Nov. 26, 1968 R. J. HENDRICKS ETAL 3,412,496

REMOTE CONTROL SELECTOR FOR AUTOMATIC PHONOGRAPHS

Filed Dec. 10, 1965 3 Sheets-Sheet 1

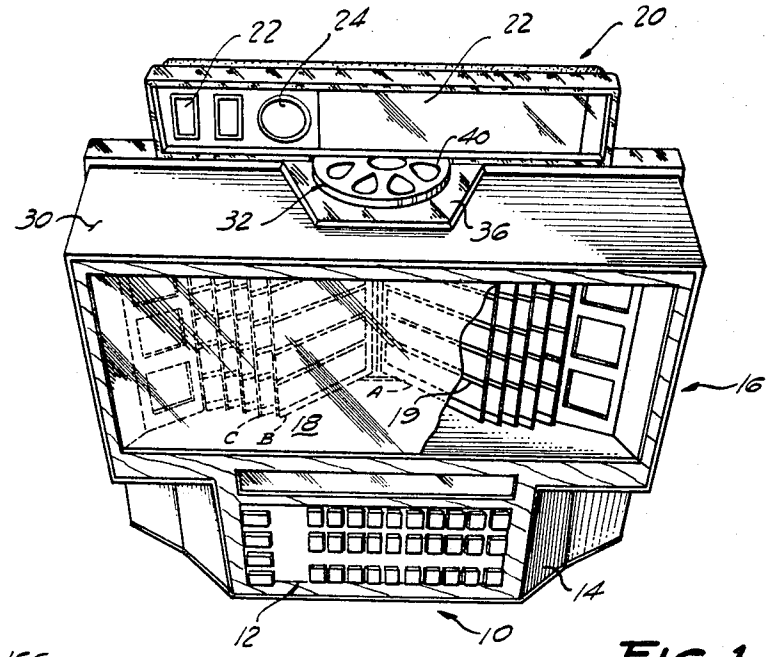


FIG. 1.

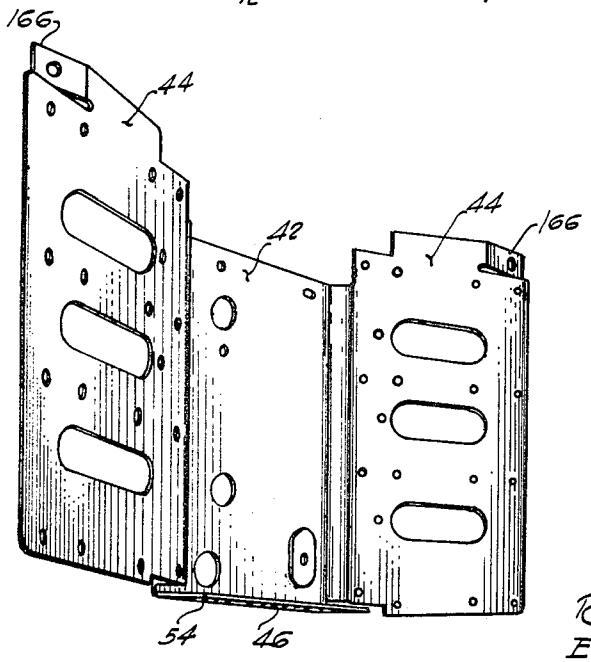


FIG. 7.

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REMOTE CONTROL SELECTOR FOR AUTOMATIC PHONOGRAPHS

Filed Dec. 10, 1965 3 Sheets-Sheet 2

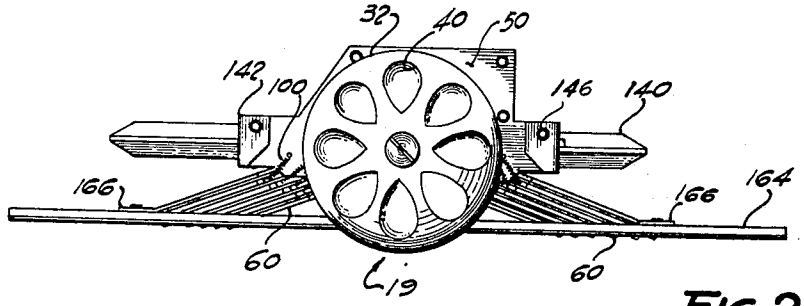


FIG. 2.

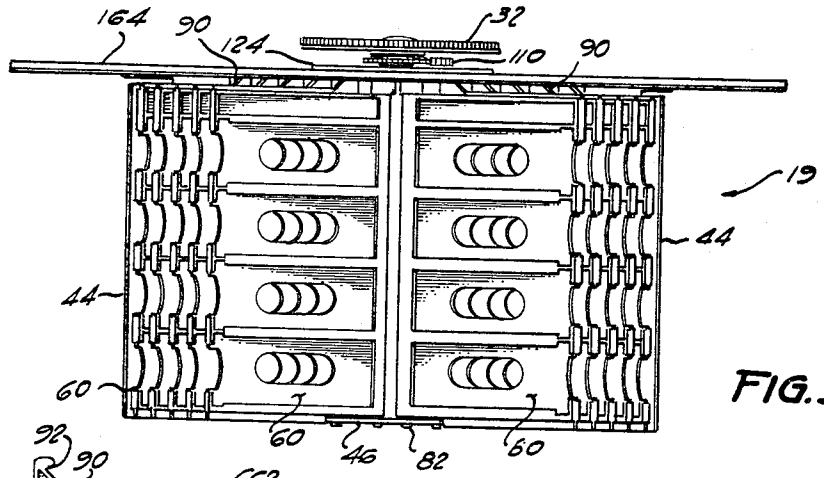


FIG. 3

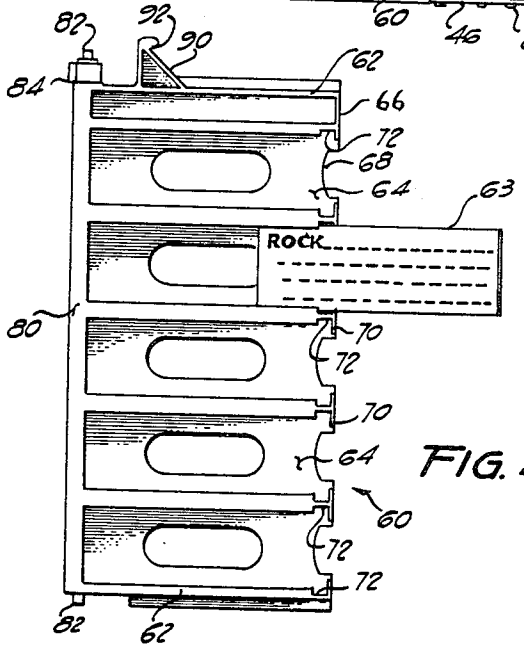


FIG. 4.

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REMOTE CONTROL SELECTOR FOR AUTOMATIC PHONOGRAPHS

Filed Dec. 10, 1965 3 Sheets-Sheet 3

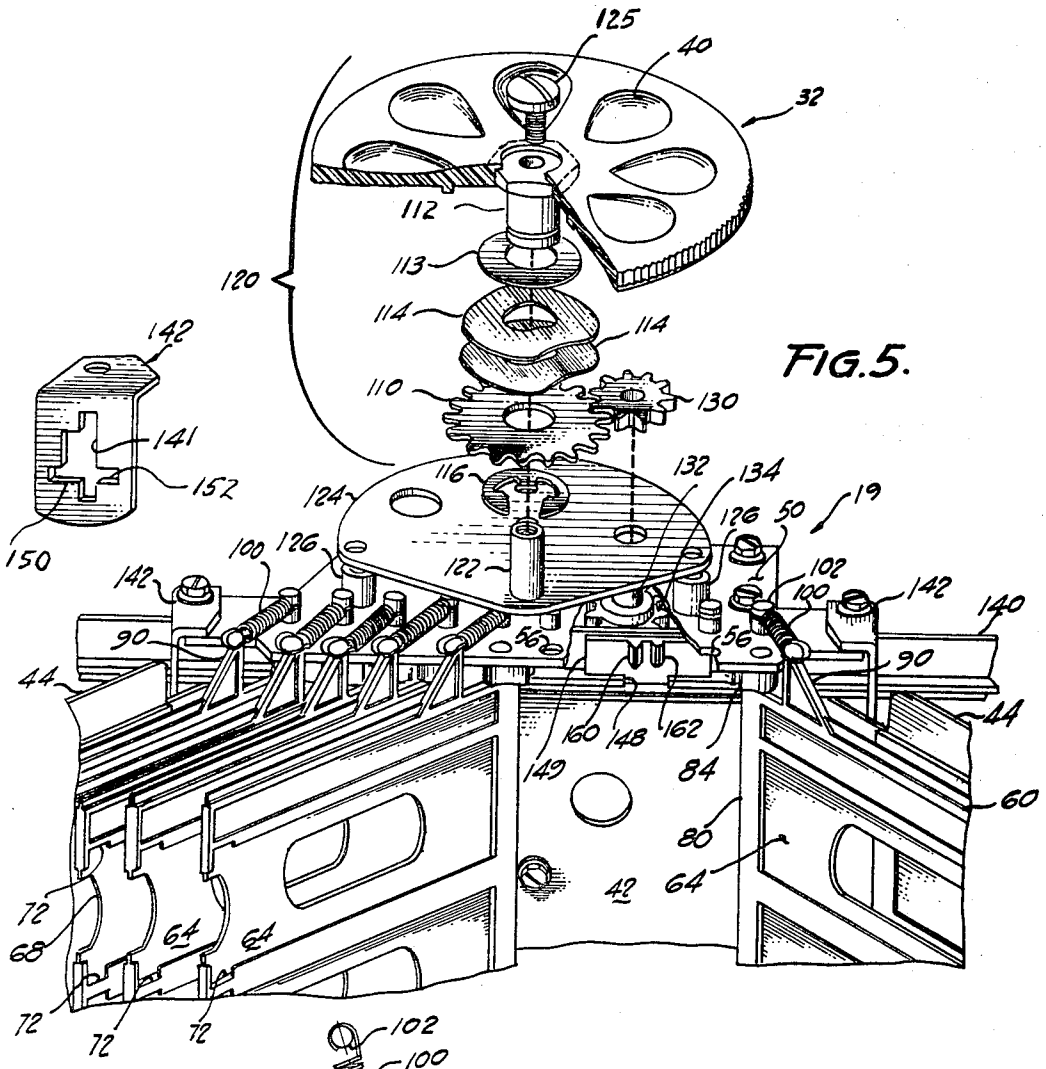


FIG. 5.

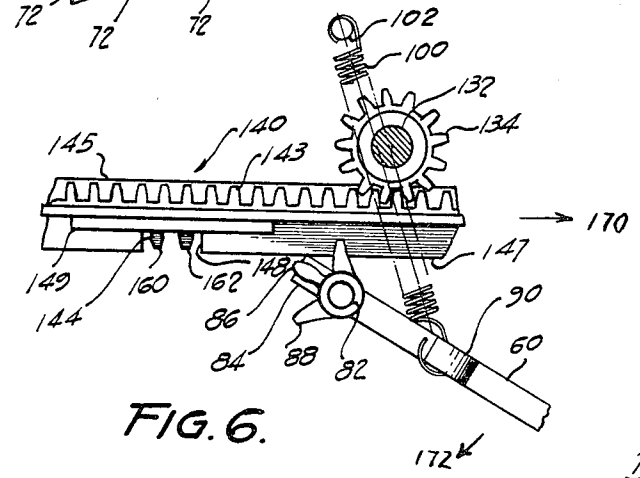


FIG. 6.

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United States Patent Office 3,412,496 Patented Nov. 26, 1968

3,412,496

REMOTE CONTROL SELECTOR FOR AUTOMATIC PHONOGRAPHS

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Filed Dec. 10, 1965, Ser. No. 512,919
3 Claims. (Cl. 40—104)

ABSTRACT OF THE DISCLOSURE

The device shown is a title page display unit for use in a remote selector or wall box for a coin-operated phonograph (juke box). In such wall boxes the available display area is small so that all available titles cannot be shown simultaneously. The titles are mounted on pages which can be turned successively under the control of a manually-operated knob. The knob actuates a gear train including a rack acting on successive sector gears, one on each page to be turned.

This invention relates to remote control selectors and more particularly to the title index mechanism for displaying titles of records available for selection therein.

In automatic phonograph or "jukebox" systems generally in use at the present time, there are available for selection up to 200 records. The titles to these recordings are generally coded into groups of ten or 20. In one approach currently in use, twenty letter groups are employed, with ten numbered record titles per group. In the main phonograph cabinet, the titles are grouped and displayed in a flat plane readily visible to the eye of the viewer. In remote selectors or wall boxes, the available viewing space is comparatively small, so that the title index must be broken up. In the usual form, the index is arrayed in book form with each code group forming a page. The pages are disposed on either side of a rigid panel. In one currently used mechanism, the panels each have an extension rising out of the cabinet, the extension being fitted through an arcuate opening in the cabinet top surface. The extension of a panel is grasped manually and turned through the arc of the opening to expose the other page of the panel being turned and one page of the adjacent panel. This approach has at least one major drawback in that an opening is exposed in the remote selector cabinet into which liquids and small objects may be placed by one bent on mischief.

In another form of remote selector cabinet now in use, half panels are mounted for rotation about a single horizontal axis. A shaft extends along this axis, the shaft being rotated by manually rotatable knobs on each opposed side of the housing. Axially and angularly spaced cams on this shaft are rotated to successively engage axially spaced cam followers on successive title pages to raise or lower the pages about the horizontal axis.

While this mechanism is acceptable, a considerable amount of friction must be generated within the apparatus to hold one or more panels in the raised position. This friction must be overcome to flip the panels in addition to the force of gravity which must also be acted against. The panels must be short in height such that two panels, one above the other, can be viewed at the same time.

The present invention overcomes these difficulties in a simple expedient manner. The title page panels are supported within a housing on individual mountings aligned successively along a horizontal line. Each panel is pivotal about its vertical mounting individually, as will be explained, and each panel once turned is firmly held in the new position.

A manual knob at the top of the housing rotates a driving gear co-axial to the knob; this gear meshes with an idler gear which drives a pinion causing gear rack to move horizontally. A pair of gear teeth are moved linearly by means of the rack to engage individual three-toothed sector gears on the successive pages and pivot the index panels to expose one page of the panel to the viewer. The panels are held in one position or another by both the configuration of the panel and rack structure and also by an overcenter spring holding the panels to their mounting structure. By the construction shown, two adjacent title pages are exposed with an angle slightly greater than 135° between the reading surface to afford a good viewing surface on each title page.

It is, therefore, an object of the invention to provide a new and improved remote selector title index viewing mechanism.

It is a further object to provide a new and improved title page apparatus which exposes two adjacent pages in a wide angle viewing relationship.

The invention both as to its organization and principle of operation, together with further objects and advantages thereof will be best understood by reference to the following specification taken in connection with the drawings in which:

FIGURE 1 is a front perspective view of a remote selection apparatus utilizing the present invention;

FIGURE 2 is a plan view of the index page mechanism of the present invention;

FIGURE 3 is a front view in elevation of the mechanism of FIGURE 2;

FIGURE 4 is a front view in elevation of a typical title page panel;

FIGURE 5 is an exploded view in perspective of the gear train and panel mounting structure of the invention;

FIGURE 6 is a partial view of the rack member and the page sector gear in mesh; and

FIGURE 7 is a front view in perspective of the title page backing plate used herein.

In a remote selector for a jukebox, or automatic phonograph, there is provided means for receiving coins, means for storing credit, means for indicating to the user the record titles available for selection and means for sending credit information to the main phonograph along with the selections made. In addition, such remote selectors may have a speaker or speakers with volume controls and the like. The selector must be sturdy enough to withstand attempts to pilfer the inserted coinage and to withstand minor acts of vandalism.

In FIGURE 1, there is shown a remote selector unit employing the present invention for an automatic phonograph or "jukebox" system. The remote unit has a housing **10** which may be considered as divided into three vertical sections of which the lowermost is the selection control and auxiliary control area **12** which may include speakers behind the side panels **14**. Above the control area is a record title viewing section comprising a rectangular cabinet section **16** with a glass enclosure **18** covering the front and sides of the viewing section. Within the enclosure is visible the record index assembly **19**. Surmounted on the cabinet section is a vertically extending coin panel area **20** with various signal bearing indicia **22** at either side of a coin receiving slot **24**.

Above the top wall **30** of the cabinet section **16**, there is mounted a horizontally disposed, manually rotatable knob **32** for controlling the movement of the panels of the record index assembly **19**. Knob **32** is spaced above an embossing **36** which forms a decorative part of top wall **30**. The knob is spaced above the embossing **36** and partially hidden beneath the coin panel **20**, so that it is freely rotatable but cannot be removed without removal

of the panel **20** or dismantling of housing **10**. The knob **32** is a thin disc which preferably could be fabricated of clear plastic with spaced finger indentations **40** depressed in an annular pattern in the upper knob surface. In addition, the knob periphery may be serrated, both the serrations and indentations allowing the knob to be easily grasped and rotated.

The knob **32** on rotation selectively exposes successive pages of the record index assembly **19** thereby showing the record titles available for selection and the selection code applicable.

The record index assembly **19** is positioned at the front of the cabinet section **16** within the glass enclosure **18**. This record index is positioned to cover the conventional credit indicating mechanism and selection transmission mechanism (both not shown). The record index assembly is mounted on support structure which includes a flat backing plate **42** with side plates **44** extending obliquely from the backing plate. The side plates are disposed with individual included angles of slightly more than 155° between each side and the backing plate. Thus, the included angle between the two side plates at the front of the index is slightly greater than 130°. At the bottom edge of backing plate **42** is a panel mounting flange **46** which extends horizontally normal to the backing plate. The backing plate **42**, side plates **44**, and flange **46** may be formed as an integral unit of suitable sheet metal, as shown in FIGURE 7.

Fastened to the top edge of the flat backing plate **42** is a top panel mounting plate **50** which is secured to the backing plate through a triangular shaped reinforcing bracket (not shown). Aligned adjacent the front of the panel mounting flange **46** are a series of ten equally spaced bearing holes **54**. Similarly aligned along the front of the top panel mounting plate **50** is a like set of bearing holes **56**. These bearing mounting holes are used to position and mount therein the individual title bearing panels **60**, which combine to form the record index.

Each title bearing panel **60** is fabricated of a flat sheet of material such as sheet metal or formed plastic resin. Each panel has similarly configured title pages on each of its side surfaces. Each of the pages, as employed within the embodiment of the invention shown, has five vertically spaced title card mounts. Each title card mount is bordered on the top, bottom, and inner edge by a bordering frame **62** which may be recessed to support slideably therein a title card as indicated in FIGURE 4 by title card **63**. Each of the cards preferably would have an upper and lower title thereon. Suitable indicia is permanently or semi-permanently located on the inner edge frame adjacent each title to indicate the selection code designation representing that title position. To facilitate the insertion and removal of title cards, the panel **60** may be slotted at the center of bearing area **64**. At its outer edge **66**, each title bearing area **64** may be notched, as indicated by the reference character **68**. In addition, a slide blocking ridge **70** may extend from the bordering frame at the upper and lower extremes of the outer edge **66**. Adjacent the ridges **70**, the bordering frame **62** may be incised as indicated by numeral **72** to additionally facilitate insertion and removal of title cards.

Along its inner rim **80**, each title page is reinforced throughout its title area by the side edge of the bordering frame **62**. At both its lower and upper edges along the inner rim **80**, the title panel terminates in opposed vertically extending spindles **82**. These spindles are sized to fit within opposed bearing holes **54** and holes **56**. In this way, a panel **60** will be held vertically upright within the opposed horizontal mounts comprised of the flange **46** and plate **50**. Co-axially disposed beneath the upper spindle, each title panel has a three-toothed sector gear **84**. The teeth cover approximately 120° of the gear periphery which would have a total of six teeth if complete. Of the three teeth in the sector, the central tooth **86** extends planarly from the title panel with the flanking teeth **88** angularly spaced approximately 60° from the central tooth.

Arising from the upper surface of each title panel forwardly of the sector gear **84** is a spring mounting tab **90** of substantially triangular shape with its spring recesses **92** positioned above the upper surface of top mounting plate **50**. Each of spring mounting tabs **90** holds the forward end of a tension spring **100** individual to that title panel. The opposed or rearward end of each of these tension springs is affixed to a dowel pin **102**. The individual dowel pins upstand from the mounting plate **50** and each dowel pin is directly behind the bearing hole **56** for its respective panel **60**. Since the spring mounting tabs are disposed along the top of the title panel spaced from the upper panel spindles **82**, the springs **100** tend to hold the panels individually in an oblique position in an overcenter condition. The panels thus are either held in a first position canted toward one side plate **44** or in a second position canted toward the other side plate.

To turn the panels by means of the manually manipulatable knob **32**, there is provided a multiple gear train. Within the gear train there is provided a driving gear **110** co-axially positioned with respect to the knob on a tubular support **112**. The knob **32** is spaced from the driving gear **110** by a thrust washer **113** and two annular compression washers **114**. A retaining washer **116** holds the driving gear compression washers and knob in a unitary assembly. Within this assembly, the knob and driving gear are normally coupled together in a coupling which can be overridden by rotative force. Thus, this assembly **120**, in effect, is productive of a slip clutch effect. The driving gear assembly **120** rides demountably on a vertical stationary pintle **122**. The pintle is internally threaded to receive a lock screw **125** which holds the assembly together. The pintle **122** upstands from a horizontal seating plate **124**, which, in turn, is spaced above and suitably fastened to the mounting plate **50** by a series of spacer members **126**. Thus, the driving gear assembly rides, above the seating plate **124**, on pintle **122** which rotatably retains tubular support **112**.

In mesh with drive gear **120** is an idler gear **130**. The speed ratio of the driver to idler preferably should be approximately at a ratio of 1 to 2.5. The idler gear is affixed to a vertical shaft **132** which extends through both seating plate **124** and top plate **50** and is rotatable within bearing in both plates. Beneath top plate **50**, the shaft **132** has affixed to it a pinion **134** of approximately the same gear pitch diameter as idler gear **130**. By this construction, rotation of idler gear **130** causes direct rotation of pinion **134**.

Mounted below the line of dowel pins **102**, the pinion **134** meshes with a gear rack **143** on a horizontally elongated rack member **140**. This rack member is mounted for rectilinear transverse motion, under the effect of the gear train. Rack member **140** is supported within opposed straddle brackets **142**. These brackets are suitably affixed to the outermost edges of mounting plate **50** and depend therefrom to support rack member **140** for rectilinear transverse motion. Along the rear side of member **140** the transverse rack gear **143** extends for about two thirds of the length of member **140**. At the transverse center of the opposed or front face of rack member **140**, there is a two-toothed partial gear **144**. This gear is aligned with and successively engageable with the three-toothed sector gear **84** on each title panel.

Through the previously described gear train, rotation of the knob **32** will effect rotation of driving gear **110** through their common mounting on shaft **112**. Drive gear **110** will mesh with idler gear **130** and rotate it. On rotation of idler gear **130**, pinion **134** rotates and meshes with rack **143** of rack member **140** to move it and its partial gear **144** transversely across the line of panel mountings.

Rack member **140** rests and rides within slots **141** in straddle brackets **142**. These brackets are inverted, L-shaped, and overlap a portion of the panel mounting plate

50 at each of the transverse plate ends and are secured thereto by a screw 146 in a suitable threaded opening. Since only one screw holds each bracket 142, the bracket is adjustable to position the rack member 140 in a forward-to-rear-sense.

The rack member 140 is in effect a thin rail member extending laterally in the assembly 19 and which has a horizontally reinforcing rib 145 extending rearwardly below the gear rack 143. The rib provides a strengthening member and a bearing surface for travel in horizontal step 150 of slot 141. Above this rib 145, the rack is configured with the line of gear teeth 143 ending a few inches from either transverse end of the member 140. On the front of the member 140 there is a forwardly extending rib 147 extending transversely for the extent of the member 140 to provide support and a bearing surface for travel within a suitable horizontal leg 152 of slot 141 in bracket 142. At the center of the member 140, rib 147 is recessed for approximately 3/8" in a transverse direction as indicated by reference character 148. Above the recess, a reinforcing block 149 extends for approximately one inch transversely on the member 140. This reinforcing block has mounted thereon symmetrically the two-toothed partial gear 144 which meshes with the successive panel sector gears.

The recess 148 in front rib 147 must be long enough to provide clearance for the inner rim of one title panel as it is being turned. When the recess 148 has been moved transversely from behind the one panel, its inner rim will interfere with the rim edges, if turning of the one panel is attempted. Thus, all panels are locked by front rib 147 and only one panel at a time is allowed clearance to turn, a condition occurring only when that panel is located in front of recess 148.

As mentioned previously, the rack member 140 on linear movement moves its partial gear 144. This linear movement drives the partial gear 144 along a lateral path successively past the panel sector gears to engage successive sector gears and to turn the successive gears and their appurtenant panels. Thus, the line-up of pages is successively changed as successive panels are turned from having their right page exposed to a condition in which their left page becomes exposed. During this movement, the left page of one panel A and the right page of the adjacent panel B are both exposed. Continued movement of gear train will turn the panel B listed above to a condition in which its left page is now exposed and the right page of the next panel C. The panels once turned are held in the new position by interference with the rib 147, as described, and by the action of springs 100.

When the panels 60 have all been turned to a condition in which the end panel is superimposed over the remaining panels within its outermost page exposed, block 149 will strike the inside of the straddle bracket 142 and prevent further lateral travel of the rack member 140. In this position, continued rotation of the knob 32 will cause the driving gear 110 to remain stationary with tubular support 112 rotating within it. Consequently, no rack movement or further panel motion can take place. In this way, the impression of an excessive amount of force on the knob will not cause damage to the mechanism due to this slip arrangement.

Now a description of some of the features of the invention as described, and the reasons for these features will be given. First, referring to the configuration of the gears, three teeth are provided on each sector gear 84 and two teeth are provided on the partial gear 144 on the rack member. When a panel is in one or the other of its stable positions and the panel is the next in line to be turned, the sliding partial gear 144 approaches the flanking tooth 88 which is facing toward the rack member 140. As viewed in FIGURE 6, as the rack member 140 moves in the direction of arrow 170, the leading tooth 162 of the partial gear 144 will first strike the flanking tooth in the space between it and the center tooth, will engage the flanking tooth and will begin to rotate the sector gear and its panel in the direction of arrow 172. The trailing tooth 160 of the partial gear will fall into the space between the center tooth 86 and the other flanking tooth and will continue turning of the panel. When the panel is fully turned to a position canted in the position opposite that shown in FIGURE 6, the trailing tooth 160 of the partial gear will leave the sector gear passing under the center tooth of the sector.

During the period of turning movement of a panel, its inner edge rotates in the recess 148 and can be turned. This panel will then be held in the turned condition by its spring 100 and by interference of the front rib 147 which will not allow sufficient clearance for rotation of the inner panel rim. The partial gear on continued transverse movement approaches the sector gear of the adjacent panel and will turn it in the same manner. The panels will be turned successively from an oblique position in which one page is exposed and in which a panel is resting on the panels to one side of it to a position in which its opposite page is exposed and in which the panel is resting on the panels to the other side of it.

With embodiment of the invention shown, the major considerations were based on having the maximum viewing angle for minimum index width. To allow the titles to be readable, it was concluded that twenty titles, ten per page, should be visible at a time. To produce a mechanism which met these considerations, it was found that a sector gear which, if complete, would have six teeth with a diametral pitch of 18. The spacing between centers of the panel mounting spindles 82 are on the order of .4375 inch to maintain clearance between adjacent sector gears 84. The gear rack as used with the exemplary values above has thirty-three teeth extending over about five inches of the length of the rack. The values above are primarily listed to illustrate the comparative relationship of the parts found to be successful in the apparatus.

Another point to be noted is that the record index assembly 19 is mounted in the wall box as a unit and may be removed as such for replacement of panels, and for such other repairs as become necessary. The assembly as a unit includes as its main components the backing plate 42, top mounting plate 50, seating plate 124, rack member 140, panels 60, and bracing rod 164. This rod is secured to cross the entire assembly 19 forward of the mounting plate 50. This rod 164 is affixed to end tongues 166 of the backing plate side plates 44, and reinforces the assembly, allowing the assembly 19 to be handled readily as a unit. Further, this bracing rod may be used to mount the assembly in the housing 10.

When the entire remote control cabinet is mounted on a wall or the like, the viewing window or enclosure 18 is exposed. To gain access to the record index assembly, the outer housing must be removed and the mounting elements for the assembly 19 released. Thus, if desired, the entire assembly 19 could be replaced. For further disassembly, the knob assembly 120 can be removed from pintle 122 by the removal of screw 125.

While there has been described what is at present thought to be the preferred embodiment of the invention, it will be understood that modifications may be made therein and it is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. A remote selector for an automatic phonograph system having a main phonograph, comprising:
   (a) a housing;
   (b) a transparent window in said housing;
   (c) a record index viewable through said window;
   (d) said index comprising a plurality of individually movable panels having on both sides indicia denoting recordings which may be selected for play at said main phonograph from which one or two panel sides may be exposed to view at any particular time;
   (e) individual pivotal support means for each movable

panel, said support means aligned to postiion said panels within the housing;

(f) a knob manually rotatable from the exterior of the housing to turn said panels singly whereby to expose different sides to view;

(g) a gear on each of said panels, and

(h) a gear train coupling said knob to said panel gears;

(i) said gear train including a planar rack movable in response to rotation of the knob to engage and turn one panel at a time;

(j) said rack including locking means acting on all page panels not being turned to hold said last-mentioned panels;

(k) said rack further including a toothed portion slideable on movement of said rack to engage successive panels for turning same; and

(l) said locking means comprising a ridge extending substantially the length of said rack with an opening adjacent the rack toothed portion.

2. A selector as claimed in claim 1, in which:

(a) there are means straddling said rack at either end thereof for mounting said rack to index;

(b) said ridge ends configured to contact the adjacent straddle means and limit the movement of said rack at its extremes.

3. In a remote selector for an automatic phonograph system wherein there is a selector housing including a transparent window, and an index of the record titles available for selection from said system, the index comprising:

(a) a manually rotatable knob extending from the housing;

(b) a plurality of movable panels in said housing, said panels having on both sides listing of record titles available for selection;

(c) individual means pivotally supporting each of the movable panels within the housing on separate rotatable axes;

(d) a sector gear mounted on the rotatable axis of each of said panels;

(e) a horizontal rack coupled to said knob for movement on rotation of the knob;

(f) a toothed portion on said rack positioned to engage successive ones of said sector gears on movement of said rack;

(g) and a lateral rib on said rack discontinuous adjacent said toothed portion for cooperatively holding all panels not in engagement with said toothed portion against movement in the position to which said panels had last been turned.

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