

Nov. 29, 1949

E. G. HENRY

2,489,577

COIN-CONTROLLED SYSTEM

Filed May 4, 1945

FIG. 1.

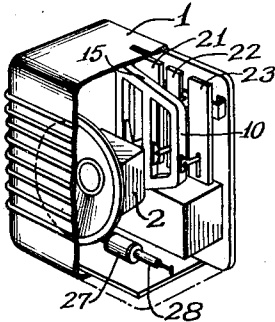


FIG. 5.

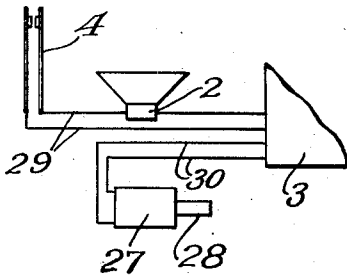


FIG. 2.

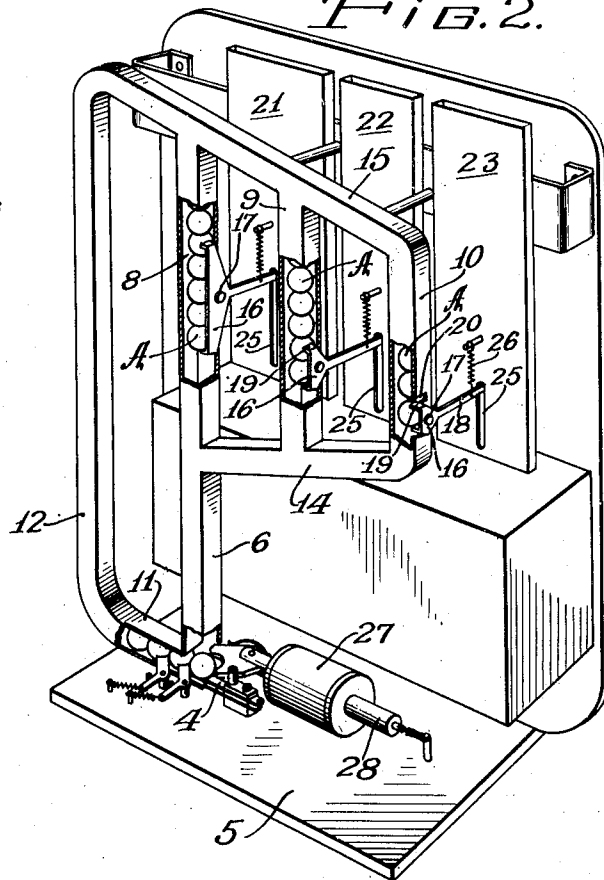
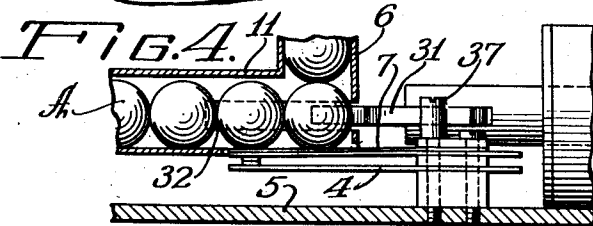
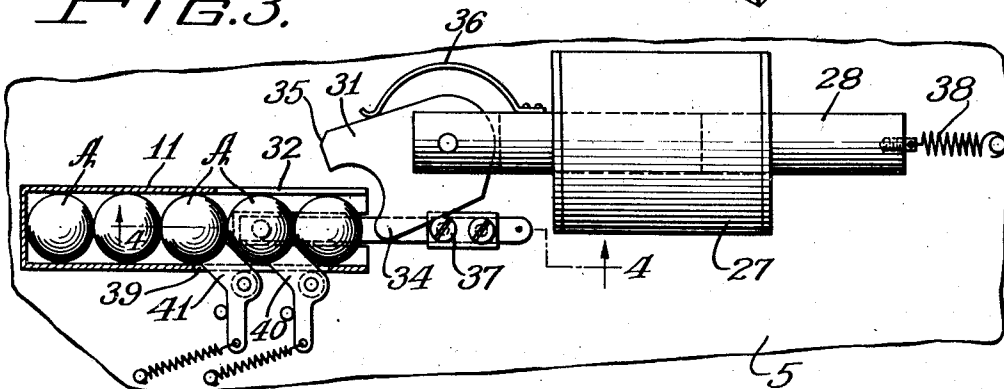


FIG. 3.



Inventor:
Earle G. Henry,
By Wm. F. Froudenreich,
Attorney

UNITED STATES PATENT OFFICE

2,489,577

COIN-CONTROLLED SYSTEM

Earle G. Henry, Wilmette, Ill., assignor to Buckley Music System, Inc., a corporation of Illinois

Application May 4, 1945, Serial No. 592,039

7 Claims. (Cl. 194—9)

1

There is a type of coin controlled record playing system wherein records are played in automatic succession, the playing becoming audible only through speakers which are energized in response to and to the extent of the value of coins that are deposited. So far as the listener is concerned, the playing usually starts at an intermediate point in a record and ends with the completion of that record unless a credit has been established to pay for additional complete records. In any event, the customer seldom receives completely the service for which he pays.

The primary object of the present invention is to insure that the customer shall always be able to hear the playing of a complete record even upon depositing only a coin representing the price asked for playing a single record.

In carrying out my invention, I have conceived a new form of credit-establishing apparatus and, therefore, in one of its aspects, the present invention may be said to have for its object the creation of a credit-establishing means that is simple, novel, reliable and easy to operate.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of the invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is a perspective view of a box or casing containing a small speaker and a coin-controlled credit establishing and consuming apparatus embodying the present invention, a part of the box wall being broken away; Fig. 2 is a perspective view, on a larger scale than Fig. 1, of the credit cancelling means and so much of the box or casing as directly supports such means; Fig. 3 is a view on a still larger scale, partly in plan and partly in section of the devices that control the opening and closing of the speaker circuit; Fig. 4 is a section on line 4—4 of Fig. 3; and Fig. 5 is a circuit diagram.

Referring to the drawing, 1 represents a box or casing containing a small speaker 2, which is connected to a continuously operating phonograph, shown only at 3 in the diagram, Fig. 5. This is a system in common use, the speaker being energized only upon the closing of a switch by a coin or coins deposited in the speaker. So far as this old system is concerned, the present invention has to do only with a new means of controlling this speaker circuit, so that the latter, once it is closed, will not be interrupted until

2

after at least one complete record has been played.

The speaker circuit is controlled by a switch that tends constantly to assume or remain in the open position. This switch may take any desired form. For the purpose of illustration I have shown a simple switch 4 mounted on the bottom wall 5 of the box just below the open lower end of a chute 6 down which little weights, preferably balls, may drop and, resting on the movable member of the switch, close the same without the intervention of any other actuating element. Metal balls A about one quarter of an inch in diameter, may conveniently be used. The member of the switch on which the balls come to rest is shown as having its upper side faced with a layer 7 of insulating material.

The chute 6 is part of a closed system of chutes or channels in which balls are stored, dropped upon the switch when coins are deposited, and started on a new journey back through the system as the credits represented thereby are consumed. Associated with the system of chutes is at least one coin-controlled device to feed balls to the switch-closing point. In the arrangement shown, there are three such devices and, therefore, the upper end of chute 6 is constituted into three branches, 8, 9 and 10, of which one, branch 8, may be a direct extension of chute 6. Connected to the lower end of chute 6 is a short horizontal section 11 into which the balls are pushed, as will hereinafter be explained, after they have served their purpose of closing the switch. Chute section 11 curves gradually upward to join a section 12 that leads to the upper ends of sections 8, 9 and 10. In the arrangement shown, sections 6, 8, 9, 10 and 12 are all vertical, although that is not essential, all that is required being that the parts be so disposed that the balls may drop by gravity into switch-closing positions when released as will later be described. With the sections 9 and 10 vertical, it is advisable that their lower ends be connected to section 6 by a downwardly sloping section 14. There is also a downward slope to the top section 15 which connects section 12 to sections 8, 9 and 10, although it makes little difference whether or not section 15 is slanting; the main reason for the slant shown being that ordinarily the capacity of chute 10 may advantageously be less than that of chute 8.

Associated with each of the chutes 8, 9 and 10 is an escapement each of which is adapted to release a different number of balls than the others; the number in each instance depending upon the

value of the coin by which that escapement is adapted to be operated. These escapements are alike except that they differ as to span. Each escapement consists of a body portion in the form of a bar or long, narrow plate, 16 pivotally supported on one side of the corresponding chute by a pivot pin 17 located midway between its ends, together with a long, thin radial arm or stem 18. The ends of the body portion of each escapement are bent laterally to create fingers 19 which extend a short distance into the interior of the adjacent chute through slots 20. The fingers of the escapement associated with chute 10 span, for example, only one ball, those on chute 9, span two balls and those on chute 8 span five balls; the column of balls in each chute being normally supported on the lower finger of the corresponding escapement, while the upper finger of that escapement stands clear of the balls but in position to swing under one side of the ball which, after the escapement is rocked to release the ball or balls spanned thereby, becomes the lowermost ball of the column.

Behind each of the chutes 8, 9 and 10 is a coin chute, these being indicated at 21, 22 and 23, and being adapted, for example, to receive quarters, dimes and nickels, respectively. Each coin chute contains in its front wall a long, vertical slot 25 through which the free end of arm or stem of the corresponding escapement extends. Light springs 26 normally hold the arms or stems of the escapements at the tops of these slots. When a coin is dropped into a coin chute, it strikes the escapement arm or stem that lies in its path and presses it down, thereby rocking the escapement until its lower finger moves out from under the ball resting thereon and the upper finger swings under the side of the first ball above the escapement; the ball or balls spanned by the escapement dropping down into chute 6. When the coin drops from the escapement stem, the spring draws the stem up to rock the escapement into its normal position, allowing the column of balls to drop until it rests on the lower escapement finger.

The escapements are so proportioned that they rock about their centers of gravity, thereby making it impossible to cheat by shaking the box and jarring the escapements until they release a ball or balls.

The means heretofore described makes it possible to establish a credit represented by one or by many balls that will hold the switch closed until all of the credit has been consumed. This consumption or cancellation of the established credit can be effected only by moving all of those balls past the switch-closing point and clear of the switch. This cancelling of the credit may conveniently be done by an electromagnetic actuator mounted on the bottom of the box near the switch and energized at the end of each record that is played. In the arrangement shown, the electromagnet comprises a stationary coil 27 and a movable armature in the form of a plunger 28; the plunger serving to push balls on the switch ahead during a forward stroke and permit another ball (if any remain), to drop down on the switch during the return stroke. Two circuits between the phonograph and the speaker box are therefore required. In Fig. 5 one of these circuits, represented by wires 29, is the usual energizing circuit for the speaker, and the other circuit 30 being the usual cancelling circuit; this latter circuit serving to interrupt circuit 29, when no further credit remains, by energizing the electro-

magnet at the end of each record played by the phonograph.

If a credit corresponding to a single ball, only, is established, it is not enough that such ball be pushed off the switch the first time that the electromagnet is energized, because the speaker may have become audible only in the middle of a record; and, if the switch opened at the end of that record, the customer would not have received full value for his coin. However, if the plunger is compelled to make two forward strokes to drive a ball clear of the switch, at least one complete record will be played for each ball reaching the switch. I accomplished this by mounting a swinging dog 31 on the forward end of the plunger, in about the plane of the center of balls on the switch and in chute section 11, and cutting a slot 32 through walls of chute sections 6 and 11 to permit the dog to enter these sections. The dog has thereon two lugs or projections, 34 and 35, the first of which is adapted to engage the ball that was last to be deposited on the switch, while the other at the same time engages the ball just ahead of that ball if there be two balls on the switch. To be effective, the dog must move laterally into the space above the switch in making a working stroke and must then swing out again during the return stroke of the plunger. In the arrangement shown, the plunger is a little to one side of the plane of the ball chutes, a spring 36 tends constantly to swing the dog laterally to and past that plane, and a stationary pin 37 engages with the edge of the dog on the side toward the ball chutes and pushes the dog away from said plane as the plunger is retracted.

In Fig. 3 the plunger is in its retracted position, being held there by a spring 38, and the dog is entirely clear of the ball chute structure; lug 34 being behind one edge of the latter and the lug 35 at one side thereof. When the coil is energized, the plunger is driven toward the left, the dog leaves the pin 37 and spring 36 rocks the dog over until the lug 35 enters through slot 32 and contacts the second ball from the right at about the same time that lug 34 engages with the rear side of the right hand ball. After this has occurred, further movement of the plunger positively drives the balls ahead and, if the chutes 11 and 12 are filled, a ball will roll out of the top of section 12 and down section 15 into the first of the sections 8, 9 and 10 that is not full.

Extending through a slot 39 in the side of chute section 11, opposite slot 32, are two spring held pawls, 40 and 41, in position to engage the second and third balls from the right, in Fig. 3 and prevent them from rolling back toward the right when the plunger is retracted. The second ball is still on the switch, whereas the third ball is beyond the switch.

It will thus be seen that if there is but a single ball dropped down on the switch, the first stroke of the plunger will cause it to be driven by lug 34 into the second ball position, still on the switch, and to be held there by pawl 40. Consequently, if the speaker became audible at some intermediate point in a record being played, it will not be cut out at the end of that record, but a following, complete record must be played so as again to energize the electromagnet. When that occurs, the lug 35 on dog 31 contacts the ball and pushes it ahead until it reaches the third ball position, where it remains until another ball is deposited on the switch and, in its turn, is driven forward two steps.

It will thus be seen that I have produced a

5

unique credit establishing device that not only is simple and of a construction that will not easily get out of order, but can be constructed in a great variety of forms and sizes and by making a simple change in the escapements, the same coin may be caused to denote different numbers of units each represented by a ball. This is an important advantage in addition to that of being able to make certain that a customer will have played for him at least the full number of records for which he has paid, in the kind of record playing system which I have described.

While I have illustrated and described with particularity only a single preferred form of my invention, I do not desire to be limited to the exact structural details thus illustrated and described; but intend to cover all forms and arrangements which come within the definitions of my invention constituting the appended claims.

I claim:

1. In combination, a credit cancelling switch including a member on which two balls may rest, one behind the other, and which causes the switch to be closed whenever there is at least one ball thereon, means to deposit balls on said member, and an actuator having thereon two shoulders so spaced that one of them engages the nearest of two balls during a working stroke when there are two balls on the switch and the other engages the same ball on the next succeeding working stroke, thereby to move each ball deposited on said member forward and off the latter in two successive steps upon two successive energizations of the actuator.

2. A combination such as set forth in claim 1, wherein the actuator for the balls is an electromagnet having a movable part provided with shoulders spaced so as simultaneously to engage with both of two balls on the switch member and successively to engage each ball, upon successive energizations of the actuator, following the placing of the ball on the switch member.

3. In combination, a credit cancelling switch including a member on which two small weights may rest, one behind the other, and which causes the switch to be closed whenever there is at least one weight thereon, means to deposit weights on said member, and an electromagnetic actuator to move a single weight off said member in two successive steps upon two successive energizations of said actuator; said actuator having thereon a shoulder in position to engage a weight that has just been deposited on said member and move it ahead one step to cause it to push another weight off said member when there are two weights on said member at a time when the actuator is energized; and a second shoulder on said actuator in position to engage directly with each weight that has been moved ahead one step and push it off said member on the next stroke of the actuator, when no additional weight has been deposited between two successive strokes of the actuator.

4. A combination such as set forth in claim 3, wherein there are two pawls to engage both weights, when there are two on the switch member, and leave both weights free to move in the direction to carry them off said member, while preventing movements of the weights in the opposite direction after having been moved in the aforesaid direction.

5. A credit establishing apparatus for a coin

6

controlled system comprising a movable controller member adapted to be actuated by the weight of a ball deposited thereon, a plurality of ball chute sections connected at their lower ends to a common section located above and having an open lower end located in position to feed balls to said member, a coin chute located near each upper ball chute section, an escapement associated with each of the latter sections, an arm on each escapement extending into the corresponding coin chute in position to be driven down by a coin descending in that chute and thus rock the escapement, the escapements being of different capacities so that each releases a different number of balls than do the others.

6. An apparatus for establishing a credit in connection with a system whose operation is determined by a controlling member and subsequently cancelling it, which comprises a ball supply chute composed of a lower section above the controlling member to feed balls thereto and a plurality of upper sections all connected and delivering to the lower section, a coin-operated escapement device associated with each upper chute section to release balls and allow them to run down into the lower section, the escapement devices being of different capacities so that each releases a different number of balls than do the others, means to push balls off said member, and a return chute in position to receive balls from said member and guide them into the upper ends of the upper supply chute sections.

7. In combination, a credit cancelling switch including a member of such length that two small weights may rest thereon at the same time, side by side, and which causes the switch to be closed whenever there is at least one weight thereon, a chute for a stack of weights located above said member in position to deposit weights on said member, a pusher device, and elements on the pusher device so spaced that one or the other of them engages a weight on said member at about the same point in a stroke of the pusher device regardless of which of the two weight positions on said member is being occupied by that weight, thereby causing a weight to be pushed off said member in two successive steps after having been deposited on the latter.

EARLE G. HENRY.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
396,674	Vaughn	Jan. 22, 1889
402,773	Simons	May 7, 1889
404,450	Vaughn	June 4, 1889
920,281	Dittmar	May 4, 1909
1,534,273	Krema	Apr. 21, 1925
1,591,202	Wynn	July 6, 1926
1,800,537	Johnson	Apr. 14, 1931
1,833,724	Schwegler	Nov. 24, 1931
1,941,191	Schwegler	Dec. 26, 1933
2,122,550	Adrian	July 5, 1938
2,290,817	Smith	July 21, 1942
2,306,654	Triman	Dec. 29, 1942
2,342,652	Eakins	Feb. 29, 1944
2,393,374	Herrick	Jan. 22, 1946