Aug. 2, 1966 H. G. JENSEN ET AL 3,263,788

SCAN AWARD SYSTEM

Filed July 10, 1964 5 Sheets-Sheet 1

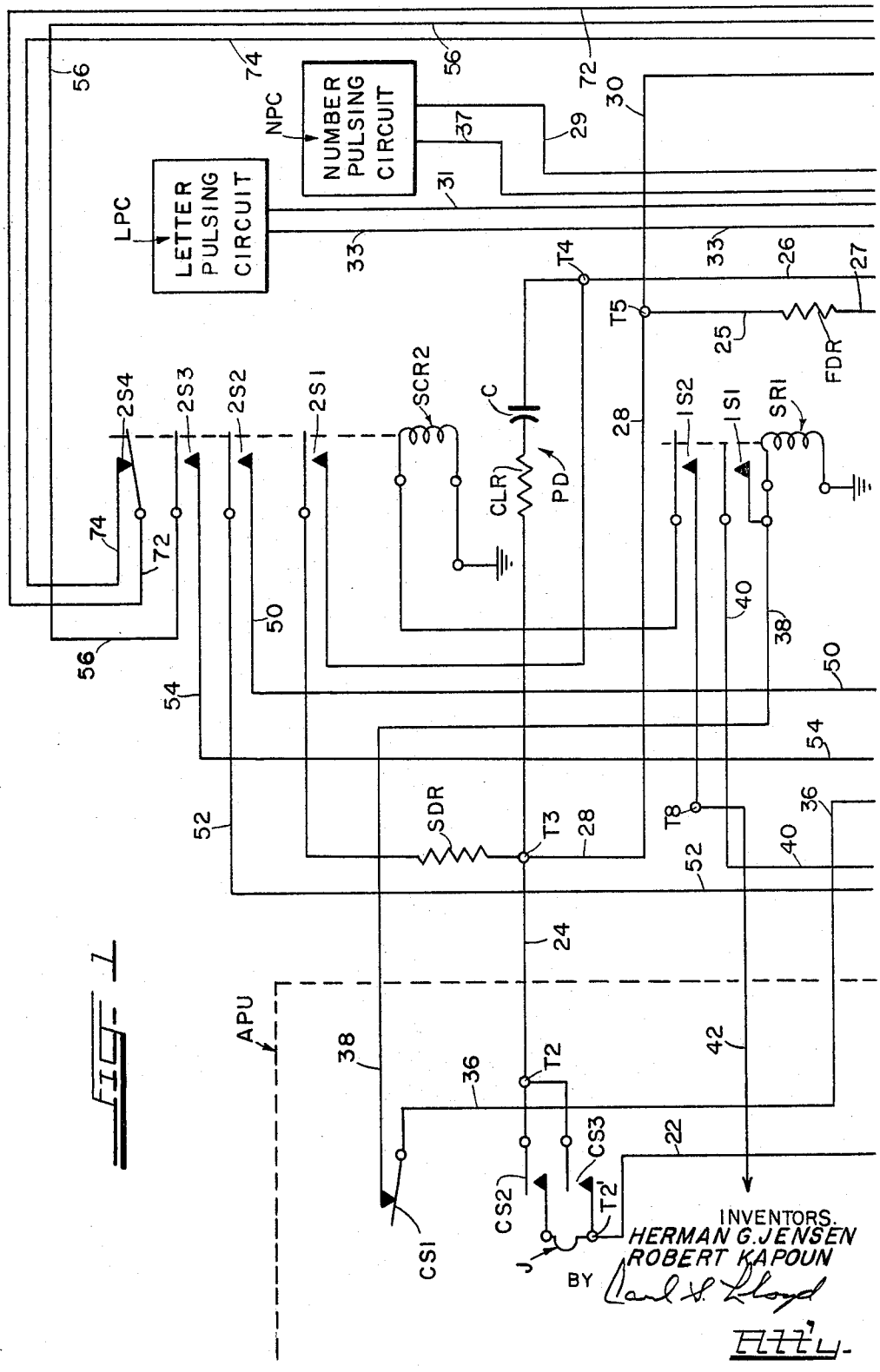


FIG. 1

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SCAN AWARD SYSTEM

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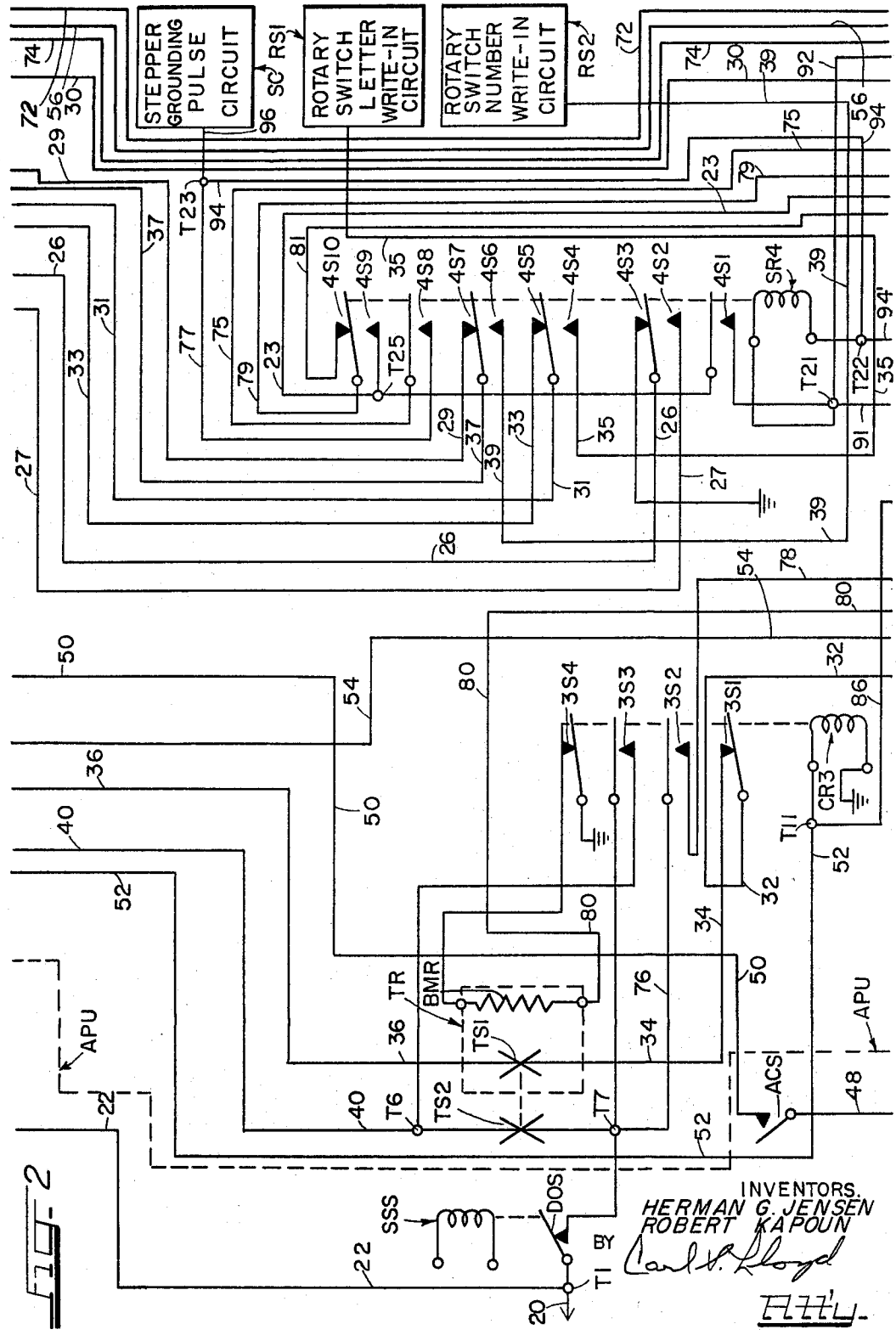


FIG. 2

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SCAN AWARD SYSTEM

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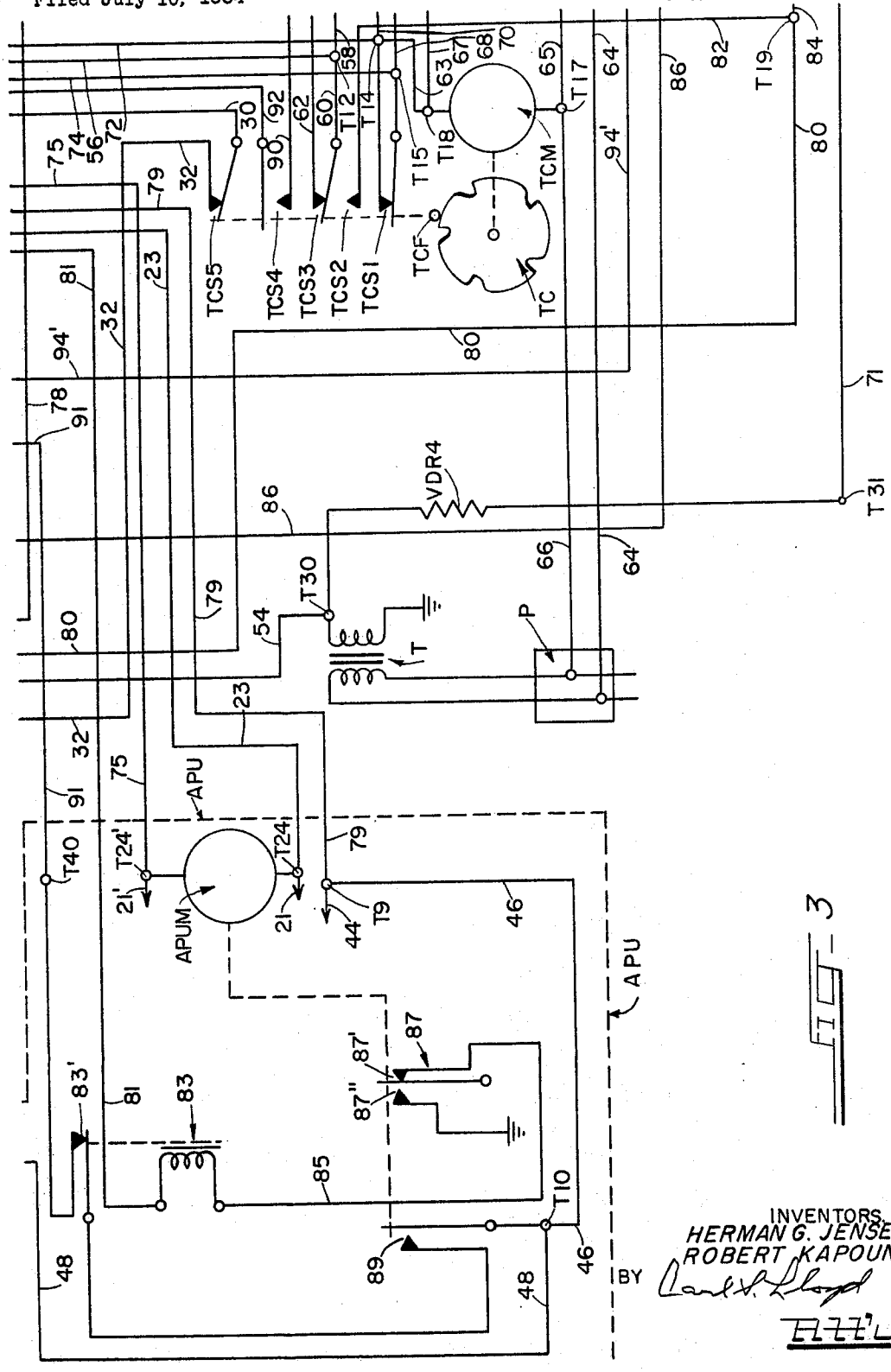
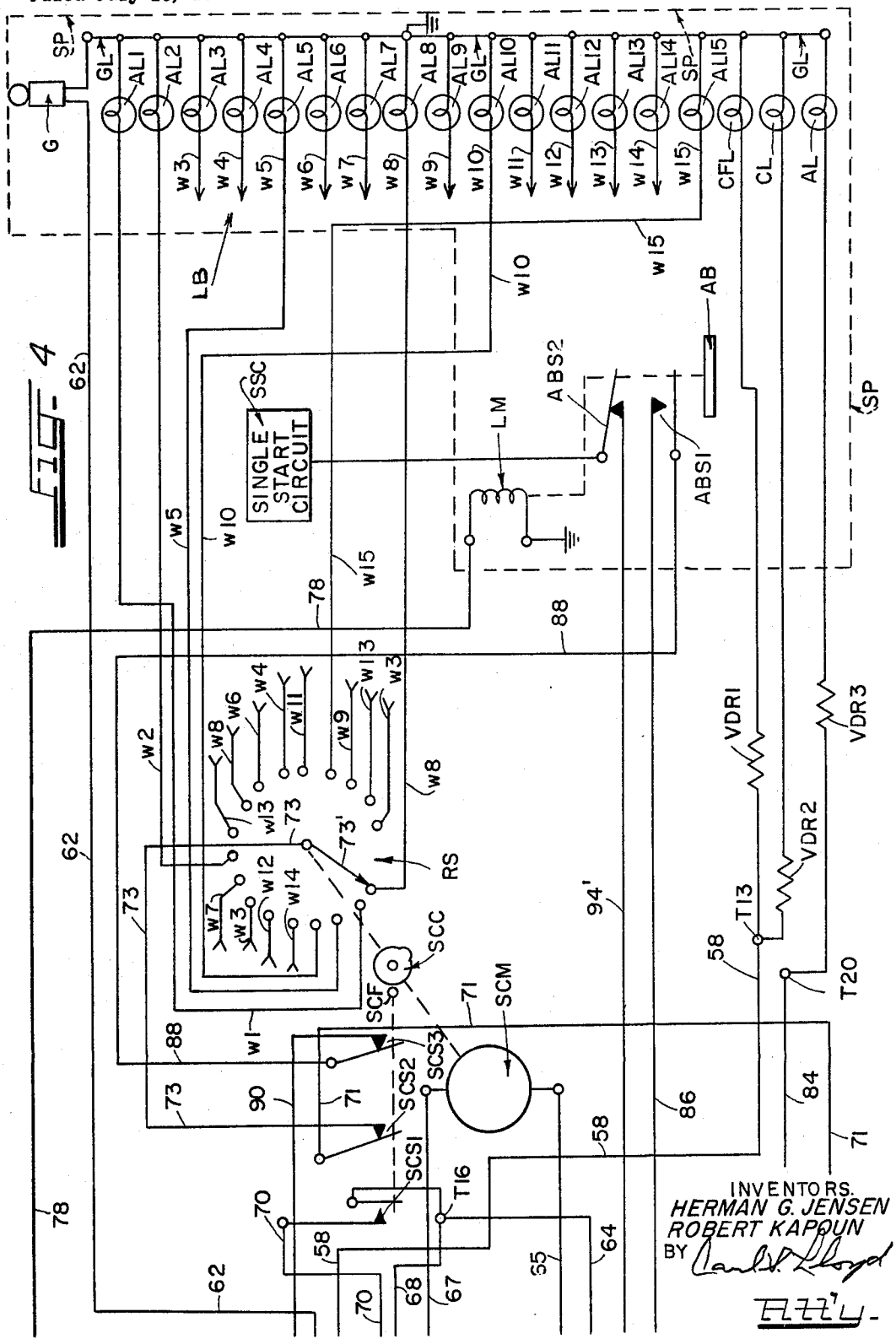


FIG. 3

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SCAN AWARD SYSTEM

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SCAN AWARD SYSTEM

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FIG. 6

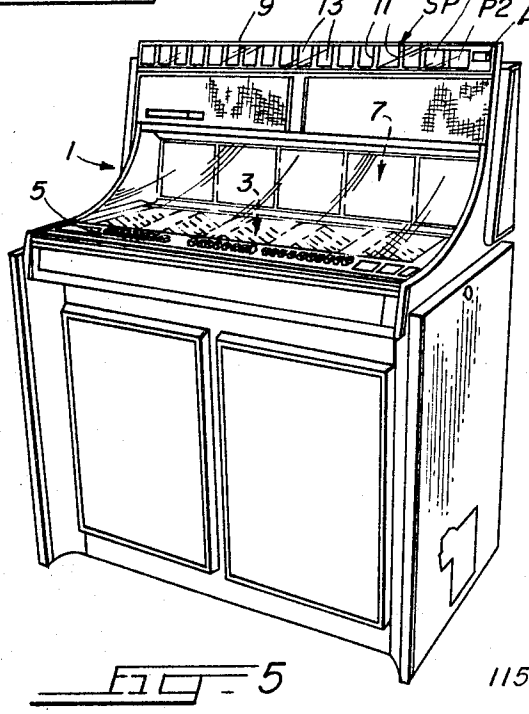


FIG. 5

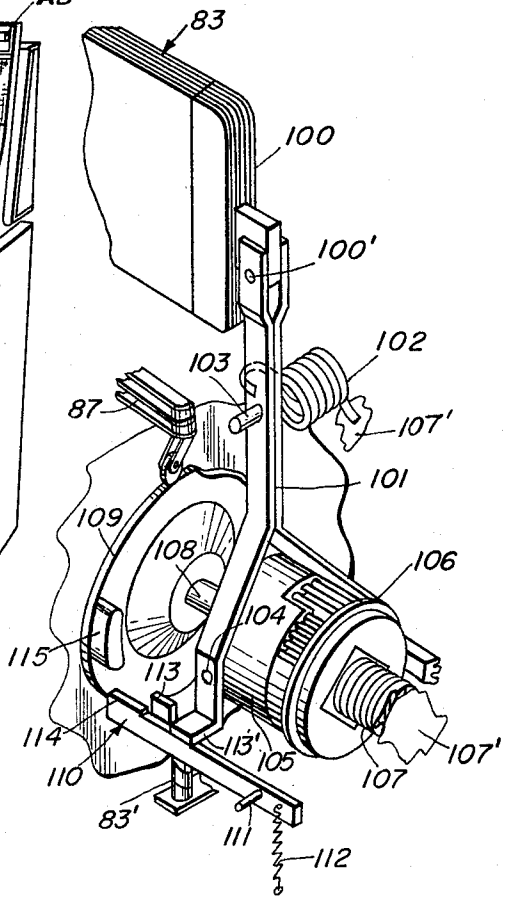


FIG. 8

FIG. 1	
FIG. 2	
FIG. 3	FIG. 4

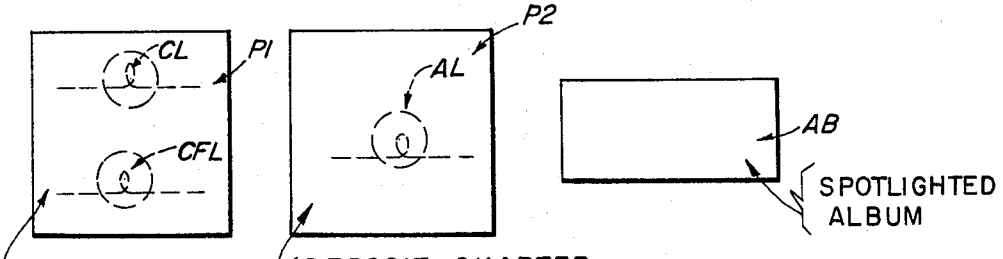


FIG. 7

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United States Patent Office 3,263,788 Patented August 2, 1966

3,263,788

SCAN AWARD SYSTEM

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Filed July 10, 1964, Ser. No. 381,715
24 Claims. (Cl. 194—12)

This invention relates to a scan award system and to a rotary switch scan control system therefor and in a described embodiment to a scan award system for a coin-operated phonograph vending installation adapted to vend an awarded record selection under certain predetermined conditions at a bargain price.

It is of course a well known fact that automated vending installations have become a significant factor in the retail merchandising of articles (e.g., candy bars) and of services (e.g., the playing of recorded music). However, one important drawback to such installations has been their relative inflexibility for utilizing proven merchandising techniques based upon award and bargain concepts. To an extent, bargain merchandising has been used in the vending business (as, for example, by offering a single selection record play for 10¢ and three single selection record plays for 25¢ in coin-operated phonographs), and such use has been highly successful. However, vending merchandisers are constantly striving for additional ways to utilize bargain concepts, and this invention provides a new and unique approach for utilizing both bargain and award concepts in the operation of a vending installation.

In the embodiment set forth herein, the invention is described in conjunction with an exemplary coin-operated phonograph; however, it will be readily apparent to one skilled in the vending art that various other types of vending installations could be equipped with corresponding systems based upon the principles of the subject invention.

The exemplary coin-operated phonograph is adapted to dispense either single selection record plays for a first price or album selection plays for a second and higher price. Signal means are provided in the phonograph cabinet for displaying selectively illuminated facsimiles of a number of album jackets in an award scan panel situated atop the phonograph cabinet. Normally activated scan means illuminate each of the facsimiles one at a time in an apparently random (although actually predetermined) scan pattern so that the flashing lights will attract the customer's attention.

After the customer deposits sufficient coins and thereby conditions the phonograph to vend an ordinary selection at regular prices pursuant to normal operation thereof, start means automatically activate award conditioning means, which in turn deactivate the scan means, and thereby cause the scanning random illumination to cease, with one given "spotlighted" facsimile remaining illuminated. The customer has no control over the determination of which potential award is made available, and thus, from the customer's viewpoint, award availability is based upon an arbitrary or random pattern of selection.

Also, visual and audible signals are communicated to the customer to inform him that the album corresponding to the given spotlighted facsimile is available at the bargain price. The customer may then deposit additional coins (so as to establish credit corresponding to the bargain price), and award selection means will then be activated so as to vend the awarded selection. However, only a predetermined time interval is allowed for selecting the spotlighted album, and, if the customer fails to take the benefit of the awarded bargain, the availability of the bargain selection is automatically erased from the phonograph unit by a time delay system.

Means are provided to deactivate the start means during

an award vend function so as to prevent the granting of an award based upon an award selection, etc., and to prevent the vending of an ordinary selection during an award vend function. Also, the exemplary coin-operated phonograph is provided with shiftable credit subtract means adapted to remove established credits at ordinary and at bargain prices, as required.

Thus, the arrangement described herein is adapted to incorporate both award and bargain concepts into a vending installation by automatically making available a given one of several potential awards at a bargain price. However, it should be understood that, in one of its aspects, the subject invention relates to the award selection concept even in the absence of a bargain price associated with the award. Moreover, in another of its aspects, the subject invention embraces a rotary switch scan control arrangement that is new and unique in its own right. This randomly timed scan control arrangement may form a part of and indeed is especially adapted for use in a scan award system based upon the principles of the subject invention.

Accordingly, it is a primary object of this invention to provide a new and unique scan award system for utilizing award concepts in a vending installation and preferably for incorporating both award and bargain concepts into the vending operation.

It is a related object of this invention to provide a new and unique rotary switch scan control system for fixing the position of the rotary switch at a randomly selected point.

It is also an object of this invention to provide a scan award system of the type described having a scan control system of the type described incorporated therein.

More specifically, it is an object of this invention to provide a new and unique arrangement for vending award selections at a bargain price, especially in coin-operated phonographs.

These and other objects, advantages, and features of the subject invention will hereinafter appear, and, for purposes of illustration, but not of limitation, an exemplary embodiment of the subject invention is shown in the appended drawings, in which:

FIGURES 1–4 are schematic circuit diagrams of respective portions of a scan award system produced in accordance with the subject invention;

FIGURE 5 is a schematic layout view showing the inter-relationship of the various elements illustrated in FIGURES 1–4;

FIGURE 6 is a front perspective view of an exemplary coin-operated phonograph equipped with a scan award panel adapted to operate in conjunction with the system shown in FIGURES 1–4;

FIGURE 7 is an enlarged diagrammatic view of portions of the phonograph scan award panel shown in FIGURE 6; and

FIGURE 8 is a fragmentary perspective view of a shiftable credit subtract system for the coin-operated phonograph.

With reference to the drawings, FIGURE 6 shows a vending installation in the form of a coin-operated phonograph **1** which is adapted to operate in conjunction with a scan award system produced in accordance with the subject invention. The phonograph **1** is provided in a conventional manner with a title display **3** and with selector buttons **5** so that, upon the establishment of appropriate credit by the deposit of coins during normal operation, the customer may select an ordinary record play of his choice by correlating depression of the selector buttons **5** with the corresponding record title shown in the title display **3**. In the described embodiment, some of the titles that the phonograph **1** vends during normal operation take the form of single play selections available at a first given price (10¢ per play or three plays for 25¢) and the re-

mainder of the titles take the form of album or long-playing selections available at a second and higher given price (50¢ per play).

The phonograph 1 is additionally adapted to vend award selections (one of fifteen albums normally vended at 50¢ per play) at a bargain price (25¢ per play) in the following manner.

A display board 7 is provided perpendicularly adjacent the title display 3 so that five album jackets (i.e., printed material describing a given album) can be displayed to the customer's view. A scan award panel SP is also provided atop the phonograph 1, and the panel SP comprises a frame 9 having a series vertical ribs 11 extending across a hollow interior thereof so as to define a series of fifteen display windows 13. Each window 13 is adapted to receive a miniaturized facsimile of an album jacket, and a light is positioned behind each window (i.e., award lamps AL1–15, arranged in a lamp bank LB as shown in FIGURE 4) so that the windows may be selectively illuminated in an apparently random scan pattern, as hereinafter described.

The scan award panel SP is also provided with two translucent indicia panels P1 and P2 (FIGURES 6 and 7) and an opaque award button AB (FIGURES 4, 6, and 7). As shown in FIGURE 7, the panels P1 and P2 are provided with the following indicia messages, respectively: "AWARD 50¢ ALBUM FOR ONLY A QUARTER" (P1) and "DEPOSIT QUARTER AND PRESS THIS BUTTON [arrow sign pointing to award button AB] FOR THE SPOTLIGHTED ALBUM" (P2). Likewise, the award button AB is provided with the following indicia message: "SPOTLIGHTED ALBUM." The indicia messages on the panels P1 and P2 are ordinarily invisible, while the message on the award button AB is ordinarily exposed to the customer's view. However, as shown in FIGURE 7, a normally deactivated credit flashing lamp CFL and a normally deactivated credit lamp CL are provided behind the panel P1, and a normally deactivated award lamp AL is provided behind the panel P2, so that upon appropriate energization of these lamps the various messages displayed by the said panels P1 and P2 will be illuminated for view by the customer, in a manner hereinafter described.

FIGURES 1–4 (which are spatially interrelated in the manner shown in FIGURE 5) schematically illustrate the normal or stand-by scanning positions of certain circuitry and mechanical elements which form the scan award system described herein. This system is adapted for use in conjunction with the exemplary coin-operated phonograph 1 shown in FIGURE 6.

An album pricing unit APU (which is contained within a broken outline shown in FIGURES 1–3) is adapated to add and subtract credit values in response to the deposit of coins in the phonograph 1 and thus serves as a prime control for the scan award system. The pricing unit APU corresponds in general to the multiple pricing credit mechanism set forth and described in a copending application (entitled "MULTIPLE PRICING CREDIT MECHANISM FOR COIN-RESPONSIVE EQUIPMENT," Serial No. 301,064, filed August 9, 1963, in the name of Herman G. Jensen), now Patent No. 3,202,256. For purposes of brevity, only certain relevant portions of the pricing unit APU are illustrated and described in detail herein, it being understood that reference may be had to the said co-pending application for a more comprehensive explanation of the credit add and subtract functions described therein. However, the pricing unit APU is modified relative to multiple pricing credit mechanism of the aforementioned co-pending application in at least one important respect (as illustrated in FIGURE 8 and as herein after described in detail) in order to correlate the conventional or regular price credit subtract feature with a bargain credit subtract feature of the scan award system described herein.

As shown in FIGURES 1 and 2, credit switches CS1–3 are provided in the pricing unit APU to serve as start conditioning controls, whereby the scan award system is conditioned for bargain operation only after the establishment of sufficient credit (switches CS2 or CS3, as the case may be) and the removal of the established credit by appropriate selection (switch SC1), in the following manner.

A lead 22 (shown in FIGURES 1 and 2) interconnects terminals T1 and T2' of pricing unit APU. Terminal T1 is connected to a D.C. power source by a lead 20 (FIGURE 2), and terminal T2' is connected to a terminal T2 by normally opened credit switches CS2 and CS3 connected in parallel by a jumper J (FIGURE 1). The jumper J is provided to determine which of the credit switches CS2 and CS3 will be controlling as input signals to signify the establishment of sufficient credit to warrant an award selection. The switches CS2 and CS3 are operated in the manner described in the aforementioned co-pending application Serial No. 301,064, now Patent No. 3,202,256, and credit switch CS2 is adapted to be closed when two or more credit units are established in the pricing unit APU (e.g., two credit units established by the deposit of 10¢ for a single play selection), while credit switch CS3 is adapted to be closed when six or more credit units are established (e.g., six credit units established by the deposit of 25¢ for three single play selections, or twelve credit units established by the deposit of 50¢ for an album play selection). With the jumper J connected as shown in FIGURE 1, credit switch CS2 would be controlling, where as with the jumper J removed, credit switch CS3 would be controlling, since credit switch CS2 would be open-circuited. In this manner, the phonograph 1 can be readily adjusted to award bargain selections in response to the establishment of a predetermined credit value (e.g., either two or more or six or more established credit values, as the case may be).

A lead 24 interconnects terminal T2 with a terminal T3 (FIGURE 1), and a normally deactivated power discharge system PD is connected between terminal T3 and a terminal T4. The power discharge system PD comprises a capacitor C in series with a current limiting resistor CLR. As shown in FIGURES 1 and 2, terminal T4 is connected by a lead 26 through a normally closed switch 4S3 (controlled by a selector relay SR4, FIGURE 2) to ground.

Thus, when a predetermined credit value has been established in the pricing unit APU (i.e., two credit values in the illustrated arrangement, since the jumper J is connected between terminal T2' and credit switch CS2), a D.C. charge is impressed across the capacitor C by a circuit traced from the D.C. power source (FIGURE 2) through lead 20, terminal T1, lead 22 (FIGURES 1 and 2), terminal T2', jumper J, closed credit switch CS2, terminal T2, lead 24, terminal T3, current limiting resistor CLR, capacitor C, terminal T4, lead 26 (FIGURES 1 and 2), and normally closed switch 4S3 to ground. When the established credit is removed from pricing unit APU by appropriate selection (in the manner described in the aforementioned co-pending application Serial No. 301,064), now Patent No. 3,202,256, credit switch CS2 is opened so as to disconnect the charging voltage from capacitor C.

As previously indicated, a credit switch CS1 is also provided in pricing unit APU, and switch CS1 is adapted to be normally closed (as shown in FIGURE 1) at a zero credit position and is adapted to be opened upon the establishment of two or more credit values in pricing unit APU. Credit switch CS1 opens prior to the closing of credit switch CS2 upon the designated establishment of two or more credit values and closes when pricing unit APU reverts to a one or zero credit value position.

Credit switch CS1 controls power discharge system PD which in turn controls the energization of a normally deactivated start relay SR1 by discharge of capacitor C.

Thus, the removal of credit (i.e., closing opened switch CS1) in response to a normal operation selection serves to condition the scan award system for bargain operation, in the following manner. When pricing unit APU reverts to a one or zero credit value position, credit switch CS1 is closed. Terminal T3 is connected by a lead 28 to a terminal T5, which in turn is connected by a lead 30 (FIGURES 1–3) to a normally closed switch TCS5 (controlled by a timing cam TC, FIGURE 3). Switch TCS5 is connected by a lead 32 (FIGURES 3 and 2) to a normally closed switch 3S1 (controlled by a normally deactivated credit relay CR3, FIGURE 2). Switch 3S1 is connected by a lead 34 through a normally closed thermal switch TS1 (controlled by a normally deactivated bimetallic resistor BMR in a thermal relay system TR, FIGURE 2) to a lead 36 (FIGURES 2 and 1), which connects through closed credit switch CS1 to a lead 38 and through start relay SR1 to ground. In other words, start relay SR1 is shunt connected across terminals T3 and T4 so that discharge of capacitor C may serve to energize start relay SR1 when credit switch CS1 is closed.

When start relay SR1 is thus energized, normally opened switches 1S1 and 1S2 which are controlled thereby are closed. Switch 1S1 functions as a hold for start relay SR1 since terminal T1 (FIGURE 2) is connected through a normally closed drop-out switch DOS (controlled by a single subtract solenoid SSS of pricing unit APU, FIGURE 2) to a terminal T7, through a normally closed thermal switch TS2 (in thermal relay system TR, FIGURE 2) to a terminal T6, and thence through a lead 40 (FIGURES 2 and 1) and through closed switch 1S1 to the high side of start relay SR1.

Closing of switch 1S2 functions as a start signal for a normally deactivated scan control relay SCR2 (FIGURE 1) since a lead 42 (FIGURE 1) connects an A.C. power source to a terminal T8 and through closed switch 1S2 and scan control relay SCR2 in series to ground.

The foregoing arrangement of credit switches CS1–3, power discharge system PD, and start relay SR1 constitutes a start arrangement that is responsive to normal operation of the phonograph 1. However, it will be understood that the start arrangement could be adapted to respond to normal operation of the phonograph 1 in a variety of other manners, although the described utilization of a signal responsive to credit establishment for charging a power discharge source and of a signal responsive to credit removal for discharging the said source constitutes the preferred practice of the subject invention in the environment of a coin-operated phonograph.

Energization of scan control relay SCR2 by energization of start relay SR1 closes normally opened switches 2S1, 2S2, and 2S3 and opens normally closed switch 2S4 which are controlled thereby. Switch 2S1 is connected in series with a slow discharge resistor SDR (FIGURE 1) between terminals T3 and T4, and thus closing of switch 2S1 functions to bleed off residual charge on capacitor C across resistor SDR (at least during the award purchase period determined by thermal relay system TR, as hereinafter described).

Closing of switch 2S2 functions to condition credit relay CR3 (FIGURE 2) for activation upon the establishment of six credit values in the following manner. A lead 44 (FIGURE 3) connects a terminal T9 in pricing unit APU with a power source. Terminal T9 is connected by a lead 46 to a terminal T10, which in turn is connected by a lead 48 (FIGURES 3 and 2), a normally opened album award credit switch ACS (in pricing unit APU, FIGURE 2), and a lead 50 (FIGURES 2 and 1) to switch 2S2. Switch 2S2 connects lead 50 to a lead 52 (FIGURES 1 and 2) which connects to a terminal T11 (FIGURE 2). Since credit relay CR3 is connected between terminal T11 and ground, that relay will be energized when both switch 2S2 (FIGURE 1) and album award credit switch ACS (FIGURE 2) are closed. The album award credit switch ACS is adapted to be closed upon the establishment of six credit values, that is, in amounts sufficient to vend the awarded selection, in the manner described in the aforementioned co-pending application Serial No. 301,064, now Patent No. 3,202,256. In other words, once relays SR1 and SCR2 are energized by the establishment and removal of credits (by conditioning credit switches CS1–3, as previously described), the customer must deposit sufficient coins to cause the closing of album award credit switch ACS in order to obtain the benefit of the bargain award.

Scan control relay SCR2 further functions to visually and audibly signal the availability of an award selection (so that the customer may, if he chooses, deposit coins to close album award credit switch ACS) by control of switch 2S3, in the following manner. As shown in FIGURE 3, a plug P connects the input side of a transformer T to an A.C. power source. An output terminal T30 of transformer T is connected by a lead 54 (FIGURES 3–1) to switch 2S3. Switch 2S3 is also connected by a lead 56 (FIGURES 1–3) to a terminal T12 (FIGURE 3). From terminal T12, a lead 58 (FIGURES 3 and 4) connects to a terminal T13.

The previously described credit flashing lamp CFL (FIGURES 4 and 7) is connected in series with a voltage dropping resistor VDR1 and similarly the previously described credit lamp CL is connected in series with a voltage dropping resistor VDR2, and the said series combinations are connected in parallel between terminal T13 and a grounded lead GL of light bank LB (FIGURE 4). Also, a switch TCS3 (controlled by timing cam TC, FIGURE 3) is connected to terminal T12 by a lead 60 and to a normally deactivated gong G by a lead 62 (FIGURES 3 and 4), with gong G being grounded by grounded lead GL of light bank LB.

Gong G, while not illustrated in detail, is a conventional electromagnetically operated sound-emitting device which utilizes an armature to strike a first plate upon electromagnetization and to strike a second plate upon de-electromagnetization, whereby sound is emitted both upon the energization and upon the de-energization of gong G.

Credit flashing lamp CFL is provided with a conventional flasher mechanism (not shown) so that lamp CFL intermittently operates when energized in order to produce a flashing effect. As previously indicated and as shown in FIGURE 7, credit flashing lamp CFL and cerdit lamp CL are physically located behind indicia panel P1.

Thus, when switch 2S3 is closed upon energization of scan control relay SCR2, gong G will sound (that is, as soon as switch TCS3 is closed by movement of timing cam TC, in case the said switch happens to be opened when switch 2S3 is closed); credit flashing lamp CFL will intermittently illuminate the message on panel P1; and credit lamp CL will continuously illuminate the said message on panel P1.

Scan control relay SCR2 also functions to condition the randomness of the award selection by controlling the operation of a normally activated timing cam motor TCM and of a normally activated scan control motor SCM (FIGURES 3 and 4, respectively) via operation of normally closed switch 2S4 (FIGURE 1) in the following manner. Timing cam motor TCM is connected between terminals T17 and T18 (FIGURE 3), and scan control motor SCM is shunt connected with timing cam motor TCM by leads 65 and 67 (FIGURES 3 and 4). Terminal T17 connects to plug P by a lead 66, and terminal T18 connects to a terminal T14 by a lead 63. A lead 64 (FIGURES 3 and 4) interconnects plug P and a terminal T16 (FIGURE 4). Terminal T16 is also connected by a lead 68 (FIGURES 4 and 3) to a terminal T15 (FIGURE 3).

Three switches are parallelly connected across the terminals T14 and T15 in the following manner. A first carry-over switch SCS1 (controlled by a normally activated rotary scan control cam SCC, which is driven by scan control motor SCM, (FIGURE 4) is connected be-

tween terminal T16 and terminal T14 by a lead 70 (FIGURES 4 and 3). As previously indicated, terminal T16 is connected to terminal T15 by a lead 68 (FIGURES 4 and 3) so that switch SCS1 is thus connected across terminals T14 and T15. Likewise, a lead 72 (FIGURES 3–1) connects terminal T14 with switch 2S4 (controlled by scan control relay SCR2, FIGURE 1), and, in the same fashion, a lead 74 connects terminal T15 with switch 2S4, so that switch 2S4 is the second switch connected across terminals T14 and T15. Finally, as shown in FIGURE 3, a carry-over switch TCS1 (controlled by timing cam TC, which is driven by timing cam motor TCM, FIGURE 3) is the third switch connected across terminals T14 and T15.

With the foregoing arrangement, it will be apparent that motors TCM and SCM will both be continuously energized (so as to drive the respective cams TC and SCC) so long as any one of the switches 2S4 (FIGURE 1), TCS1 (FIGURE 3), or SCS1 (FIGURE 4) are closed. Since switch 2S4 is normally closed during a normal stand-by or zero credit situation and is not opened until scan control relay SCR2 is energized, both of the motors TCM and SCM will be continuously operated until activation of scan control relay SCR2 conditions phonograph 1 to vend an award selection. When scan control relay SCR2 is energized so as to open-circuit switch 2S4, both of the motors TCM and SCM will be conditioned for de-energization when both of their respective carry-over switches TCS1 and SCS1 are open-circuited.

As indicated, energization of scan control relay SCR2 will condition motors TCM and SCM to de-energize through opening of the switch 2S4. Switches TCS1–5 (FIGURE 3) are controlled by the relative positioning of timing cam TC (driven by timing cam motor TCM) and a timing cam follower TCF which is adapted to physically operate switches TCS1–5. When follower TCF is adjacent one of the five staggered lobes or raised surfaces of rotary timing cam TC (as shown in FIGURE 3), switches TCS1–5 will retain the respective closed or opened positions shown in FIGURE 3. When, however, follower TCF is positioned adjacent one of the corresponding five staggered dwells or lowered surfaces of cam TC, switches TCS1–5 will reverse from the positions shown in FIGURE 3. The use of five such staggered dwell and lobe portions is of course arbitrary, and various other arrangements could be substituted. One convenient arrangement for such substitution takes the form of fill-in inserts (not shown) that can be placed in a given dwell area so as to form one continuous lobe from the two lobes that originally surrounded the given dwell.

Similarly, a follower SCF is provided for scan control cam SCC (operated by scan control motor SCM), and scan control follower SCF will position switches SCS1–3 (FIGURE 4) in their respective closed or opened positons depending upon the relative positioning of follower SCF and cam SCC (i.e., the one lobe or dwell thereof). The rates of rotation for cams TC and SCC can be appropriately correlated (i.e., asynchronously, as for example 1 r.p.m. for cam TC as compared to 26 r.p.m. for cam SCC) and the dwell and lobe portions for each of the cams can likewise be correlated (as in FIGURES 3 and 4) so that at some given time followers TCF and SCF will both be adjacent respective dwell areas of cams TC and SCC respectively, whereby both switches TCS1 and SCS1 will be simultaneously open-circuited. When such conditions are achieved, both motors TCM and SCM will be de-energized if scan control relay SCR2 has been energized so as to open-circuit switch 2S4. It will be appreciated that by providing a series of dwell surfaces on cam TC at staggered intervals (as shown in FIGURE 3) and by operating motors TCM and SCM asynchronously, it will be practically impossible for the customer to predetermine exactly when cam followers TCF and SCF will be appropriately positioned so as to de-energize motors TCM and SCM. As will be apparent from the subsequent description of the scanning function of scan control motor SCM, this arbitrary or random timing for the shut-off of motors TCM and SCM precludes the customer's predetermination of exactly which of the fifteen potential award albums he will receive.

It should be noted at this stage that the interaction of timing cam TC and carry-over switch TCS1 functions in and of itself to provide a random timing control for operation of motor TCM. That is, even aside from the interaction of scan control cam SCC and carry-over switch SCS1, timing cam TC serves to arbitrarily designate periodic intervals during which motor TCM may be de-energized since the customer-induced energization of scan control relay SCR2 (so as to open-circuit switch 2S4) can occur at any given angular disposition of timing cam TC relative to timing cam follower TCF. The additional presence of scan control cam SCC, carry-over switch SCS1, and asynchronous scan control motor SCM serves to compound the randomness of arbitrary de-energization for parallelly connected motors TCM and SCM and further to insure that motor SCM is not stopped during a scanning shift function, as hereinafter described.

When both motors TCM and SCM cease rotating, switches TCS1–5 and SCS1–3 (which are respectively controlled by motors TCM and SCM) will necessarily have the following dispositions: TCS1, opened; TCS2, closed; TCS3, opened; TCS4, closed; TCS5, opened; SCS1, opened; SCS2, closed; and SCS3, closed, by virtue of the defined requisites for simultaneous stopping of motors TCM and SCM. As switch TCS3 opens, gong G sounds again (since the said gong is in series with switch TCS3). This second gong signal indicates to the cutomer that a particular "spotlighted" album can now be selected by appropriate depression of award button AB (shown in FIGURES 4, 6, and 7).

Simultaneously, since switch TCS2 has been closed, award lamp AL (physically situated behind panel P2, as indicated in FIGURE 7) is energized to illuminate the indicia message thereupon and thereby to visually indicate to the customer that the "spotlighted" award selection can now be made by establishing the requisite bargain credit. Award lamp AL is energized by switch TCS2 in the following manner. A lead 60, switch TCS2, and a lead 82 in series connect power terminal T12 to a terminal T19 (FIGURE 3), and terminal T19 is in turn connected to a terminal T20 by a lead 84 (FIGURES 3 and 4). Award lamp AL is connected in series with a voltage dropping resistor VDR3 between terminal T20 and grounded lead GL of light bank LB. As previously indicated, terminal T12 is a power terminal since it is connected to the output terminal T30 of transformer T (FIGURE 3) via lead 54 (FIGURES 3–1), closed switch 2S3 (FIGURE 1), and lead 56 (FIGURES 1–3).

Closing of switch TCS2 also serves to activate thermal relay system TR (FIGURE 2) so as to start an award purchase time running via a lead 80 (FIGURES 3 and 2) that connects terminal T19 to bimetallic resistor BMR in thermal relay system TR. It will be recalled that credit relay CR3 is energized when switch 2S2 is closed (by energization of scan control relay SCR2) if album award credit switch ACS has been closed by the establishment of six credit values in pricing unit APU. If the customer fails to deposit sufficient coins in order to establish the credit values required for the award selection, credit relay CR3 will not be energized. In that case, the availability of the award will be extinguished within a predetermined time interval by means of thermal relay system TR, in the following manner.

Terminal T19 (which as previously indicated is connected to power terminal T12 via lead 60, closed switch TCS2, and lead 82) is connected by lead 80 (FIGURES 3 and 2) to bimetallic resistor BMR, which is connected

to ground via a normally closed switch 3S4 controlled by credit relay CR3 (FIGURE 3). Thus, when switch TCS2 closes, bimetallic resistor BMR is energized (since under the assumed conditions credit relay CR3 is not energized). After a predetermined time interval of energization for bimetallic resistor BMR (e.g., 30 to 60 seconds, depending upon its particular characteristics), resistor BMR will distort so as to open-circuit thermal switches TS1 and TS2 (which are controlled by resistor BMR and which are normally maintained in a closed disposition by a permanent magnet, not shown). When switches TS1 and TS2 are opened, as indicated, both the start circuit and the hold circuit for start relay SR1 (FIGURE 1) will be open-circuited, whereby scan control relay SCR2 will be de-energized and motors TCM and SCM will recommence rotation, so as to erase the potential of an award selection after the predetermined time interval.

However, if credit relay CR3 is energized by suitable deposit of appropriate coins in the vending installation (so as to close album award credit switch ACS, as previously indicated) prior to the opening of thermal switches TS1 and TS2, switch 3S4 will be opened and a normally opened switch 3S3 will be closed (since both switches 3S4 and 3S3 are controlled by credit relay CR3). Opening of switch 3S4 open-circuits bimetallic resistor BMR so as to de-activate thermal relay system TR, thereby to prevent the erasure of the available award. Likewise, closing of switch 3S3 shunts thermal switch TS2 (which controls the hold circuit for start relay SR1) via a short circuit bypass, thereby to prevent thermal over-shooting in thermal system TR, which might otherwise deprive the customer of the award availability.

Energization of credit relay CR3 also opens normally closed switch 3S1 and closes a normally opened switch 3S2. Switch 3S1, as previously indicated, is in series in the start circuit for start relay SR1, so that any energization of start relay SR1 based upon the deposit of 25¢ for the award selection will be obviated. In other words, a second award selection (and so forth) cannot be based upon a first award selection, but only upon a regular credit selection, as determined by the previously described credit conditioning switches CS1–3. In the same manner, it will be noted that switch TCS5 controlled by timing cam TC will likewise be open-circuited when award credit is being established, thereby to serve as a further means to prevent re-energization of the start relay SR1 during the award function.

Closing of switch 3S2 serves to condition the scan award system for energization of the previously mentioned select relay SR4 upon appropriate depression of award button AB by the customer. Switch 3S2 is connected by a lead 76 to power terminal T7 (FIGURE 2) and by a lead 78 (FIGURES 2–4) to a grounded latch magnet LM (FIGURE 4). Latch magnet LM is an electromagnetic holding device adapted to cooperate with switches ABS1 and ABS2 associated with award button AB. Switch ABS1 is normally opened and switch ABS2 is normally closed, and depression of the award button AB serves to close switch ABS1 and to open switch ABS2. Latch magnet LM is provided with sufficient magnetization to hold switch ABS1 closed and switch ABS2 opened once button AB is depressed by the customer.

Select relay SR4 is controlled in the following manner. A circuit may be traced from terminal T11 in FIGURE 2 (which is a power terminal when credit relay CR3 is energized) through a lead 86 (FIGURES 2–4), closed switch ABS1 (which is closed by depression of award button AB by the customer, as previously indicated), a lead 88 (FIGURE 4), closed switch SCS3 (controlled by scan control cam SCC, FIGURE 4), a lead 90 (FIGURES 4 and 3), closed switch TCS4 (controlled by timing cam TCC, FIGURE 3), and a lead 92 (FIGURES 3 and 2) to a terminal T21 (FIGURE 2). Select relay SR4 is connected between terminal T21 and a terminal T22, and a lead 94 interconnects terminal T22 and a terminal T23 (FIGURE 2). Finally, a lead 96 connects terminal T23 with a conventional stepper grounding pulse circuit SC (FIGURE 2). Circuit SC normally grounds lead 96 but is adapted (by conventional means not shown) to intermittently open-circuit lead 96 via a stepping action.

Thus, it should be apparent that, when the scan award system is appropriately conditioned (i.e., energization of relays SR1, SCR2, and CR3), select relay SR4 can be energized by depression of award button AB by the customer (so as to close switch ABS1.) It will be noted that closed switch SCS3 (FIGURE 4) is in series in the start circuit for the select relay SR4, so that it is impossible for the customer to make an award selection (i.e., energization of select relay SR4) when the scan control motor SCM is functioning (i.e., scan control motor SCM, as previously described, can only cease rotation when the switches SCS1–3 are in the dispositions shown in FIGURE 4). Likewise, closed switch TCS4 associated with timing cam motor TCM serves a corresponding function.

Normally closed switch ABS2 (which, as previously indicated, is opened upon depression of award button AB) serves to disconnect a conventional single start circuit SSC (FIGURE 4) which is connected in series with switch ABS2 and with terminal T22 (FIGURE 2) by a lead 94′ (FIGURES 2–4). In this manner, the selection of the bargain award serves to preclude energization of single start circuit SSC.

Energization of select relay SR4 reverses each of the switches 4S1–10 from their normal dispositions shown in FIGURE 2 and thereby accomplishes the following functions. Switch 4S1 serves as a holding switch for relay SR4. Album pricing unit motor APUM (FIGURE 3) is connected between carry-over terminals T24 and T24′ (high and low, respectively), each of which are connected by respective leads 21 and 21′ to carry-over power sources for operation of motor APUM (as described in greater detail in the aforementioned co-pending application Serial No. 301,064) now Patent No. 3,202,256. Thus, a circuit can be traced from power terminal T24 through a lead 23 (FIGURES 3 and 2) to a terminal T25 (FIGURE 2). Switch 4S1 is connected between terminal T25 and the previously described terminal T21 so that when switch 4S1 is closed upon energization of relay SR4, the said relay is locked in.

As previously indicated, normally closed switch 4S3 is in series with the charging circuit for power discharge system PD. However, when select relay SR4 is energized, switch 4S3 is opened so as to prevent any charging of capacitor C during the award function. Simultaneously, normally opened switch 4S2 is closed, thereby to connect terminal T5 (FIGURE 1) through a lead 25, a fast discharge resistor FDR, a lead 27 (FIGURES 1 and 2), closed switch 4S2, and lead 26(FIGURES 2 and 1) to terminal T4. In this manner any remaining charge across the capacitor C is rapidly dissipated across the shunted fast discharge resistor FDR, which is of relatively low resistance as compared to the previously described slow discharge resistor SDR (FIGURE 1). This fast discharge is of course accomplished only after thermal relay system TR has been deactivated (by credit relay CR3), so as to insure the availability of the award.

The re-orientation of switch pairs 4S4–5 and 4S6–7 upon energization of select relay SR4 serves to shift the selection circuitry from a conventional letter pulsing circuit LPC and a conventional number pulsing circuit NPC (FIGURE 1) to the control of the scan award system, in the following manner. Leads 31 and 33 (FIGURES 1 and 2), which are connected to letter pulsing circuit LPC, are bridged by normally closed switch 4S5. Similarly, leads 29 and 37, which are connected to number pulsing circuit NPC, are bridged by normally closed s witch 4S7. When select relay SR4 is not energized, switches 4S5 and 4S7 remain closed, and the conventional letter and number pulsing circuits LPC and NPC, respectively, operate in a conventional manner to determine selections

and are unaffected by the scan award system described herein. When, however, select relay SR4 is energized, switches 4S5 and 4S7 are open-circuited, while simultaneously switches 4S4 and 4S6 are closed. Closing of switch 4S4 connects lead 31 to a lead 35, which thus serves to interconnect letter pulsing circuit LPC via lead 31 to a rotary switch letter write-in circuit RS1 (FIGURE 2), while open-circuiting lead 33. Similarly, closing of switch 4S6 interconnects lead 37 with a lead 39, which thus serves to interconnect number pulsing circuit NPC via lead 37 with a rotary switch number write-in circuit RS2, while open-circuiting lead 29.

As is well known to one skilled in the art, during normal operation of a coin-operated phonograph, such as phonograph 1, rotary switches (not shown) in circuits LPC and NPC serve to transmit pulse signals to cause the physical playing of a given selection, as determined by a given letter number pair (e.g., B9, K3, etc.) that is written-in to the said circuits by the customer's manipulation of selector buttons 5 (shown in FIGURE 1). However, during an award sequence, as determined by energization of select relay SR4, the said pulse signals are transmitted instead through write-in circuits RS1 and RS2 of the scan award system described herein, as the said circuits RS1 and RS2 are respectively connected to conventional circuits LPC and NPC.

Rotary switches (not shown) are provided in circuits RS1 and RS2, and these switches (which correspond functionally to the previously mentioned rotary switches of circuits LPC and NPC) are synchronously driven by scan control motor SCM so as to successively condition a series of vend circuits for activation, in a conventional manner. Each of the said vend circuits corresponds to a potential award selection. Thus, upon energization of select relay SR4, the letter-number pair that is written-in to the conventional selection circuitry of the phonograph 1 is determined automatically by the angular positioning of the rotary switches in circuits RS1 and RS2 (which in turn are controlled by the angular positioning of the rotor, not shown, of motor SCM), rather than by the customer's manipulation of selector buttons 5.

In actual practice, the rotary switches in circuits RS1 and RS2 correspond to the schematic rotary switch RS shown in FIGURE 4. Switch RS is driven synchronously with the said rotary switches by motor SCM and is provided with a conventional rotary arm 73' which interconnects a lead 73 with a series of angularly spaced contact points (eighteen in the described embodiment). The said contact points are connected by leads *w*1–15 (leads *w*3, *w*8, and *w*13 each being connected to two contact points) to corresponding ones of award lamps AL1–15 provided in lamp bank LB (FIGURE 4). As shown in FIGURE 4, the contact points of rotary switch RS are connected to a randomly selected series of leads *w*1–15 so as to sequentially energize a given one of the lamps AL1–15 at a time in an apparently random scanning pattern. The pattern will of course repeat for each cycle of revolution of rotary arm 73' and thus is actually predetermined, although apparently random from the customer's viewpoint. Energization of the said lamps is effected by a circuit traced from output terminal T30 of transformer T (FIGURE 3), through a voltage dropping resistor VDR4, a terminal T31, a lead 71 (FIGURES 3 and 4), closed switch SCS2 (controlled by scan control cam SCC, FIGURE 4), and the previously mentioned lead 73 which connects to rotary arm 73' of rotary switch RS.

It will be noted that switch SCS2 must be closed in order for any of the lamps AL1–15 to be illuminated. The lobe and dwell surfaces of scan control cam SCC are correlated so that switch SCS2 will be closed when rotary arm 73' is positioned on a given contact point but will be opened when the arm 73', is in the process of shifting into contact with the next adjacent contact point. Preferably, a rotary stepping switch of the type set forth and described in a co-pending application (entitled "ROTARY STEPPING SWITCH," filed of even date herewith, in the name of Joseph E. Wright, Jr.) is utilized in order to accomplish a step-wise incremental switching function so that rotary arm 73' dwells on a given contact point for a predetermined interval and then advances to the next adjacent contact point, etc. In practice, rotary arm 73' is preferably adapted to advance one position (i.e., 20° of angular rotation for the disclosed eighteen contact rotary switch) for each revolution of scan control cam SCC, in the manner set forth in the said Wright, Jr. co-pending application.

With the foregoing arrangement, motor SCM can be de-energized only when switch SCS2 is closed (since switch SCS2 is closed only when switch SCS1 is opened) or, in other words, only when a given one of the award lamps AL1–15 is being illuminated. As previously indicated, this requirement compounds the randomness primarily attributable to timing cam TC and also insures that the scanning function can cease only in discrete steps (as determined by scan control cam SCC) when selection can be effected (via write-in circuits RS1 and RS2). Thus, when scan control motor SCM ceases rotation, a given one of the lamps AL1–15 will "spotlight" the randomly selected album (by appropriate illumination of a given facsimile 13 in scan panel SP, FIGURE 1), so as to indicate to the customer that the given "spotlighted" album selection is available at a bargain price. If the award album is then selected by the customer (via operation of album award credit switch ACS and award button AB, as previously described), the phonograph 1 will write-in and play the "spotlighted" award album.

It will be observed that the synchronous drive of rotary switch RS and the rotary switches (not shown) of circuits RS1 and RS2 will define a correlation between a given one of the award lamps AL1–15 and a letter-number pair determined in write-in circuits RS1 and RS2. As previously indicated, selections in coin-operated phonograph installations are determined by written-in letter-number pairs, so that the wiring of the circuits RS1 and RS2 relative to the wiring of rotary switch RS can serve to predetermine which album selections will be available for award selection and in what apparently random order these albums will be scanned, as indicated by the sequentially flashing lights in scan panel SP of phonograph 1 (see FIGURE 6). It will of course be understood that the scanning pattern as well as the correlation to the actual award selections can be varied as desired.

Energization of select relay SR4 also serves to close normally opened switches 4S8 and 4S9, thereby to activate motor APUM of pricing unit APU (FIGURE 3), in the following manner. Terminal T24' (FIGURE 3), which as previously indicated connects to a low side carry-over of the motor APUM, is connected by a lead 75 (FIGURES 3 and 2), through switch 4S8, and by a lead 77 to intermittently grounded terminal T23. Similarly, terminal T24 (FIGURE 3), which connects to a high-side carry-over for motor APUM, is connected by the previously described lead 23 (FIGURES 3 and 2) to terminal T25, through switch 4S9, and through a lead 79 (FIGURES 2 and 3) to power terminal T9 (FIGURE 3). In this manner, energization of select relay SR4 causes the commencement of rotation of motor APUM, which then continues to rotate under the influence of its own carry-over functions. Motor APUM in turn serves to control the credit subtract functions of pricing unit APU (by removing established credits from a ratchet credit wheel, not shown, in the manner described in the aforementioned co-pending application Serial No. 301,064 now Patent No. 3,202,256).

Select relay SR4 also controls a normally closed switch 4S10, which serves to control the energization of a subtract shift solenoid 83 (FIGURE 3). Power terminal T9 (FIGURE 3) is connected by lead 79 (FIGURES 3 and 2) through normally closed switch 4S10, a lead 81

(FIGURES 2 and 3), through subtract shift solenoid **83**, a lead **85**, and a switching system **87** to ground. Switching system **87** comprises a normally closed switch **87'** and a normally opened switch **87"**, which are controlled by motor APUM. Switching system **87** functions as a make-before-break switch so that the switch **87"** is closed before the switch **87'** is opened, thereby to provide for pulse-energization of subtract shift solenoid **83**.

FIGURE 8 illustrates the mechanical functioning of subtract shift solenoid **83**, as well as of switching system **87** (which, as indicated in FIGURE 3, is controlled by motor APUM). The FIGURE 8 disposition illustrates the arrangement of the described parts during a maximum (as opposed to a minimum) credit removing position, as indicated by the following description.

Subtract shift solenoid **83** controls an armature **100** which is connected to a pin **100'** to a bifurcated yoke **101**. Yoke **101** is pivotally mounted on a shaft **103** and is biased by a spring **102** to normally rotate away from the solenoid **83** (i.e., away from the position shown in FIGURE 8). The bifurcated legs of yoke **101** are attached (as by a rivet **104**) to a shiftable barrel housing **105** provided in pricing unit APU. Housing **105** supports a subtract ratchet segment **106** thereupon so that rotation of housing **105** (as by a shaft **108** driven by motor APUM) rotates ratchet segment **106** in order to subtract established credits from a ratchet credit wheel (not shown), in the manner described in the aforementioned co-pending application Serial No. 301,064 now Patent No. 3,202,-256. As described in the said application, ratchet segment **106** is provided with an inner and an outer set of ratchet teeth so that the axial positioning of housing **105** and therefore of ratchet segment **106** relative to the ratchet credit wheel (not shown) can be serve to determine the amount of credit units subtracted (e.g., either six or twelve).

In the embodiment described herein, ratchet segment **106** is normally positioned so as to remove six credit units from the ratchet credit wheel but is adapted to be shifted by energization of solenoid **83** (thereby inducing rotation of yoke **101**) to a new position (as shown in FIGURE 8) wherein twelve credit values are removed upon a one-cycle revolution of pricing motor APUM.

A compression spring **107** is provided between a frame support **107'** and barrel housing **105** to cooperate with the previously mentioned spring **102** so as to normally urge yoke **101** to rotate away from solenoid **83**, thereby to normally urge ratchet segment **106** toward the left (as seen in FIGURE 8) to its minimum credit-removing position (e.g., the removal of six credit units). When subtract shift solenoid **83** is pulse-energized, yoke **101** is rotated so as to cause ratchet segment **106** to move toward the right (as seen in FIGURE 8) to its position of maximum credit removal (e.g., the removal of twelve credit units). When ratchet segment **106** has been shifted, as illustrated in FIGURE 8, a pivotable latch lever **110** acts to lock yoke **101** in position adjacent solenoid **83** even after the said solenoid is de-energized by the opening of switch **87'** of switching system **87** (FIGURE 3). Latch lever **110** is pivoted on a shaft **111** and is biased by a spring **112** for rotation in a clockwise direction (as seen in FIGURE 8) so as to urge a latch arm **113** thereof into impeding engagement with an extending leg **113'** of yoke **101**. Latch lever **110** is also provided with an extension **114** which is positioned in the path of movement of a lug **115** provided on a rotary cam **109** fixedly positioned on the previously mentioned shaft **108** of pricing motor APUM. In this manner, as rotary cam **109** completes a cycle of revolution, lug **115** will engage extension **114** so as to rotate latch lever **110** out of engagement with yoke **101**, whereby springs **107** and **102** will cause housing **105** and its associated ratchet segment **106** to revert to the minimum credit removing position.

Rotary cam **109** is also provided with circumferential dwell and lobe portions in order to operate switching system **87** (FIGURE 3) in the previously described make-before-break manner. A normally opened switch **89** (FIGURE 3) is also closed upon operation of motor APUM, but switch **89** is not illustrated in FIGURE 8.

Latch lever **114** may be cocked against the force of its spring **112** (by superimposed engagement of leg **113'**) so as to bear against a contact blade of a normally closed switch **83'** (FIGURES 3 and 8) in order to close the said switch whenever latch lever **110** is rotated against the force of its spring **112**. When subtract shift solenoid **83** is energized, so as to displace ratchet segment **106**, latch lever **110** rotates under the influence of its spring **112** so as to allow switch **83'** to open (as shown in FIGURE 8), until such time as latch lever **110** is again cammed out of locking engagement with yoke **101** by engagement with lug **115** of rotary cam **109**.

The foregoing arrangement provides a unique anti-cheat function in the following manner. It will be observed that, since normally closed switch **4S10** (FIGURE 2) is in series with subtract shift solenoid **83** (FIGURE 3) this solenoid will be pulse-energized upon each regular price selection. Thus, credit removal in pricing unit APU will be conditioned for maximum or regular album price conditions (e. g., twelve credit units/album play) except during an award function. When select relay **SR4** is energized (so as to vend an award selection at a bargain price of, for example, six credits), switch **4S10** is opened so as to prevent the energization of solenoid **83** and therefore the shifting of ratchet segment **106** to its maximum credit removing position. By thus maintaining ratchet segment **106** in its minimum credit removal position during an award function, an amount of credits corresponding to established credits at the bargain price will be removed.

To avoid cheating during the award function of phonograph **1**, the previously described switch **89** (controlled by motor APUM, FIGURE 3) and switch **83'** (controlled by subtract shift solenoid **83**, FIGURES 3 and 8) are provided in series with select relay **SR4** (between terminal **T10** and a terminal **T40**, which is connected by a lead **91**, shown in FIGURES 3 and 2, to terminal **T21**) so as to provide an independent route for the energization thereof. If subtract shift solenoid **83** has not operated (i.e., if switch **83'** remains closed, as during an award function), closing of switch **89** (by operation of pricing motor APUM) will serve to provide an alternate path of energization for select relay **SR4**. This insured energization of select relay **SR4** wil prevent a customer from disconnecting line power to phonograph **1** in an effort to de-energize select relay **SR4** and thereby to prevent switches **4S4–7** from functioning to shift the write-in selection to circuits **RS1** and **RS2**. The customer might desire to attempt this maneuver in order to obtain a non-bargain album selection at the bargain price. Thus, switch **89** will close upon commencement of rotation of motor APUM and switch **83'** will remain closed (so long as subtract shift solenoid **83** has not been energized so as to open switch **83'**), whereby select relay **SR4** will remain energized even if the line power is disconnected and reconnected to phonograph **1**. It should be understood that in the described arrangement subtract shift solenoid **83** will be engerized only when a regular price album play is selected and will not be energized whenever a bargain award is selected (i.e., by virtue of the normally closed status of switch **4S10** controlled by select relay **SR4**).

The operation of the previously described circuitry and mechanical elements may be briefly summerized in the following manner. Normally, scan award panel **SP** of phonograph **1** will display the flashing facsimilies **13**, one at a time, in an apparently random scan pattern (via stepping rotary switch **RS**, operating in conjunction with switch **SCS2**), as motors **TCM** and **SCM** both continuously operate. In this manner, the customer's attention is directed to the series of potential award selection repre-

sented by the flashing fascimiles 13. When the customer deposits coins in phonograph 1 and thereafter selects an ordinary record play of his choice, conditioning credit switches CS1–2 will cause power discharge system PD to activate start relay SR1, which in turn activates scan control relay SCR2 (via switch 1S2), so as to condition phonograph 1 for the vending of an award selection. Start relay SR1, once activated, will lock-in (via switch 1S1).

When scan control relay SCR2 is thus activated, gong G sounds (via switches 2S3 and TCS3), and credit lamp CL and credit flashing lamp CFL illuminate panel P1 to inform the customer of an upcoming award availability (via switch 2S3). Simultaneously, motors TCM and SCM are conditioned for deactivation (via switch 2S4), and credit relay CR3 is also conditioned for activation (via switch 2S2, in series with normally opened album award credit switch ACS). Scan control relay SCR2 also functions (via switch 2S1) to commence discharge of power discharge system PD across slow discharge resistor SDR.

As soon as rotary cams TCC and SCC are properly orientated (if indeed such proper orientation did not happen to occur exactly when relay SCR2 was activated), motors TCM and SCM both cease rotating (via switches TCS1 and SCS1), and the scanning function ceases so as to determine the availability of a given one of the award selections (via circuits RS1–2). The facsimile corresponding to the said given one of the award selections is "spotlighted," and so far as the customer is aware, the determination of this given "spotlighted" selection as the available award (by virtue of the angular positioning of timing cam TC) is arbitrary and random.

Also, as soon as motors TCM and SCM cease rotating, the start circuit for start relay SR1 is open-circuited to prevent an award based on an award (via switch TCS5). Also, gong G sounds again (via switch TCS3), and simultaneously award lamp AL illuminates panel P2 (via switch TCS2) to inform the customer that the particular selection corresponding to the "spotlighted" facsimile may be purchased at a bargain price by depositing suitable coins and then operating award button AB. Thermal relay system TR is simultaneously activated (also via switch TCS2) to start a predetermined award purchase time running against the customer. If the customer does not establish bargain credits by suitable coin deposits within the award purchase time, the conditioned award will be erased, as thermal relay system TR deactivates start relay SR1 (via switches TS1–2); however, if album award credit switch ACS is closed by the establishment of bargain credits within the award purchase time, thermal relay system TR will itself be deactivated (via activation of credit relay CR3, which controls switches 3S3–4) so as to stop the running of the award purchase time.

As indicated, credit relay CR3 is activated when album award credit switch ACS is suitably closed. Simultaneously, select relay SR4 is conditioned for activation (via activation of credit relay CR3 and the conditioning status of switches TCS4 and SCS3 attributable to the deactivated status of motors TCM and SCM) and in fact is so activated when the customer operates award button AB. Activation of credit relay CR3 serves to prevent an award by deactivating the start circuit for start relay SR1 (via switch 3S1) and, as previously indicated, to deactivate thermal relay system TR (via switches 3S3–4).

Likewise, activation of select relay SR4 deactivates power discharge system PD (via switch 4S3); discharges residual power in power discharge system PD across fast discharge resistor FDR (via switch 4S2); shifts the selection write-in from conventional pulsing circuits LPC and NPC to rotary switch write-in circuits RS1 and RS2, which are correlated by the positioning of motor SCM to the "spotlighted" award selection (via switches 4S4–7); and activates the bargain credit subtract functions of pricing motor APUM (via switches 4S8–9), while simultaneously open-circuiting shift solenoid 83 (via switch 4S10) so as to cause the removal of minimum credits (via ratchet segment 106). Select relay SR4, once activated, will lock-in (via switch 4S1).

The selected award is then played by phonograph 1 (via conventional means, not shown), while motor APUM (and ultimately single subtract solenoid SSS) remove the established credits (and extinguish the award conditioning status, by opening drop-out switch DOS). Also, an anti-cheat arrangement is provided (via switches 89 and 83') to insure energization of select relay SR4 during an award function. If an award selection is not made by the customer, credit removal at regular (i.e., non-bargain) prices is effected as in the foregoing manner, except that subtract shift solenoid 83 is activated (via switch 4S10) so as to cause the removal of maximum credits (via ratchet segment 106) and also to cause the deactivation of the independent energization route for select relay SR4 (via switch 83).

It will be noted that the foregoing arrangement is based upon a premise of "normal" bargain price credit removal and "exceptional" regular price credit removal (i.e., subtract shift solenoid 83 must be activated to remove regular price credits, while a deactivated status thereof functions to remove bargain price credits) since in the environment of a coin-operated phonograph of the type described herein album selections tend to be vended more often as awards than as regular price plays, and thus wear and tear on the credit subtracting elements are minimized. However, this arrangement could be readily inverted, as required.

Finally, it should be noted that the previously mentioned drop-out switch DOS (controlled by single subtract solenoid SSS of pricing unit APU) serves as a shut-off control to completely deactivate the award functions upon the final removal of credit in pricing unit APU, in the following manner. As more fully explained in the aforementioned co-pending application Serial No. 301,064, after pricing motor APUM completes one cycle of revolution and stops, solenoid SSS is energized to remove the last one or two established credit units in pricing unit APU, and this energization of solenoid SSS serves to open-circuit the hold circuit for start relay SR1, which causes scan control relay SCR2 to deactivate, thereby reactivating motors TCM and SCM and simultaneously deactivating credit relay CR3. The hold circuit for select relay SR4 is deactivated when pricing motor APUM stops (i.e., carry-over terminal T24 is then de-energized); the start circuit for select relay SR4 is open-circuited when credit relay CR3 is deactivated; and finally the independent excitation circuit for select relay SR4 is interrupted when pricing motor APUM stops (since switch 89 is then opened).

For convenience, the scan award system has been described with reference to single album award selections. However, it will be obvious to one skilled in the art that the system described herein may readily be adapted by conventional changes in selection circuitry to provide multiple award selections (e.g., two or more album award selections instead of one, or a choice of selecting from among two or more album award selections). Accordingly, the term "award selection" as used herein should be understood to encompass multiple as well as single award arrangements.

It should be understood that the invention set forth herein broadly embraces the bargain and award concepts described with reference to the operation of a vending installation and especially a coin-operated phonograph. However, the scope of the invention also contemplates the award concept in and of itself, regardless of a particular environment of use. It should further be understood that various changes, modifications, and alterations may be effected in the details and arrangements of the various elements described herein, without departing from the

spirit and the scope of the subject invention, as defined in the appended claims.

What is claimed is:

1. A scan award system for a vending installation adapted to vend award selections at a given price and comprising:
- normally activated scan means adapted when activated to continuously scan a series of potential award selections one at a time pursuant to a predetermined pattern;
- normally deactivated award conditioning means adapted upon activation to determine the availability of a given one of the award selections by deactivating the scan means;
- start means for activating the award conditioning means;
- normally deactivated award selection means adapted upon activation to vend the said given one of the award selections; and
- credit means responsive to the establishment of credit corresponding to the given price and responsive to the activation of the award conditioning means for activating the award selection means.

2. A scan award system as claimed in claim 1 and further comprising:
- timing control means operative in conjunction with the award conditioning means for determining the availability of a randomly selected given one of the award selections.

3. A scan award system for a vending installation adapted to vend award selections at a given price and comprising:
- scan means adapted to scan a series of potential award selections;
- award conditioning means adapted upon activation to determine the availability for vending of a randomly selected given one of the award selections scanned by the scan means;
- start means for activating the award conditioning means;
- award selection means adapted upon activation to vend the said given one of the award selections; and
- credit means responsive to the establishment of credit corresponding to the given price for activating the award selection means.

4. A scan award system as claimed in claim 3 and further comprising:
- first signal means responsive to the operation of the scan means for signalling the potential availability of the series of award selections; and
- second signal means responsive to activation of the award conditioning means for signalling the potential availability of a given one of the award selections.

5. A scan award system as claimed in claim 4, wherein the said first signal means comprises a series of lights, one for each of the award selections, and a rotary switch operated by the scan means and adapted to successively cause the illumination of each of the lights.

6. A scan award system as claimed in claim 3 and further comprising:
- time delay means for deactivating the award conditioning means within a predetermined time interval after the activation of the award conditioning means.

7. A scan award system as claimed in claim 6 and further comprising:
- credit responsive means for deactivating the time delay means in response to the establishment of credit corresponding to the given price.

8. A scan award system as claimed in claim 3 and further comprising:
- award sensitive means for preventing activation of the start means in response to operation of the vending installation pursuant to the vending of an award selection.

9. A scan award system as claimed in claim 3 and further comprising:
- award shut-off means for deactivating the award conditioning means in response to operation of the vending installation pursuant to the vending of an award selection.

10. A scan award system for a vending installation adapted to vend award selections at a given price pursuant to normal operation of the vending installation and adapted in addition to vend award selections at a bargain price and comprising:
- normally activated scan means adapted when activated to continuously scan a series of potential award selections one at a time pursuant to a predetermined pattern;
- normally deactivated award conditioning means adapted upon activation to determine the availability of a given one of the award selections by deactivating the scan means;
- start means for activating the award conditioning means;
- conditioning means responsive to normal operation of the vending installation for activating the start means;
- normally deactivated award selection means adapted upon activation to vend the said given one of the award selections; and
- bargain credit means responsive to the establishment of credit corresponding to the bargain price and responsive to the activation of the award conditioning means for activating the award selection means.

11. A scan award system for a vending installation adapted to vend award selections at a given price pursuant to normal operation of the vending installation and adapted in addition to vend award selections at a bargain price and comprising:
- scan means adapted to scan a series of potential award selections;
- award conditioning means adapted upon activation to determine the availability for vending of a given one of the award selections scanned by the scan means;
- start means for activating the award conditioning means;
- conditioning means responsive to normal operation of the vending installation for activating the start means;
- award selection means adapted upon activation to vend the said given one of the award selections; and
- bargain credit means responsive to the establishment of credit corresponding to the bargain price for activating the award selection means.

12. A scan award system as claimed in claim 11 and further comprising:
- bargain credit subtract means responsive to activation of the award selection means and adapted to remove the established credit corresponding to the bargain price.

13. A scan award system as claimed in claim 11 and further comprising:
- given price credit subtract means adapted to remove established credit corresponding to the given price;
- bargain credit subtract means adapted to remove established credit corresponding to the bargain price;
- shift means responsive to a deactivated status of the award selection means for activating the given price credit subtract means and for simultaneously deactivating the bargain credit subtract means.

14. A scan award system as claimed in claim 13 and further comprising:
- anti-cheat means for activating the award selection means, independently of the activation thereof effected by the bargain credit means, in response to activation of the bargain credit subtract means.

15. A scan award system as claimed in claim 11 wherein the said conditioning means comprises:
power source means;
credit means responsive to the establishment and to the removal of credit corresponding to the given price for activating the power source means; and
start signal means responsive to activation of the power source means for activating the start means.

16. A scan award system as claimed in claim 11 wherein the said vending installation comprises a coin-operated phonograph.

17. A scan award system for a vending installation adapted to vend selections at a given price pursuant to normal operation of the vending installation and adapted in addition to vend award selections at a bargain price and comprising:
normally activated scan means for successively conditioning a series of vend circuits for activation, each said vend circuit corresponding to a potential award selection;
normally deactivated bargain credit means adapted to be activated in response to the establishment of credit corresponding to the bargain price;
normally deactivated award conditioning means;
power means responsive to normal operation of the vending installation for activating the award conditioning means;
control means responsive to activation of the award conditioning means for deactivating the scan means so as to fix the availability of a randomly selected potential award selection;
award selection means responsive to activation of the bargain credit means and to activation of the award conditioning means for activating the vend circuit corresponding to the fixed potential award selection; and
credit subtract means responsive to activation of the award selection means for causing the removal of the established credit corresponding to the bargain price.

18. A scan award system for a vending installation adapted to vend selections at a given price pursuant to normal operation of the vending installation and adapted in addition to vend award selections at a bargain price and comprising:
vend conditioning scan means adapted to successively condition a series of vend circuits for activation, each said vend circuit corresponding to a potential award selection;
normally activated scan drive means for operating the vend conditioning scan means;
normally deactivated bargain credit means adapted to be activated in response to the establishment of credit corresponding to the bargain price;
normally deactivated start means;
normally deactivated scan control means;
normally deactivated select means;
power means responsive to normal operation of the vending installation for activating the start means;
means responsive to activation of the start means for activating the scan control means;
means responsive to activation of the scan control means and to activation of the bargain credit means for activating the select means;
means responsive to activation of the scan control means for deactivating the scan drive means so as to fix the availability of a given potential award selection;
means responsive to activation of the select means for activating the vend circuit corresponding to the fixed potential award selection; and
credit subtract means responsive to activation of the select means for causing the removal of the established credit corresponding to the bargain price.

19. A scan award system for a vending installation adapted to vend selections at a given price pursuant to normal operation of the vending installation and adapted in addition to vend award selections at a bargain price and comprising:
vend conditioning scan means adapted to successively condition a series of vend circuits for activation, each said vend circuit corresponding to a potential award selection;
award signal scan means adapted to successively activate a series of signal circuits, each said signal circuit corresponding to a potential award selection;
normally activated scan drive means for synchronously operating the vend conditioning scan means and the award signal scan means;
normally activated timing control means adapted upon deactivation to deactivate the scan drive means;
normally deactivated bargain credit means adapted to be activated in response to the establishment of credit corresponding to the bargain price;
normally deactivated manual selection means adapted to be manually activated by the customer;
normally deactivated start means;
normally deactivated scan control means;
normally deactivated credit means;
normally deactivated select means;
power means responsive to normal operation of the vending installation for activating the start means;
means responsive to activation of the start means for activating the scan control means;
means responsive to activation of the scan control means and to activation of the bargain credit means for activating the credit means;
signal means responsive to activation of the scan control means for signalling to the customer the availability of a potential award selection;
means responsive to activation of the scan control means for deactivating the timing control means and thereby the scan drive means so as to fix the availability of a given potential award selection;
means responsive to activation of the credit means for deactivating the start means;
means responsive to activation of the credit means and to activation of the selection means for activating the select means;
means responsive to activation of the select means for deactivating the power means;
means responsive to activation of the select means for activating the vend circuit corresponding to the fixed potential award selection; and
credit subtract means responsive to activation of the select means for causing the removal of the established credit corresponding to the bargain price.

20. A scan control system for fixing the position of a rotary switch adapted to continuously scan a series of contacts and comprising:
scan control motor means adapted to rotate at a first given rate of revolution and thereby to drive the rotary switch;
timing control rotary cam means;
timing control motor means adapted to rotate at a second given rate of revolution and thereby to drive the timing control rotary cam means;
means connecting the scan control motor means and the timing control motor means in parallel;
source means adapted to connect the parallelly connected motor means to a power supply; and
timing control switch means connected in series between the timing control motor means and the source means and adapted to be closed during one portion and to be opened during another portion of the cycle of revolution of the timing control rotary cam means,
whereby the scan control motor means and the timing control motor means may be simultaneously de-energized so as to fix the position of the rotary switch

only when the timing control switch means is opened by the timing control rotary cam means.

21. A scan control system as claimed in claim **20** and further comprising:

scan control relay means; and

normally closed scan control relay switch means connected in parallel with the timing control switch means and adapted to be opened upon energization of the scan control relay means,

whereby the scan control motor means and the timing control motor means may be simultaneously de-energized only when the timing control switch means is opened by the timing control rotary cam means and when the scan control relay switch means is opened by energization of the scan control relay means.

22. A scan control system as claimed in claim **20** and further comprising:

scan control rotary cam means adapted to be driven by the scan control motor means synchronously with the first given rate of revolution; and

scan control switch means connected in parallel with the timing control switch means and adapted to be closed during one portion and to be opened during another portion of the cycle of revolution of the scan control rotary cam means,

whereby the scan control motor means and the timing control motor means may be simultaneously de-energized so as to fix the position of the rotary switch only when both the scan control switch means and the timing control switch means are both opened by the respective scan control rotary cam means and the timing control rotary cam means.

23. A scan control system as claimed in claim **20** and further comprising:

scan control rotary cam means adapted to be driven by the scan control motor means synchronously with the first given rate of revolution;

stepping means responsive to operation of the scan control motor means for driving the rotary switch stepwise from contact to contact of the series of contacts by holding the rotary switch for a predetermined interval in alignment with a given contact; and

scan control switch means connected in parallel with the timing control switch means and adapted to be opened by the scan control rotary cam means whenever the rotary switch is in alignment with a given contact and otherwise to be closed thereby,

whereby the scan control motor means and the timing control motor means may be simultaneously de-energized so as to fix the position of the rotary switch in alignment with a given contact only when both the scan control switch means and the timing control switch means are both opened by the respective scan control rotary cam means and the timing control rotary cam means.

24. A scan control system as claimed in claim **23** and further comprising:

scan control relay means; and

normally closed scan control relay switch means connected in parallel with the timing control switch means and adapted to be opened upon energization of the scan control relay means,

whereby the scan control motor means and the timing control motor means may be simultaneously de-energized to fix the position of the rotary switch in alignment with a given contact only when both the scan control switch means and the timing control switch means are both opened by the respective scan control rotary cam means and the timing control rotary cam means and when the scan control relay switch means is opened by energization of the scan control relay means.

References Cited by the Examiner

UNITED STATES PATENTS

2,285,061	6/1942	Shoemaker	194—15
3,173,530	3/1965	Lord	194—2
3,185,279	5/1965	Spears	194—1

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