Feb. 4, 1930. R. SAUSE 1,745,506

COIN CONTROLLED RADIORECEIVER

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Fig. 2.

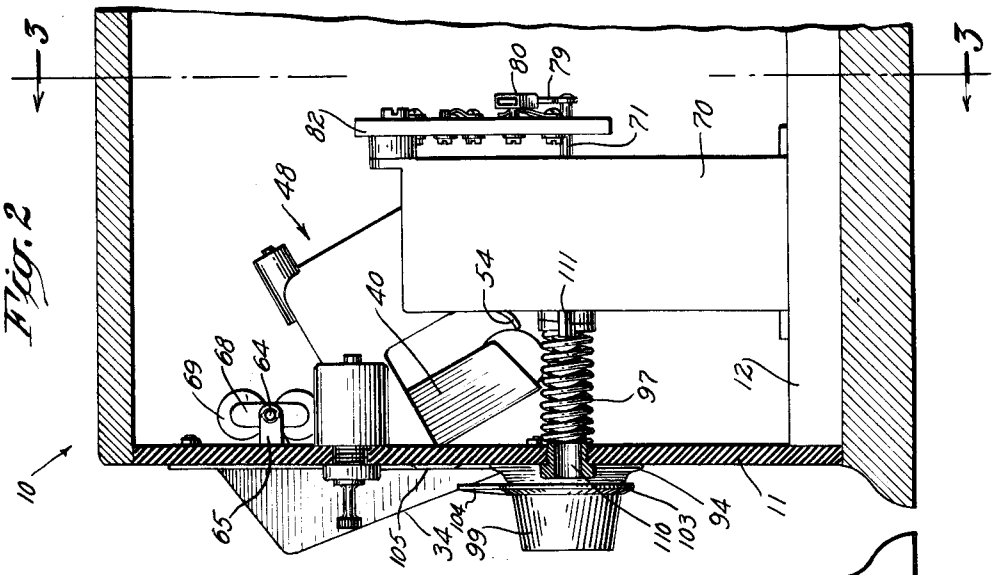
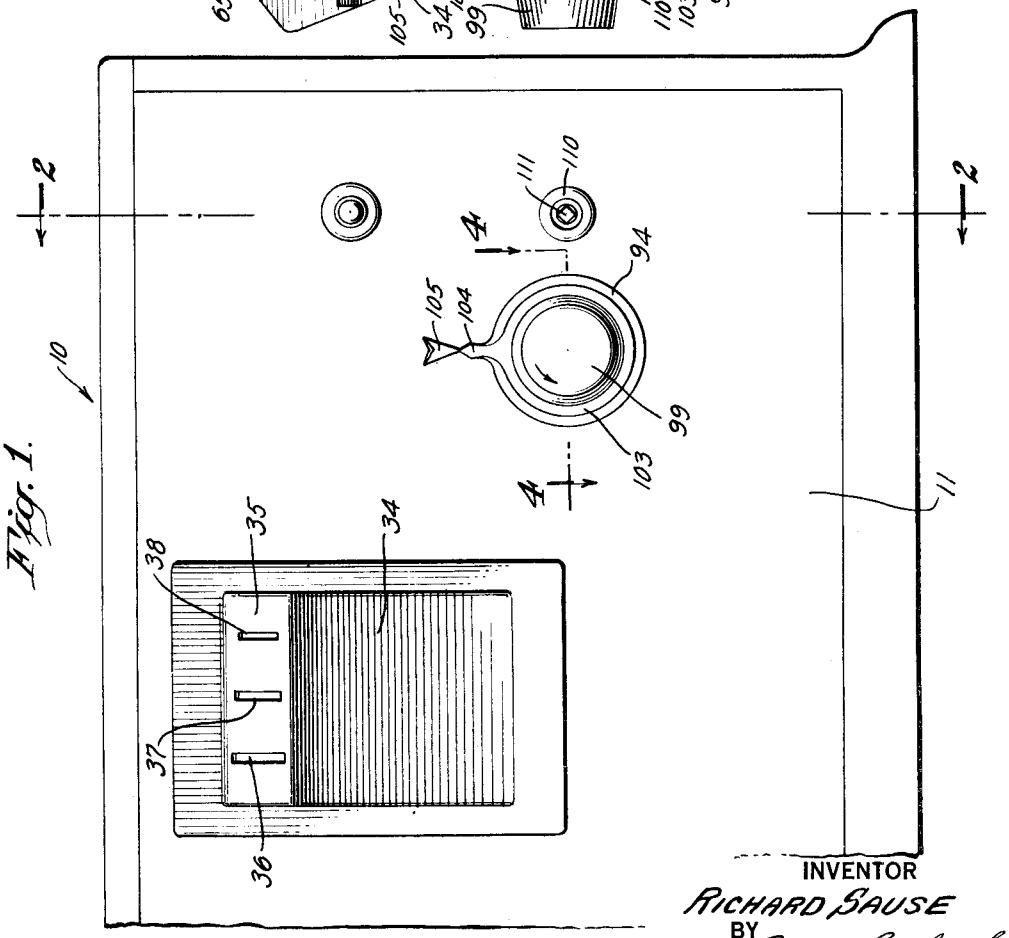


Fig. 1.



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COIN CONTROLLED RADIORECEIVER

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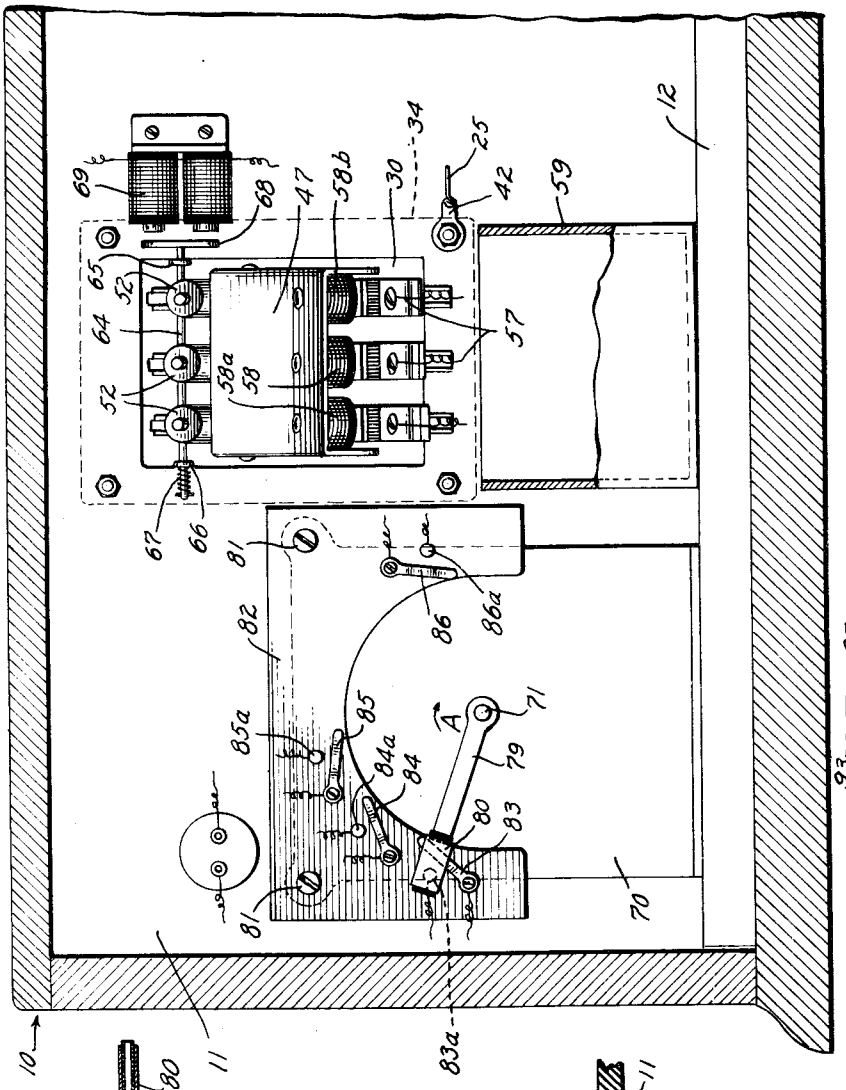


Fig. 3.

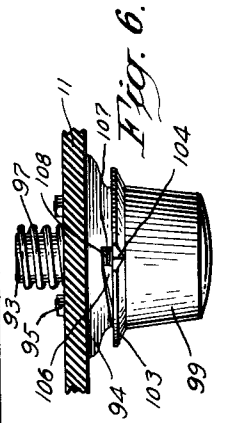


Fig. 6.

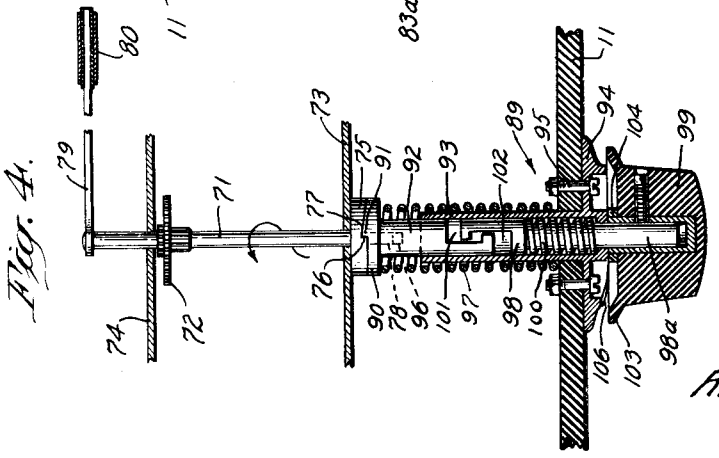


Fig. 4.

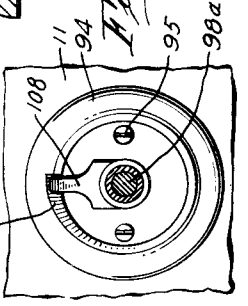


Fig. 5.

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COIN CONTROLLED RADIORECEIVER

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Fig. 7.

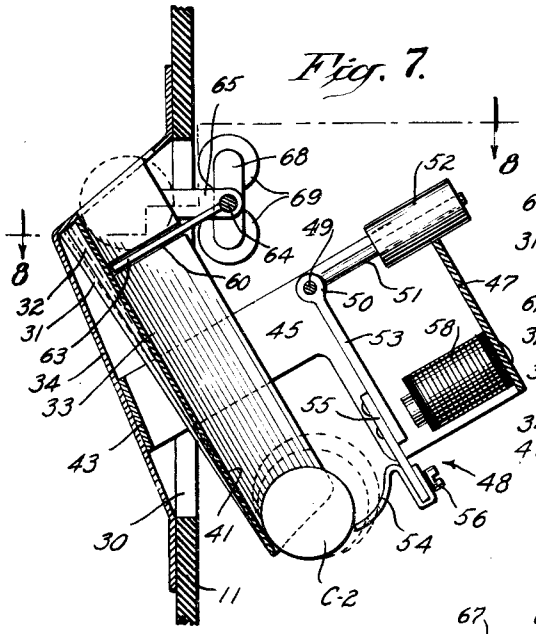
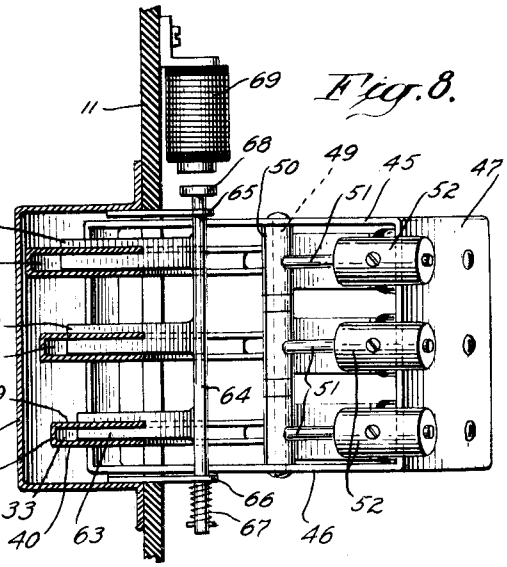


Fig. 8.



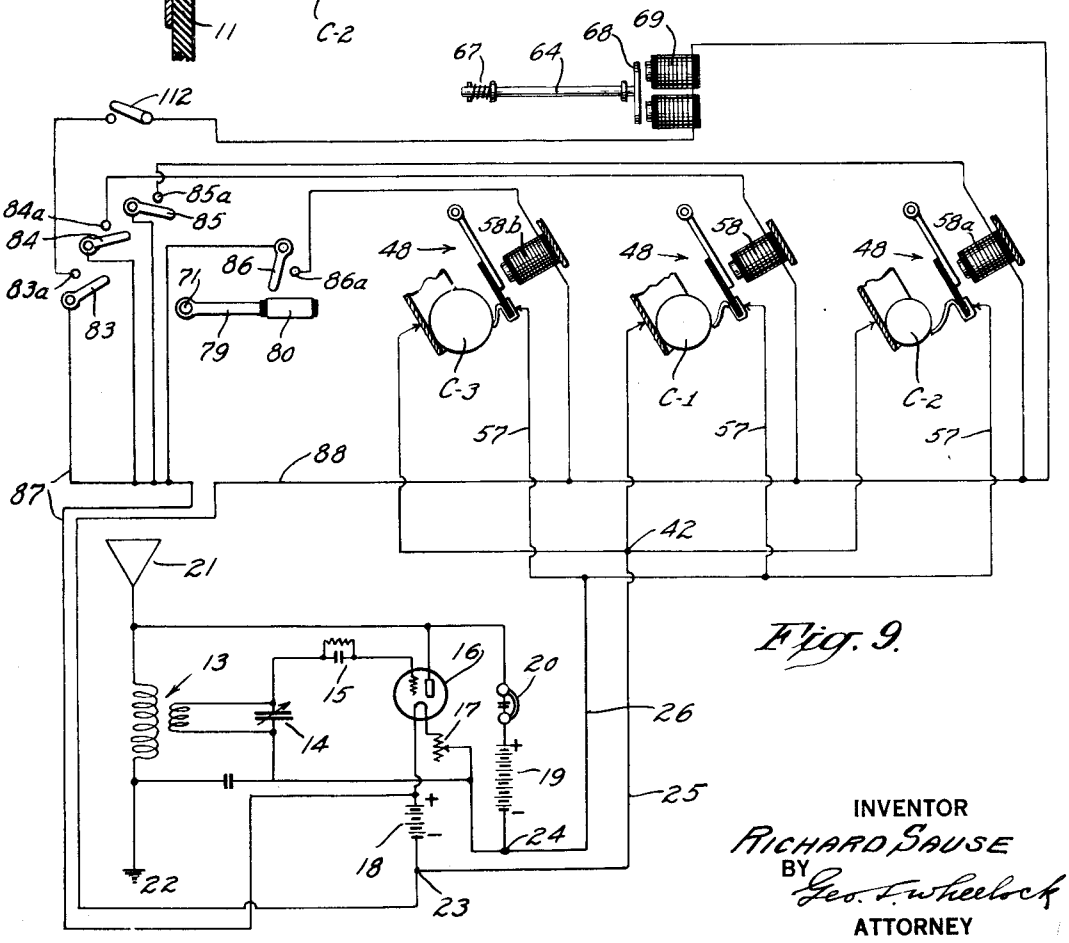


Fig. 9.

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UNITED STATES PATENT OFFICE

RICHARD SAUSE, OF NEW YORK, N. Y.

COIN-CONTROLLED RADIORECEIVER

Application filed March 26, 1927. Serial No. 178,711.

This invention relates to improvements in coin-controlled radio receivers, and has particular reference to such devices wherein coins of different denominations can be selectively employed to operate the radio receiver during time cycles of different lengths commensurate with the values of the several different coins.

An important object of the invention is to provide a coin-controlled radio receiver in which the respective time cycles are accurately defined by automatic means, and in which the commencement of the prepaid time cycle is manually controlled after insertion of a selected coin in the apparatus.

Another object is to provide such a device of extremely simple construction, which will be "fool-proof", and thoroughly reliable and efficient in use.

Another object is to provide such a device wherein the actuating coin electrically completes a normally open circuit, and wherein the circuit is opened by the automatic release of the coin from its operative position at the end of a definite, prepaid time cycle.

Another object is to provide such a device with a novel overrunning clutch forming a yieldable connection between a manual setting member and a continuously operating time-measuring means.

With these and other objects and advantages in view, the invention resides in the novel details of construction and arrangement of parts hereinafter set forth, illustrated in the accompanying drawings, and specifically pointed out in the appended claims.

In the drawings, wherein one preferred embodiment of the invention is shown by way of illustration,

Figure 1 is a fragmentary front elevation of a radio receiver embodying the invention;

Fig. 2 is a vertical transverse sectional view on line 2—2 of Fig. 1;

Fig. 3 is a vertical longitudinal sectional view on line 3—3 of Fig. 2;

Fig. 4 is a horizontal sectional view on line 4—4 of Fig. 1, and showing more clearly the construction of the clutch employed in the manual setting means;

Fig. 5 is a detail view of the means for indicating the point of commencement of the time cycles;

Fig. 6 is a detail top plan view thereof with its associated hand dial;

Fig. 7 is a vertical sectional view through one of the coin slots and showing the coin arresting and receiving mechanism;

Fig. 8 is a horizontal sectional view on line 8—8 of Fig. 7, and

Fig. 9 is a diagram of the wiring connections of a conventional radio receiver and the improved coin-control mechanism.

Referring now to the drawings in detail it will be seen that the radio receiver has been shown as including a cabinet 10 having as its front wall a usual panel 11, preferably of dielectric material, with which is associated a base plate 12, and on which is mounted in any desired manner, suitable radio receiving apparatus connected in a radio circuit. The invention is not restricted to any particular "hook-up" but may be employed with any one of the many well known types, and for the purpose of illustration it has been shown in the drawings as associated with a conventional one-tube set. This specific "hook-up" (Fig. 9) includes an inductance unit 13, a condenser 14, a grid leak 15, a detector tube 16, a rheostat 17, an "A" battery 18, a "B" battery 19, and a pair of ear-phones 20, all suitably connected together and to an antenna 21, and grounded at 22. Also included in the circuit are a pair of separated or spaced terminals 23 and 24 which render the circuit normally open and between which the improved coin-control mechanism is adapted to be connected by means of conductors or wires 25 and 26. By closing the circuit through said wires 25 and 26, the set will be available for radio reception, and in accordance with this invention, the circuit is so closed by the presence of a coin in the apparatus, and is reopened through the instrumentality of a time-measuring mechanism at the end of a definite time cycle commensurate with the value of the actuating coin. The circuit-controlling means are preferably capable of being actuated by selected coins of different standard diameters and values, and the circuit is maintained in closed condition during a definite

predetermined time cycle or period commensurate with the value of the selected coin. When a coin is inserted in the apparatus it is initially intercepted in the coin guiding means before it reaches its operative position with reference to the circuit-controlling means, and it is then necessary to manipulate a manual control knob to move a contact maker which causes the coin to be released from the intercepting means and presented to its operative position to close the radio circuit, and said contact maker simultaneously defines the commencement of the prepaid time cycle.

As best shown in Figs. 1, 7, and 8, the illustrated embodiment of the invention has means for receiving selected coins of three different sizes, but it is to be understood that any other number of different coins or other sizes may be provided for as desired. The panel 11 is formed with a substantially rectangular opening 30, through which a plurality of coin guiding chutes 31, 32 and 33 extend, there being a separate chute for each size of coin contemplated, said chutes being inclined inwardly and downwardly and being secured at their upper ends to a suitable mounting plate 34 of neat appearance which completely covers the opening 30. The mounting plate 34 has an upper inclined wall portion 35 provided with a plurality of different sized coin slots 36, 37, and 38 each of which defines the coin entrance to one of the coin guiding chutes. Each of the coin guiding chutes 31, 32 and 33 is preferably formed from a sheet metal channel member having a pair of spaced side flanges 39 and 40 so related as to maintain the coins in a substantially vertical plane as they roll down the bottom wall 41 of the channel, and said chutes are preferably open at their inner sides to render fraudulent tampering more difficult. The wire 25 is provided with a terminal 42 which is attached to the mounting plate 34 (Fig. 3), and through it the coin chutes 31, 32, and 33 are connected in parallel in the circuit, each forming in effect one side of a normally open switch.

Secured to the mounting plate 34 is a bracket 43 having inwardly extending side portions 45 and 46 connected together by an inner end wall 47, and supported by said bracket 43 are a plurality of circuit-controlling devices 48 corresponding in number with the coin chutes 31, 32, and 33, and each disposed in substantial alinement with one of said coin chutes as best shown in Fig. 8. Extending between the bracket portions 45 and 46, in a direction parallel with the panel 11, is a rod 49 which pivotally supports certain movable portions of the circuit-controlling devices 48, and since said devices are all alike, a detail description of one of them will be sufficient for a complete understanding of the invention. Each of said circuit-controlling devices 48 includes a bell-crank having a hub portion 50 mounted on the rod 49, an outwardly extending arm 51 having an adjustable weight 52, and a downwardly extending arm 53 which carries at its lower end a combined coin-stop and switch contact 54. The coin-stop 54 is preferably insulated from the arm 53 by means of a strip of suitable insulation material 55, and may be secured thereto by a screw 56 which forms a convenient connecting means for a flexible conductor or wire 57, which electrically connects said coin-stop and contact 54 with the previously described wire 26. The weight 52 tends to turn the bell-crank about the rod 49 in a clockwise direction, as viewed in Fig. 7, but such movement is restricted by abutment of said weight against the upper edge of the bracket portion 47, and in this normal position, the extremity of the member 54 is sufficiently close to the lower edge of the corresponding coin chute to prevent passage of a coin therethrough. As a result, an actuating coin which comes to rest in its operative position, completes the radio circuit, rendering the set in condition for radio reception, and such condition is maintained during a predetermined period of time, at the end of which the coin is released and the circuit reopened.

In order to release the actuating coins, each circuit-controlling device 48 includes an electro-magnet 58 which is mounted on the bracket portion 47 inwardly from the lower end of the bell-crank arm 53, and the arrangement is such that when the electro-magnet 58 is energized it draws the arm 53 and the member 54 toward it sufficiently to release the coin, which then drops into a coin receptacle 59 within the cabinet 10. As has previously been stated, the coin chutes are adapted to receive coins of different diameters, there being a chute for each size of coin as clearly shown in Figs. 7 and 9, where, by way of illustration, the coin C^1 may be considered as a five cent piece or "nickel", the coin C^2 as a ten cent piece or "dime", and the coin C^3 as a twenty five cent piece or "quarter". The respective coin-stop members 54 may therefore be of different lengths to normally arrest the intended coins, and to permit passage of said coins when the bell-cranks are tripped by the electro-magnets 58. The periods or time cycles, during which radio reception may be had, are commensurate with the values of selected coins of the standard diameters contemplated, and are automatically measured by a mechanism to be hereafter described.

As selected coins are inserted in the coin slots 36, 37, and 38, they are initially intercepted in the respective coin chutes before reaching their operative positions, in order to insure commencement of the prepaid time cycle at the instant that the selected coin closes the circuit. For this purpose, the side

flanges 39 of the coin chutes are formed with alined slots 60, in which are slidable shelf members 61, 62, and 63 carried by a supporting rod 64. The rod 64 is preferably disposed above the circuit-controlling means and substantially parallel with the panel 11, and is longitudinally slidable in a pair of fixed arms 65 and 66 secured to the mounting plate 34 at opposite sides of the aperture 30. One end of the rod 64 extends beyond the fixed arm 66 and is fitted with a compression spring 67 which normally acts upon the rod in such a manner as to draw the shelf members 61, 62, and 63 into the coin slots 31, 32, and 33 respectively against their side flanges 40, whereby to normally restrict downward passage of inserted coins. Said shelf members are spaced below the coin entrance slots a distance less than the diameter of the smallest contemplated coin, so that an inserted coin can be withdrawn, if desired, before its release from the intercepting means. The opposite end of the rod 64 is provided with an armature 68 which is in line with and spaced from the poles of electro-magnets 69, which, in turn, are mounted in fixed position on the inner side of the panel 11. The magnets 69 are connected in a control circuit, and as they are energized, they attract the armature 68, drawing the rod 64 against the pressure of its spring 67, and correspondingly moving the coin shelf members 61, 62, and 63 from their obstructing positions in the coin chutes. The previously intercepted coins are then free to drop down to their operative positions to close the radio circuit as has already been described.

The time-measuring means has been shown in the drawing as a clock spring motor 70 mounted upon the base 12, and includes a continuously operating shaft 71 to which power is supplied through a gear 72. The shaft 71 may be journalled in front and rear motor casing plates 73 and 74 (Fig. 4) and is provided at its front end with an overrunning clutch disk 75, having its forward face notched to define an abrupt shoulder 76, from the base of which extends a cam surface 77 merging with the face of the disk 75. An extension 78 of the shaft 71 projects forwardly from the disk 75 functioning as a trunnion as will later be described. At its rearward end the shaft 71 carries a radial arm 79, provided adjacent its outer end with a suitably insulated contact member 80, and as the clock motor operates, the arm 79 and contact member 80 travel in a circular path like that of the minute hand of a clock.

Mounted on the motor casing plate 74, and preferably secured thereto as by screws 81, is a switch contact block 82 which supports a plurality of spaced contacts in the path of movement of the contact member 80, said spaced contacts being arranged in pairs and designated by the reference characters 83, 83ª, 84, 84ª, 85, 85ª, 86, and 86ª. The contacts 83 and 83ª are respectively connected to the positive side of battery 18, and through electro-magnet 69 to the negative side of said battery, and from this it will be evident that when the contact member 80 is in engagement with both contacts 83 and 83ª as shown in Fig. 3, current will flow through the control circuit to energize the electro-magnets 69, withdrawing the coin shelf members 61, 62, and 63 from the coin chutes. This defines the beginning of a prepaid time cycle, since such movement permits passage of an inserted coin from its intercepted position to its operative position in the radio circuit-controlling mechanism 48. The contacts 84, 85, and 86 are each connected to the positive side of the battery 18 by means of a wire 87, and the contacts 84ª, 85ª, and 86ª are respectively connected to the electro-magnets 58, 58ª, and 58ᵇ, which in turn are connected in parallel to the negative side of the battery 18 by a wire 88. Thus as contact member 80 continues in its movement from contacts 83 and 83ª, under the influence of the motor 70, it will progressively close the circuits through the several pairs of contacts 84, 84ª; 85, 85ª; and 86, 86ª, resulting in progressively energizing the magnets 58, 58ª, and 58ᵇ to correspondingly trip the coin stops 54 and release the actuating coins. The spacing between the several pairs of contacts is designed to define time cycles commensurate with the values of selected actuating coins, and by way of example, it may be that the arcuate travel of the arm 79 from contact 83ª to contact 84ª will require five minutes; from contact 83ª to contact 85ª, ten minutes; and from contact 83ª to contact 86ª, twenty-five minutes. These time periods may, of course, be varied as desired in different sets as the commercial aspects develop, and the invention is not restricted to any specific time cycles. It is furthermore to be understood that in the illustrated embodiment of the invention, only one coin at a time is intended to be deposited.

In order to be able to commence the prepaid time cycle as and when desired, a manual control or setting means 89 is employed. This setting means 89 is associated with the shaft 71, and includes a clutch disk 90 yieldingly supported in opposition to the disk 75, and said disk 90 has a single ratchet tooth 91 opposed to the shoulder 76 and cam surface 77. The disk 90 is secured to the rear end of a clutch shaft section 92 which is rotatable and longitudinally movable in a fixed tubular bearing 93, said bearing extending inwardly through the panel 11 and having adjacent its front end a flange 94 adapted for securement to the panel 11 by suitable fastening means 95. The inner end of the clutch shaft section 92 has a substantially central bore 96 for receiving the motor shaft extension or trunnion 78, and is main-

tained thereon against the disk 75 by a coiled compression spring 97 disposed between the disk 90 and the inner side of panel 11. A second clutch shaft section 98 is also rotatably mounted in the tubular bearing 93, said section 98 having a forwardly extending portion 98[a] of reduced diameter projecting beyond the bearing flange 94, and to which is secured a turning knob 99. A coiled compression spring 100, normally urges the shaft section 98 and the knob 99 inwardly, and the meeting ends of the shaft sections 92 and 98 are notched as at 101 and 102, and overlapped in such a manner that they will rotate together and each being capable of longitudinal movement independent of the other.

The motor shaft is caused to rotate at a uniform speed in a clock-wise direction as viewed in Fig. 3, and as indicated by the arrow "A". During the course of such rotation, the cam surface 77 will ride over the ratchet tooth 91, this being possible by virtue of the yieldable mounting of the shaft 92 and its associated disk 90. In using the device, after a selected coin is inserted in the proper coin slot 36, 37, or 38, it is initially intercepted as previously described, and then the depositor rotates the knob 99 one revolution in the same direction as that of the shaft 71, causing the disk 90 to correspondingly rotate. During this one revolution, the tooth 91 comes into abutting engagement with the shoulder 76, after which the shaft 71 and arm 79 are carried with it to the position which defines the commencement of the prepaid time cycle. The knob 99 may then be released and the arm 79 and contact member 80 will continue their normal travel under the influence of the motor 70, and will eventually close the circuit through the coin-releasing magnets 58, 58[a], and 58[b], releasing the actuating coin from its operative position.

As best shown in Figs. 1, 2, 5, and 6, the knob 99 has an annular flange 103 at its inner end, and from this flange is a radially extending pointer 104, which, when alined with a fixed indicator 105 on the front of panel 11, visibly indicates the proper position of the movable contact member 80 for the commencement of the time cycle. This indicating means gives a positive definition of a complete revolution of the setting mechanism. In order to prevent reverse movement of the arm 79 and contact member 80, and thus to prevent tampering with the apparatus, the flange 94 is provided with a notch 106 having an abrupt shoulder 107 facing in the opposite direction from the shoulder 76 on disk 75, and rotatable with the knob 99 is a flat spring or pawl 108 adapted to seat in said notch when the pointer 104 is in line with the indicator 105. From this it will be evident that the knob 99 can only be turned in one direction, namely, the direction of rotation of shaft 71.

Any suitable means may be employed for winding the spring motor 70, as for example, a bushed opening 110 in the panel 11 in line with the motor winding stem 111 and permitting application of a usual key or socket wrench thereto. Interposed in the circuit, preferably between the contact 83[a] and the electro-magnet 69 is a manually controlled switch 112, which may be preferably concealed within the cabinet 10 or somewhere adjacent thereto, the arrangement being such that said switch 112 can be opened when the radio receiver is to be withheld from service.

It is thought that the operation of the device will be clear from the foregoing description, but brief recapitulation will be resorted to. Assuming the parts to be in their normal positions and the switch 112 closed, a person desiring to enjoy the use of the radio receiver for a short while selects a proper coin, for example, a "nickel" and inserts it through the coin slot 37, into the chute 32. The coin will come to rest on the shelf member 62, in such a manner that it partly extends above the upper wall 35 of the plate 34. The knob 99 is then turned through a complete revolution in a counter-clockwise direction as viewed in Fig. 1, bringing the pointer 104 to rest in line with the indicator 105, which results in closing the circuit across the contacts 83, 83[a], to energize the magnets 69, which by attraction of the armature 68, results in withdrawing shelf member 62 from the coin chute 32. The coin C[1] is then free to roll or drop down to the lower end of the chute where it is arrested by the corresponding coin stop 54, and there resulting in closing the circuit through the coin and radio receiver, which may then be tuned as desired in the usual manner. Thereafter the arm 79 is turned slowly by the clock motor 70, and at the end of a definite time period the contact member 80 reaches the point where it closes the circuit through the contact 84 and 84[a] resulting in energizing the electro-magnet 58 which, by attraction of the armature 53, releases the actuating coin from its operative position and thus reopens the radio receiver circuit. If a longer time cycle is desired, a coin of higher value, for which the apparatus is adapted, may be inserted in one of the other coin slots, and the operation repeated. By adjustment of the weights 52 on the bell-crank arms 51, a fine degree of sensitivity may be had, and particularly when the cabinet 10 is locked, the entire device is practically fool-proof.

It will be evident from the foregoing that a substantial advance has been made in the art to which this invention pertains, by the provision of a coin control mechanism for radio receivers, of extremely simple con-

struction, few parts, economical to manufacture, and thoroughly efficient and reliable in use. Obviously, changes may be made in the details of construction and arrangements of parts, and the right is herein reserved to make such changes as fall within the scope of the appended claims without departing from the spirit of the invention.

Having thus described my invention, what I claim is:

1. A coin-controlled radio receiver embodying in combination, a radio circuit having suitable radio apparatus connected therein, a plurality of circuit-controlling means in independent circuits and normally movable into position to support a coin and whereby the presence of a selected coin directly in the circuit of its own controlling means is operative to close said radio circuit, a time-measuring element, means for separately presenting selected coins of different standard diameters and values to the separate circuit-controlling means whereby to close the radio circuit, each circuit controlling means comprising a movable contact for impingement of such selected coin, and electro-magnetic means operable by said time-measuring element upon the appropriate movable contact for releasing the actuating coin directly from its own circuit-controlling means at the end of a time cycle commensurate with the standard value of the selected actuating coin.

2. In a coin-controlled radio receiver, the combination with a radio circuit having suitable radio apparatus connected therein, of a plurality of circuit-closing switches respectively rendered electrically operable by selected coins of different standard diameters, independent circuits for the different coins connected with the radio circuit, and with the respective switches, independent electro-magnetic releasing means for each of said switches and having independent circuits connected with the radio circuit, a time measuring element for defining variable time cycles commensurate with the standard values of the several selected actuating coins, and means associated with the time measuring element for independently actuating said releasing means for each switch at the end of a defined time cycle.

3. In a coin-controlled radio reciever, the combination with a radio circuit having suitable radio apparatus connected therein, of a plurality of circuit-closing switches respectively rendered electrically operable by selected coins of different standard diameters, independent circuits for the different coins connected with the radio circuit, and with the respective switches independent electro-magnetic releasing means for each of said switches and having independent circuits connected with the radio circuit, a time-measuring element for defining variable time cycles commensurate with the standard values of the several selected actuating coins, means associated with the time-measuring element for independently actuating said releasing means for each switch at the end of a defined cycle, and manually-controlled means causing passage of a coin to its circuit-closing switch at the common point of beginning of all of the variable time cycles.

4. In a coin-controlled radio receiver, the combination with a radio circuit having suitable radio apparatus connected therein, of a plurality of coin chutes for selected coins of different diameters, a plurality of circuit-closing switches adjacent the said coin chutes, and each switch having its own circuit independently connected with the radio circuit, whereby it is adapted to close the radio circuit through the corresponding switch, means for initially intercepting coins in the coin chutes before their delivery to said switches, time-measuring means for defining variable time cycles commensurate with the values of standard actuating coins of the selected diameters, manually controlled means for commencing the time cycle, means for releasing the inserted coin from said intercepting means simultaneously with commencing the time cycle, and independent means at each chute for automatically releasing said coins from the circuit-closing switch whereby to reopen the circuit at the end of the prepaid time cycle, each releasing means having an independent circuit leading to the radio circuit.

5. In a coin-controlled radio receiver, the combination with a radio circuit having suitable radio apparatus connected therein, of a plurality of coin chutes for selected coins of different diameters, a plurality of circuit-closing switches adjacent the said coin chutes, said switches being normally open and electrically connected in parallel with the radio circuit, and each switch being operable by a selected coin to close the radio circuit through its own independent circuit, means for initially intercepting coins in the coin chutes before their delivery to said switches, continuously operating time-measuring means for defining variable time cycles commensurate with the values of standard actuating coins of the selected diameters, manually controlled means for simultaneously commencing the time cycle and releasing the inserted coin from said intercepting means, and electro-magnetic means for each chute, each independently operable by said time-measuring means for releasing said coins from the circuit-closing switch whereby to reopen the circuit at the end of the prepaid time cycle, each releasing means having an independent circuit leading to the radio circuit.

6. A coin-controlled mechanism, for use with a conventional radio receiver, including the circuit of the radio, independent circuits connected with the radio circuit and having

control switches, supporting means for coins, means for separately receiving and guiding selected coins of different diameters to operative supporting positions to close a circuit through the switch for coins of a given diameter and permit reception through the radio receiver, means associated with the separate switches, whereby to permit automatically measuring definite but variable time cycles commensurate with the value of the selected coins, manually controlled means for commencing the time cycle at the instant the selected coin reaches its operative supporting position, and means operated by the time measuring means for automatically releasing said coin and discontinuing reception at the end of the prepaid time cycle..

7. A coin-control mechanism, for use with a conventional radio receiver, including the circuit of the radio, independent circuits connected with the radio circuit and having control switches, supporting means for coins, means for separately receiving and guiding selected coins of different diameters to operative supporting positions to close a circuit through the switch for coins of a given diameter and permit reception through the radio receiver, means associated with the separate switches, whereby to permit automatically measuring definite but variable time cycles commensurate with the value of the selected coins, means for commencing the time cycle at the instant the selected coin reaches its operative supporting position, and electro-magnetic means operable by said time-measuring means for releasing the actuating coin from its operative position at the end of the prepaid time cycle.

8. In a coin-controlled radio receiver, the combination with a radio circuit having radio apparatus connected therein, of means comprising a plurality of coin chutes for receiving selected coins of different standard diameters and values, circuit-controlling means associated with each of such chutes and each such means having its own coin controlled circuit and contacts independently of the other coin circuits, each circuit controlling means normally causing the radio circuit to be broken, and operable by the presence of a selected coin therein to close the radio circuit through the contact at the chute for that coin, additional contacts which are variably spaced apart with reference to different time cycles, controlling means including separate coin releasing means in circuit with the additional contacts and electrically connected with the radio apparatus, and time measuring means having a traveling contact member for engaging with the additional contacts of the second mentioned controlling means and cooperating independently with each of the first mentioned contacts to release the coin and to reopen the radio circuit at the end of a definite time cycle commensurate with the value of the so selected actuating coin.

9. In a coin-controlled radio receiver, the combination with a radio circuit having radio apparatus connected therein, of means comprising a plurality of coin chutes for receiving selected coins of different standard diameters and values, circuit-controlling means associated with each of such chutes and each such means having its own coin controlled circuit and contacts independently of the other coin circuits, each circuit controlling means normally causing the radio circuit to be broken, and operable by the presence of a selected coin therein to close the radio circuit through the contact at the chute for that coin, additional contacts which are variably spaced apart with reference to definite time cycles, controlling means including separate coin releasing means in circuit with the additional contacts and electrically connected with the radio apparatus, and time measuring means having a traveling contact member for engaging with the additional contacts of the second mentioned controlling means and cooperating independently with each of the first mentioned contacts to release the coin and to reopen the radio circuit at the end of a definite time cycle commensurate with the value of the so selected actuating coin and manually controlled means for causing passage of the selected coin to the circuit-controlling means and thus defining the beginning of a time cycle, whereby variable time cycles are provided for the respective coins employed.

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