Nov. 6, 1928.

1,690,267

R. Y. BARROWS ET AL

PHONOGRAPH

Filed Jan. 27, 1921

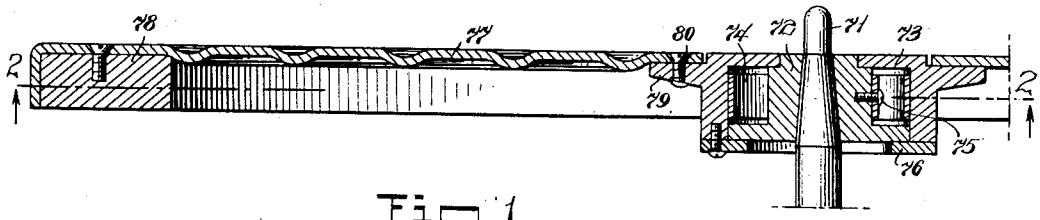


Fig. 1.

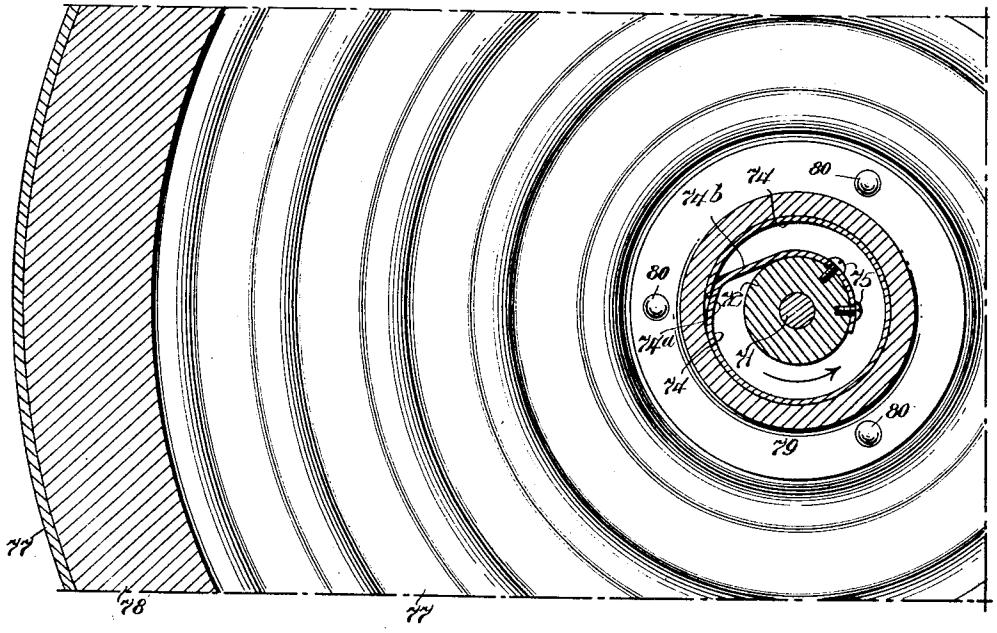


Fig. 2.

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UNITED STATES PATENT OFFICE.

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PHONOGRAPH.

Application filed January 27, 1921. Serial No. 440,384.

This invention relates to phonographs and more particularly to the construction of the record-supporting table and the driving connection thereto.

The principal object of our invention, generally considered, is to provide an improved fly-wheel construction in the rotary record-supporting table for overcoming, as far as possible, fluctuations in speed which cause disturbing variations in tone and in combining therewith an improved driving connection between the motor shaft and the table to prevent the increased inertia of the latter from injuriously affecting the governor.

Other objects and advantages of the invention relating to the particular arrangement and construction of the various parts will become apparent as the description proceeds.

Referring to the drawings illustrating our invention, the scope whereof is defined by the appended claims:

Figure 1 is a fragmentary vertical sectional view of the rotary table and the driving connections therefor, the driving spindle being shown in elevation.

Figure 2 is a horizontal sectional view on the line 2—2 of Figure 1, looking in the direction of the arrows.

In the operation of driving the record table of a phonograph, the power required is not entirely uniform due to the difference in character of the spiral line of the record when music or sound of different character is produced. Where sudden increase of power is recorded in the spiral line of the record the added resistance to the stylus causes the motor to slow down sudenly before the governor can operate to restore the normal speed, which causes a slight but constant and disagreeable fluctuation from correct pitch in the sound produced.

This may be obviated by weighting the outer edge of the turn table, thus distributing the variations over a much greater period of time and making the speed practically uniform. The usual weight of a turn table is 2½ pounds. We have found that 6 pounds will give satisfactory results if 3 or 4 pounds of this weight is placed in close juxtaposition to the outer edge of the table. In order to provide suitable means for preventing any strain being thrown on the motor at times when the rotary table is moving faster than it would be driven by the motor, we interpose a clutch between the motor shaft and said rotary table, said clutch being adapted to positively connect the rotary table to the shaft when the shaft tends to move faster than the table and to permit free relative movement when the table tends to move faster than the shaft. By means of this construction, whenever there is a tendency for the rotary table to move faster than the motor shaft, a condition which exists when the table is started by hand, the positive driving connection between them is interrupted so that it becomes impossible for the inertia of motion in the fly wheel record supporting table to be transmitted to the motor governor.

Referring to the drawings in detail, like parts being designated by like reference characters, there is shown a motor-driven spindle 71 with a hub 72 removably mounted thereon and a collar 73 rotatably connected thereto. Interposed between the hub 72 and the collar 73, which respectively constitute the driving and driven members of the clutch, is a spiral spring 74, the latter being secured at one end to the hub 72 by means of screws 75. The spring 74 extends in a coil about the hub 72 and has its other end for nearly a complete turn of its length in slidable engagement with the inner cylindrical wall of the collar 73. From an inspection of Figure 2, it will be understood that relative rotation of shaft 71 with respect to collar 73 in the direction of the arrow will tend to expand the inner end of the spring 74 and hence positively clutch the hub 72 to collar 73. It will also be obvious that relative rotation of the hub in the opposite direction will tend to wind the spring 74 on the hub 72 and cause its free end to slip over the inner cylindrical wall of collar 73. Secured to the lower end of the collar 73 is an annular plate 76 which prevents relative axial displacement between the hub 72 and collar 73.

An annular sheet metal plate 77 which extends outwardly from the collar 73, is provided with a peripheral weight 78 which is preferably mounted on the under surface of sheet metal plate 77. According to the present embodiment of our invention this weight has been designed and arranged to obtain a maximum moment of inertia for a given weight of table carried by the motor driven shaft without materially increasing the space to be occupied by the rotary table. The inner periphery of the annular plate 77 rests upon a flange

79 to which it is secured by rivet screws 80. Whenever the rotary table is removed, the collar 72 is lifted with it from the motor driven spindle 71.

We claim:—

1. In a phonograph, a motor driven spindle, a record supporting table having a circumferential weight attached thereto adjacent the periphery thereof, and means for clutching said table to said spindle for a one-way movement only, said means including a two-part hub attached to and removable with said table.

2. In a phonograph, a motor driven spindle, a record supporting table, means for weighting said table for sustaining the speed of rotation under variable resistance, and a multi-part hub interposed between said spindle and table, means for positively connecting one of said parts to said spindle and clutching means interposed between the parts of said hub, said clutching means being adapted to permit said table to be rotated faster than said spindle and in the same direction.

3. In a phonograph, a power driven spindle, a record supporting table including a clutch comprising a hub mounted on said spindle and a collar rotatable relatively to said hub, and a spiral spring interposed between said hub and said collar, said spring being secured to said hub and conforming to the inner cylindrical surface of said collar.

4. In a phonograph, a power driven spindle, a record supporting table including a clutch comprising a hub mounted on said spindle and a collar rotatable relatively to said hub, a spiral spring interposed between said hub and said collar, said spring being secured to said hub and conforming to the inner cylindrical surface of said collar and a circumferential weight extending around the periphery of said rotary table.

5. In a phonograph, the combination with a rotary record table having a weighted peripheral edge portion, of a motor driven spindle, a hub mounted on said spindle, and a yieldable driving connection between said hub and supporting table, said driving connection permitting the weighted table to move relatively faster than it is normally driven by the motor spindle for preventing strain upon the latter, but acting to clutch the table when it tends to move slower than the motor spindle.

6. In a phonograph, a record supporting table having a hub with a tapered aperture therein adapted to receive a motor driven spindle for frictional engagement, said hub being movable with respect to said table and means extending between said hub and the adjacent portion of said table permitting relatie movement between said hub and table in one direction but clutching said table and preventing relative movement therebetween in the other direction.

7. In a phonograph, a record supporting table, a central collar rigidly connected to said table, a hub rotatably mounted within said collar and resilient means connected to said hub and extending outwardly to engage the adjacent surface of the collar, said means contracting and permitting free relative movement between said hub and collar in one direction but expanding and gripping the collar to the hub upon relative movement in the other direction, said hub being provided with a central aperture adapted to receive and frictionally engage driving means for the table.

8. A clutch adapted for use with a record supporting table of a phonograph comprising a hub portion formed with a central aperture adapted to receive and frictionally engage a driving spindle, a collar surrounding said hub adapted for connection with a record supporting table of a phonograph and for rotative movement with respect to said hub, means for preventing undesired axial movement between the hub and collar and resilient means extending spirally from a connection with the hub to frictionally engage the adjacent inner surface of the surrounding collar, said means being contracted upon relative movement between the collar and hub in one direction with substantially no resistance to such movement and expanded to grip the surrounding collar upon attempted relative movement in the other direction for exerting driving force from said hub to the collar.

9. A clutch adapted for use with record supporting tables of phonographs comprising a central hub formed with a central conical aperture therethrough for receiving a driving spindle, a collar surrounding said hub for rotative movement therebetween, an annular member connected to said collar and overlapping a portion of the hub for preventing axial displacement between said hub and collar, a spiral spring connected to the hub and extending outwardly to engage the adjacent inner surface of the collar, said spring contracting and permitting free rotative movement of the hub in one direction with respect to the collar but expanding and gripping the collar to drive the same when the hub is rotated in the other direction.

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