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PHONOGRAPH REPRODUCING SYSTEM

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My invention relates in general to a phonograph reproducing system and more specifically to a system in which information as to the deposit of coins and a selection of records desired may be transmitted to a central station from a remote station and recorded, and wherein the attendant at said central station may then cause transmission of the recordings on the desired records to the customer at the remote station, and exercise certain controls over the equipment at the remote station.

Among the features of the present invention are the provision of an electric circuit extending between the stations over which phonograph music or the like may be transmitted and the provision of an impulse sender and coin operated contacts at the remote station by means of which the customer may deposit coins to pay for a plurality of record selections and then transmit, by means of the sender, a series of numbers to the attendant at the central station, to indicate thereat the record selections desired.

I have further provided a circuit superimposed on the said electric circuit by means of which signals are transmitted to the central station when the coins are deposited and over which the selection impulses are transmitted, together with means at the central station for setting up certain credit units when coins are deposited and subtracted from such units upon receipt of and recording of record selection numbers.

I have also provided means at the central station operative upon deposit of coins to permit the transmission of numbers to the central station, and for preventing further transmission of such numbers after the credit established by the deposited coins is used up. There is also means for controlling the loud speaker and amplifier at the customer's station from the central station over the superimposed circuit to reproduce the records at that point.

Other features of novelty relating to the inter control over the electric circuit from the customer's station to the central station will be apparent from the following detailed description.

In the single figure of the drawing I have shown an electric circuit extending from a customer's station C to a central or attendant's station A. At the customer's station C is the loud speaker LS with its usual amplifier shown in block form and connected to said circuit by the transformer T. A coin controlled pair of contacts Y and Z are included in the customer's equipment as well as a calling device or impulse sender CD, and a pair of control relays 1 and 2.

The calling device CD is of standard type such as shown in U. S. Patent No. 1,642,822, issued September 20, 1927, to H. F. Obergfell, and has a set of off normal springs which disconnect the relay 1 when the finger hole dial of the device is first operated and maintains the connection to the impulse sending springs until the dial returns to normal position. The impulse springs 20 are of the make type instead of the break type. The coin controlled springs Y and Z may be a part of any known form of coin control device. The only mechanism required being a coin chute through which the coin travels to a collect box and during its travel successively operates the springs Y and Z in the order named.

At the central station the transformer T1 connects the said circuit having conductors 10 and 11 to the usual phonograph amplifier of the phonograph (not shown) by means of which the attendant may play any of a stock of records for transmission through the phonograph amplifier to the remote station. A set of springs N are associated with the phonograph in any desired manner so that these springs are closed when all of the records placed in the phonograph have been played. The springs N cause the operation of a signal S at the central station and send a terminating signal over a simplex circuit to the customer's station to restore the same to its normal condition. Also at the central station is an adding and subtracting credit switch indicated generally at CS having a credit magnet CM and a debit magnet DM as well as a set of off normal springs ON. The switch CS may be of any desired type, such as shown in U. S. Patent No. 2,057,911, issued October 10, 1936, to H. F. Obergfell, in which one magnet CM steps the springs ON one step forward for each coin deposited away from circuit opener P thus opening the springs ON on the first step, while the other magnet DM steps the device P one step forward for each impulse until the springs ON are again opened. In the present case DM is operated once for each two digits of impulses sent in by a customer to indicate a record selection. The springs ON will therefore be closed when the first coin is deposited and opened when as many pairs of digits have been transmitted as there have been coins deposited.

In addition there are a group of control relays 3—8 at the central station, and a pen register, only the operating magnet of which is shown at 9. This pen register may be of any desired type wherein a moving tape is marked with a short dash line for each impulse received so that if

the number 22 is transmitted by the calling device CD then two sets of two impulses each will be transmitted and two short dash lines followed by a short space and two more short dash lines will appear on the tape.

I will now describe the detailed operations of the circuit arrangements. When a customer at station C desires to hear a selection of records he first deposits a number of coins one for each record to be played. Each coin first closes spring Y and later springs Z. The first closure of the main spring 12 with spring 13 completes a circuit from ground through transformer secondary of T2, condenser C2, springs 13 and 12, over the simplex circuit including the two halves of the secondary winding of T in parallel, conductors 10 and 11 in parallel, halves of primary winding of T1 in parallel, condenser C1, A. C. relay 6, and ground. The primary of transformer T2 is connected to commercial 110 volts A. C. current and is so designed that approximately 25 volts of A. C. is produced in the secondary and therefore in the above traced circuit. When this circuit is closed relay 6 is energized and by means of its springs 14 completes a circuit for adding or credit magnet CM of the adding and subtracting unit CS over a circuit extending from ground through springs 14 and magnet CM to battery. The connections shown as arrows to the various magnets such as CM and to other relays at the central station indicate connections to a central battery of approximately 75 volts D. C. at the central station. This battery may, of course, be any type of current supply having one pole grounded and the other connected to the various elements as indicated. The operation of magnet CM closes the off normal springs ON and in turn causes energization of relay 7 over the obvious circuit. Relay 7 upon energizing completes the circuit of a signal or credit lamp L at springs 15 and prepares a circuit for relay 3 at springs 16. Each deposited coin causes a further operation of relay 6 and therefore a further operation of credit magnet CM to step springs ON farther away from the element which opens them. As shown in the patent these springs ON cannot be closed again until magnet DM has operated as many times as magnet CM was operated. Returning now to the operation of springs Y by the dropping of the coins, this operation is only momentary and when spring 12 restores to its back contact and after relay 7 in the central station has operated, a circuit is completed from ground through relay 1 in the customer's circuit, normal springs 17 and 18 of calling device CD, spring 12 and its back contact, over the simplex circuit to the central station, through springs 16 and relay 3 to battery. Relays 1 and 3 are of such resistance that they will not operate when in series with each other over this circuit. Each coin after operation of springs Y as described also momentarily operates springs Z as it passes on through the coin chute. This completes a circuit from ground through secondary of transformer T2, condenser C2, through springs 21 and A. C. relay 2 to ground. The 25 volt alternating current from T2 causes operation of A. C. relay 2 over this circuit. Relay 2 locks itself energized over a circuit including its own make springs 22, back contacts 23 of relay 1, and condenser C2 to transformer T2, and also by closure of springs such as 24 and 25 connects the usual power source to the amplifier for the customer's loud speaker LS to activate the same.

After the coins have been deposited for as many

record selections as the subscriber desires, he may then dial the two digit numbers of a corresponding number of record selections. Assuming three coins to have been deposited, then three two digit numbers such as 12, 22 and 26 may be sent by calling device CD to indicate that the customer desires to have the correspondingly numbered records played by the attendant.

Each operation of the calling device CD causes closure of springs 18 and 19 on the forward movement of the finger hole dial and subsequent backward movement causes closure of impulse springs 20 a number of times in accordance with the digit transmitted. The circuit over which impulses are transmitted extends from ground at the calling device through impulse springs 20, springs 18 and 19, coin spring 12 and its back contact, over the simplex circuit and through springs 16 and relay 3 to battery at the central station. Relay 3 energizes over this circuit to close springs 26 to in turn complete the obvious circuit for pen register print magnet 9 and slow relay 4 in parallel. Relay 4 is slow to release and holds its armature attracted throughout the operations of relay 3 for each digit. Magnet 9 however follows the operations of relay 3 and records the digit on the tape in short dash lines thereon. The energization of relay 4 closes springs 27 to complete a circuit from ground through said springs, springs 29 and 30, and through lower windings of relays 5 and 8 in multiple to battery. A branch of this circuit extends through springs 31 and 32 and the upper winding of relay 8 to battery. Relays 5 and 8 are differentially wound so that when one winding alone is energized the armature is attracted while when both windings are energized they oppose each other and the armature falls back. In the present case relay 5 pulls up to close springs 28 and 30 and open springs 29 and 30, thereby closing an obvious locking circuit for its lower winding and holding the lower winding of relay 8 energized. Relay 5 also closed one point at 35 in the circuit of debit or subtracting magnet DM of the credit switch CS. This condition exists until all impulses of a digit have been transmitted and recorded on the pen register and until the calling device CD returns to normal to open springs 18 and 19. At that time the circuit of relay 3 is opened long enough for relay 4 to fall back and open springs 27. This opens the circuit of the upper winding of relay 8 at springs 27, both lower windings being still held energized over the circuit including springs 28 and 30. Relay 8 now attracts its armature to close springs 34, open springs 31 and 32 and close springs 31 and 33. Springs 34 prepare another point in the circuit of magnet DM which is still open at springs 27 and also prepares a circuit for upper winding of relay 5 at springs 31 and 33. The transmission of the next digit by CD again causes intermittent operation of relay 3 to record a second digit on the pen register and causes a second energization of relay 4 during such transmission. Energization of relay 4 again closes springs 27 to complete the prepared circuit of magnet DM from ground through springs 27, 35, and 34, and magnet DM to battery, and also completes a circuit through springs 27, 31 and 33 for the upper winding of relay 5. Relay 5, having its windings opposed, now retracts its armature to open springs 28 and 30 and close springs 29 and 30 and open springs 35. Springs 29 and 30 close before springs 28 and 30 open and therefore both lower windings of relays 5 and 8 are still held energized. Springs 35 open

the circuit of magnet DM which deenergizes to complete the operation of subtracting one credit from those recorded on the switch CS by moving the element P one step nearer to its position where it can again open springs ON. After the impulses of this digit cease relay 3 again remains deenergized long enough for relay 4 to fall back and open springs 27. At this time the circuits of both windings of relay 5 are opened and the circuit of the lower winding of relay 8 is opened. Relay 5 remains in retracted position and relay 8 now falls back to open its springs 34 and again close springs 31 and 32 and open springs 31 and 33. These two relays 5 and 8 have now completed a cycle of operations whereby the transmission of two digits has caused a single operation of magnet DM. As soon as the same number of pairs of digits have been received as there have been coins deposited then the element P has moved forward as many steps as the springs ON were moved by the deposit of coins and the springs ON are again opened. The opening of these springs opens the circuit of relay 7 which falls back to open springs 16 to prevent further operation of relay 3 over the impulse circuit and therefore prevent the recording of further selections on the pen register. Relay 7 also opens springs 15 to darken lamp L to indicate that the number of selections paid for have been sent in.

The attendant may now place the desired records, as indicated by the recorded numbers, on the phonograph so that the music will be transmitted over the amplifiers and loud speaker to the customer. The spring combination N is so arranged that when the last record desired has been completely reproduced then these springs close to operate the signal S for the attendant to remove the records and to connect battery through springs 36 over the simplex circuit, spring 12 and its back contact, springs 18 and 17, and relay 1 to ground. Relay 1 energizes over this circuit to open springs 23 in the locking circuit of relay 2, causing said relay to remove the power from the customer's amplifier and restore it to normal.

It will thus be seen that units of credit are established at the central station by the deposit of coins and the consequent operation of credit magnet CM and that each two digits transmitted to the central station operate the debit magnet DM to reduce the established credit by one unit. When credit is thus exhausted the springs ON cause deenergization of magnet 7 to open the receiving circuit to prevent the transmission of further record selecting digits.

Having fully described the features of the system and the detailed operation thereof what I consider to be novel will be set forth in the appended claims.

I claim:

1. In a phonograph reproducing system, a record playing station, a circuit over which music or like recordings are transmitted from said station, coin operated means for transmitting coin impulses over said circuit in response to the deposit of coins to establish units of credit at said station, means for transmitting a plurality of series of selection impulses corresponding to a series of digits over said circuit to indicate record selections at said station, means at the station responsive to each pair of series of impulses transmitted for subtracting one unit of credit from the units established, and for preventing the

transmission of further selection impulses corresponding to digits when the established credits have been exhausted.

2. In a phonograph reproducing system, a phonograph connected over a circuit to a loud speaker, coin operated contacts and an impulse sender, means responsive to operation of said contacts by the deposit of a plurality of coins for rendering the loud speaker operative and preparing an impulsing circuit over said connecting circuit, means responsive to the transmission of impulses of a plurality of digits over the prepared circuit by said sender for indicating a record selection and for opening the prepared circuit when a certain number of digits have been transmitted dependent on the number of coins deposited, and means for signalling the attendant and rendering the loud speaker ineffective upon the completion of the playing of the last record of the selection.

3. In a record selecting system, a control station and a remote station, record selecting and credit recording means at the remote station, a two conductor trunk connecting said stations, coin operated means at the control station for transmitting impulses of alternating current over the conductors of the trunk to operate the credit means at the remote station, means controlled by the credit means for connecting said selecting means to said conductors, means in the control station for transmitting impulses of direct current over said conductors to operate the selecting means to select records, and means for transmitting recorded matter from the selected records over the conductors of said trunk to the control station.

4. In a record selecting system a control and a remote station, a trunk circuit linking said stations and comprising only two conductors, a reproducer connected to one end of the circuit and a loud speaker connected to the other end thereof, a control circuit superimposed on said trunk circuit, credit storing and subtracting means at the remote station and record selecting means thereat, means controlled by the deposit of coins at the control station for controlling the credit means over said superimposed circuit to store units of credit, means controlled by said credit means for preparing a circuit for said selecting means including said superimposed circuit, and means in the control station for controlling said prepared circuit to perform record selections as long as credit units are stored at the remote station and cause transmission of the recorded matter over said trunk circuit.

5. In a record selecting system, a control and a remote station linked by a two conductor trunk, record selecting means at the remote station and credit recording means thereat, a circuit including said conductors controlled from the control station to operate the recording means to store credit units and prepare a circuit for the selecting means over said trunk, means at the control station for transmitting impulses corresponding to digits over said prepared circuit to select records, each two series of digits causing a record selection and causing operation of the recording means to subtract a unit of credit from the units stored thereon, and means for transmitting the recorded matter on the selected records over said trunk conductors to the control station.

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