March 31, 1931. S. L. MILLER ET AL 1,799,056

COIN CONTROLLED TIMING DEVICE

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Fig. 1

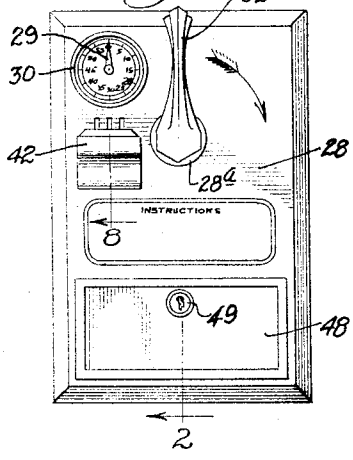


Fig. 3

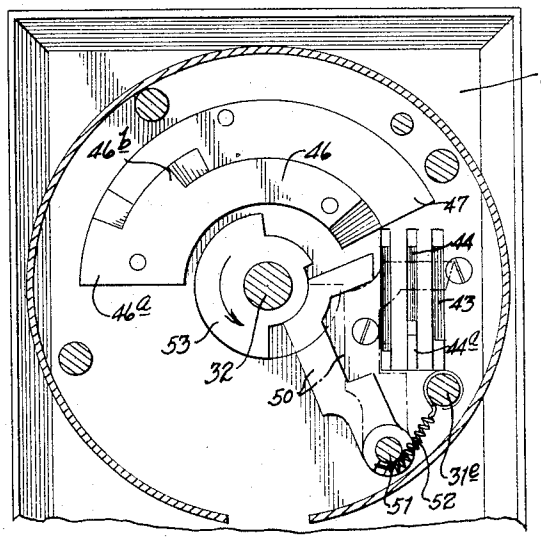
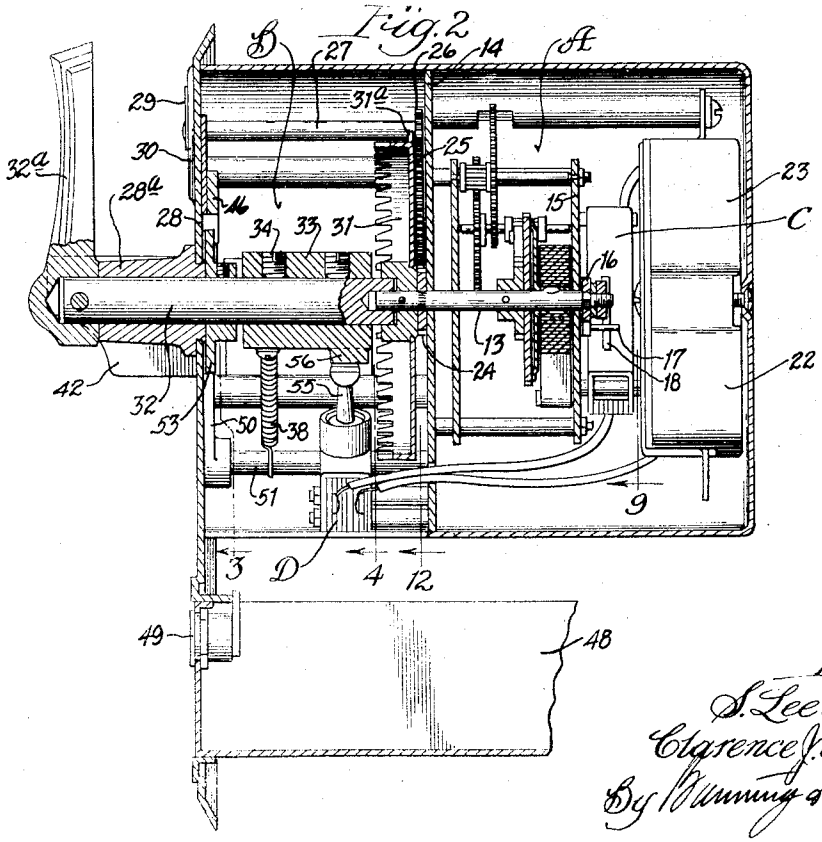


Fig. 2



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Fig. 4

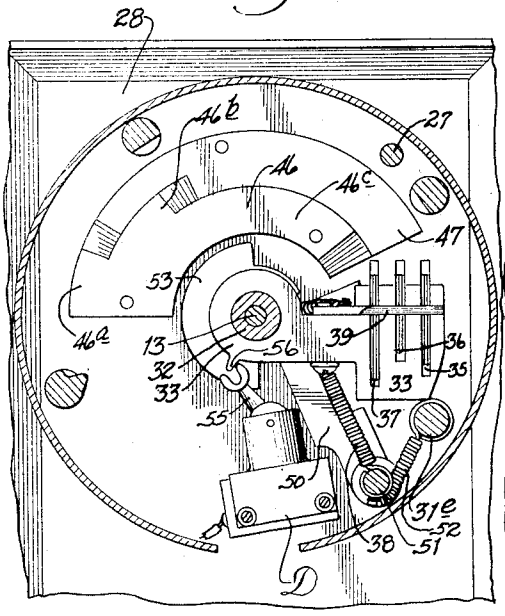


Fig. 5

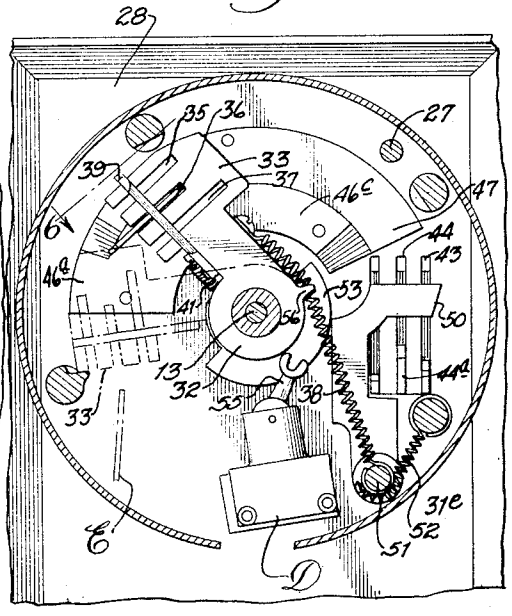


Fig. 6

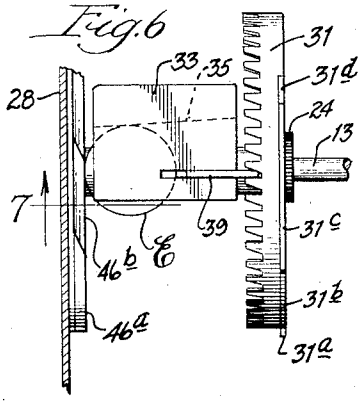


Fig. 7

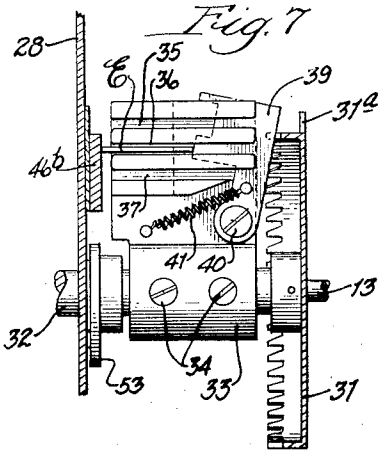
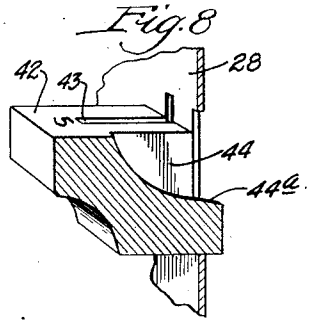


Fig. 8



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Fig. 9

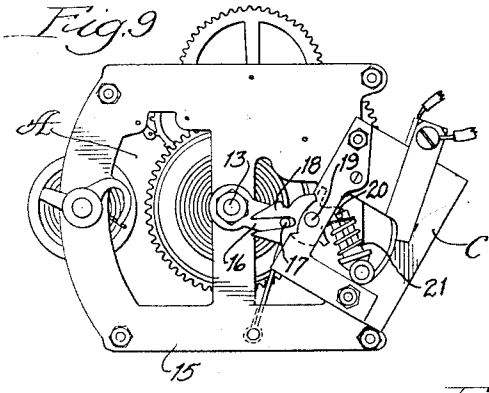


Fig. 10

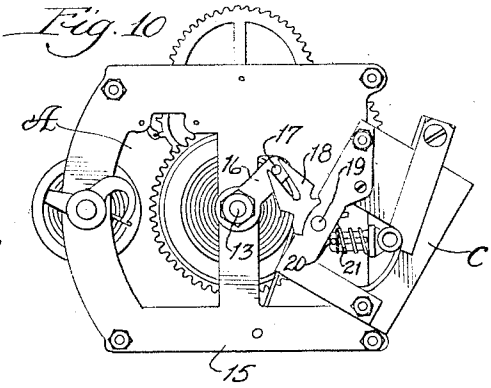


Fig. 11

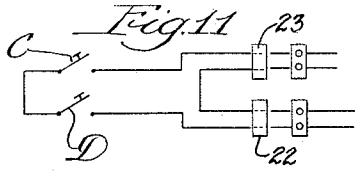
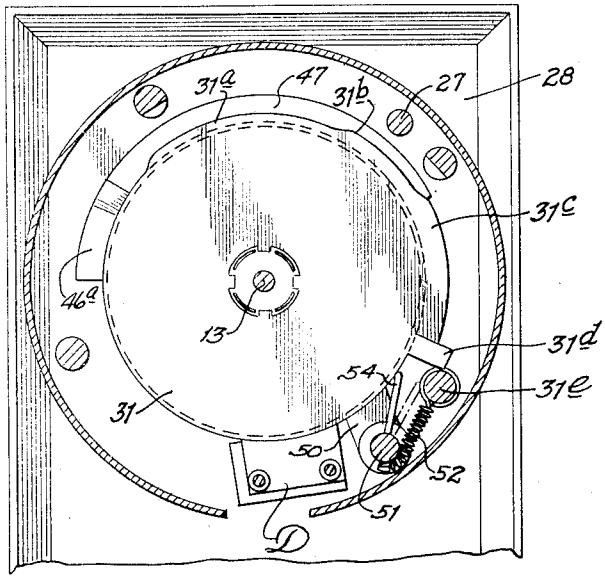


Fig. 12



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Patented Mar. 31, 1931 1,799,056

UNITED STATES PATENT OFFICE

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COIN-CONTROLLED TIMING DEVICE

Application filed June 28, 1930. Serial No. 464,666.

An object of this invention is to provide an improved coin-controlled timing device for use particularly on radio sets, and the like.

This and other objects, as will hereinafter appear, are accomplished by this invention, which is fully described in the following specification and shown in the accompanying drawings, in which—

Figure 1 is a front elevation of the front panel of a box embodying the invention;

Fig. 2 is an enlarged vertical section on the line 2 of Fig. 1 showing the timing device in section;

Fig. 3 is a transverse vertical section on the line 3 of Fig. 2;

Figs. 4 and 5 are transverse vertical sections on the line 4 of Fig. 2;

Fig. 6 is a partial detail view taken on the line 6 of Fig. 5;

Fig. 7 is a view taken on the line 7 of Fig. 6;

Fig. 8 is an enlarged partial perspective view on the line 8 of Fig. 1;

Figs. 9 and 10 are partial sectional views taken on the line 9 of Fig. 2;

Fig. 11 is a wiring diagram of the electrical connections; and

Fig. 12 is a partial section on the line 12 of Fig. 2.

The embodiment illustrated comprises, in the main, a clock work mechanism A, a coin-operated winding mechanism B, a switch mechanism C controlled by the clockwork mechanism A, and adapted to be connected in series circuit with a radio set, or the like (not shown), and a switch D in series with the switch C, as shown in Fig. 11. The switch C, as will hereinafter be described, is so connected to the clockwork mechanism A that the switch C is closed only when the clockwork mechanism A is wound and operated. The switch D, on the other hand, is merely a safety device to prevent the operating lever being thrown over and held in a position which would maintain the switch C closed. In other words, the switch D is merely a throw-out switch which is normally closed, and which is open only during the time the clockwork mechanism is being wound or the operating handle is moved. The radio set, therefore, or other device to which this mechanism is connected is not operable during the instant of winding.

Referring now to Fig. 2, the clockwork mechanism A is provided with a shaft 13 which makes one revolution in an hour, and, therefore, corresponds to the shaft which carries the usual minute hand. This shaft extends through the front and back plates of the clockwork mechanism 14 and 15, respectively (Figs. 2, 9 and 10), and is suitably journaled therein, and carries at the back a lever 16 which has a pin 17 which is adapted to engage the slot of the lever 18, which is pivotally mounted at 19 and which in turn has a pin 20 which throws the operating lever 21 of the switch D. Figure 9 shows the switch C in the off-position, which is the position it assumes when the clockwork mechanism has run down, that is, when it has returned to what corresponds to its zero position. Figure 10, on the other hand, shows the switch C closed with the shaft 13 wound to a point where there is about fifteen or twenty minutes of playing time before the shaft 13 will again return to the position of Fig. 9.

Referring now to Fig. 2, the electric connections terminate in sockets 22 and 23, which are shown diagrammatically in Fig. 11. The shaft 13 extends through the front plate 14 and carries a gear 24 which meshes with an idler 25, and that with a gear 26 on a shaft 27 which extends through the front panel 28, as shown in Fig. 1, and carries a minute hand 29 which operates over a dial face 30, which is graduated in minutes. The gears 24 and 26 are preferably of the same size so that the position of the shaft 13 is shown at all times by the position of the hand 29. As the clockwork mechanism is wound, the hand 29 moves clockwise around the dial 30 an amount corresponding to the coin used, as will later be described, and then as the clockwork mechanism runs down the hand 29 moves back over this same dial in a counter-clockwise direction. When the mechanism is at rest the hand 29 will be at zero, as shown in Fig. 1. It always indicates, therefore, the number of minutes which the mechanism will play without being rewound.

The coin-operated winding mechanism will now be described. The shaft 13 carries a circular ratchet 31 which is keyed thereon, as shown in Fig. 2, and has a stop 31^d which strikes a post 31^e on the frame. The shaft 13 extends somewhat beyond so as to provide a bearing in the inner end of a winding shaft 32, which also extends through and is journaled in a bearing 28^a which is carried by the front panel 28. This shaft is provided with an operating lever 32^a. The shaft 32 carries a block 33 which is adjustably secured thereon by means of set screws 34, and which has a series of slots 35, 36, 37 which are adapted to receive nickels, dimes, and quarters, respectively, for operating the winding mechanism. The block 33 is normally returned to the position shown in Figs. 2 and 4, by means of the tension spring 38.

The block 33 carries a pawl 39 which is hingedly mounted thereon at 40, as shown in Fig. 7, and which is normally retracted by means of a spring 41. This pawl is adapted, when moved outwardly, to engage the teeth of the ratchet on the ratchet wheel 31. When the pawl 39 is thus held outwardly, as shown in Fig. 7, as by means of the dime E in the slot 36, it engages a tooth in the ratchet wheel 31 so that as the shaft 32 is turned by means of the lever 32^a in a clockwise direction as seen in Fig. 1, the ratchet wheel 31 and the shaft 13 will be turned in a direction to wind up the spring of the clockwork mechanism A.

The mechanism for bringing about the necessary movement of the pawl 39 will now be described. On the front of the panel 28 is an outwardly extending block 42 having a series of three slots lying immediately in front of and in registration with the slots 35, 36, 37 of the block 33 when the latter is in its normal retracted position, as shown in Fig. 4. Thus the slot 43 of the block 42 (Fig. 8) lies immediately in front of the slot 35 of the block 33, and the slot 44 lies immediately in front of the slot 36. Suitable openings, as shown, are formed in the panel 28, and the slots 43, 44, etc., are provided with extensions at 44^a so as to guide the coin toward the slots in the block 33. The slots in the block 33 slope slightly toward the back, as indicated in dotted lines in Fig. 6, and these slots are of such a depth that the coin will strike the pawl 39 just slightly above their center. This is shown in Figs. 4 and 6.

Having dropped a coin, as the dime E, into its appropriate slot 44, it rolls by gravity into the slot 36 in the block 33 until it is brought to rest upon striking the edge of the pawl 39. The block 33 with the dime E in place can now be rotated by means of the operating lever 32^a. As the block 33 is rotated with the coin therein, the coin encounters a cam on the inner face of the panel 28. This cam 46 (Fig. 4) is made arcuate, and concentric with the axis of the shaft 32. The terminal end 46^a of this cam is preferably the same for all three coins, there being three positions, namely, 46^a, 46^b, and 46^c, which correspond to the three coins used, the nickel, the dime, and the quarter. Back of the cam 46 is a plate 47 which is just high enough to cause the coin to be frictionally held between the plate 47 and the pawl 39 until it encounters the forwardly inclined edge of the cam 46. The forwardly inclined edges of 46^a and 46^b are shown in Fig. 6 in edge view.

Thus it will be seen that as the dime E, for example, is inserted, it will slide along the plate 47 with just sufficient friction to be held in place until it rides up on the inclined cam surface 46^b. When it does so, as shown in Fig. 7, it forces the pawl 39 outwardly, and as the block 33 continues to move forwardly, carries the ratchet wheel 31 with it, thereby winding the spring of the clockwork mechanism A. The block 33 then continues to move until the coin passes off the lower edge 46^d of the cam 46. When this occurs, the coin falls out of its slot and drops into the coin box 48, as shown in Fig. 2. This box is provided with a suitable lock 49.

It will thus be seen that the pawl 39 engages the teeth of the ratchet 31, varying amounts depending upon the relative lengths of the cam faces 46^a, 46^b and 46^c, and these lengths are in the proportions of the values of these coins, namely, 5, 10 and 25, respectively. Thus if it is intended that a nickel coin will cause the mechanism to be operated say five minutes, the dimes and quarters when inserted will cause it to operate for ten and twenty-five minutes respectively.

The surface of the cam 46 is roughened, particularly 46^c, so that any backward movement of the block 33 will cause the coin to be rolled out of its slot therein. Otherwise, it might be possible to cause the quarter to run up the slope 46^c advancing the ratchet wheel 31 by one or two notches, and then by backing it off this sloping surface the pawl 39 is withdrawn, and on again advancing the block 33 the pawl 39 catches one or two teeth further back on the ratchet wheel, thereby cheating the device.

The mechanism has also been provided with means for preventing the operator from inserting coins at a time when they could not be utilized to properly operate the device. This consists primarily of a lever 50 which is pivotally mounted at 51, and retracted by means of a spring 52. The shaft 32 carries a cam 53 which engages the back of the lever 50 causing it to be moved across the back of the openings in the panel 28, corresponding to the coin slots 43, 44, etc., in the block 42 so that after the lever 32^a is moved from its normal inoperative position coins cannot be inserted until the handle is returned to its normal position.

It is also necessary to prevent the insertion

of a coin when the ratchet wheel 31 has been wound to a point where further winding of an amount equivalent to the coin inserted cannot be accomplished. As a practical proposition, only about fifty minutes out of a possible 60 is permitted with the mechanism here shown. Thus, two quarter coins may be inserted, five dimes, or ten nickels, or combinations of them, which will not aggregate more than fifty minutes. Thus, if more than twenty-five minutes has been passed, it is necessary to prevent insertion of a quarter, after forty minutes has been passed, it is necessary to prevent the insertion of a dime, etc.

Thus, on the periphery of the ratchet wheel 31, there is provided a cam having three elevations 31^a, 31^b, and 31^c which correspond to the positions described above. A cam follower 54 is connected to the shaft 51 and rides on this cam. This follower is carried by the shaft 51 so that after the cam follower 54 is lifted, it causes the stop 50 to be moved across the slots through which the coins are introduced. Thus, as long as the follower 54 is on the elevation 31^a, the quarter slot will be closed, while it is on the elevation 31^b the dime slot will also be closed, and while it is on the elevation 31^c all three slots will be closed. Thus, it will be seen that the operator is prevented from introducing coins when the mechanism has been so far wound up as to make it impossible to wind it a further amount corresponding to the coin introduced.

In order to prevent the operator from inserting a coin, partially operating the machine, and holding it in that position, a switch D is inserted in series with the switch C, and this is provided with an operating lever arm 55 which has a notch at its outer end adapted to engage a projection 56 on the back of the block 33, so that as the block 33 is moved out of its normal position the switch D is opened and remains open until the block 33 returns to its normal position.

The sockets 22, 23 (Figs. 2, 11) may be connected in the electric circuit of any mechanism to be operated, such as, a radio receiving set, a telephone station for local and long distance calls, a washing machine, an electric refrigerator, an exercising machine, and the like. While the present dial as shown and described is graduated in terms of minutes to go, or in this instance, pennies inserted and still to be used, any desired multiple or division of these may be employed by properly choosing the gearing, timing mechanism, length of coin or slug operating cam, and the like.

As applied to a radio set, the socket connections 22, 23 may be made on the set itself, as on the leads for furnishing power to the set, or it may be on the load speaker circuit as where a number of these devices are used, each to control a speaker, as in a hotel room, and all the speakers are connected to a central receiving set which is kept in operation at regular times to receive broadcast programs.

As applied to a telephone, the device has particular utility to calls of a definite duration, because the user can see at all times just how much more time he can talk for the coin inserted before he is cut off, which is done automatically, and does not depend upon a central station operation to see that he does not run over his allotted time. If he finds that the time still to run is not enough, he can insert another coin and thus extend the time without being cut off.

The term "ratchet" used in the specification and claims is intended to cover generically any form of clutch mechanism for operatively connecting the coin block to the winding mechanism when a coin is inserted, such as, a clutch holding in one direction and not in the other, a rack, etc.

While we have shown and described but a few embodiments of the invention, it is to be understood that it is capable of many modifications. Changes, therefore, may be made in the construction and arrangement which do not depart from the spirit and scope of the appended claims.

We claim:

1. In coin-controlled apparatus, ratchet means for controlling or operating an associated mechanism, a member movable relative to said ratchet, a pawl carried by said member and adapted to engage said ratchet, and a plurality of spaced means for receiving coins of varying diameters for operatively connecting said pawl with said ratchet.

2. In coin-controlled apparatus, means for setting an associated mechanism, a member movable relative to said means, and spaced means for receiving coins of varying diameters for operatively connecting said member and setting means.

3. In coin-controlled apparatus, ratchet means for controlling or operating an associated mechanism, a member movable relative to said ratchet means, and coin-controlling means for operatively connecting said member and ratchet means, said member including a plurality of spaced means for receiving coins of varying dimensions to cause the associated mechanism to be controlled or operated a predetermined period of time for each dimension of coin employed.

4. In coin-controlled apparatus, ratchet means for controlling or operating an associated mechanism, a member movable relative to said ratchet means, a pawl carried by said member and adapted to engage said ratchet means, and coin-controlling means for operatively connecting said pawl with said ratchet means, said member including a plurality of spaced means for receiving

coins of varying dimensions to cause the associated mechanism to be operated or controlled a predetermined period of time for each dimension of coin.

5. In coin-controlled apparatus, ratchet means for controlling or operating an associated mechanism, a member movable relative to said ratchet means, a pawl carried by said member and adapted to engage said ratchet means, said member having a plurality of slots, and means for forcing coins carried in the slots against said pawl to cause the latter to engage said ratchet means for a predetermined movement of the member.

6. In coin-controlled apparatus, ratchet means for controlling or operating an associated mechanism, a member movable relative to said ratchet means, a pawl carried by said member and adapted to engage said ratchet means, said member having a plurality of slots, and a cam associated with each slot for forcing a coin in a slot against said pawl to cause the latter to engage said ratchet for a predetermined movement of the member.

7. In coin-controlled apparatus, ratchet means for controlling or operating an associated mechanism, a member movable relative to said ratchet means, a pawl carried by said member and adapted to engage said ratchet means, coin-controlling means for operatively connecting said pawl with said ratchet, and means operable by said ratchet for preventing the insertion of a coin into said member when the ratchet has advanced a predetermined amount.

8. In coin-controlled apparatus, ratchet means for controlling or operating an associated mechanism, a member movable relative to said ratchet means, a pawl carried by said member and adapted to engage said ratchet means, coin-controlling means for operatively connecting said pawl with said ratchet means, and means including a cam carried by said ratchet for preventing the insertion of a coin into said member when the ratchet has advanced a predetermined amount.

9. In coin-controlled apparatus, ratchet means for controlling or operating an associated mechanism, a member movable relative to said ratchet means, coin-operating means for operatively connecting said member and ratchet means, and means operable by said ratchet means for preventing the insertion of a coin into said member when the ratchet means has advanced a predetermined amount.

10. In coin-controlled apparatus, ratchet means for controlling or operating an associated mechanism, a member movable relative to said ratchet means, a pawl carried by said member and adapted to engage said ratchet means, said member having a plurality of slots for coins of different sizes, and means for forcing a proper coin in any one of said slots against said pawl to cause the latter to engage said ratchet for a predetermined movement of the member depending upon the coin used.

11. In coin-controlled apparatus, ratchet means for controlling or operating an associated mechanism, a member movable relative to said ratchet means, a pawl carried by said member and adapted to engage said ratchet means, said member having a plurality of slots for coins of different sizes, and a cam having a plurality of lengths of shoulders, one for each of the coins adapted to be used for forcing a proper coin in any one of said slots against said pawl to cause the latter to engage said ratchet means for a predetermined movement of the member depending upon the coin used.

12. In coin-controlled apparatus, having a clockwork mechanism including a spring for driving the same, and means for winding said spring including a ratchet, a member movable relative to said ratchet having means for receiving coins of different denominations, a pawl carried by said member and adapted to engage said ratchet, dissimilar coin-controlling means for operatively connecting said pawl with said ratchet, and means operably associated with said ratchet means for indicating the condition of the clockwork mechanism whereby the operator may insert another coin or coins before the clockwork mechanism has reached its operating limit.

13. In a coin-controlled device, mechanism for setting an associated apparatus, selective means for receiving coins of varying denominations, and shiftable coin deflected clutching means associated with the selective coin receiving means operable for connection with said mechanism to set the associated apparatus for periods of time, depending upon the denomination of coin deposited in said coin receiving means.

14. In a coin-controlled apparatus, a ratchet for setting an associated mechanism, a pawl movable for engaging said ratchet, means for receiving coins of varying denomination operatively associated with the pawl, said pawl movable to engage the ratchet to actuate the latter for setting the associated mechanism for periods of time, depending on the denomination of coin employed.

15. In a coin-controlled device, mechanism for setting an associated apparatus, means for actuating said mechanism comprising means for receiving coins of varying denominations, and spring returned coin deflected clutching means operatively associated with the coin receiving means for controlling said actuating means, to set the apparatus for periods of time, depending upon the denomination of coin employed.

16. In a coin-controlled device, mecha-

nism for setting an associated apparatus, relatively movable means for actuating said mechanism comprising means for receiving a coin, means operatively associated with the coin receiving means to render the device operable to actuate said mechanism upon the insertion of a coin, and means operable by said relatively movable means to prevent insertion of a coin during each actuation thereof, said means being also operable by the associated apparatus to prevent insertion of a coin when set by said mechanism.

In testimony whereof, we have hereunto set our hands and affixed our seals this 20th day of June, 1930.

S. LEE MILLER.
CLARENCE J. ANDERSON.