SWITCHING SYSTEM FOR REMOTE PHONOGRAPH REPRODUCING UNIT

Filed April 8, 1966

Inventors
Fred H. Osborne
Robert J. Pfister
By: Osborne, Pfister
Wolfe & Bushnell
This invention relates to the art of automatic, specifically coin-operated, phonographs, and more particularly to a remote unit, or wallbox, as associated with such apparatus.

Coin-operated automatic phonographs, often referred to as "juke boxes," are often provided with remote control units, commonly mounted on the wall in a booth or next to a table, and usually referred to as "wallboxes." Several wallboxes may be associated with each phonograph. When wallboxes were first developed, the number of selections available on a phonograph was usually rather limited, such as one, or perhaps two, dozen. Cables would run from each wallbox to the main phonograph apparatus, there being one wire for each selection, plus a common ground or return. Modern coin-operated automatic phonographs more typically run on the order of one hundred to two hundred selections. Obviously, a cable with a wire for each selection would be cumbersome and prohibitively expensive. Hence, it is fairly common practice to use a code-sending device in a wallbox, typically sending a series of pulses in accordance with the selection that has been made and operating a receiving unit in the main phonograph apparatus to make the selection on the master selection apparatus therein.

In one successful commercial apparatus the wallbox includes a motor-driven commutator having a series of patches thereon. The patches are interconnected with letter and number buttons on the front of the wallbox, and the energized, or "hot," patches are determined by which buttons are pressed. When a coin has been dropped in the slot and a pair of push buttons (one letter button and one number button) has been depressed, the motor starts and runs through a full cycle of the commutator driven thereby, the "hot" or energized patches determining the code signal which is sent from the wallbox to the main phonograph apparatus.

Some wallboxes simply are able to exert remote control on the main phonograph, and patrons must listen to the sound emanating from the loudspeakers of the main phonograph, or perhaps from extension speakers attached thereto. This is often satisfactory for smaller installations, or in installations in which the physical layout of the premises is appropriate. However, many modern wallboxes also incorporate loudspeakers, in some instances stereophonic loudspeakers.

There are also systems in which a phonograph plays constantly and a wallbox loudspeaker is switched on for a predetermined time period when a coin is deposited. It has been found popular with patrons to provide a loudspeaker which is switched on whenever a patron deposits money and makes a selection, and which thereafter remains on to play music from the main phonograph as long as the main phonograph continues to play, irrespective of whether the credit and selections on the main phonograph have been made from the particular wallbox in question (other than the first selection which starts the wallbox loudspeaker in operation). However, such loudspeaker-equipped wallboxes have presented certain problems. The control of the loudspeaker or loudspeakers heretofore has been by way of relays, and the relays drop out if the power is interrupted in any manner, such as by accidental unplugging of the main phonograph apparatus. Such relays also add substantially to the cost of the wallbox installation. Furthermore, perhaps a more serious objection is that once a loudspeaker has been placed in operation, it is impossible under normal circumstances to remove it completely from operation until all credit has been used on the main phonograph apparatus and the playing of selections has ceased.

Accordingly, it is an object of the present invention to provide a loudspeaker-equipped-wallbox with a simplified switching system for switching the loudspeaker when a selection is made and keeping it on as long as credit remains or playing continues in the main phonograph, which switching system adds a minimum of cost over a similar wallbox in which the loudspeaker is at all times connected to the main phonograph.

It is further an object of the present invention to provide a loudspeaker-equipped-phonograph wallbox wherein switching turns the loudspeaker on when a selection is made, and wherein the loudspeaker remains switched on irrespective of interruptions in power until the main phonograph has stopped playing and all credit therein is used.

Another object of the present invention is to provide a loudspeaker-equipped-phonograph wallbox in which a patron can turn off the loudspeaker for a period of silence whenever desired.

Other and further objects and advantages of the present invention will be apparent from the following description when taken in conjunction with the drawing illustrating a preferred embodiment of the present invention, the drawing being largely in schematic form.

In the drawing, the main phonograph is shown at 10, and this phonograph is largely of conventional nature. By way of specific example, for anyone who may wish to delve into the details of the main phonograph, the Wurlitzer Model 2900 phonograph is cited as exemplary. The phonograph has a power supply 12 illustrated as having an output at a of 24 volts A.C. There is also a ground connection provided at a. The phonograph further is provided with a ground switch 14 which is controlled by the mechanism in the phonograph so that the switch is open while the phonograph is playing or while there is credit on the phonograph, and is closed only when the phonograph is in completely idle position, as with all credit used and all selections through playing. The switch is grounded on one side, and on the other side is provided with an output indicated at c.

The phonograph 10 further includes record-playing equipment (not shown) and a stereophonic audio system 16. The stereophonic audio system is provided with a grounded common output, and with channel A and channel B outputs, the latter two outputs being indicated at A and B and the grounded common output being indicated at G.

The wallbox is indicated at 18, and there are additional like wallboxes 20, 22 et seq. The exact number of wallboxes is not germane to the present invention. The internal construction of all of the wallboxes is the same, and essential parts thereof are illustrated in connection with wallbox No. 1 as indicated at 18.

The wallbox includes a motor 24, including a field winding 26 and a rotor or armature 28. One end of the field winding 26 is connected at a to the 24-volt line from output terminal a of the main phonograph. It will be observed that the same terminal aa is indicated also in wallbox No. 2 and wallbox No. 3, similar terminals being provided in all wallboxes. The opposite end of the field winding 26 is provided with a junction point 30, and two connections are taken therefrom as illustrated and as hereinafter will be discussed.

The armature or rotor 28 drives a shaft 32, the
shaft being illustrated schematically, and the drive preferably being through reduction gearing (not shown). The drive shaft 32 drives the commutator portion of a motor controller and pulse sender commutator illustrated schematically at 34. This mechanism as well as the motor and most of the parts of the wallbox are known in the art, and reference is made for illustrative details to wallbox Model 5220 manufactured and sold by The Wurlitzer Company. There is also a credit cancel mechanism 36 interconnected with the motor controller and pulse sender commutator, and also illustrated schematically. As a practical matter, the motor controller and pulse sender commutator comprises an insulating board with a multi-contact commutator armature rotated thereon and with the commutator armature contacts engaging various paths on the board. The rotating system is provided with peripheral cam teeth which operate the credit cancel mechanism.

The shaft 32 also drives a push-button reset cam 38 which serves to reset the selection buttons on the wallbox which have been depressed.

The rotor cam indicated at 40 is mounted on and driven by the shaft 32. This cam is mainly circular in outline and is provided with a protuberance 42 in the form of a ramp with a shoulder providing a rapid drop-off. The protuberance 42 opens a normally closed switch 44, one contact of which controls various functions of the wallbox, the functions being illustrated schematically at 46 and not pertinent to the present invention, except that the same cam is used for an additional purpose hereinafter to be described. The other side of the switch 44 is connected to ground by way of wallbox contacts 66 leading to the terminal or contact b of the main phonograph power supply.

The cam 40 further is provided with a notch 48 having a sharp drop-off and a gradual rise thereafter. The notch 48 controls the operation of a switch generally designated by the numeral 56, and having several normally open contacts. The switch includes an insulating base 52 and a switch blade 54 bearing contact 55 and 58 riding on the periphery of the cam 40. The blade 54 is disposed adjacent to a blade 60 having a contact 62 positioned for cooperation with the contact 56, but normally spaced therefrom. The blade 60 on its back side carries a contact 64 cooperable with a contact 66 on a third blade 68. All of the contacts just mentioned normally are out of engagement.

The blade 54 is connected to a ground line 70 leading to contact G and from thence leading to terminal G of the stereophonic audio system in the main phonograph. Blades 60 and 68 respectively lead to the loudspeakers 72 and 74, forming ground return and anode connections for each loudspeaker from the phonograph to the wallbox, with connections from this point being made to the terminals A and B of the stereophonic audio system of the main phonograph. As will be apparent, when the contacts 56, 62, 64, 66 are held out of engagement by the cam 40, the ground circuit to the anode and the com of the loudspeakers to terminals A and B of the wallbox is broken, with no sound emanating therefrom. Conversely, when the follower 58 falls into the notch 48 the contacts engage one another, and there is a ground return, whereby musical and the like signals from the stereophonic audio system will be transduced into audible sound by the loudspeakers 72 and 74.

In addition to the blades and contacts mentioned heretofore, the switch 50 includes a blade 80 spaced from the foregoing blades and having a plastic or other suitable insulating block 82 extending from the blade 80 to the follower 58, whereby the blade 80 is fixed along with the blade 54. The blade 80 carries a contact 84 normally spaced from, but engageable with, a contact 86 on a fifth blade 88. The blade 88 is connected by means such as a wire 90 to the previously mentioned junction 39 at the end of the motor winding 26 from whence the connection is made to the motor controller 34. The blade 80 is connected to the terminal cc of the wallbox and hence to the terminal c of the switch 14 in the main phonograph.

In the normal state of rest of the wallbox, the contacts of the switch 50 are all out of engagement with one another, and no sound comes from the loudspeakers 72 and 74, even though the main phonograph may be playing. When a coin is dropped in the coin mechanism and selection is made by pushing a pair of push-buttons on the wallbox, the motor controller and pulse sender commutator causes the motor 24 to run, and thereby to send pulses to the main phonograph to make the selection therein. The motor controller causes the motor to stop when the cam 40 in the position shown by which the contacts 56, 62 and 64, 66 are closed, thereby placing both loudspeakers 72 and 74 in circuit so that the record being played in the main phonograph will be heard at the wallbox. It will be observed that an additional circuit is set up to the field winding 26 of the motor through the switch contacts 84, 86, 25 and 26, in such fashion that until the follower 58 and plastic block 82 have run up onto the outer periphery of the cam with the circuit is not completed due to the open switch 14.

When the number selected from the wallbox has ceased playing, the parts in the wallbox, notably the cam 40, will stay in the position shown indefinitely, as long as credit remains in the main phonograph, or selections remain to be played in the main phonograph. However, when all of the credit and selections in the main phonograph are finally exhausted, the switch 14 will close. For example, in the Wurlitzer phonograph identified heretofore, the switch 14 is associated with the wobble plate in the selector mechanism, and closes when all of the credit and selections are used. This completes the circuit to the field winding 26, and causes the motor to run until the follower 58 and plastic block 82 have run up onto the outer periphery of the cam 40, whereby to open the switches, thereby opening the motor circuit, and also removing the loudspeakers from circuit.

The design and construction of the motor controller and pulse sender commutator as existing prior to the present invention in accordance with the wallbox previously identified is such that the cam stops in the position shown in the drawing with the lobe 42 opening the switch 44. In accordance with the present invention, the notch 48 has been provided in exactly the position shown so that the various contacts of the switch 50 will engage one another with the cam so it stops. It will be understood that the parts stop in this position when the credit deposited in the wallbox has been used. For example, if a dime has been deposited and one selection made, the parts stop as shown. However, if credit remains on the wall, such as, for example, 25c having been deposited (it is common practice to give one play for a dime and three plays for a quarter), after one selection has been made the motor shaft 32 turns a few degrees past the stopped position shown in the drawing. The design of the notch 48 is such that the follower 58 and plastic block 82 would be up on the periphery of the cam with the motor shaft stopped in this position. Hence, the wallbox will not play, and this draws the patron's attention to the fact that there is credit remaining and he should make another selection.

The foregoing example wherein the parts stop with the notch 48 beyond the switch followers with less than all of the credit exhausted in the wallbox gives rise to another important advantage. In this case, the coin box would be seated adjacent to a wallbox which is already playing, and the patron for one reason or another would not care to listen. Also, it might be that a particular selection would appear on the main phonograph which the patron would not care to listen to. The patron can purchase an indefinite number of selections with a coin and the coin box. This causes the motor controller and pulse sender commutator 34 to advance the motor shaft a few degrees, and in this position the follower 58 and
block 82 are on the main periphery of the cam and out of the notch, as previously explained. In this position the contacts 56, 62 and 64, 66 are open and the loudspeaker 72 and 74 are silent. To many patrons, this is an extraordinary great advantage. Furthermore, the time of silence purchased is not any finite, short, time, but is whatever the patron may choose. When the patron, after purchasing a period of silence, wishes to make a selection, he may do so, and this registers his selection on the main phonograph and brings the loudspeakers 72 and 74 into circuit.

It will be understood that volume control apparatus may be provided for the loudspeakers if so desired. This is quite conventional in nature, and therefore is not specifically illustrated. The manner in which the motor controller and pulse sender commutator operates the credit cancel mechanism also is known, and hence is not shown. Indeed, conventional parts have been shown entirely in schematic fashion to avoid obscuring the present invention and the mechanically simple execution thereof.

It will be understood that the wallboxes 20 and 22 and any other similar wallboxes are identical in construction with the wallbox 18 and are connected to the main phonograph in parallel therewith, with the connections being from the lettered terminals exactly as shown and described in connection with the wallbox 18.

The specific example of the invention as herein shown and described will be understood as being for purposes of illustration only. Various changes in structure will doubtless occur to those skilled in the art and will be understood as comprising a part of the present invention so far as they fall within the spirit and scope of the appended claims.

The invention is claimed as follows:

1. A switching system for interconnecting a coin-operated remote phonograph reproducing unit, including loudspeaker means, with a main phonograph at which records are selected and played, comprising motor means in said remote unit, motor control means in said remote unit connected to said motor means for operating said motor means in predetermined manner as an incident to the making of a selection in said remote unit, a cam in said remote unit operatively connected to said motor means, said motor control means stopping said motor means with said cam in a predetermined position following the making of a selection, audio switch means operatively connected with said cam and closed with said cam in said predetermined position to establish a power circuit to said motor means, power means in said main phonograph, switch means in said main phonograph open when said main phonograph is operating and closed when said main phonograph stops operating, and means interconnecting said main phonograph switch means, said power means, said remote unit power circuit to run said motor means and thereby to advance said cam a predetermined increment to open said audio switch means and said motor switch means to de-energize said motor means and to de-activate said loudspeaker means upon closing of said main phonograph switch means.

2. A switching system as set forth in claim 1 wherein said remote phonograph reproducing unit is of a type having selection-setting mechanism, commutator means for sending code signals corresponding to the selections in the main phonograph, and credit cancelling mechanism, wherein said motor means drives said commutator means, and operates mechanism to cancel credit in said credit mechanism and to re-set the selection-making mechanism.

3. A switching system as set forth in claim 1 wherein said audio switch means and said motor switch means comprise separate switch sections of a common switch.

4. A switching system for interconnecting a coin-operated remote phonograph reproducing unit including a pair of stereophonic loudspeaker means with a main phonograph at which records are selected and played, comprising motor means in said remote unit, motor control means in said remote unit connected to said motor means for operating said motor means in predetermined manner as an incident to the making of a selection in said remote unit, a cam in said remote unit operatively connected to said motor means, said motor control means stopping said motor means with said cam in a predetermined position following the making of a selection, stereophonic audio means in said main phonograph, audio switch means in said remote unit, a common ground for said stereophonic loudspeaker means, means interconnecting said stereophonic loudspeaker means, said audio switch means, and said common ground to provide a ground return for said stereophonic loudspeaker means with said audio switch closed, said audio switch being closed with said cam in said predetermined position, additional circuit means respectively interconnecting said stereophonic loudspeaker means and said stereophonic audio means, motor switch means operated by said cam and closed with said cam in said predetermined position partially to establish a power circuit to said motor means, power means in said main phonograph, switch means in said main phonograph open when said main phonograph is operating and closed when said main phonograph stops operating, and means interconnecting said main phonograph switch means, said power means, and said remote unit power circuit to run said motor means and thereby to advance said cam a predetermined increment to open said audio switch means and said motor switch means to de-energize said motor and to de-activate said loudspeaker means upon closing of said main phonograph switch means.

5. A switching system as set forth in claim 4 wherein said audio switch means includes first and second contacts respectively connected to said pair of stereophonic loudspeaker means and further including ground contact means electrically engageable with said first and second contacts with said cam in said predetermined position.

References Cited

UNITED STATES PATENTS

2,538,358 1/1951 Farrell \[340—162 X

SAMUEL F. COLEMAN, Primary Examiner.