

Sept. 2, 1958

H. H. VANDERZEE

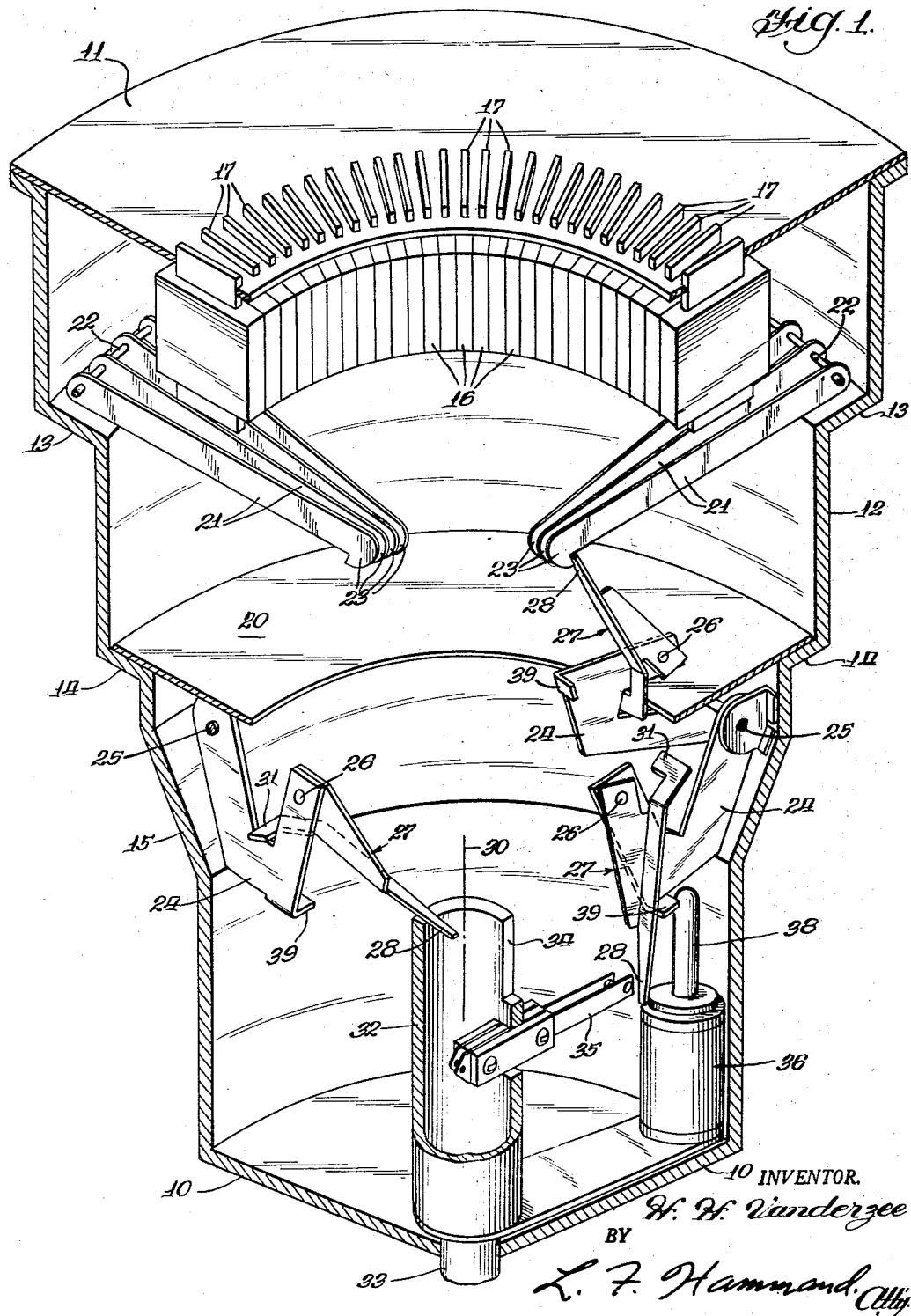
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TRUE SEQUENCE SELECTOR

Filed May 9, 1955

3 Sheets-Sheet 1

Fig. 1.



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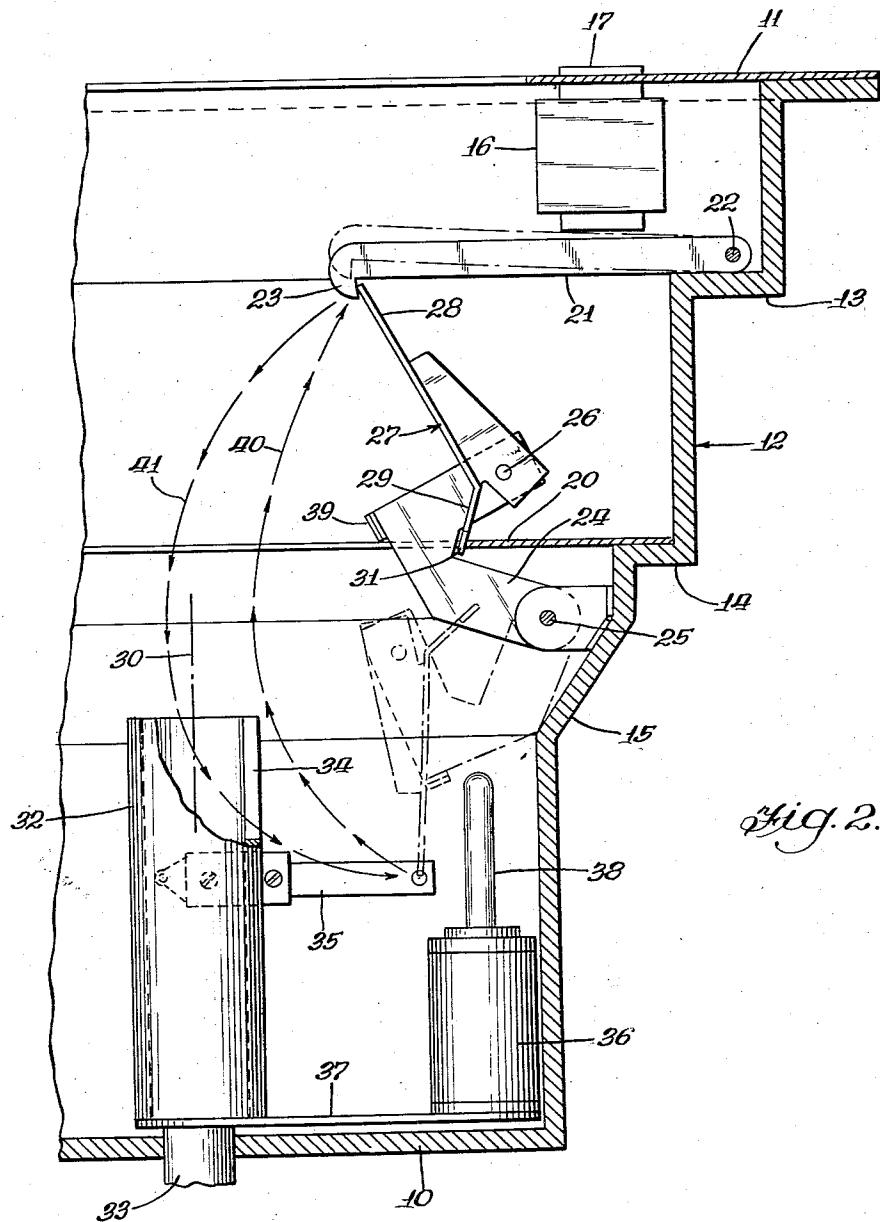
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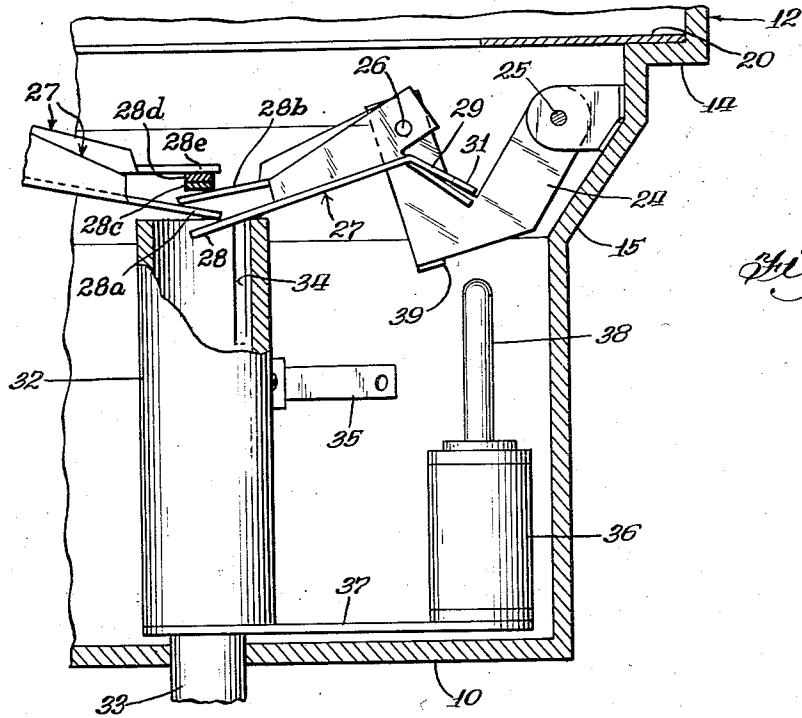
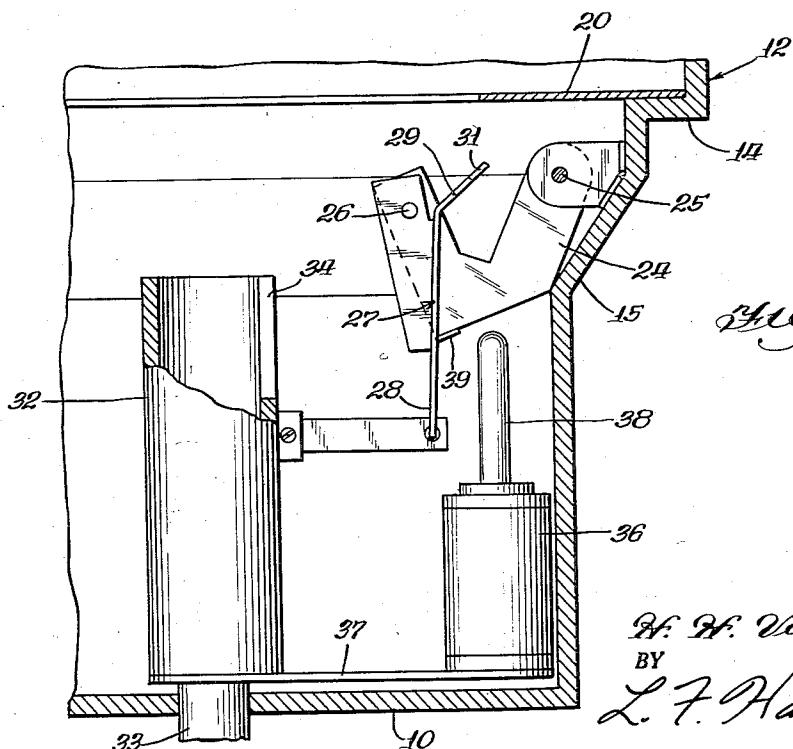


Fig. 3.



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TRUE SEQUENCE SELECTOR

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7 Claims. (Cl. 274—10)

This invention relates to selector mechanisms, and has particular reference to a sequential selector suitable for the control of the record changer of an automatic phonograph.

It is the general aim of the present invention to provide a relatively simple, compact and trouble-free mechanical unit whereby one or all of the records in the magazine of the phonograph may be selected in advance of playing, yet wherein the individual records will be reproduced in the same order in which the selections are made. This is, of course, in sharp contrast to the mode of operation of any automatic phonographs now commercially available in the United States.

As an introduction to the present disclosure, it may be explained that no automatic phonographs produced on a commercial scale in the United States (or elsewhere, so far as known) are capable of reproducing a series of selected records in "true sequence," that is, in the same order in which the selections are made. It is well known, of course, that the patented art discloses numerous record changers designed to achieve this result, yet it is significant that none of these patented mechanisms have found commercial acceptance. Probably the principal reason for the above is that, while theoretically capable of accomplishing the desired result, the machines known in the patented art have been so complex, undependable, or otherwise impractical as to preclude commercial adoption. Also, manufacturers hesitate to adopt any selector which is not compatible with record changers presently in production, and naturally do not favor any mechanism so designed as to lend itself to monotonous repetition of the same recording over and over again.

It is accordingly the primary object of the present invention to provide a true sequence selector so designed as to be suited to the control of automatic phonographic record changers of the types now generally in commercial use, and to provide a simplified mechanism of such design and construction as to be inherently capable of trouble-free operation and consequently acceptable from a commercial and manufacturing standpoint.

A further object of the invention is to provide a sequentially true selecting mechanism adapted to use with any conventional electric push button or pulse control system, yet wherein the sequence of play of the records is governed primarily by mechanical means.

A further object of the invention is the provision of an improved selector mechanism wherein any or all of the individual recordings available on an automatic phonograph may be played in the same sequence as selected, yet wherein the mechanism cannot be set to repeat the same selection over and over again.

The above objects are accomplished according to the present teaching by a compact mechanical unit which may easily be attached to any one of several phonographic record changers now in commercial production. It follows that the principles of this invention may be put to use without the need of complete redesign, recon-

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struction and retooling, such as would be required by other types of selectors.

In operation, the present invention departs from prior practices by the provision of a multiplicity of individual selector elements which are individually adapted to be moved from an idle to a "set" or actuating position, but wherein the shift to actuating position is not accomplished in a single motion as in most prior devices, but is achieved by a unique arrangement in which each of the selector members moves through a common locus, so that the individual elements are caused to stack upon each other or "fall in line" as they move toward actuating position. Thus by sensing the selector elements from the underneath side of the stack, the records may be played in an order and sequence corresponding to the sequence in which the individual's selections were made.

In the preferred embodiment of the invention illustrated in the drawings attached hereto:

Figure 1 is a fragmental quarter sectional view of a selector housing as used in a preferred embodiment of this invention, with the individual selector arms and fingers therein shown in typical operating positions;

Figure 2 is a diagrammatic side elevational view of the selector arms, fingers and associated mechanisms utilized in the unit of Figure 1, with the parts shown in idle position;

Figure 3 is a view similar to Figure 2 with several of the selector elements illustrated in their intermediate or accumulating position; and

Figure 4 is a fragmentary view similar to Figure 3 with one of the selector elements illustrated in actuating position.

As illustrated, the mechanism of the invention is housed within a stepped housing of generally circular shape, having a bottom 10 and a top plate 11 spaced apart by vertical side walls 12 offset at 13, 14 and 15. The top plate serves as a mount for a multiplicity of electromagnets 16, each of which is provided with an individual core portion 17. It will be understood to those acquainted with the art that there will be one of these electromagnets 16 for each available selection on the phonograph. As a consequence, any conventional push button system or system of pulsed remote control transmitters conventionally used in automatic phonographs may be directly utilized to energize these magnets for purposes of making selections with the present equipment. It will also be understood that while the present drawings show about twenty-five magnets in a quarter section of the unit and thus represent an assembly capable of handling a phonograph of one hundred selections, yet this number may be increased or decreased as required.

The individual electromagnets 16 are each disposed immediately above one of a series of latches 21, which have their outer end portions mounted on pivots 22. The latches are arranged radially, so that the individual latch levers extend inwardly and terminate in downwardly directed hooks 23.

A series of selector arms 24 corresponding in number to the latches are mounted on pivots 25 adjacent the offset 14 of the housing wall. These arms consist of levers of somewhat L-shape, and the individual levers are each capable of limited movement between the lowermost position illustrated in Figures 3 and 4 of the drawings and the uppermost position shown in Figure 2. As shown, their downward movement is limited by the side wall 12 of the housing of the mechanism, while their upward movement is limited by engagement with the inner circular edge of an annular plate 26 conveniently supported on the offset 14 of the housing. The selector arms 24 each have a swinging pivot 26 at their free

end, upon which selector fingers 27 are pivotally mounted. The selector fingers 27 are thus swingable on either of two pivots, so that the selector finger and its arm form a jointed link of selector elements capable of the unique path of motion described more fully hereinafter. A short tab or limit stop 31 is provided to limit the pivotal movement between the finger 27 and its mounting arm 24.

The selector fingers 27 each include a free end portion 28 at one end and a somewhat shorter tail portion 29 at the other. Thus, as seen in Figure 2, the end portion 28 of any finger may be moved upwardly into latched relationship with the hook 23 of the corresponding latch 21. This is the idle position of the selector elements. The parts are self-retaining so long as the latch hook 23 is engaged, since the tabs 31 prevent pivoting motion between each arm and its finger. Whenever one of the electromagnets 16 is energized, however, it will release a finger 27 from the corresponding latch. The selector elements 27 and 24 are then free to swing downwardly, the end 28 of the finger describing a curved path as indicated by the arrows 41 (Figure 2) until the end 28 of the finger strikes the uppermost end of a scanning cylinder 32 positioned on the central axis of the housing 10. Thus whenever one of the electromagnets 16 is energized, one of the latches is released and one of the selector fingers moves to the position of Figure 3. In each instance, the outer end 28 of the finger lies on the vertical center line 30, so that when several selections are made the fingers are caused to assume a stacked relation, one upon another, at a common locus, with their end portions 28a, 28b, 28c, 28d and 28e overlying the end portion 28 of the lowermost finger as best shown in Figure 3. This may be termed the intermediate or accumulating position of the individual selector elements.

The scanning cylinder 32 is interconnected with the mechanism of the record changer by means of a rotatable shaft 33 extending downwardly through the bottom 10 of the housing of the mechanism. Thus as the record transfer mechanism of the phonograph associated with the selector is moved relative to the magazine thereof, the shaft 33 will be rotated and a corresponding rotation will be imparted to the scanning cylinder 32. Also, as best shown in Figure 1 of the drawings, the scanning cylinder 32 is provided with a release slot 34 which rotates as the cylinder revolves so that it will eventually come into registry immediately below the end 28 of any one of the selector fingers 27 when in the accumulating position illustrated. Obviously, as the slot 34 moves under a selector finger resting on the upper edge of the cylinder, the end 28 of the finger will be released for further downward movement, and will swing from the accumulating position of Figure 3 to the actuating position of Figure 4. In this position, its lowermost end 28 lies in the path of movement of one of the blades of a scanning switch 35, mounted on and carried with the cylinder 32. Obviously, this scanning switch may be connected with the traverse motor of any conventional phonographic mechanism, so that as the contacts of switch 35 are actuated, the transfer mechanism of the phonograph is caused to stop in a position in alignment with a record corresponding to the individual selector finger engaged thereby.

After each selection, it is of course necessary to reset the selector finger and arm in order that the mechanism be cleared for the following selection. If desired, a multiplicity of reset devices, individual to the several selector fingers, may be utilized to return these parts to the latched position of Figure 1, although the present invention contemplates an improved and simplified arrangement wherein a single solenoid coil 36 is mounted on a swinging arm 37 projecting laterally from the selector cylinder 32 so that the plunger 38 of the solenoid assumes a position immediately below one of the selector arms 24 as each selection is made. With this arrangement, the

individual selector arms and fingers may then be reset simply by energizing the solenoid 36 as each selection is made. The plunger 38 will thus be projected upwardly, engaging the appropriate arm 24 and moving the arm 24 and finger 27 upwardly to latched position.

From Figure 4 it will be apparent that when any arm 24 is moved upwardly by the solenoid, its tab 39 will engage the selector finger 27, so that the arm and finger move together. It follows that the entire assembly will 10 pivot upwardly around the center 25 until the tab 31 on the tail portion 29 of the finger strikes the plate 20. The finger 27 will then swing on the pivot 26, which is itself moving in an arc about the pivot 25.

The end result of these two motions is that the outermost end 28 of the selector finger will be caused to swing upwardly along the return path indicated by the arrows 40 of Figure 2. It is accordingly seen that the path 40 traversed in the return movement of the selector finger follows a different course than the path 41 along which the fingers move downwardly. By this expedient, all of the fingers are caused to move through a common locus and engage the cylinder 32 as they move toward "set" position, yet the individual fingers are allowed to by-pass the cylinder 32 on their upward or resetting movement. The individual fingers and arms may thus be reset immediately upon the making of any given selection, without interference from the other arms which may be stacked on the cylinder 32.

From the above it will be evident that machines according to the present invention accomplish sequential true selection by a mechanism and system of simple design, both mechanically and electrically. The desired results are accomplished without resort to recording tapes or other sequence recording devices commonly utilized in the past, and without the need of slides, tokens, chips or other devices which necessarily require resorting or reclassification after they have served their function. Also, according to the present invention, "true sequence" selection is accomplished by a machine which does not lend itself to continued repetition of any single recording.

Having thus described the invention, what I claim as new and desire to protect by United States Letters Patent is:

1. A sequential selector mechanism for an automatic phonograph comprising, in combination, a multiplicity of selector assemblies, each individual to one of the recordings available in the phonograph; said selector assemblies each consisting of a swingable supporting arm with a hinged finger portion on the free end; with said arms and fingers arranged in generally radial positions, with the arms extending inwardly from a series of arcately arranged mounting pivots; an individual latch for holding each of said selector assemblies in idle position, means for biasing the individual selector assemblies from idle position through a curved path to actuating position, and electromagnetic means for individually releasing said latches; a scanning device comprising a shiftable stop element disposed at an intermediate point in the said curved path of movement of said selector fingers to engage said selector fingers and accumulate a plurality of said fingers in sequential relation at an intermediate accumulating position between the idle latched position and the actuating position thereof; with means for individually releasing said fingers from said accumulating position for movement to actuating position, and sensing means arranged to move progressively through the actuating positions of each of said fingers to engage any one of said fingers in actuating position and initiate operation of the phonograph.

2. A sequential selector mechanism for an automatic phonograph comprising, in combination, a multiplicity of selector assemblies, each individual to one of the recordings available in the phonograph; said selector assemblies each consisting of a swingable supporting arm

with a hinged finger portion on the free end; with said arms and fingers arranged in generally radial positions, with the arms extending inwardly from a series of arcuately arranged mounting pivots; an individual latch for holding each of said selector assemblies in idle position, means for biasing the individual selector assemblies from idle position through a curved path to actuating position, and electromagnetic means for individually releasing said latches; a scanning device comprising a shiftable stop element disposed at an intermediate point in the said curved path of movement of said selector fingers to engage said selector fingers and accumulate a plurality of said fingers in sequential relation at an intermediate accumulating position between the idle latched position and the actuating position thereof; with means for individually releasing said fingers from said accumulating position for movement to actuating position.

3. A sequential selector mechanism for an automatic phonograph comprising, in combination, a multiplicity of selector assemblies each individual to one of the recordings available in the phonograph; said selector assemblies each consisting of a swingable supporting arm having a pivoted finger portion on the free end, with said arms and fingers arranged in generally radial positions; latches for holding each of said selector assemblies in idle position, means for releasing said latches; and a stop element disposed at an intermediate point in the path of movement of said selector fingers to engage said selector fingers and accumulate a plurality of said fingers in sequential relation at an intermediate accumulating position between the idle latched position and the actuating position thereof; with means for individually releasing said fingers from said accumulating position for movement to actuating position, and sensing means arranged to move progressively through the actuating position of each of said fingers to engage any one of said fingers in actuating position and initiate operation of the phonograph.

4. A non-repeating sequential selecting mechanism for an automatic phonograph comprising, in combination, a frame having a vertical central axis and including a curved selector-supporting portion and a curved latch-supporting portion coaxial therewith and spaced therefrom; the selector supporting portion having a multiplicity of selector mounting pivots in arcuate arrangement around the vertical axis and a multiplicity of selecting elements carried by said pivots; each selecting element including an elongated projecting finger having one free end, with a multiplicity of selector latches in arcuate arrangement around the aforesaid latch-supporting portion of the frame to individually hold the aforesaid selecting element fingers in upstanding position; said selecting element fingers when selected extending laterally inwardly toward each other in converging directions and disposed in generally radial relation to the axis of the frame, with a stop member on the axis of the frame and at least one selected finger engaging the stop member; and with said selected fingers intersecting each other in overlying, stacked relation, and in contact with each other adjacent their ends; with sensing means engaged by said fingers to control operation of the phonograph, means to individually release the lowermost finger from the aforesaid stop member, and means to move said

fingers into upright position to engage the aforesaid selector latches.

5. A non-repeating sequential selecting mechanism for an automatic phonograph comprising, in combination, a frame having a multiplicity of selector mounting pivots; a multiplicity of selecting elements carried by said pivots; each selecting element including an elongated finger having one free end and a mounting end hinged to one of said pivots; a multiplicity of selector latches to individually hold the aforesaid selecting element fingers in inoperative position, with a plurality of said selecting element fingers when selected extending inwardly toward each other in converging directions and disposed in generally radial relation; with a stop member and at least one selected finger engaging the stop member, and with said selected fingers intersecting each other in overlying, stacked relation, and in contact with each other adjacent their ends; with sensing means engaged by said fingers to control operation of the phonograph, means to individually release said fingers from the aforesaid stop member in the order of their engagement therewith, and means to move said fingers into engagement with the aforesaid selector latches.

6. A non-repeating sequential selecting mechanism for an automatic phonograph comprising, in combination, a frame and a multiplicity of selecting elements carried by said frame; each selecting element including an elongated projecting finger shiftable from an inoperative position to a selected position; selecting means for shifting said fingers, with said selecting element fingers when selected extending inwardly toward each other in converging directions and disposed in generally radial relation; with a stop member and at least one selected finger engaging the stop member, and with said selected fingers intersecting each other in overlying, stacked relation, and in contact with each other; with means to individually release said fingers from the aforesaid stop member in the order of their engagement therewith, and with sensing means engaged by said fingers to control operation of the phonograph.

40 7. A non-repeating sequential selecting mechanism for an automatic phonograph comprising, in combination, a frame having a vertical central axis and including a curved selector-supporting portion having a multiplicity of selector mounting pivots in arcuate arrangement around the vertical axis and a multiplicity of selecting elements carried by said pivots; each selecting element including a finger having one free end and a mounting end hinged to one of said pivots and shiftable from an inoperative position to a selected position; selecting means for shifting said fingers, with a stop member and at least one finger engaging said stop member; said selecting element fingers when selected engaging each other and disposed in overlying, stacked relation; with means to individually release the lowermost finger from the aforesaid stop member, and sensing means engaged by said fingers to control operation of the phonograph.

References Cited in the file of this patent

UNITED STATES PATENTS

60	2,545,361	Kasnowich	-----	Mar. 13, 1951
	2,569,115	Rockola	-----	Sept. 25, 1951
	2,631,856	Osborne	-----	Mar. 17, 1953
	2,666,649	Vanderzee et al.	-----	Jan. 19, 1954