Dec. 27, 1949 G. MATARAZZO 2,492,874

MECHANISM FOR INVERTING DOUBLE-FACED PHONOGRAPH RECORDS

Filed Feb. 7, 1945 4 Sheets-Sheet 1

FIG. 1

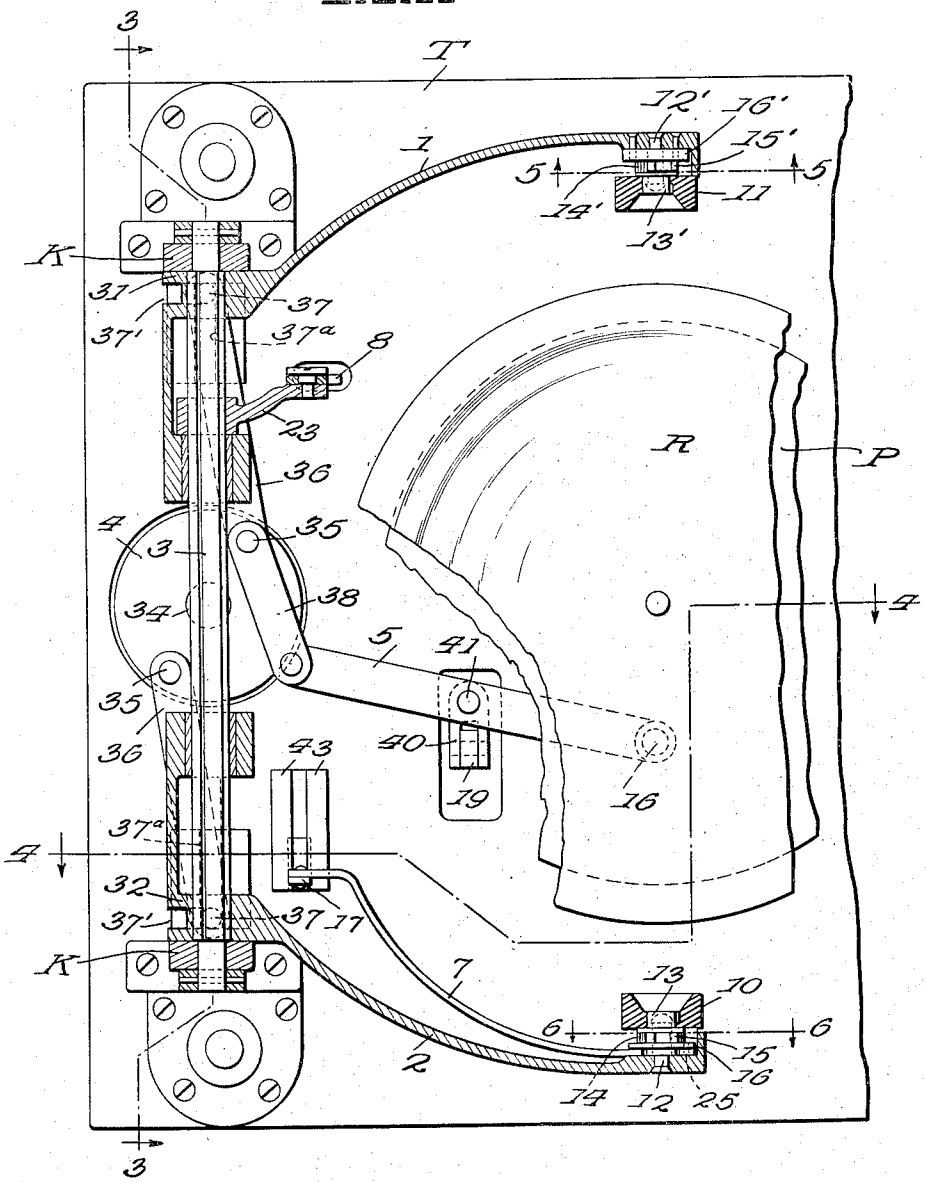


FIG. 1A

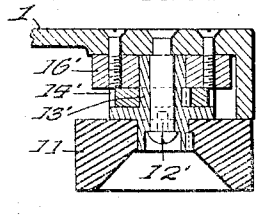
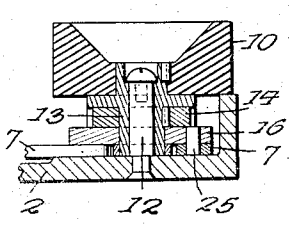


FIG. 1B



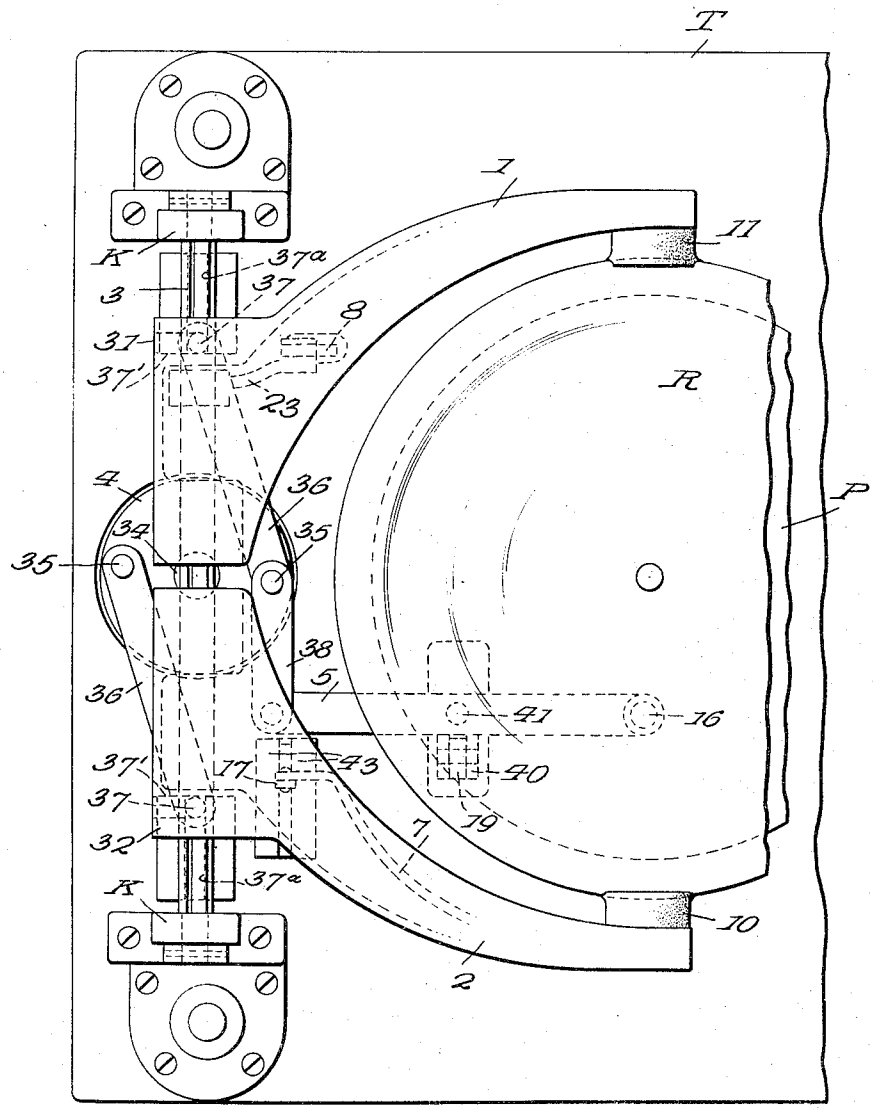
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MECHANISM FOR INVERTING DOUBLE-FACED PHONOGRAPH RECORDS

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FIG. 2



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MECHANISM FOR INVERTING DOUBLE-FACED PHONOGRAPH RECORDS

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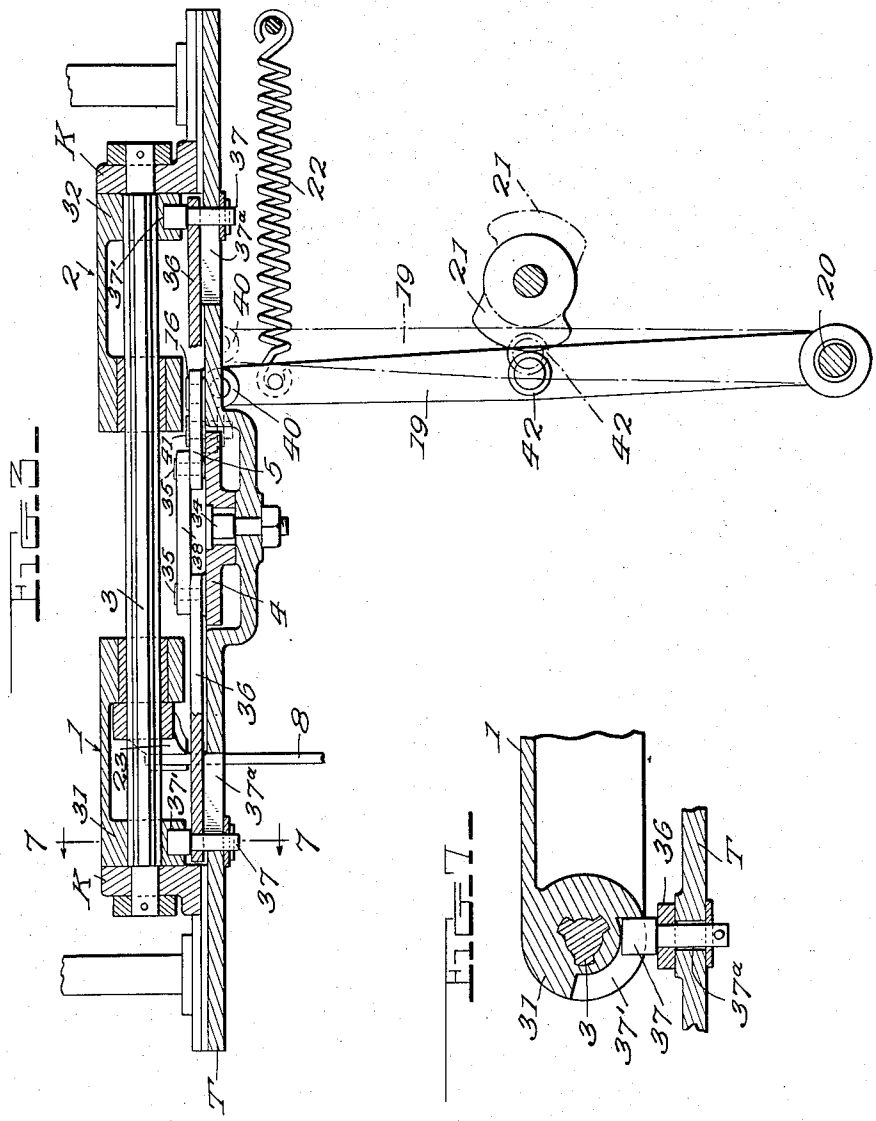


FIG. 5

FIG. 7

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MECHANISM FOR INVERTING DOUBLE-FACED PHONOGRAPH RECORDS

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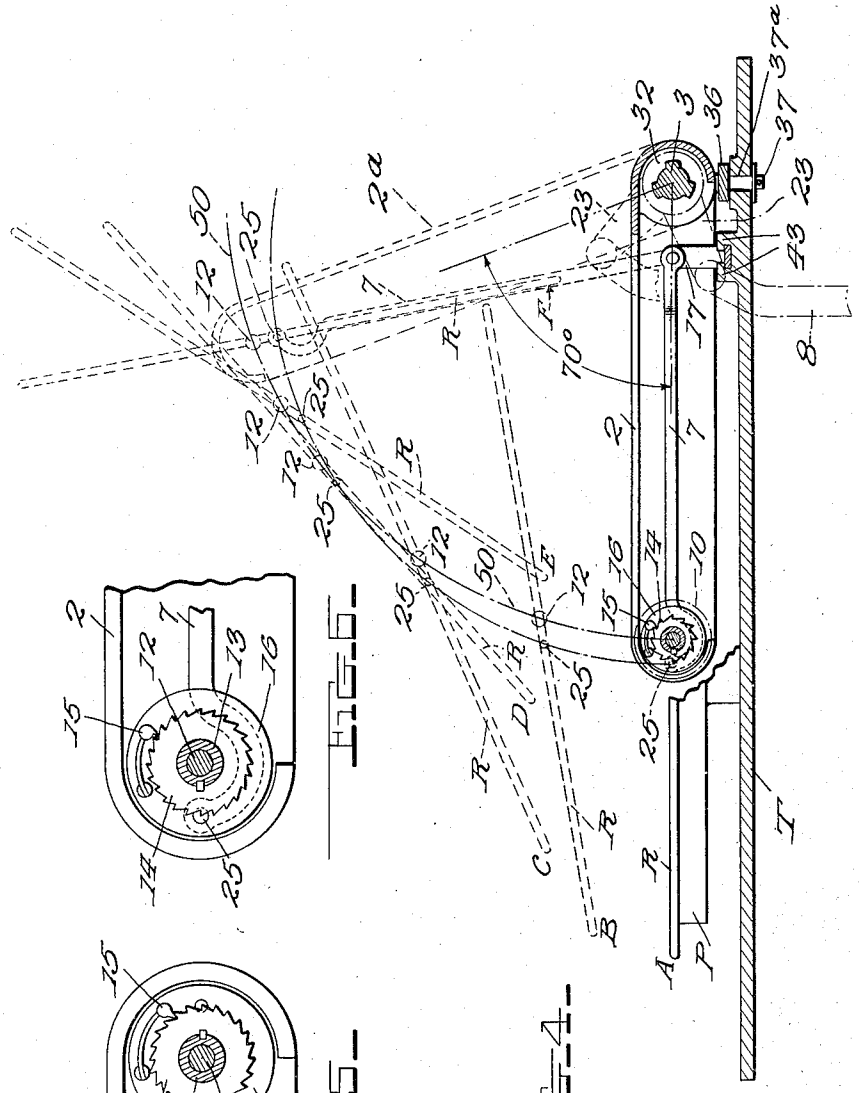


FIG. 1

FIG. 5

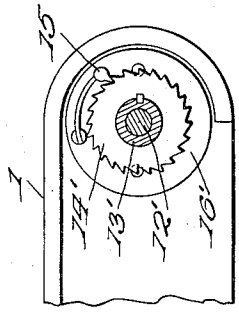


FIG. 4

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UNITED STATES PATENT OFFICE

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MECHANISM FOR INVERTING DOUBLE-FACED PHONOGRAPH RECORDS

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Application February 7, 1945, Serial No. 576,616

4 Claims. (Cl. 274—10)

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Phonographs are known with rotating playing tables to receive disk-shaped phonograph records having sound grooves on each face, and with means for inverting or turning these records so that first one face and then the other may be played.

Records are not of a single standard diameter, as some records are around 10", others around 12", and yet others of other diameters.

Mechanisms currently used for the inversion or turning of double-faced records have certain difficulties which limit their use, due to the weight or to incapacity of adapting themselves to the actual dimension of the record in use, wherewith manually adjusted compensating or adjusting means must be employed or the records must be mounted on adapter pieces. In addition to this, such mechanisms may cause shocks in handling the records and result in breakage thereof.

A feature of the present invention is the provision of record-handling and inverting devices which operate smoothly for engaging the record, for raising and inverting the same, and for then returning the record to its operating or playing position in reversed position.

Another feature of the invention is the provision of means therein by which the parts automatically adapt themselves to the actual diameter of the record being played, without requiring manual attention to this phase.

With these and other features as objects in view, an illustrative form of practice of the invention is shown in the accompanying drawings in which:

Figure 1 is a horizontal sectional view through the center of the bearings for the main shaft of the inverting mechanism and showing the record playing table, the record engaging arms and associated structures in position for permitting the playing of the record.

Figure 1A is a sectional view through the end of one of the arms and the pad associated therewith which pad prevents retrograde movement of the record during the inverting of the same.

Figure 1B is a similar view of the other pad and the associated mechanism which operates through the pad for the turning of the record.

Figure 2 is a plan view of the record inverting mechanism and the playing table with the record engaging pads in engagement with the record for inverting the same.

Figure 3 is a vertical sectional view substantially on the line 3—3 of Figure 1.

Figure 4 is a vertical sectional view substantially on the line 4—4 of Figure 1 with the record

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lifting rock arm and inverting link shown in dotted lines to indicate their behavior during the raising of the record from the table.

Figure 5 is a sectional view on an enlarged scale on the line 5—5 of Figure 1.

Figure 6 is a sectional view on an enlarged scale on the line 6—6 of Figure 1.

Figure 7 is a vertical sectional view through one of the sleeves of a carrying arm and showing the means for moving the sleeve lengthwise of the shaft while permitting the sleeve to oscillate with the shaft.

The record inverting mechanism is illustrated as mounted on a frame including a top T, above which is the rotatable record playing table P. Two arcuate rock arms 1, 2 are mounted by their sleeve portions 31, 32 for movement with a splined horizontal shaft 3 which is journalled in the bearing brackets K on the top T. The sleeves 31, 32 are slidable to and from one another on the shaft 3. A vertical stud 34 is secured to the top T and on this stud is mounted a disc 4. The disc is provided with two pivots 35 which are diametrically opposite one another and equidistant from the center of the disc. Associated with each sleeve 31 and 32 is a stud 37. This stud is mounted in a slot 37a in the top T and is slidable lengthwise of the slot. The slot is parallel with the shaft 3. Each sleeve has a slot 37' therein and the head of the stud engages in this slot. When the stud is moved along the slot it will shift the sleeve along the shaft to which it is splined and at the same time the sleeve with the arm carried thereby is free to oscillate with the shaft. For shifting the studs and moving the sleeves 31 and 32, there are links 36 which are connected to respective pivots 35 on the disc 4. A link 38 extends from one of the pivots 35 to the free end of the actuating arm 5 which has a pivot 16 mounted on the top T.

Beneath the top T (Fig. 3) a pivot 20 is supported by the general frame and receives a rock lever 19 which has its upper end near the level of the top T and pivotally connected to a link member 40 which in turn carries a pin 41 engaged with the actuating arm 5. A cam 21 engages the anti-friction follower roller 42 mounted on lever 19, and can force this lever counter-clockwise to the full-line position of Fig. 3, from which the lever is returned to the dash-line position of Fig. 3 by spring 22 when the cam 21 passes to the dash-line position.

An arm 23 is splined on the shaft 3 and is engaged by the link 8 which extends through a hole in the top T, and is effective to produce and con-

trol the rocking of the arm 23, and therewith of the shaft 3 and arms 1, 2, about the shaft axis.

The outer or free ends of arms 1, 2 are constructed and arranged to carry record-engaging and record-turning structures which can move about an axis extending diametrically of the record, and thus this axis in one position of the arms (Fig. 1) intersects the axis of the playing table P. The arm 1, at its free end, carries the pivot pin 12' which receives the rotatable sleeve 13' upon which are tightly fitted a ratchet 14' and a yieldable rubber record-engaging pad 11 which has a central hollow so that the engagement with the record occurs at points spaced from the aforesaid diametrical axis. A disk 16' surrounds the outer end of the sleeve 13', is fixed to the arm 1, and yieldably supports a pawl 15' engaged with the ratchet 14'. The arm 2, at its free end, carries the pivot pin 12 which receives the sleeve 13 upon which are fitted a ratchet 14 and a yielding rubber record-engaging pad 10 identical with pad 11. The disk 16 surrounds and is free to rotate about the sleeve 13, and yieldably supports a pawl 15 engaged with the ratchet 14. Each of the pads 10, 11 is free with its sleeve 13 and ratchet 14 to rotate in one direction as the pawl 15 clicks: and thus the symmetrical shape of the pad permits long use at successively different positions, without disabling wear having occurred. The disk 16 also has a pivot pin 25 by which it is connected to link 7, and the latter in turn is pivotally connected to the bracket 17 slidable along the ways 43 on the top T. The link 7 has its end adjacent the pivot 12 curved, so that it can occupy the full line position shown in Fig. 4. The bracket connection is eccentric to the axis of the shaft 3.

While records are being removed from or placed on the playing table P, and during playing of a record, the parts are in the position of Fig. 1.

When playing of one side of a double-faced record has ended, and it is desired to play the other side, the operations for reversing or turning the record are as follows:

The tone arm (not shown) is moved out of the way by hand or by means well known in the art, thus clearing the space above the record.

The cam 21 is actuated from the full-line to the dotted line position of Fig. 3, wherewith the lever 19 is moved by spring 22, and the arm 5 is rocked from the position of Fig. 1 toward that of Fig. 2. The link 38 actuates the disc 4 and this latter rotates relatively clockwise in the figures, pulling links 36 and therewith the sleeve 31, 32 toward the position of Fig. 2: bracket 17 can move along the ways 43. The arms 1, 2 move toward one another until the rubber pads 10, 11 engage and grip the edge of the record (Fig. 2) with elastic deformation as shown, and then the further movement of parts under the urge of spring 22 stops. Thus the structure automatically accommodates itself to records of differing sizes.

The link 8 is now actuated to raise the free end of lever 23 (Fig. 4), and rock the shaft 3 and therewith the sleeves 31, 32 and the arms 1, 2, and thus raise the record R through the engagement of the rubber pads 10, 11 with the edge thereof. As the common axis of pins 12, 12' swings in the arc 50 (Fig. 4) determined by the arms 1, 2, the diametrical axis of the record continues to coincide with this common axis. Due to the offset or eccentric position of the pivot bracket 17 relative to the shaft 3, a pull is exerted along link 7, which causes the pivot 25 to effect a relative rotation of the disk 16, so that pawl 15 causes the ratchet 14 to rotate and to turn the pad 10 so that the record

R successively passes from the full-line position A on the playing table P through the dotted line positions B, C, D, E until it attains the dotted line position F when the arms 1, 2 have been rocked, in this illustrative form, through an angle of 70 degrees into the dotted line position 2a: the record in position F is substantially in a plane with the line extending between the pivot points at the ends of the link 7.

The link 8 now lowers as the arms 1, 2 return to their lowered or full line position in Fig. 4. The link 7 causes the disk 16 to rock backward, wherewith the pawl 15 passes freely over the ratchet 14: but the pawl 15' on arm 1 now acts on ratchet 14' to prevent retrograde rotation of the record about its diametrical axis. As the arms 1, 2 approach the full-line position, the lower edge (to the right in Fig. 4) of the record may engage the playing table P, and a further angular movement of the record then occurs until it lies flat and concentrically on the playing table, having been reversed or turned through 180 degrees by the operations described.

The cam 21 is moved back to its full line position, and thus the lever 19 acts through lever 5 and links 38, 36, 36 to cause the sleeves 31, 32 to move apart and into the position of Fig. 1, at which the rubber pads 10, 11 have freed the record. The rotation of the record is started, the tone arm and its stylus are brought into position, and the playing of the new side of the record begins.

What is claimed is:

1. A record inverting mechanism for phonographs having a record playing table and a supporting frame therefor comprising a shaft journalled on said frame adjacent said playing table, means for oscillating said shaft, sleeves mounted on said shaft and keyed thereto for endwise movement on the shaft and for oscillation with the shaft, an arm carried by each sleeve and disposed at opposite sides of the playing table, co-axial rotatable record engaging devices at the free ends of said arms, said devices in the lowered position of the arms being in alignment with diametrically opposed parts of the rim of a phonograph record on said table, a rockable member movable about an axis at right angles to the shaft, links connected to said rockable member at diametrically opposite points and an equal distance from the axis thereof and to said sleeves for moving said sleeves endwise of the shaft and said record engaging devices into and out of contact with a playing record, means for oscillating said rockable member, a link associated with one of said arms and having one end thereof pivotally secured to said frame at a point adjacent to and eccentric to the axis of said shaft, and means carried by the record engaging device to which the other end of said link is connected and operating, when said arms are raised for lifting the record from the table, for turning the record so as to invert the same when returned to the record playing table.

2. A record inverting mechanism for phonographs having a record playing table and a supporting frame therefor comprising a shaft journalled on said frame adjacent said playing table, means for oscillating said shaft, sleeves mounted on said shaft and keyed thereto for endwise movement on the shaft and for oscillation with the shaft, an arm carried by each sleeve and disposed at opposite sides of the playing table, co-axial rotatable record engaging devices at the free ends of said arms, said devices in the lowered

position of the arms being in alignment with diametrically opposed parts of the rim of a phonograph record on said table, a rockable member movable about an axis at right angles to the shaft, links connected to said rockable member at diametrically opposite points and an equal distance from the axis thereof and to said sleeves for moving said sleeves endwise of the shaft and said record engaging devices into and out of contact with a playing record, a lever, means for connecting said lever to said rockable member for oscillating the same, a spring for moving said lever for moving the record engaging devices into engagement with the playing record and a cam for moving the lever in the opposite direction for disengaging the record engaging devices from the playing record, a link associated with one of said arms and having one end thereof pivotally secured to said frame at a point adjacent and eccentric to the axis of the shaft, and means carried by one of said record engaging devices to which the other end of the link is connected and operating when said arms are oscillated for lifting the record from the table, for turning the record so as to invert the same when returned to the record playing table by the lowering of the arms.

3. A record inverting mechanism for phonographs having a record playing table and a supporting frame therefor comprising a shaft journalled on said frame adjacent said playing table, means for oscillating said shaft, sleeves mounted on said shaft and keyed thereto for endwise movement on the shaft and for oscillation with the shaft, an arm carried by each sleeve and disposed at opposite sides of the playing table, co-axial rotatable record engaging devices at the free ends of said arms, said devices in the lowered position of the arms being in alignment with diametrically opposed parts of the rim of a phonograph record on said table, means for moving said sleeves toward and from each other on said shaft for moving the record engaging devices into and out of contact with a playing record, one of said record engaging devices including a pawl and ratchet mechanism for turning the record as it is raised, a link associated with said pawl and ratchet mechanism for turning the record, said link being pivoted to a bracket on the top disposed adjacent the axis of the shaft carrying the arms but eccentric thereto whereby the raising of the arms will cause the pawl to turn the ratchet and thus turn the record as the arms are raised.

4. A record inverting mechanism for phonographs having a record playing table and a supporting frame therefor comprising a shaft journalled on said frame adjacent said playing table, means for oscillating said shaft, sleeves mounted on said shaft and keyed thereto for endwise movement on the shaft and for oscillation with the shaft, an arm carried by each sleeve and disposed at opposite sides of the playing table, coaxial rotatable record engaging devices at the free ends of said arms, said devices in the lowered position of the arms being in alignment with diametrically opposed parts of the rim of a phonograph record on said table, means for moving said sleeves toward and from each other on said shaft for moving the record engaging devices into and out of contact with a playing record, one of said record engaging devices including a pawl and ratchet mechanism for turning the record as it is raised, a link associated with said pawl and ratchet mechanism for turning the record, said link being pivoted to a bracket on the top disposed adjacent the axis of the shaft carrying the arms but eccentric thereto whereby the raising of the arms will cause the pawl to turn the ratchet and thus turn the record as the arms are raised, a pawl and ratchet mechanism associated with the other record engaging devices and operating to prevent retrograde movements of the record during the turning of the same.

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