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SPEED-CHANGING MECHANISM FOR PHONOGRAPHS

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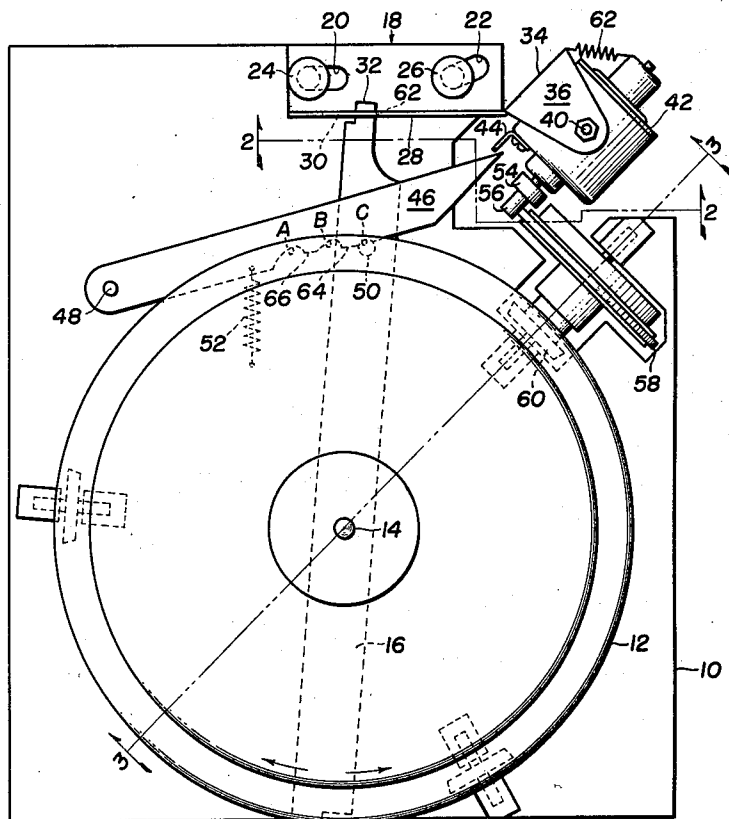


FIG. 1

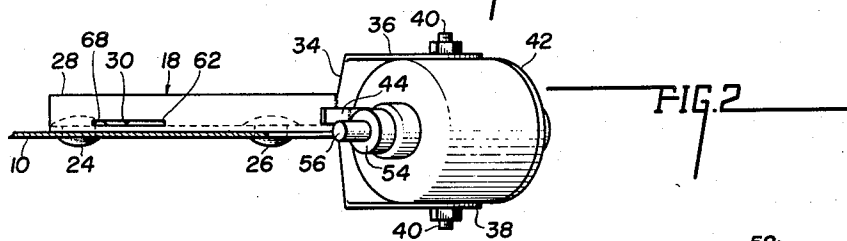


FIG. 2

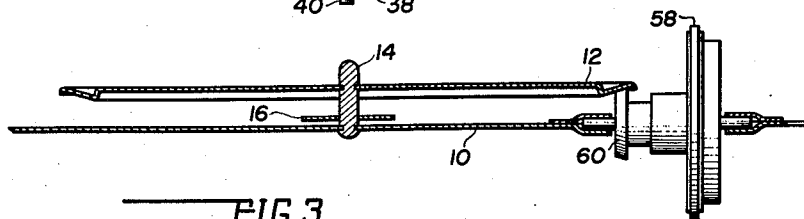


FIG. 3

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SPEED-CHANGING MECHANISM FOR PHONOGRAPHS

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5 Claims. (Cl. 74-200)

The present invention relates to speed changing mechanisms for phonographs and more particularly to a speed-changing mechanism especially adapted for use in automobile phonographs.

Automobile phonographs are small in size and for this reason use only the smaller diameter records, for example, the disc type records of approximately six and one-half inches in diameter. In order to obtain a relatively long period of play-time on a record of this size, it is necessary that the slower turntable speeds be used, suitable speeds being forty-five (45), thirty-three (33), and sixteen (16) revolutions per minute (r.p.m.).

Inasmuch as these different slower speeds are available, it becomes desirable that the phonograph be capable of playing different speed records. Since automobile phonographs are small in size and at the same time are rugged in construction, it is necessary that any acceptable speed-changing mechanism be correspondingly small in size and ruggedly constructed.

It is an object of this invention to provide a speed-changing mechanism for phonographs which is small in construction, reliable in operation and economical to build.

It is another object of this invention to provide a speed-changing mechanism which is especially adapted for use in automobile phonographs.

Other objects will become apparent as the description proceeds.

To the accomplishment of the above and related objects, my invention may be embodied in the forms illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that specific change be made in the specific constructions illustrated and described, so long as the scope of the appended claims is not violated.

In the drawings:

Fig. 1 is a top plan view of one embodiment of this invention;

Fig. 2 is a fragmentary sectional illustration showing the motor mounting; and

Fig. 3 is a fragmentary sectional illustration showing the idler wheel in driving engagement with the turntable.

Referring to the drawings, a rigid sheet metal chassis 10 rotatably supports a turntable 12 about a center spindle 14. Pivotably supported about the spindle 14 and located between the chassis 10 and turntable 12 is an operating lever 16, this lever 16 being movable in either clockwise or counter-clockwise directions.

On the rear of the chassis is mounted a supporting bracket or motor support 18 which is provided with two elongated slots 20 and 22, the slot 22 being at a slight angle as shown in Fig. 1. Suitable pins or rivets 24 and 26 pass through the slots 20 and 22, respectively, for securing the bracket to the chassis, a free clearance being provided between the rivet heads and the bracket to permit sliding movement of the latter.

The bracket 18 is provided with an upstanding flange

28 (see Fig. 2) having a longitudinally extending slot 30 for receiving the end 32 of the lever 16. The slot 30 is of such length as to provide for a certain amount of relative movement between the lever end 32 and bracket 18 as will be described more fully hereinafter.

The upstanding flange 28 is extended longitudinally outwardly to be formed into a trunnion support 34 having two parallel mounting lugs 36 and 38. Two pivot supports or trunnions 40 mount an electric motor 42 therebetween for pivotal movement about a vertical axis, the motor shaft axis being disposed in a horizontal plane. A right angle bracket or abutment 44 is bolted to the motor for selective engagement by the end of a lever 46 which is pivoted on the chassis at 48. This lever 46 is positioned between the turntable and the chassis, and is provided with three different depth notches A, B and C, as indicated having different depth lands therebetween.

On the lever 16 is a stud 50 which is selectively engageable with the three notches A, B and C as will be explained more fully hereinafter. A tension spring 52 is connected between the lever 46 and the chassis for urging the lever into contact with the stud 50.

The motor 42 is provided with a driving spindle having two different diameter portions 54 and 56, these portions being selectively engageable with the rubber rim of an idler wheel 58 which is mounted for rotation about an axis lying in the plane of the chassis 10. The idler wheel 58 carries a smaller driving-wheel 60 which engages and drives the turntable 12. It will now be evident that the speed of rotation of the turntable 12 will depend on which of the spindle portions 54 or 56 are in contact with the idler wheel 58.

A tension spring 62 is connected between the rear of the motor 42 and the support 34 for urging the motor in a counter-clockwise direction as viewed in Fig. 1.

In considering the operation of the mechanism thus far described, it will be assumed that the notch "B" of the lever 46 will correspond to a central or "off" position of the phonograph. In other words, the phonograph will not operate when the notch B is engaged by the stud 50 of the lever 16. The other two notches A and C may be considered as corresponding to forty-five (45) and sixteen (16) r.p.m. of the turntable, respectively. It will, however, be evident to a person skilled in the art that the turntable speeds represented by these notches A and C will depend upon the relative sizes of the spindle portions 54 and 56, so that this invention is not limited to the use of the two specifically mentioned speeds of sixteen (16) and forty-five (45) r.p.m.

With the mechanism adjusted as shown in Fig. 1, and the energizing circuit to the motor closed, the motor will rotate and the turntable 12 will be driven through the spindle portion 56, idler wheel 58 and drive wheel 60. It should be noted in Fig. 1 that for the speed corresponding to notch C, the lever end 32 is in contact with the right-hand end 62 of the slot 30.

When it is desired to change the mechanism to neutral position, that is to a position in which the spindle 54, 56 is held out of engagement with the rubber rim on the wheel 58, the lever 16 is moved counter-clockwise to position the stud 50 into notch "B." Analyzing this movement in two steps, it will be noted that as the stud 50 moves, it first encounters the land portion 64 which serves to move the lever 46 counter-clockwise into engagement with the motor abutment 44, which in turn swings the motor 42 clockwise out of engagement with the wheel 58. The next motion permits the stud 50 to drop into the notch "B" which is made to such a depth that it will still hold the motor 42 out of contact with the wheel 58.

Continued counter-clockwise movement of the lever 16 moves the stud 50 onto the land 66 which is of such

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depth as to swing the motor 42 clockwise to an extent which will provide peripheral clearance between the spindle portion 54 and the wheel 58. At the moment the stud 50 is positioned on the land 66 the lever end 32 engages the left-hand end 68 of the bracket slot 30. Thus, continued movement of the stud 50 into the notch A serves to move the bracket 18 toward the left (Fig. 1) carrying the motor 42 therewith. At the end of this leftward movement, the spindle portion 54 is positioned in registry with the wheel 58. As the stud 50 drops into the notch A, the lever 46 is permitted to swing clockwise under the tension of spring 52 to allow the spindle portion 54 to engage the wheel 58. Thus, the speed of the turntable has been effectively changed by shifting the spindle portion 56 out of contact with the wheel 58 and to shift the spindle portion 54 into contact therewith.

In moving from notch A to notch C, the action is reversed, with the motor being pivoted outwardly from the wheel 58 prior to being moved in a planar direction to a position at which the spindle portion 56 is in registry with the wheel 58.

The specific constructions of the turntable 12 and idler wheel 58 constitutes the subject matter of two other applications, respectively, Serial No. 587,683, filed May 28, 1956 and Serial No. 597,512, filed July 12, 1956 by the same inventor, both abandoned.

What is claimed is:

1. A mechanism of the character described comprising a supporting chassis, a turntable mounted for rotation on said chassis, a motor support movably mounted on said chassis, a motor pivotally mounted on said motor support, said motor having a spindle of at least two different diameter portions, a first lever pivoted on said chassis for pivoting selectively said motor, a second lever on said chassis operatively connected to said movable support, and a detent device interconnecting said first and second levers whereby operation of said second lever actuates both said first lever and said motor support for changing the operative relationship of said spindle portions with said turntable.

2. A mechanism of the character described comprising a supporting chassis, a turntable mounted for rotation on said chassis, a motor support movably mounted on said chassis, a motor pivotally mounted on said motor support, said motor having a spindle of at least two different diameter portions, a first lever pivoted on said chassis for pivoting selectively said motor, a second lever on said chassis which is received by a slot in said motor support, said motor support thereby being movable by said second lever, and a detent device interconnecting said first and second levers, said detent device including means which actuates said first lever prior to the actuation of said motor support for changing the operative relationship of said spindle portions with said turntable.

3. A mechanism of the character described comprising a supporting chassis, a turntable mounted for rotation on said chassis, a motor support movably mounted on said chassis, a motor pivotally mounted on said motor support,

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said motor having a spindle of at least two different diameter portions, a first lever pivoted on said chassis for pivoting selectively said motor, a second lever on said chassis operatively connected to said movable support, and a detent device interconnecting said first and second levers whereby operation of said second lever actuates both said first lever and said motor support for changing the operative relationship of said spindle portions with said turntable, said detent device including means which actuates said first lever prior to the actuation of said motor support during the speed-changing cycle.

4. A mechanism of the character described comprising a supporting chassis, a turntable mounted for rotation on said chassis, a motor having a spindle of two different diameter portions, a support carrying said motor and slidably mounted on said chassis for moving one or the other of said two portions into operative relation with said turntable and including a pivotal connection to said motor for providing swinging movement of said spindle out of and into operative relation with said turntable, a first lever pivotally mounted on said chassis in engagement with said motor for swinging said spindle out of and into operative relation with said turntable, a second lever pivotally mounted on said chassis and engaging said motor support for reciprocating said support, and means linking said levers for initially operating said first lever and swinging said motor and subsequently effecting a change of spindle portion in operative relation with said turntable.

5. A mechanism of the character described comprising a supporting chassis, a turntable mounted for rotation on said chassis, a motor having a spindle of two different diameter portions, a support carrying said motor and movably mounted on said chassis for moving one or the other of said two portions into operative relation with said turntable and including a connection to said motor for providing movement of said spindle out of and into operative relation with said turntable, a first member movably mounted on said chassis in operative relation with said motor and operable for moving said spindle out of and into operative relation with said turntable, a second member movably mounted on said chassis in operative relation with said motor support for moving said support, and means operatively associated with said members for coordinating their operation to initially operate said first member and move said spindle out of operative relation with said turntable and subsequently to effect a change of spindle portion in operative relation with said turntable.

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