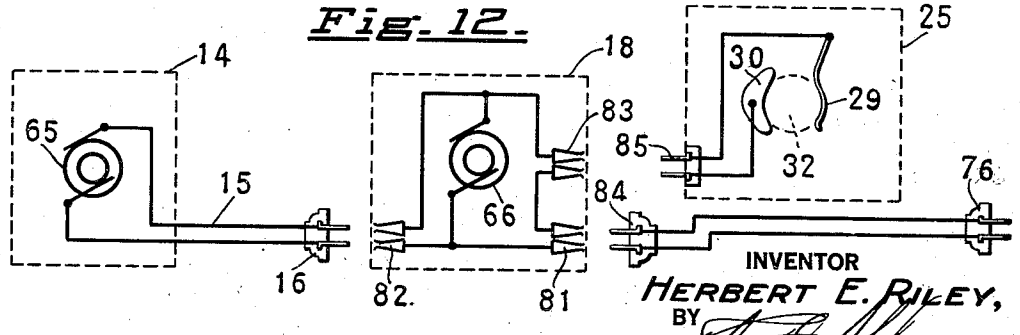


Fig. 12.



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UNITED STATES PATENT OFFICE

2,015,411

MONEY COLLECTOR FOR AUTOMATIC REFRIGERATORS, ETC.

Herbert E. Riley, New York, N. Y.

Application December 11, 1931, Serial No. 580,308

10 Claims. (Cl. 194—6)

My invention relates particularly to electrical apparatus combining a time clock and savings bank, useful in connection with the sale on the installment plan of automatic household refrigerators.

One object of my invention is to provide simple, inexpensive but reliable apparatus for the collection of coins in accordance with a predetermined contract for the sale of such apparatus.

A special object is to provide a time clock and money collection means so constructed that the proper number of coins must be kept in the apparatus in order to insure continuous operation of the refrigerator or other power consuming device.

Another object is to provide apparatus of this character such that the coin collection receptacle can be taken out by the customer and returned to the seller where the coins are taken out and the amount deposited, credited on the sales account.

Another object is to provide mechanism of this character from which the automatic control mechanism can be readily removed from the clock and used again with another clock for the purpose of a subsequent sale after payment of the first merchandise.

Another object is to provide apparatus for automatically indicating at the front of the clock when there are coins available for continuing the operation in accordance with the contract.

Another object is to provide means for disabling the power consuming apparatus when the coin collector is removed.

Another object is to provide apparatus of the character described which can be readily interposed between the power consuming device and an ordinary household convenience outlet.

In carrying out the invention I have illustrated the details as particularly applied to the sale of merchandise such as an electrically actuated refrigerator. A time clock of the self-starting synchronous motor driven type is employed as the basis of the control system. To the back of this clock is unobtrusively connected a switch mechanism for controlling the refrigerator motor. This switch mechanism includes a coin chute with contacts which may be connected either solely in the refrigerator motor circuit and/or in the clock motor circuit. A coin collecting receptacle or bank is also removably mounted in the rear of the clock and may be used to control the power consuming circuit.

Fig. 1 is a perspective view illustrating the apparatus embodying my invention.

Fig. 2 is a rear view of the clock case with the coin collecting and switch mechanism.

Fig. 3 is a vertical sectional view and partial side elevation of the combined clock, switch and bank mechanism.

Fig. 4 is a perspective view of one form of coin collector or bank.

Fig. 5 is an edge view on a somewhat larger scale showing the coin and switch mechanism in its relation to the back of the clock.

Fig. 6 is a rear view of the coin chute and switch.

Fig. 7 is a detail view of the means for periodically releasing the coins.

Fig. 8 is a perspective view showing the coin signal device.

Figs. 9, 10, 11 and 12 are diagrams showing different electric circuits for carrying out my invention according to various modifications.

In Fig. 1 the power consuming unit 14 is diagrammatically intended to represent a refrigerator or other apparatus employing an electric motor. Such devices usually have an extension cord 15 and a plug 16 adapted to be inserted in any suitable type of convenience outlet such as 17.

The clock 18 may be of any suitable type but preferably of the self-starting synchronous motor driven type arranged in a suitable case which can be located in any convenient place.

The bank 19 may be of any suitable construction having a suitable type of orifice 20 for the admission of the coins. The bank would also have a suitable type of key controlled door 21 to permit access and removal of the coins by an authorized person. The rear of the clock is provided with a receptacle or compartment 22 into which the bank is adapted to be inserted and from which it may be removed under proper circumstances.

The coin control switch unit consists of a plate 25 which is detachably mounted in the rear of the clock case and provided with a coin groove 26 adapted to be lined up with the slot 27 in the upper part of the clock case. This groove 26 has an inclined entrance portion and a vertical discharge outlet 28 arranged in such a position that the coins may pass directly from the coin chute or groove into the opening 20 in the bank.

Above the outlet 28 are arranged two contact members, namely, a spring finger 29 and an oscillating hand-like member 30 which is hinged at 31. The edge of the member 30 which faces the contact 29 is suitably shaped to receive a coin 32 of the proper size which, when in position, electrically connects the contacts 29 and 30 and supports such additional coins as 33 as may have been

inserted in the chute above the lower coin. A spring retainer 34 may be provided to prevent coins being accidentally shaken out. At the back of the plate 25 is an arm 35 held yieldingly by a spring 36 in the position shown dotted in Fig. 6 and shown in full lines in Fig. 7.

Behind the back plate 37 of the clock I provide a disc 38 driven by the clock mechanism and provided with a pin 39 adapted to engage a flange 40 at the outer end of the oscillating arm 35, so that as the pin 39 rotates it will engage the flange 40 and tilt the arm 35 and the hand 30 as the disc rotates and thus permit the lower coin 32 to drop out when the hand is in the position shown in the dot and dash lines of Fig. 7. It will be seen that as the hand 30 moves from the position of Fig. 6 to the dot and dash position of Fig. 7 that the upper finger 41 of the hand will be interposed into the path of movement of the succeeding coin 33, thus holding it up until the coin 32 is discharged into the bank. As soon as the pin 39 has passed the tip of the flange 40 the spring 36 will retract the arm 35 to the position shown in Fig. 6 and permit the coin 33 to fall into place between the contacts 29 and 30.

The coin chute 26 will, of course, be designed to accommodate the number and size of coins desired. The disc 38 will be designed and arranged to be driven so as to actuate the switch mechanism at the desired intervals. For instance, if one coin per day is required by the contract the disc 38 would be provided with a single pin 39 and arranged to rotate once in each twenty four hours. By providing the disc 38 with two pins the same mechanism might be employed to actuate the switch twice in twenty four hours. By changing the ratio of the gearing from the shaft 43 to the gear 44 any desired number of revolutions per day may be produced.

For cheapness in construction the gear 44 is preferably mounted on a hub 45 which carries the disc 38 and this hub is detachably mounted on the rear end of the shaft 46 which is arranged to project through the back plate 37 of the clock.

The back plate 50 of the switch mechanism is removable with the switch mechanism and provided with a passage for the stem of the time-set shaft 51 and the time-set shaft is preferably provided with a detachable connection with the inside of the clock so as to permit it to be removed in the manner customary in clock constructions.

I also preferably provide a series of windows 52, 53, etc. in line with the positions which the coins occupy when in place in the coin chute so that the owner can readily tell by looking at the back of the clock just how many coins are available in the clock.

I also preferably provide an indicator visible at the front of the clock so that the owner can tell whether or not there is a spare coin available in the chute. For this purpose I provide a window 54 in the front of the clock and behind it mount an oscillating target 55 which is carried by a shaft 56 pivoted in the clock case. This target is suitably impelled by a spring 57 or by gravity to a position such that a part of the target, which may be colored red, normally tends to stand in line with the window 54. In the coin and switch mechanism I mount a shaft extension 58 adapted to be detachably connected with the shaft 56 and removed with the switch unit. The rear end of the shaft 58 carries a finger 59 which stands in the path of movement of the coin 33 so that when there are two coins in the chute the upper coin will hold the finger 59 in position so as to retract the target from the window 54. When there is no second or reserve coin in the chute the finger 59 automatically rises against the stop 60 and permits the target 55 to bring the red signal portion in line with the window 54. When the coin unit is entirely removed the target 55 then moves still further under the influence of the spring 57 so that the portion 61 which is white comes into line with the window 54 and thus avoids showing the red signal.

The contract between the dealer and the purchaser will ordinarily require the bank 19 to be periodically brought to the dealer for removal of the collected coins. To insure automatic defrosting periodically I may provide a switch having contacts 63 and 64 which are normally held closed by the presence of the bank 19 in the clock case (see Fig. 9). When the bank is removed this switch is opened and current to the refrigerator cut off so that the ice box will be automatically defrosted.

It will be understood that when the payments have been completed the dealer will remove the automatic switch mechanism and the coin collecting bank, which can be again used in another installation, the intention being that the clock shall be given to the purchaser as a premium for completion of the contract.

It should be understood that the circuit arrangements for the use of my invention may be designed to meet the needs of various dealers. I have accordingly shown on Sheet 3 a number of circuits especially useful for this purpose.

On Sheet 3 of the drawings I have shown diagrammatically four different circuit arrangements for utilizing various modifications of my invention. In each figure a power consuming unit, such as a refrigerator, is indicated by a dotted line 14 containing a motor 65 suitable for driving the mechanism of the article which is the subject of the primary sale contract. This is provided with a cord 15 and a plug 16 of the usual type adapted to be plugged into a wall receptacle 17 or other outlet. The time telling clock 18 is also represented by a dotted line in Fig. 9, containing a motor 66 which, as previously stated, is preferably of the self-starting synchronous type suitable for driving the usual clock mechanism and time telling hands. This clock has a usual extension cord and plug 64.

The coin controlled switch mechanism is indicated generally by the dotted line 25 corresponding to the panel or plate 25, previously described. The switch contacts 29 and 30, previously described, are also shown in Fig. 9, together with a coin which acts as the movable switch member.

For the purpose of simplicity in installation I preferably provide a clock case and a switch unit with interfitting socket and plug members, such as 67 and 68, and the switch unit is also preferably provided with an extension cord 68 and socket 69 adapted to receive the plug 13 of the refrigerator unit.

It will thus be seen that the clock unit and the switch unit may be readily united for the purpose of installation and the terminals of the clock unit can be plugged into a wall or other convenience outlet in the usual manner. Similarly the switch unit may be connected in the usual manner with the refrigerator unit.

In Fig. 9 I have also shown an automatic switch actuated by the coin collecting or bank unit 19. When the various plugs are connected in the order indicated it will be seen that the circuit may be traced from the wall outlet 17 through the plug

64, bus bar 70, socket 67, plug 68, spring contact 29, coin 32, coin receiving contact hand 30, socket 69, plug 16, motor 65, and back through the lower side of the plug 16, socket 69, switch contacts 63, 64', plug 68, socket 67, bus bar 71 and plug 64 to the outlet 17.

It will also be seen that the clock motor 66 is connected in parallel across the line between the bus bars 70 and 71. The result is that the clock motor will run all the time. When the coin collector 19 is in place and the switch contacts 63 and 64 are connected the circuit will be completed through the power motor whenever a coin 32 is in place. When the coin is released and dropped into the bank, as previously described, the circuit through the power motor is, of course, automatically broken. If there is a second coin in the coin chute it will be resting on the upper end of the contact member 29 and the tip of the horn 30 so as to provide a parallel path and avoid opening the circuit when the lower coin is dropped.

It is, of course, understood that in refrigeration apparatus the power motor should from time to time be stopped so as to insure defrosting. As the system contemplates in its complete scheme of operations the monthly return of the bank by the customer to the dealer for opening and crediting the deposits, I may provide a convenient means of insuring the defrosting by a switch, as previously described, which is automatically opened by spring action when the coin bank is removed. This also serves as a supplementary safeguard to at least deter the customer or members of the household from removing the bank and surreptitiously allowing the coins to drop into the bottom of the clock case instead of in the savings bank.

If desired any suitable form of device may be made to seal or lock the bank in place in the clock case.

It will also, of course, be understood that the power consuming unit may be provided with the usual automatic controls and hand switches if desired.

With the system illustrated in Fig. 9 when the merchandise has been paid for and the contract fulfilled the coin collecting unit and switch are removed from the clock case and may be used again. It will also be seen that the power consuming unit can then be plugged into any convenience socket or directly into the socket 67 of the clock.

It will be seen, however, that the clock unit and the power consuming unit are entirely independent and may be installed in any convenient location.

In the arrangement shown in Fig. 10 the switch unit is intended to be connected in the power line between the clock unit and the outlet so that the coin controlled switch also controls the circuit through the clock motor. Consequently the clock will stop whenever the customer fails to leave a coin in the switch mechanism. In this figure I have also shown a switch 72 which may be used in the clock to open the circuit to the power consuming unit. It will be understood that the plug of the power consuming unit may be sealed or wired to the socket 67 in the clock or to the socket 69, shown in Fig. 9, so as to prevent tampering.

In this construction shown in Fig. 10 the socket 73 is shown as a part of the switch unit arranged to receive the plug 64 of the clock unit and the switch unit is provided with an extension plug 74 for insertion in a convenience outlet. It will be understood that the switch unit is to be inserted in the back of the clock unit and actuated as previously described. When the switch unit is removed the clock unit and the power unit are independent.

In the arrangement shown in Fig. 11 the clock unit is provided with a jack switch 75 and an extension plug 76, so that considered by itself as a clock unit the jack switch 75 is normally closed and the hand switch member 77 may be connected to the contact 78 or 79. In either case the current will flow from the plug 76 either directly through the contact 79 and switch member 77 to the motor or through the jack switch 75 and contact 78 and switch member 77 and thence back through the lower side of the cord to the plug 76. The switch unit 25 has the usual type of tip and sleeve plug 80 which is adapted to be plugged into the jack 75 so as to substitute the switch circuit through the coin 32 for the direct short through the switch 75. When the switch member 77 is closed on one of the contacts 78 or 79 the coin switch controls the circuit through the motor 65 of the power unit. If the switch member 77 is on the contact 79 the clock motor 66 will be in parallel with the line and will operate independently of the condition of the coin switch. When the switch member 77 is on the contact 78 the clock motor 66 is in parallel with the power motor 65 and both motors are controlled by the action of the coin switch.

With a construction embodying the automatic jack switch 75 it will be seen that the system can be used with or without the coin switch unit and no manual operation or re-arrangement is required of the clock unit and the power unit. The switch member 77 also provides a means of disconnecting or disabling the clock motor if desired without otherwise affecting the power circuit.

This switch 77 also provides means for connecting the clock motor so that it will operate either independently of the condition of the coin switch or dependent upon the coin switch. In the latter case the clock hands serve as visual indication of the open circuit in the coin switch.

In the arrangement shown in Fig. 12 the clock unit is provided with sockets 81, 82 and 83. The extension cord has a plug 76 at one end for insertion in the usual power outlet and a plug 84 at the other end adapted to be inserted in either socket 81 or socket 82. The plug 16 of the power unit is also adapted to be inserted in either the socket 81 or socket 82. When the plug 84 is inserted in socket 81 and the plug 16 is inserted in socket 82 and the coin switch plug 85 is inserted in the socket 83 it will be seen that the coin switch controls the circuit through both the clock motor 66 and the power motor 65 which are in parallel beyond the coin switch. The clock hands, therefore, serve as a telltale to the condition of the coin switch. By interchanging the connections of the plugs 84 and 16 so that the plug 84 is inserted in socket 82 and plug 16 is inserted in socket 81, the clock motor 66 is in parallel with the power supply circuit ahead of the coin switch so that the coin switch in this case merely controls the circuit through the power motor 65 and the clock will therefore operate independently of the condition of the coin switch.

When the sales contract is completed the coin switch unit will be removed and a dummy short circuiting plug (not shown) will be substituted

for the plug **85** in the socket **83**. It will be obvious, of course, that the automatic short circuiting jack, such as **75**, may be substituted for the socket **83**, in which case the usual tip and sleeve plug **80** would be used in place of the conventional two bladed plug **85**. If the clock alone is to be used after the coin switch unit has been removed the plug **84** may be inserted in the socket **82** to connect the clock motor in a circuit independently of the sockets **81** and **83** or other terminal or switching devices. Obviously the power consuming unit is wholly independent of the clock unit and the coin switch unit when they have been disconnected. In other words, each of the units is substantially self-contained and independent of the other units except when it is desired that they shall be connected in a given cooperative relation.

It will be seen from the foregoing that the coin switch mechanism is of an extremely simple type which is inexpensive and easily assembled with a standard type of electric clock mechanism. I purposely avoided the complicated relays and so-called safety devices commonly employed in coin collecting mechanisms because it has been found that they are unnecessary in an installment collecting system such as herein set forth.

The purchaser signs a contract requiring the deposit of a certain coin in the receptacle at predetermined intervals. At other predetermined intervals the coins are removed from the collecting bank and credited to the purchase account. The customer can not conceal from the dealer any tampering with the mechanism because the entire transaction is revealed as soon as the bank is opened.

This system also ordinarily eliminates the cost of collection and insures the presence of the customer at the store at periodic intervals to deposit the coins collected during the preceding contract period. This constitutes an additional utility to the dealer, who at all times is the owner of the coin switch device, in that the customer being present at the store is attracted to examine and perhaps purchase other displayed merchandise.

As the coin switch and collecting mechanism is intended to be repossessed by the dealer at the conclusion of the contract, it will be seen that it is the only permanent capital investment. The clock mechanism per se constitutes in effect an advertising expense and serves to the customer as a premium on the fulfillment of the contract.

I claim:

1. Refrigeration control apparatus comprising an electric time clock having a case, a detachable coin actuated switch unit having a member driven by the clock, a collecting bank removably mounted in the clock case and receiving coins from the switch unit, and a switch in circuit with the coin actuated switch unit and actuated by the bank, said electric time clock being operable after said coin actuated switch unit has been removed.

2. Control apparatus comprising an electric time clock having a case, a removable coin actuated switch unit having a member driven by the clock, a bank removably mounted in the clock case and receiving coins from the switch unit, and a switch in circuit with the coin actuated switch unit and actuated by the insertion and removal of the bank, said clock being operable after said coin actuated switch unit is removed.

3. Refrigerator control apparatus comprising a time clock, a separable coin controlled switch unit having a member actuated by the clock, an indicator target showing from the front of the clock and having a member controlled by a coin about to actuate the switch unit and means for resetting the target, said target and said controlled member being automatically separable and engageable upon the removal and replacement of said coin controlled switch.

4. Refrigerator control apparatus comprising an electric time clock unit, a coin controlled switch unit having a contact actuated by the clock mechanism and an indicator showing from the time displaying face of the clock and having a coin controlled actuator carried by the switch unit and removable therewith, said indicator and said actuator being automatically separable upon the removal of said switch unit and permitting the continued functioning of said time clock unit.

5. Control apparatus comprising a time clock having a rotating gear at the rear, a coin chute, a pivoted switch member at one edge of the chute for engagement by a coin in the chute and having a horn adapted to be interposed above the coin in the chute and beneath the next coin above it in the chute, a movable indicator having a finger engaged by a coin in the chute, means for resetting the indicator, a contact finger at the opposite edge of the chute, an arm connected to the pivoted member and actuated by the rotating gear of the clock and means for resetting said pivoted switch member.

6. Control apparatus comprising an electric time clock unit having a rotating gear at the rear, a detachable plate having a coin chute, a pivoted switch contact member at one edge of the chute and having a recess for a coin in the chute and having a horn adapted to be interposed above the coin in the recess and beneath the next coin above it in the chute, a contact finger at the opposite edge of the chute adapted to be engaged by the coin in the recess and to close an electric circuit, an actuating arm connected to the pivoted member and a disc having a gear carried by the plate and detachable therewith, said latter gear automatically engaging with the gear of the clock when the plate is secured to the clock unit and said disc having a pin for actuating the said arm and means for resetting said arm and pivoted members.

7. As an article of manufacture, a coin controlled switch unit having an extension cord and electric connector and including a contact making device having a coin detent, a second contact adaped to be engaged by the detented coin, an arm for actuating the detent, resetting means acting upon said detent and said arm, a gear adapted to mesh with a member on the back of an electric time clock, a pin carrying member secured to the gear for actuating the arm intermittently, and means for detachably connecting said switch unit to the back of an electric clock case whereby the switch unit and the clock can be used to jointly control a power consuming device such as an electrically motivated refrigerator.

8. Refrigeration control apparatus comprising a coin actuated switch unit, a collection receptacle detachable from said switch unit and a second switch in circuit with the coin controlled switch and actuated by the collection receptacle.

9. Refrigeration apparatus control comprising a coin switch unit for controlling current to the refrigerator, an electrically actuated time clock unit, means for detachably connecting said units so that a part of the switch unit is actuated by the clock unit, and means for automatically con-

necting the clock unit in circuit with the refrigerator when the switch unit is removed.

10. Refrigeration control apparatus comprising an electric time clock, a coin actuated switch having a release member driven by the clock so that the refrigeration apparatus will be de-energized when there is no coin in the switch, a collection receptacle for receiving coins deposited from said switch, and means for de-energizing the refrigeration apparatus when the collection receptacle is removed and without stopping the clock.

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