

Dec. 19, 1939.

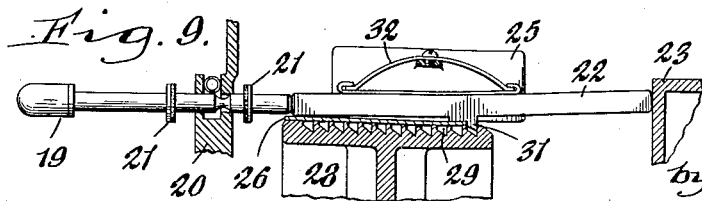
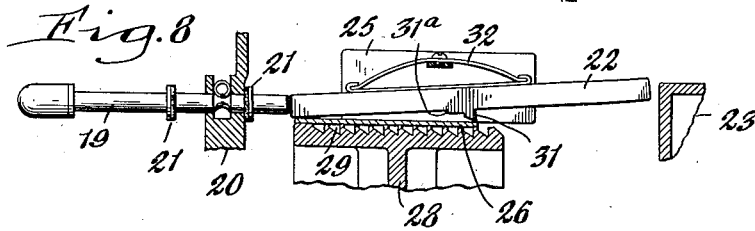
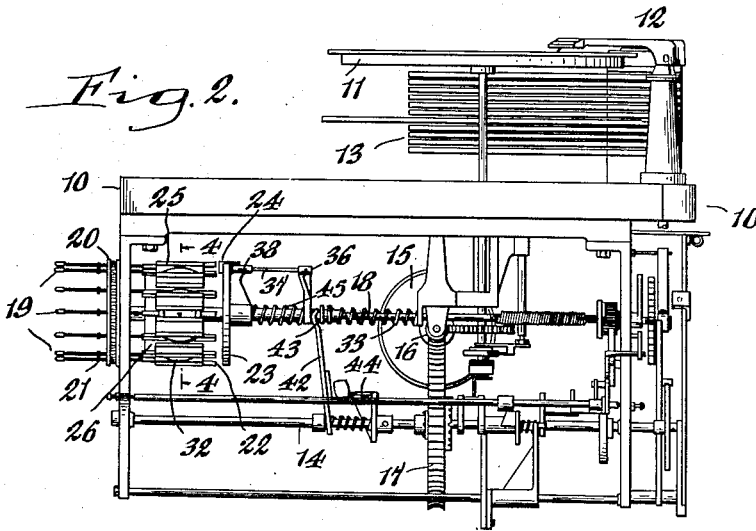
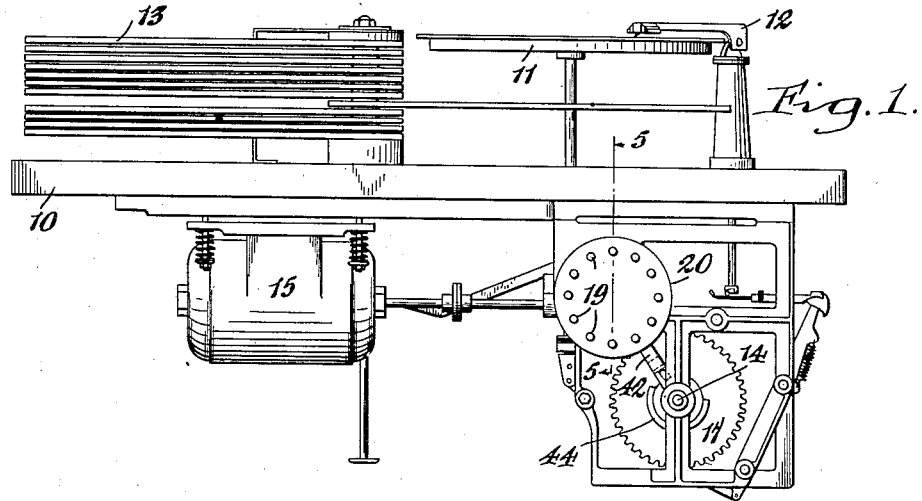
E. A. EBERT ET AL

2,183,607

SEQUENCE SELECTOR MECHANISM FOR AUTOMATIC PHONOGRAPHS

Filed June 3, 1938

3 Sheets-Sheet 1



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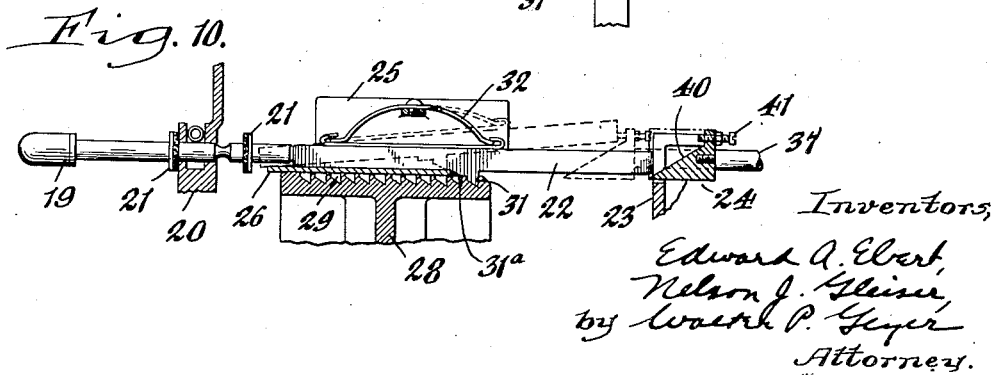
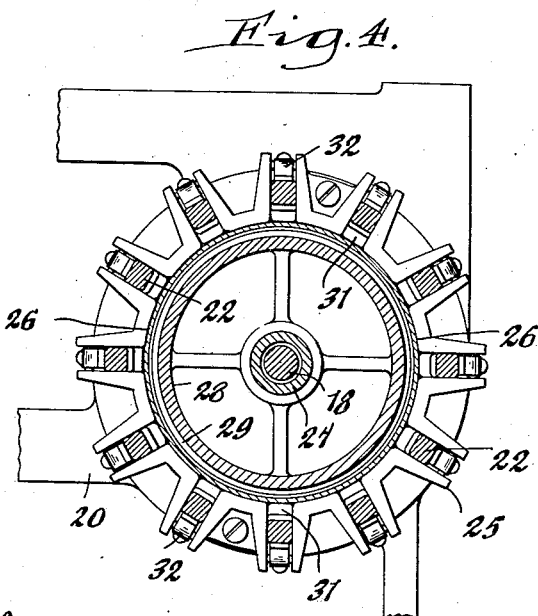
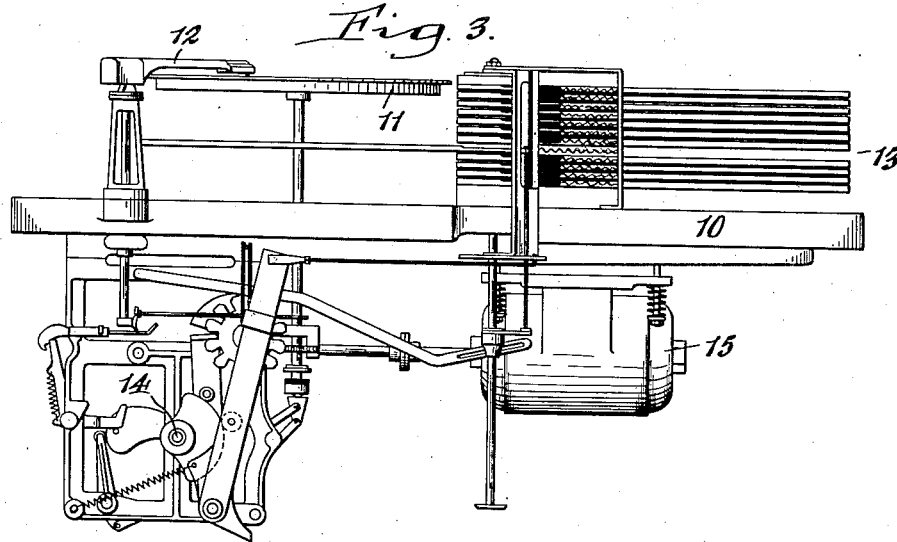
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SEQUENCE SELECTOR MECHANISM FOR AUTOMATIC PHONOGRAPHS

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3 Sheets-Sheet 2



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SEQUENCE SELECTOR MECHANISM FOR AUTOMATIC PHONOGRAPHS

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3 Sheets-Sheet 3

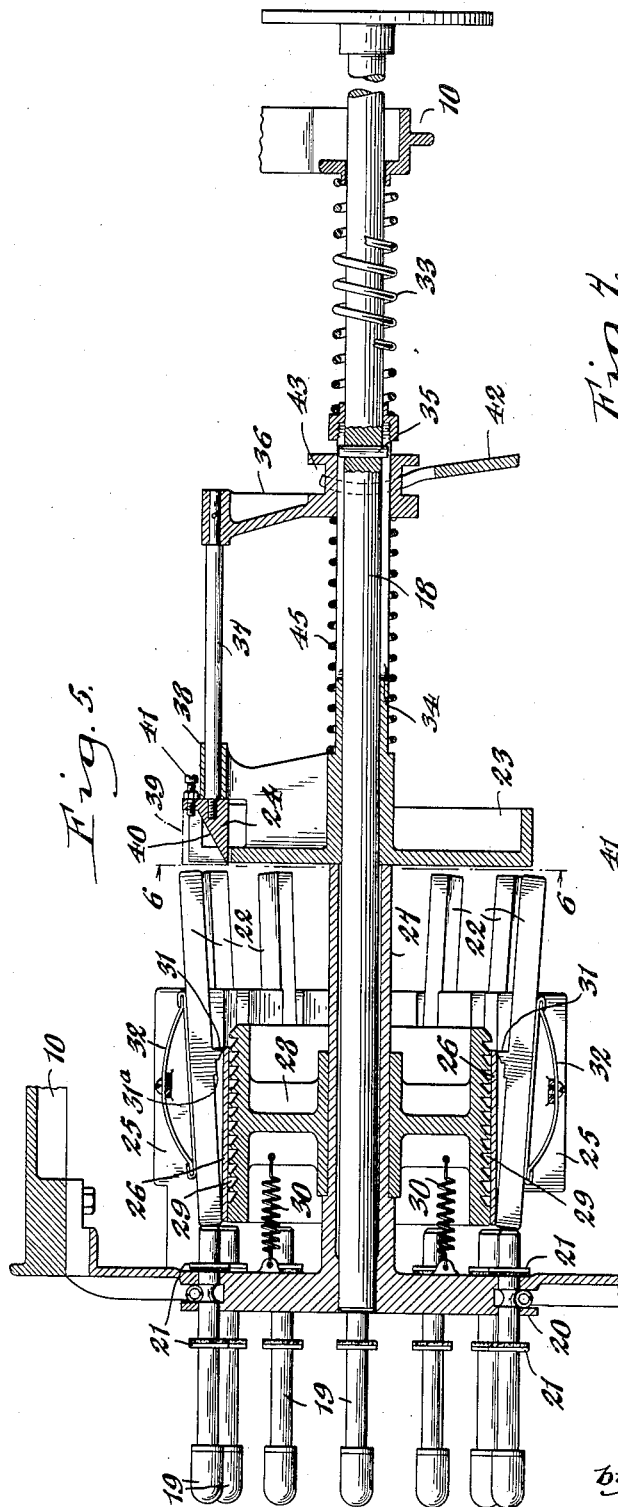


Fig. 5.

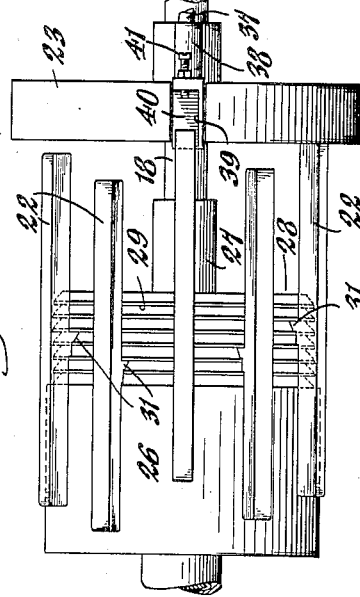


Fig. 7.

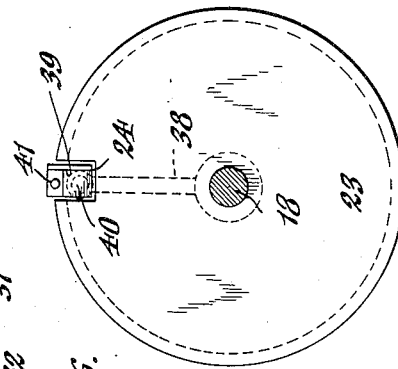


Fig. 6.

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UNITED STATES PATENT OFFICE

2,183,607

SEQUENCE SELECTOR MECHANISM FOR AUTOMATIC PHONOGRAPHS

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Application June 3, 1938, Serial No. 211,620

11 Claims. (Cl. 274—10)

This invention relates to certain new and use-
ful improvements in selector mechanisms for
automatic multi-selective phonographs.

It has for its main object to provide a selector
mechanism for automatic phonographs which is
designed to effect the playing of the records in a
definite order as predetermined by the choice or
selection of the user, that is, to effect the se-
quence playing of the records in the order pre-
selected.

Another object of the invention is to provide
a sequence selector for multi-selective phono-
graphs which is simple and compact in construc-
tion, reliable in operation, and which is not liable
to get out of order.

Other features of the invention reside in the
construction and arrangement of parts herein-
after described and particularly pointed out in
the appended claims.

In the accompanying drawings:

Figure 1 is a front elevation of a multi-selective
phonograph chassis showing our improved se-
quence selector applied thereto. Figure 2 is a
side elevation thereof. Figure 3 is a rear view
of the chassis. Figure 4 is an enlarged cross
section taken substantially in the plane of line
4—4, Figure 2. Figure 5 is an enlarged frag-
mentary longitudinal section taken substantially
in the plane of line 5—5, Figure 1, the selector
elements being in their retracted or non-selec-
tive positions. Figure 6 is a transverse section
taken on line 6—6, Figure 5. Figure 7 is a frag-
mentary top plan view of the selector assembly
showing the selector elements in predetermined,
sequence-selected positions relative to the selec-
tor-drum. Figures 8, 9 and 10 are fragmen-
tary longitudinal sections showing the different
positions of one of the selector elements, Figure 8
showing the selector element in non-selective
position, Figure 9 showing the selector element
in its first stage of movement or partially-selec-
tive position, and Figure 10 showing the selector
element in its fully selective position.

Similar characters of reference indicate cor-
responding parts throughout the several views.

By way of example, we have shown our se-
quence selector mechanism as applied to or in
connection with a multi-selective phonograph of
the type shown in the Wilcox Patent No.
2,002,236, dated May 21, 1935, the numeral 10
indicating the platform of the phonograph chas-
sis, 11 the vertically-movable turntable, 12 the
tone arm, and 13 a plurality of pivoted record
carriers normally disposed in stack-like fashion
at one side of the turntable and adapted to be
selectively swung horizontally to a position over
the turntable, whereby the latter, upon being
elevated, picks the record from the carrier and
brings it into playing position with the repro-
ducer, and after the playing of the record the

turntable is lowered and deposits that record on
its carrier, after which the latter is swung to its
position in the record stack.

The mechanism for selectively bringing the
carriers into and out of playing position forms
no part of the present invention and a detailed
description thereof is deemed unnecessary, suffice
it to say, however, that this mechanism includes
a cam shaft 14 driven by an electric motor 15
through the medium of a worm 16 and worm
wheel 17 for governing the selective movements
of the carriers 13 and turntable 11, and a selec-
tor shaft 18 driven by the cam shaft during the
selecting cycle of operations for predetermining
the playing of a given selected record.

The sequence selector mechanism is operative-
ly associated with the selector shaft 18 to govern
its rotating movements and in turn control the
selection of a pre-selected record for play, and
is so constructed as to select a plurality of rec-
ords at one time in advance and then have the
machine automatically play those selected rec-
ords in the same order or sequence selected by
the patron. For accomplishing these ends, the
sequence selector mechanism is constructed as
follows:

As in the case of the Wilcox patent referred
to, means are provided for stopping rotation of
the selector shaft in order to control its rotation
so that certain records may be selected for play
and in this connection we employ, as an actuat-
ing part of such means, a plurality of push rods
19 which correspond in number to the number
of records borne by the machine and which are
supported for axial sliding movement in a face
plate 20 at the front of the chassis, these push
rods being disposed in an annular fashion about
the axis of the selector shaft. Each of the push
rods is provided with a pair of spaced collars
21 adapted to abut the opposite sides of the face
plate for limiting its projected and retracted
movements. In selecting records for play, these
push rods are shifted to the position shown in
Figure 10. Alined with these push rods for se-
lective actuation thereby are companion selec-
tor bars or elements 22 which function, in con-
nection with a slidable, rotating drum 23 applied
to the selector shaft 18, to stop the rotation of
that shaft at different radial positions corre-
sponding to the selector bars chosen, said drum
having a radially-disposed, shiftable stop-lug 24
thereon which projects forwardly from the face
of the drum for abutting one or another of the
projected selector bars to stop the rotation of the
selector shaft at predetermined selected posi-
tions. These selector bars are so mounted, that
with each successive selection of a plurality of
records to be played by depressing the push rods
19 desired in advance of playing, the bars are
successively projected in step-like fashion one

in advance of the other in predetermined spaced relation to the drum 23, whereby to present them in selected sequence into operative engagement with the drum-lug 24 to effect the playing of the records in the order selected at the push rods, each bar, together with its companion push rod, being automatically actuated to its retracted position after its selecting function has been performed. To effect these results, the selector bars 22, which are a sectional part of the push rods 19, are mounted and guided for longitudinal and rocking movement between guide flanges 25 applied to the periphery of a shell or sleeve 26 supported concentrically about the front end of the selector shaft 18 and suitably secured to the face plate 20 or other adjacent part of the chassis. Guided for axial movement on a tubular extension 27 projected rearwardly from the face plate, and constituting a bearing or housing for the front end of the selector shaft, is a slidable, selector bar coupling member 28 preferably in the form of a wheel or pulley-like element whose periphery is in contiguous concentric bearing relation with the inner bore of the bar-carrying sleeve 26. In its periphery this coupling member has a longitudinal row of annular ratchet-like teeth or notches 29 with one or another of which the several selector bars are adapted to engage when moved to a selected position by the respective push rods and whereby the coupling member is adapted to be advanced a distance of one tooth by each bar selected and in step by step fashion relative to the selector shaft and the sleeve 26, a spring 30 connected to the coupling member constantly tending to urge it to its retracted or initial non-selecting position.

Projecting from the inner or bottom side of each selector bar 22, about midway thereof, is a tooth 31, which, in non-selecting position, rests on the outer surface of the sleeve 26 adjacent the rear edge thereof and clear of the coupling member 28, in the manner shown in Figures 5 and 8, a bow-like spring 32 acting on the outer or top face of each bar to retain it in the inclined, retracted position shown in such figures. Upon depressing a push rod to a record-selecting position, the first part of the stroke causes the alining selector bar 22 to drop off the end of the sleeve 26 to bring its tooth 31 into register and coupling engagement with an adjoining ratchet-notch 29 of the slidable coupling member 28, as shown in Figure 9. The remainder of the selective stroke imparts a simultaneous axial movement to the coupling member equal to a distance of the width of one of said grooves and brings such bar to its adjusted selected position shown in Figure 10, wherein it abuts the face of the rotatable selector drum 23 in the rotating path of its stop lug 24 to arrest the rotation of the selector shaft 18 at the predetermined radial position to select the corresponding record for play. Subsequent selections made transmit like step by step movements to the coupling member 28 and likewise to those selector bars 22 coupled therewith during previous selections to progressively project them one in advance of the other in the order selected, and during such advance of the respective coupled selector bars, the first-selected and foremost one, being in abutting engagement with the drum 23, causes such drum to be shifted rearwardly on the selector shaft against the resistance of a spring 33 which serves to constantly urge said drum to the position shown in Figure 5. By this construction, the first selector bar actuated as-

sumes a definite projected position relative to the coupling member, the second selector bar actuated advances the coupling member one step and assumes a projected position relative to the coupling member with its front end terminating in longitudinal spaced relation to the corresponding end of the first-named selector bar a distance equal to the width of one of its notches 29, and so on for each selection, whereby each selector bar actuated advances the drum 23 and the coupling member 28 and the selected bars coupled therewith a like distance to pre-set the bars in successive stepped positions to automatically play the records in the sequence initially ordered by the selector bars, the stop lug 24 on the drum first contacting the foremost-projected or first selected bar and thereafter in successive order the second, third, etc., selected bars.

After each record-selecting operation has been performed and the selected carrier 13 is swung out of the stack for play, means are provided for automatically cancelling or restoring the companion selector bar 22 to its initial non-selecting position to clear the way for the shifting of the selector drum 23 into the path of the next-adjointing or sequence-selected selector bar. This drum has a longitudinal slot 34 therein engaging a pin 35 projecting from the selector shaft 18, and joined to the drum, to move axially therewith in response to operative shifting movements imparted to it by the selector bars and independently thereof in the opposite direction, is a radial arm 36 having a rod 37 fixed at one end thereto in parallel relation to the selector shaft and guided at its opposite end in a bearing 38 formed in the drum, as shown in Figure 5. The stop-lug 24, which abuts the selector bars to arrest the selector shaft at predetermined points, is connected to the free end of the rod 37, and includes a selector-bar-engaging abutment or side wall 39, an outwardly inclined top wall 40 engageable with the inner or lower end of a selector bar for releasing it from coupled engagement with the ratchet-like coupling member 28, and an adjustable end abutment or screw 41 adapted to engage the end of a selector bar for restoring it to its non-selective position. Normally this stop-lug assumes the position shown in Figures 5 and 7, where it is in position to present its side wall 39 into the path of the first-positioned selector bar. After the selection is effected, motion is imparted to the radial arm 36 and its rod 37 axially of the selector shaft to shift the stop-lug 24 toward the selector bars 22, the registering or alining selector bar being first elevated by the lug-wall 40 to lift its tooth 31 from engagement with the notched coupling member 28 and subsequently encountered by the abutment-screw 41 to bodily shift the bar to its initial non-selective position. As shown in Figure 2 of the drawings, the operative, restoring stroke may be imparted to the rod 37 at a predetermined time in the cycle of operations by an actuating lever 42 radiating from and loosely mounted on the cam shaft 14 and in coupling engagement at its free end with a grooved collar 43 on the post-bearing arm 36 and actuated in an operative stroke axially of the selector shaft by a cam 44 likewise mounted on the cam shaft. A spring 45 applied to the selector shaft 18 and interposed between the selector drum 23 and its companion arm 36 tends constantly to shift the stop lug 24 and associated parts to their retracted normal position shown in Figure 5. It will be noted that the selector drum, its arm 36 and the cam-actuated

lever 42 move as a unit during the selecting strokes imparted thereto by the selector bars 22, whereby for each setting of the drum determined by the foremost projecting selector bar of a plurality selected, a companion compensating restoring stroke is adapted, in the manner above-described, to be imparted by the cam to the rod 37 to return a given selector bar to its initial position.

Each selector bar 22 has a shoulder 31^a thereon immediately to the rear of its tooth 31 which serves, in the projected position of the bar in coupling engagement with a companion groove 29 in the coupling member 28, to hold the coupling member out beyond the sleeve 26 so that the next succeeding groove in such member is exposed and in position to receive the next projected selector bar. This second bar, when projected, enters the exposed groove by the action of the bowed spring 32 and its shoulder 31^a is in position to hold the coupling member out for coupling engagement with the next selector bar and so on. The shoulder of the last selector bar pushed of a group is the only shoulder that functions to maintain the coupling member in its selector bar displacing position, until after all the selections are played, and then finally on restoring the last selector bar to its initial position, the coupling member 28 is pulled forward by reason of its spring 30.

We claim as our invention:

1. In an automatic phonograph, a plurality of movable record carriers mounted for selective movement to and from an operative record-playing position, individually-movable selector means corresponding in number to the record carriers for simultaneously selecting at will a plurality of records to be played, companion selector elements corresponding in number to and disposed for actuation by said individually-movable selector means to predetermined selective positions, a shiftable coupling member disposed in operative relation with said selector elements and engageable therewith during their movements to selective positions to successively advance the coupling member jointly as a unit with the selector elements a given distance for each selection made, whereby said elements are adjusted in predetermined sequence-selective positions relative to one another, and means governed by said selector elements for controlling the selection of the companion carriers.

2. In an automatic phonograph, a plurality of selective record carriers, a turntable, and means for controlling the selection of records in operative relation with the turntable comprising a selector shaft, means for rotating said shaft, means governed by said shaft for actuating the record carriers to a selective position, and means for stopping the rotation of said shaft at certain points corresponding to the record selected consisting of means rotatable with the selector shaft and axially adjustable relatively thereto, individually-adjustable selector means corresponding in number to the record carriers for selecting at will a plurality of records to be played and projectible in predetermined sequence to a position in the path of said means rotatable with said shaft, and shiftable means common to and disposed for coupling engagement with said selector means when the latter are adjusted to their at-will selected positions for governing their subsequent successive movements to predetermined positions to selectively play the records in the order selected.

3. In an automatic phonograph, a plurality of

selective record carriers, a turntable, and means for controlling the selection of records in operative relation with the turntable comprising a selector shaft, means for rotating said shaft, means governed by said shaft for actuating the record carriers to a selective position, and means for stopping the rotation of said shaft at certain points corresponding to the records selected consisting of means rotatable with the selector shaft and axially adjustable relatively thereto, individually adjustable annularly arranged means corresponding in number to the record carriers for selecting at will a plurality of records to be played and projectible in predetermined sequence to a position in the path of said means rotatable with said shaft, and an adjustable member disposed in cooperative relation with said selecting means for successive coupling engagement therewith and for actuation thereby when such selecting means are adjusted to their at-will selected positions to successively advance the adjustable member as a unit with the coupled selecting means a given distance for each selection made, whereby the latter are adjusted in predetermined spaced relation to said means rotatable with the selector shaft.

4. In an automatic phonograph, a rotatable shaft for controlling the selection of records, means rotatable with said shaft for stopping its rotation at selected positions, a plurality of selector elements corresponding in number to the records and each individually movable to a predetermined initial selecting position and projectible to positions in the path of and for sequential operative engagement with said stopping means rotatable with said shaft, and a shiftable coupling member common to said selector elements disposed in operative relation therewith and having means thereon for interlocking engagement with the selector elements for bodily and successively advancing initially-selected elements a given distance toward said stopping means with each movement of subsequent selector elements to their initial selecting positions.

5. In an automatic phonograph, a rotatable shaft for controlling the selection of records, means rotatable with said shaft for stopping its rotation at selected positions, a plurality of selector elements corresponding in number to the records and each individually movable to a predetermined initial selecting position and projectible to other positions in the path of and for sequential operative engagement with said stopping means rotatable with said shaft, each of the selector elements having a tooth thereon, and a shiftable coupling member common to said selector elements having a row of notches therein with one or another of which the teeth of such elements are adapted to interlock when in initially-selected positions for bodily and successively advancing in step by step fashion with each movement of subsequent selector elements to their initial selecting positions, initially selected elements for sequential operative engagement with said stopping means.

6. In an automatic phonograph, a rotatable shaft for controlling the selection of records, means rotatable with said shaft for stopping the rotation thereof at selected positions, a plurality of selector elements corresponding in number to the records and each movable individually to a predetermined initial selecting position and projectible in sequence to other positions in the path of said stopping means rotatable with the shaft, a shiftable coupling member disposed in

operative relation with the selector elements and having means thereon for interlocking engagement with said selector elements for bodily and successively advancing initially-selected elements a given distance toward said stop means rotatable with said shaft with each movement of subsequent selector elements to their initial selecting positions, and means engageable with said selector elements for successively retracting them to their non-selective positions after their companion records have been selected for play.

7. In an automatic phonograph, a rotatable shaft for controlling the selection of records having a stop member mounted thereon for rotation therewith for stopping its rotation at selected positions and free to slide axially thereof, a spring for normally urging said stop member in one direction axially of the shaft, a plurality of selector elements corresponding in number to the records and each projectible individually to a predetermined initial selecting position and successively to other positions for sequential operative relation with said stop member to arrest the rotation of said shaft, a shiftable coupling member disposed in operative relation with the selector elements for actuation thereby and having means thereon for interlocking engagement with said elements for bodily and successively advancing initially selected elements a given distance toward said stop member at each projection of subsequent selector elements to their initial selecting positions, whereby a pre-selected group of such elements are selectively disposed with their stop-member engaging ends in receding spaced relation at different predetermined distances from the stop member to control the sequence playing of the corresponding records, and means applied to said stop member and engageable with said selector elements for successively returning them to their non-selective positions after their corresponding records have been selected for play.

8. In an automatic phonograph, a rotatable shaft for controlling the selection of records, and means for stopping the rotation of said shaft at certain points to control the sequence playing of records selected comprising means rotatable with said shaft and slidable therealong and having a stop member projecting therefrom, a fixed frame disposed at one side of said rotatable means, a plurality of projectible selector bars guided on said frame for movement in predetermined sequence to a position in the path of said stop member, and means slidable axially of the shaft for coupling a projected selector bar thereto to move therewith, said slidable means and said selector bars having companion inter-engaging coupling elements thereon for causing the successive advancement of the slidable coupling means and selector elements coupled therewith a predetermined distance during each projection of a selector element to a record-selecting position.

9. In an automatic phonograph, a rotatable shaft for controlling the selection of records, and means for stopping the rotation of said shaft at certain points to control the sequence playing of records selected comprising means rotatable with said shaft and slidable therealong and having a stop member projecting therefrom, a fixed frame disposed at one side of said rotatable means, a slidable coupling member mounted for move-

ment axially of the shaft and having a spring for yieldingly resisting its advancement in a direction toward said stopping means, said coupling member having a row of notches therein, and a plurality of projectible selector bars guided on said frame for lateral and longitudinal movement to a position in the path of said stop member and each having spring means for urging such bars laterally into latching engagement with one or another of the notches in said coupling member for coupling the same therewith upon the projection of said bars to an initial selecting position.

10. In an automatic phonograph, a rotatable shaft for controlling the selection of records, and means for stopping the rotation of said shaft at certain points to control the sequence playing of records selected comprising means rotatable with said shaft and slidable therealong and having a displaceable stop member thereon movable to a predetermined position relative to said rotatable means, a fixed frame disposed at one side of said rotatable means, a slidable coupling member mounted for movement axially of said shaft relative to said frame to sequence selecting positions and having a row of notches therein, a plurality of projectible selector bars guided on said frame for lateral and longitudinal movement relative thereto to sequence selecting positions in the path of said stop member and each having yieldable means for urging such bars laterally into latching engagement with one or another of the notches in said coupling member for coupling the same therewith upon the projection of said bars to an initial selecting position, said bars in their non-selective positions engaging said frame and supported thereby clear of the notched coupling member, said stop member having abutments thereon engageable with the underside and adjoining end of a projected selector bar for elevating such bar clear of said coupling member and for shifting said bar longitudinally to its initial non-selecting position, respectively, and means for actuating said displaceable stop member at a predetermined time into and out of operative restoring engagement with said selector bars.

11. In an automatic phonograph, a rotatable shaft controlling the selection of records, a drum rotatable with and adjustable axially of said shaft and having a displaceable stop member mounted thereon for movement relative thereto and in a plane substantially parallel to the shaft-axis, a plurality of sequence selector elements each movable to a predetermined selective position for engagement with said stop member for stopping the rotation of said shaft at certain points, said elements being disposed in endwise relation to the drum and adapted for abutting engagement therewith at predetermined times for governing its adjustable displacement, spring means for normally urging said stop member to a normal position, spring means for yieldingly resisting displacement of the drum in one direction, and means operatively connected to said stop member for displacing it in the opposite direction in abutting engagement with a selector element to shift the latter to its initial non-selecting position.

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