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MULTISELECTIVE PHONOGRAPH

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This invention relates to multiselective phonographs and has for its principal object to provide such a phonograph which can readily be put into operation to reproduce a program of recordings in a definite order which can be predetermined by the operator when putting the machine into operation.

In accordance with the present invention I provide an individual token for each recording in the phonograph. The tokens may be in the form of flat members so that they can easily be stacked one on top of the other. Each token may bear a number or title of the recording which it controls. The tokens are arranged to be dispensed from one end of the stack one at a time. The dispensing means is correlated with the phonograph so that it operates periodically to dispense a token. Each token carries individual phonograph controlling means so that on dispensing a token from the stack it actuates the phonograph so that the phonograph plays the corresponding recording.

In a preferred form of phonograph the recording to be played is determined by a displaceable member which is individual to an individual recording. The phonograph motor is put into operation when one of the displaceable members is displaced and the phonograph mechanism then cooperates with the displaced member to move out the corresponding recording and play the same. The displaceable member may be returned promptly after the selection of the recording is determined. On such return the phonograph motor does not cease to operate because before the return a switch for the motor has been closed by the operation of the motor and it remains closed until the end of the reproduction. If at that time no other displaceable member is in displaced condition the phonograph motor stops but in the event that there is another displaced member the phonograph motor continues to operate until the corresponding recording has been reproduced.

My token dispensing mechanism is preferably correlated with the displaceable members in such manner that the token dispensing means is operative when no bar is displaced and is inoperative when a bar is displaced.

My stack of tokens is placed in a magazine which may, if desired, be provided with a main switch which renders the selector operable automatically. In the preferred embodiment of my invention each token is preferably provided with switch actuating means which cooperate with a switch during the dispensing operation to give

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two trains of electrical impulses. The trains are separated by a time interval. The number of impulses in each train determines which actuating member will be actuated. Thus token 05 may have means creating three impulses and means creating eight impulses. The token for recording 49 has means for creating seven impulses and then twelve impulses. The impulse creating means may suitably be projections on the tokens which actuate a stationary switch during the dispensing operation.

The invention will readily be understood from the following description of a preferred embodiment thereof taken in conjunction with the accompanying drawing, in which:

Fig. 1 is a plan view of my dispensing mechanism;

Fig. 2 is an elevational view of the dispensing mechanism shown in conjunction with a wiring diagram and necessary elements of the phonograph; and

Fig. 3 is a side elevation of my dispenser as viewed from the dispensing side, which is the righthand side of Figs. 1 and 2.

My improved selector may be associated with many existing phonographs so that it is unnecessary to disclose full details of a complete phonograph mechanism. In Fig. 2 I have shown a phonograph motor 10 which is arranged to be put into operation by any one of a plurality of selector bars 11. There may, for example, be 100 bars 11 each corresponding individually to an individual recording on the phonograph. When any bar 11 is displaced upwardly as viewed in Fig. 2 by an actuator 12 the bar makes contact with a conductive strip 13 which is connected to a relay 14. The relay 14 is connected to the ungrounded end of the secondary of a transformer 15 so that the relay 14 is energized by the upward displacement of any one of the bars 11 closing normally open switch 16 and opening normally closed switch 17. One side of the switch 16 is connected to the ungrounded side of the transformer 15, the other side of this switch being connected to the ungrounded terminal of the motor 10. A switch 18 is arranged in parallel with the switch 16 so that the motor 10 remains in operation as long as either switch 16 or switch 18 is closed. Switch 18 is arranged to be opened momentarily during the recording changing cycle of the phonograph so that it is opened after the reproduction of each recording. When the switch 18 thus opens and no bar 11 is in upwardly actuated position the phonograph motor ceases to operate until the selector moves

a bar 11 upwardly. Abutment means 50 are provided on the phonograph for cooperating with an actuated bar 11 to determine the recording to be reproduced and after the recording has thus been determined and after the switch 18 has closed, means 51 controlled by the phonograph returns the controlling bar 11 to its initial position.

The actuator 12 is associated with stepping mechanism 19 which is controlled by the two trains of impulses to locate the actuator 12 beneath the bar 11 corresponding to any two trains. After such location an electromagnet 52 controlled by the stepping mechanism 19 is energized to project last said bar 11 upwardly. The phonograph and the stepping mechanism may suitably be that described and claimed in co-pending Patents Nos. 2,382,487 and 2,382,488, issued August 14, 1945, to Mahlon W. Kenney and Herman G. Jensen or Patent No. 2,425,974 issued August 19, 1947, to Marion R. Winkler. The last mentioned patent discloses a plurality of selector elements which correspond to the selector bars 11, abutment means corresponding to the abutment means 50, a pin controlled by the phonograph corresponding to the present plunger 51 for returning the actuated selector element, and a phonograph motor controlling switch, which corresponds to the present switch 18. In the last mentioned patent the selector members were actuated by individual solenoids. In the present application the selector bars 11 are actuated mechanically by an actuator 12 as in the two patents first referred to. Other phonographs are known in which control of recording selection is determined by the actuation of one of a series of members each corresponding individually to a recording, and it is to be understood that my invention is equally applicable to all such phonographs.

Each token 20 may consist of an elongated plate of suitable material which may be of generally rectangular form as shown in Fig. 1 and it may have enough thickness so that each token can readily be dispensed separately from a magazine 21. The magazine 21 may suitably consist of an open top box in which a stack of the tokens may be placed as shown in Fig. 2. The stack may rest upon supporting members 23 which may serve as guides for a slide structure 24. The front and rear walls of the magazine 21 terminate above the supports 23 so that the upper portion of the slide structure 24 may enter the lower part of the magazine and may dispense the lowermost token 20 to the right as viewed in Fig. 1. The slide structure 24 carries rack teeth 25 which cooperate with a pinion 26 driven by gear reduction mechanism 26 which is actuated by a reversible motor 28.

One terminal of the motor 28 is connected to the power line 29. The other power line 30 is arranged to be connected by switches hereinafter described to a reversing switch 31 which is connected by lines 32 and 33 to the motor. When the arm 34 of the switch 31 is in the full line position shown in Fig. 2 the motor is conditioned to drive the pinion 26 in clockwise direction as viewed in Fig. 2. Switch 31 may suitably be a toggle switch so that its arm 34 is snapped into the full line position shown in Fig. 2 by an abutment 35 on the slide structure 24 and is adapted to be snapped into the dotted line position shown in Fig. 2 by a projection 36 carried by the slide structure 24. It is to be understood that if the circuit of the motor 28 were held closed the slide structure 24 would reciprocate to the right, to the

left, to the right and to the left indefinitely. Near the end of the righthand movement the projection 36 engages the arm 34 and throws this arm into the dotted line position of Fig. 2 which causes the motor 28 to reverse driving the slide structure 24 to the left until projection 35 throws the arm 34 into the full line position of Fig. 2 which reverses the motor 28, so that reciprocation would continue indefinitely unless the motor circuit is opened. Just when or an instant before the projection 35 throws the switch arm 34 into its full line position the projection 36 opens the switch 37 which is biased to closing condition. The projections 35 and 36 are located so that the slide structure 24 is provided with a complete dispensing movement when moving to the right as viewed in Fig. 2 and is cleared from the stack of tokens 20 in the magazine 21 during the lefthand movement of the slide structure 24. One side of the switch 37 is connected to the power line 30. The other side of the switch 37 is connected to the switch 31 and to one side of the switch 17. The power line 30 and the other side of the switch 17 are connected to a control switch 38. The switch 38 is preferably arranged so that it is closed by one or more tokens 20 located in the magazine 21. If desired the switch 38 may be arranged for manual actuation. As shown one of the leaves of the switch 38 carries an insulating pin 39 which projects upwardly through an opening 40 in one of the supports 23. One or more tokens 20 in the magazine depresses the pin 39 so as to close the switch 38. Each token 20 is provided with a longitudinal recess 41 in which are located two series of cam projections 42 and 43. These two series of projections are separated by a space 44 so that two separate trains of impulses are provided for the actuation of the stepping mechanism 19. Each projection 42 is arranged to cooperate with an insulating pin 45 of a switch 46 so that this switch is closed once for each projection 42 or 43 passing out of the magazine 21. The switch 46 is connected by wires 47 to the stepping mechanism 19.

Each token 20 bears indicia 48 which indicates the individual recording to which it corresponds. Thus with a machine for 100 recordings the tokens may bear numbers from 00 to 99. The indicia 48 may include the title of the recording and other data. Token 05 may be provided with a train of three projections 42 and a train of eight projections 43, token 19 may have four projections 42 and twelve projections 43, and token 92 may have twelve projections 42 and five projections 43, to adapt the tokens for use with stepping mechanism shown in the aforesaid Kenney and Jensen applications. Adjacent the dispensing outlet of the magazine I provided a small table 49 to maintain the token being dispensed in substantially horizontal position until it is completely dispensed. The token may fall from this table into a suitable receptacle (not shown).

The operation is as follows:

The operator selects the tokens corresponding to the recordings which he desires to reproduce. He stacks the selected tokens in the order which he desires the recordings to be reproduced. Since, in this embodiment, the tokens are dispensed from the bottom he places the token corresponding to the first recording at the bottom of the stack, the token corresponding to the next recording upon the first token and so on until the stack is completely arranged. Then he places the stack in the magazine 21. This closes the

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switch 38. Since the phonograph is out of operation no bar 11 is in its upward position and consequently the motor 31 is put into operation, its circuit being power line 30, closed switch 38, closed switch 17, reversing switch 31, and power line 29. The pinion 28 is driven in clockwise direction as viewed in Fig. 2 and the slide structure is moved to the right to dispense the lowermost token 20. It is to be noted that the initial movement of the slide structure 24 to the right closes the switch 37 and consequently the motor 31 continues to operate to cause the slide mechanism 24 to execute a complete reciprocating movement notwithstanding that during this movement the switch 38 or the switch 17 may open. During the dispensing movement of the lowermost token two trains of impulses are communicated by the switch 46 to the stepping mechanism 19. These two trains result in the location of the actuator 12 beneath the pin 11 corresponding to the dispensing token and the upward displacement of the actuator 12 by the electromagnet 52 to move this corresponding bar 11 upwardly. The upward displacement of the bar 11 opens the switch 17 so that the motor 28 cannot initiate its operation while the pin 11 is up. Upward displacement of the pin 11 closes the switch 16 so that the motor 10 goes into operation closing the switch 18 and carrying the abutment 50 into engagement with the displaced bar 11 to move the corresponding record on to the turntable and effect its playing. After the selection is determined by engagement of the abutment 50 with the actuated bar 11, the member 51 returns said bar 11 to its initial position and the phonograph motor 10 operates to reproduce the recording. Before this recording is completed the return of the pin 11 allows the switch 17 to close and the motor 28 is now rendered operative to dispense the next token 20 to control the actuation of the stepping mechanism 19 to displace the pin 11 corresponding to the next selected recording. This pin 11 remains in actuated position until the first recording is completely reproduced and the phonograph has gone through its record changing cycle and returned the second actuated pin 11. Whereupon the third token from the bottom is dispensed. This operation is repeated until all the tokens 20 are dispensed. During the dispensing of the last token the switch 38 opens but the switch 37 being closed the motor 28 continues in operation until its full reciprocation is completed. Thereafter the motor 31 is rendered inoperative until another stack of tokens 20 is placed in the magazine 21.

Although the invention has been described in connection with the specific details of a preferred embodiment thereof, it must be understood that such details are not intended to be limitative of the invention except as in so far as set forth in the accompanying claims.

I claim:

1. In an automatic phonograph, in combination, an impulser arranged to transmit different trains of impulses comprising a plurality of tokens of generally flat form arranged to be stacked, each token having an individual member of switch actuating formations, a receptacle adapted for the manual insertion of a stack of tokens, means for dispensing said tokens one at a time from one end of said stack and normally conditioned for repeatedly dispensing the tokens, a switch arranged to be closed by each switch

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actuating formation on each dispensing token as it is being dispensed to create a series of impulses of the same number as the switch actuating formations, a plurality of selector members, means responsive to said series of impulses to displace an individual selector member, and means controlled by a displaced selector member for rendering said dispensing means inoperative.

2. In an automatic phonograph, in combination, an impulser arranged to transmit on each actuation two trains of impulses comprising a plurality of tokens of generally flat form arranged to be stacked each token having a pair of trains of switch actuating formations, each train including an individual number of such formations, a receptacle adapted for manual insertion of a stack of tokens, means for dispensing said tokens one at a time from one end of said stack and normally conditioned for repeatedly dispensing the tokens, a switch arranged to be closed by each switch actuating formations on each dispensing token as it is being dispensed, whereby two characteristic trains of impulses are created corresponding in number to the two trains of switch actuating formations on the token, a plurality of selector means, means responsive to said two trains of impulses to displace an individual selector member, and means controlled by a displaced selector member for rendering said dispensing means inoperative.

3. A selector for automatic phonographs comprising a plurality of tokens of generally flat form and capable of being stacked and each corresponding individually to a recording and having an individual arrangement of switch actuating formations, a magazine adapted for manual insertion of a stack of said tokens in selected order, means for dispensing the tokens one at a time from one side of said magazine with substantially uniform movement, a selection circuit including a switch adapted to be engaged and closed by each formation on the token being dispensed, a plurality of members each corresponding to an individual recording and each adapted when actuated to control the operation of the phonograph to play the corresponding recording, an actuating member adapted to actuate any of said selector members, and means responsive to the impulses created by the formations closing said switch for positioning said actuating member in cooperative relation with the one of said members corresponding to the dispensing token.

4. A selector for automatic phonographs comprising a plurality of tokens of generally flat form and capable of being stacked and each corresponding individually to a recording and having an individual arrangement of switch actuating formations, a magazine adapted for manual insertion of a stack of said tokens in selected order, means for dispensing the tokens one at a time from one side of said magazine with substantially uniform movement, a selection circuit including a switch adapted to be engaged and closed by each formation on the token being dispensed, a plurality of members each corresponding to an individual recording and each adapted when actuated to control the operation of the phonograph to play the corresponding recording, an actuating member adapted to actuate any one of said selector members, and means responsive to the impulses created by the formations closing said switch for positioning said actuating member in cooperative relation

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with the one of said members corresponding to the dispensing token, means controlled by each of said members when actuated for rendering said dispensing means inoperative and phonograph controlled means for returning the actuated member to initial position after the selection of the corresponding recording by the phonograph is determined.

5. In a selective automatic phonograph, in combination, a plurality of tokens each corresponding individually to a recording and adapted to be arranged in a stack, a receptacle for said stack, a reciprocating slide member adapted to dispense tokens one at a time from said receptacle, a reversible motor adapted to effect complete reciprocatory movements of said slide member, means on said slide member for reversing said motor at the ends of the travels of said slide member, a main switch for supplying energy to said motor, a switch for maintaining the operation of said motor independent of the main switch when the slide member is away from normal position, a third switch in circuit with the main switch preventing initiation of the operation of said motor when said third switch is open, a series of selector elements each corresponding to an individual recording, an actuator arranged to cooperate with any one of said selector elements, switch means cooperating with a token being discharged, means controlled by last said switch means for locating said actuator in cooperative relation with the selector element corresponding to said token, automatic means for actuating said actuator to displace said selector element, a phonograph motor, means controlled by any of said selector elements in actuated position for starting the phonograph motor and opening said third switch, a switch adapted to be closed by the phonograph motor to maintain the circuit thereof, selector means operated by the phonograph motor adapted to cooperate with any actuated selector member to control the reproduction of the corresponding recording, and automatic means for returning the actuated selector element to normal position after the reproduction of said recording has been determined.

6. An automatic phonograph comprising a series of displaceable selector members each arranged when displaced to control the reproduction of a corresponding recording, an actuator arranged to be brought into cooperating relation with any one of said selector members to effect its displacement, an open magazine arranged to enable an operator to place therein a stack of tokens of generally flat form, each token having an individual array of switch actuating formations in its dispensing direction, said tokens be-

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ing arranged in desired order, each token corresponding individually to an individual selector member and recording, means for dispensing tokens serially from one end of the stack by continuous movement, a switch arranged to be closed by each formation of a dispensing token for controlling the location of the actuator for actuation of the selector member corresponding to the dispensing token, means controlled by a displaced selector member to prevent operation of said dispensing means, and phonograph operated means for returning a displaced selector member after the playing of the corresponding recording has been determined.

7. An automatic phonograph comprising a series of displaceable selector members each arranged when displaced to control the reproduction of a corresponding recording, an actuator arranged to be brought into cooperating relation with any one of said selector members to effect its displacement, an open magazine arranged to enable an operator to place therein a stack of tokens of generally flat form, each token having an individual array of switch actuating formations in its dispensing direction, said tokens being arranged in desired order, each token corresponding individually to an individual selector member and recording, means for dispensing tokens serially from one end of the stack by continuous movement, a switch arranged to be closed by each formation of a dispensing token for controlling the location of the actuator for actuation of the selector member corresponding to the dispensing token, means controlled by a displaced selector member to prevent operation of said dispensing means, phonograph operated means for returning a displaced selector member after the playing of the corresponding recording has been determined, and means associated with the magazine for rendering the dispensing means operable only when at least one token is in the magazine.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,870,547	Wise	Aug. 9, 1932
2,044,470	Devaut	June 16, 1936
2,063,830	Rouse	Dec. 8, 1936
2,120,378	Touschek	June 14, 1938
2,342,652	Eakins	Feb. 29, 1944
2,348,312	Schmidt	May 9, 1944
2,382,487	Kenney	Aug. 14, 1945
2,391,246	Kenney	Dec. 18, 1945