

July 1, 1941.

B. R. CARSON

2,247,651

PHONOGRAPH

Filed May 31, 1939

2 Sheets-Sheet 1

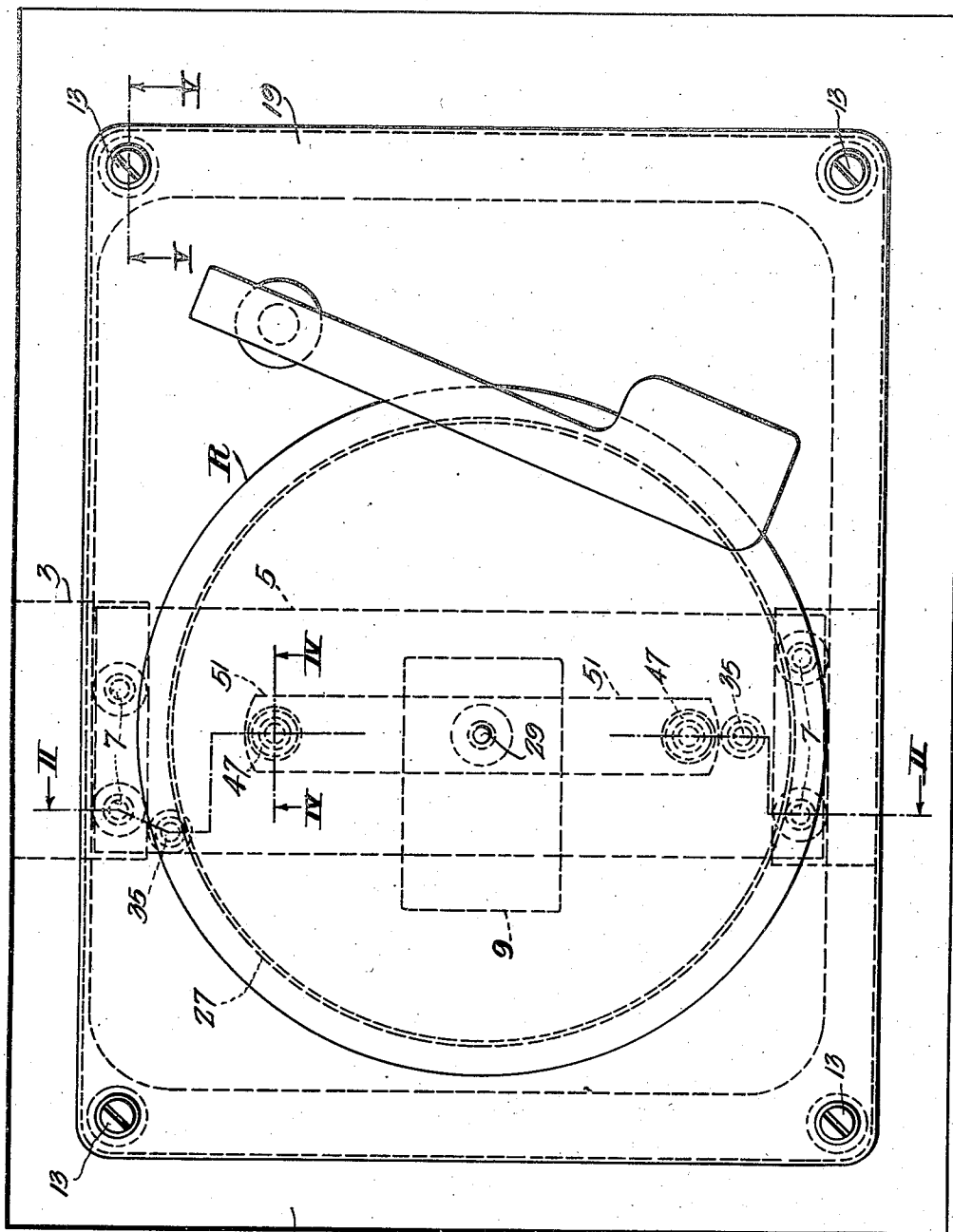


Fig. 1.

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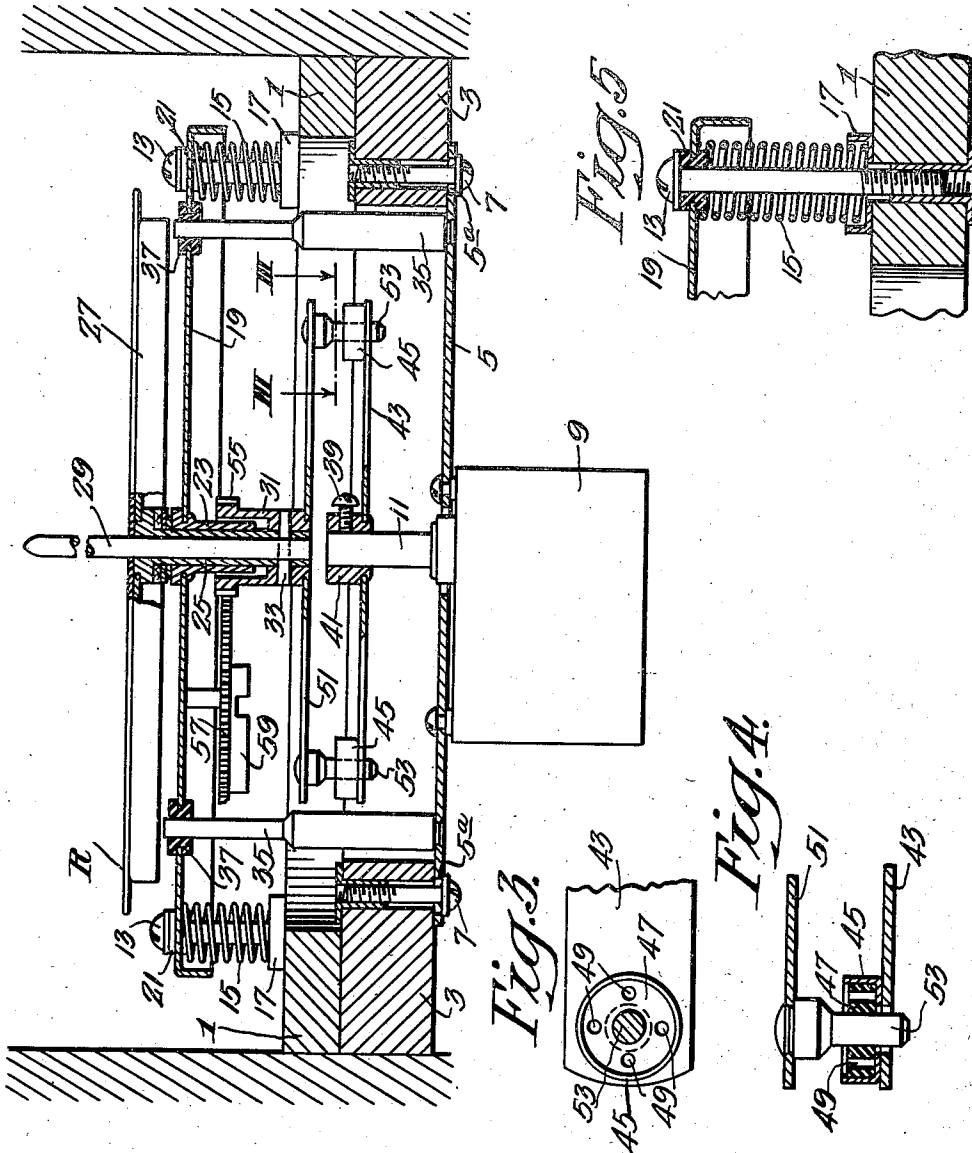


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE

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PHONOGRAPH

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Application May 31, 1939, Serial No. 276,685

6 Claims. (Cl. 274-9)

This invention relates to phonographs, and more particularly to the driving means for the turntable thereof, the present invention being particularly useful in automatic phonographs of the type wherein a series of records are automatically played in succession upon the turntable.

It is well known that it is hardly possible to manufacture driving motors which are so mechanically and electrically perfect that they do not constitute a source of mechanical vibrations. In conventional phonographs, this has been a great source of annoyance for the reason that these vibrations are transferred to the turntable and affect the quality of reproduction.

The primary object of my present invention is to provide an improved phonograph turntable drive which may be used in connection with phonograph motors generally available but without the objectionable result heretofore noted.

More particularly, it is an object of my present invention to provide an improved coupling between the turntable and the driving motor which will practically eliminate the transference of motor hum and vibrations to the turntable.

Another object of my present invention is to provide an improved phonograph turntable drive mechanism as aforesaid by means of which speed variations, commonly known as "wows," will be greatly minimized.

A further object of my present invention is to provide an improved turntable drive as previously set forth which will transfer power from the motor to the turntable with great efficiency.

Still a further object of my present invention is to provide an improved phonograph turntable mounting wherein the load of the motor will be largely removed from the turntable supporting board.

It is also another object of my present invention to provide a phonograph turntable drive and mounting which is simple in construction and which readily lends itself to economical quantity manufacture.

According to one form of my present invention, I mount the motor upon a motor plate which is in turn mounted upon the motor board, the motor including a driving shaft which extends upwardly through the motor board a short distance. Resiliently mounted on top of the motor board is a second plate which rotatably carries the turntable spindle, a plurality of aligning posts serving to align the two plates in such a manner that the turntable spindle and the motor shaft will be in substantial alignment. Preferably, the aligning posts are mounted in rubber grommets or washers on the aforesaid second plate so as to prevent rumble and other vibrations originating in the motor from being

transferred to the second plate and the turntable spindle through the aligning posts.

The motor driving shaft and the turntable spindle are not only substantially axially aligned, but are also in axially spaced relation, and each carries a diametrically extending arm, the two arms being superposed over and spaced from each other. On the ends of the arm carried by the motor shaft, there are mounted soft rubber grommets in which are frictionally received downwardly extending pins on the ends of the arm carried by the turntable spindle. Thus, a resilient coupling is provided between the driving shaft and the spindle which absorbs vibrations originating in the motor and prevents their transference to the spindle and the turntable.

The novel features that I consider characteristic of my invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and method of operation, as well as additional objects and advantages thereof, will best be understood from the following description of one embodiment thereof, when read in connection with the accompanying drawings, in which—

Figure 1 is a plan view of a phonograph embodying my invention,

Figure 2 is a sectional view taken along the line II—II of Fig. 1,

Figure 3 is a detail sectional view taken along line III—III of Fig. 2,

Figure 4 is a sectional view taken along the line IV—IV of Fig. 1, and

Figure 5 is an enlarged detailed section taken along the line V—V of Fig. 1.

Referring more particularly to the drawings, wherein similar reference characters designate corresponding parts throughout, I have shown, in Figs. 1 and 2, a motor board 1 having a pair of blocks 3 secured thereto on which a motor plate 5 is mounted by means of screws 7, the motor plate 5 carrying a motor 9 provided with an upwardly extending driving spindle 11. Preferably, the plate 5 is provided with elongated holes 5a so that the plate 5 may be adjusted transversely of the motor board for a purpose presently to be set forth. Threaded into the motor board 1, as more clearly shown in Fig. 5, are a plurality of mounting screws 13 surrounded by coil springs 15 which are received in cup members 17 resting on the motor board 1. A second plate 19 has mounted thereon a plurality of washers 21 of soft rubber in which the mounting screws 13 are received and which vibration insulate the plate 19 from the motor board 1, the plate 19 resting upon the coil springs 15.

Staked or otherwise suitably secured to the plate 19 is a bushing 23 in which the hollow hub 25 of a turntable 27 is rotatably received, a turntable spindle 29 being mounted in the hub 25

and extending above the turntable 27 a distance sufficient to receive one or more records R. The spindle 29 may be secured to the bushing 25 and to a sleeve 31 in any suitable way, as by means of a cross-pin 33, so that the spindle 29, the turntable 27 and the sleeve 31 all rotate as a unit.

Connecting the motor plate 5 and the turntable supporting plate 19 are a plurality of aligning posts 35 which may be fixed to the plate 5 and which are preferably received in rubber washers 37 carried by the plate 19, the washers 37 preventing the transmission of vibrations originating in the motor 9 to the plate 19 and the parts carried thereby. The posts 35 are employed to bring the turntable spindle 29 and the motor driving shaft 11 into substantial axial alignment by fitting the posts 35 into the openings in the washers 37, the openings 5a in the motor plate 5 permitting adjustment of the plate 5 to bring the motor shaft 11 into the desired relation with respect to the spindle 29.

Fastened to the driving shaft 11, as by means of a screw 39, is a collar 41 which is staked to an arm 43 extending diametrically from the shaft 11. The arm 43 carries on its ends the cups 45 in which soft rubber grommets 47 are mounted, the grommets 47 being preferably perforated at a plurality of points 49 in order to make them very flexible. The sleeve 31 is staked to a second arm 51 which extends diametrically with respect to the spindle 29 and which is superposed over the arm 43. At its ends, the arm 51 carries downwardly extending pins 53 which are frictionally received in the grommets 47, the grommets 47 and the pins 53 thus acting as yieldable couplings between the motor shaft 11 and the spindle 29.

The upper end of the sleeve 31 may be formed with a gear 55 which meshes with a second gear 57 rotatably mounted on the turntable plate 19. The gear 57 may carry a controlling element 59 thereon for controlling the cycle of automatic operations in the same manner, for example, as the cam member 15 shown in my United States Patent No. 2,094,255, granted September 28, 1937.

From the foregoing description, it will be apparent to those skilled in the art that I have provided a novel and improved phonograph turntable drive by means of which vibrations originating in the motor 9 will be absorbed by the yieldable coupling 47, 53, and hence not transferred to the turntable 27 and the record R. The rubber washers 21 and 37 and the coil springs 15 further insure absorption of the aforesaid vibrations to assist in preventing their transference to the turntable. Moreover, by mounting the motor 9 and the turntable plate 19 independently on the motor board, it will be apparent that motor 9 will not constitute a load on the turntable plate 19, and that smoother operation will, therefore, result.

Although I have shown and described but one specific embodiment of my invention, I am fully aware that many other modifications thereof and changes in the particular modification disclosed are possible. I therefore desire that my invention shall not be limited except insofar as is made necessary by the prior art and by the spirit of the appended claims.

I claim as my invention:

1. In a phonograph, the combination of a motor board, a motor carried thereby and including a driving shaft, a mounting plate above said motor board, resilient means supporting said plate on said motor board, a turntable spindle

rotatably mounted on said plate in axially spaced relation to and in substantial axial alignment with said shaft, and means including resilient elements coupling said shaft to said spindle whereby to provide a driving coupling therebetween, said elements being adapted to absorb vibrations originating in said motor to prevent their transference to said spindle.

2. The invention set forth in claim 1 characterized in that said coupling means comprises diametrically extending superposed arms on each of said driving shaft and said turntable spindle, said resilient elements being carried on one of said arms, and means on the other of said arms having engagement with said resilient elements.

3. The invention set forth in claim 1 characterized in that said coupling means comprises diametrically extending superposed arms one on each of said driving shaft and said turntable spindle, characterized further in that said resilient elements comprise soft rubber grommets carried on the ends of one of said arms, and characterized further by the addition of pins on the ends of the other of said arms frictionally received by said grommets.

4. In a phonograph, the combination of a motor board, a motor plate carried thereby, a motor carried by said motor plate and having a driving shaft extending above said plate, a second plate resiliently supported on said motor board in spaced relation to said motor plate, a turntable spindle rotatably mounted on said second plate, means including shock absorbing elements connecting said plates to bring said shaft and said spindle into substantial alignment with each other, and means including yieldable elements coupling said shaft and said spindle, said yieldable elements being adapted to absorb vibrations originating in said motor to prevent their transference to said spindle.

5. In a phonograph, the combination of a motor board, a motor plate carried thereby, a motor carried by said motor plate and having a driving shaft extending above said plate, a second plate resiliently supported on said motor board in spaced relation to said motor plate, a turntable spindle rotatably mounted on said second plate, means including shock absorbing elements connecting said plates to bring said shaft and said spindle into substantial alignment with each other, a pair of diametrically extending, superposed arms, one on each of said driving shaft and said turntable spindle, and resilient coupling elements connecting the ends of said arms whereby to provide a driving connection between said shaft and said spindle, said resilient elements and said shock absorbing elements serving to absorb vibrations originating in said motor to prevent their transference to said spindle.

6. In a phonograph, the combination of a motor board, a turntable supporting plate mounted on and above said motor board, a driving motor carried by and below said motor board and including a shaft extending upwardly through said motor board, a turntable spindle rotatably mounted on said plate in substantial axial alignment with and in axially spaced relation to said shaft, a turntable associated with said spindle, and a driving coupling between said shaft and said spindle, the respective weights of said motor and of said turntable supporting plate and turntable being independently carried by said motor board.

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