

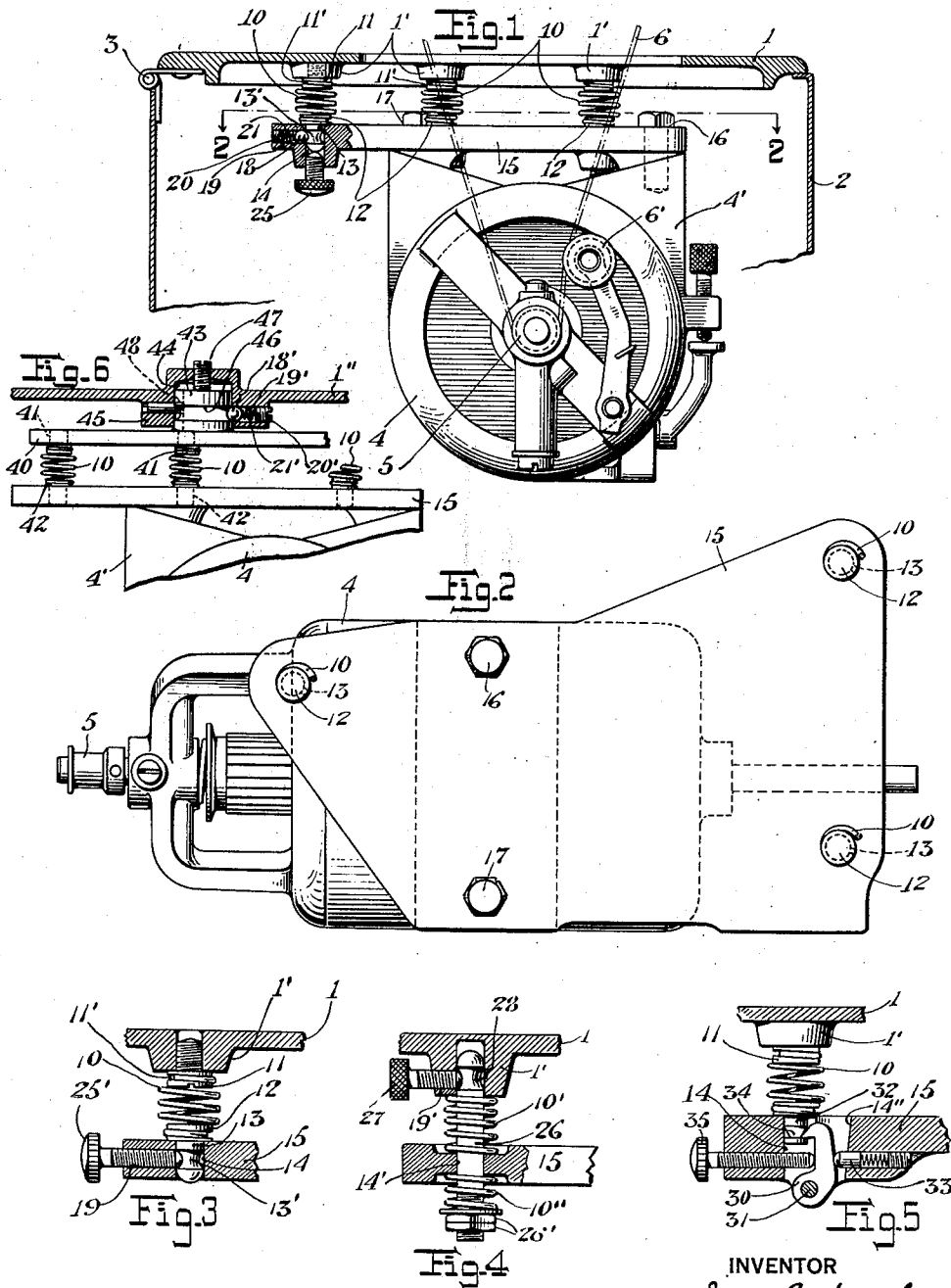
Nov. 5, 1935.

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2,020,119

MOTOR SUPPORTING MEANS

Filed Feb. 16, 1932



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2,020,119

MOTOR SUPPORTING MEANS

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Application February 16, 1932, Serial No. 593,311

4 Claims. (Cl. 248—17)

My invention relates to improved supporting means for small motors, and while especially designed for supporting the driving motors of phonographs, it is to be understood that my invention is capable of many other applications.

Phonograph motors, particularly those employed for operating recording and/or transcribing machines, are ordinarily supported from the top-plates carrying the recording and/or reproducing mechanism by cushioning devices, such as spiral springs, disposed between such top-plates and the motor frames. This manner of supporting such motors was found, in the early phonograph art, to be an effective solution of the problem of eliminating the objectionable effects which, due to motor vibration and operation, were produced in the recording and the reproducing of sound records.

The effectiveness of the construction above described for supporting a motor is still highly regarded, but involves the necessity of loosening and removing several parts when it is desired to remove the motor from the top-plate or other member from which it may be supported, for cleaning, overhauling or other purposes.

The principal object of my invention is to provide an improved construction of the character described, whereby a motor may be readily removed from or applied to the structure, such as the top-plate of a phonograph, by which it is normally designed to be supported, preferably without the necessity of removing any parts from such structure or the motor.

Another object of the present invention is to provide in a construction of this character, readily accessible means adapted by simple manipulation thereof, to disconnect the motor from or operatively connect the same to the phonograph top-plate or other structure by which it is designed to be supported.

Other objects and features of my invention will be hereinafter more specifically described and claimed.

In order that my invention may be better understood, attention is directed to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a view, partly in elevation and partly in section, showing a preferred construction in accordance with my invention for supporting a motor from the top-plate of a phonograph;

Fig. 2 is a view taken on line 2—2 of Fig. 1;

Figs. 3, 4 and 5 are detailed part sectional views,

respectively showing three modified forms of my improved supporting means; and

Fig. 6 is a detailed part sectional view of a further modified construction wherein means comprising a single-point suspension is provided for resiliently supporting a motor from the phonograph top-plate or other main support therefor.

Referring to Fig. 1, reference character 1 represents a suitable support for a motor 4, which support may also be designed to carry or be intimately associated with mechanism likely to be affected by vibrations and noise which result from the operation of the motor. The support 1 shown is the top-plate of a business phonograph and is designed to carry thereon the usual phonograph mechanism (not shown), comprising the mandrel, feed screw, carriage and, recording and/or reproducing devices. The top-plate 1 is supported on the upper edge of the usual cabinet 2 for the motive means of the phonograph, and 20 is preferably hinged at 3 to said cabinet so that it may be swung or tilted upwardly to render readily accessible the motor and other parts which are normally disposed within the cabinet.

The motor 4 is an electric motor of conventional form and comprises a pulley 5 for driving a belt encircling a larger pulley (not shown, but supported above the top-plate) which transmits power to the phonograph mechanism. A spring-pressed idler pulley 6 engages the belt 6 30 and acts to maintain the latter properly taut at all times, in spite of vibratory movements of the motor with respect to the support or top-plate 1, which may occur.

The construction above specifically described is 35 well known, and comprises, per se, no part of my invention.

In accordance with my invention, the motor 4 is resiliently suspended from the main support or top-plate either at one or at a plurality of 40 points. As shown in Fig. 1, the motor is so supported from the top-plate 1 at three points by means comprising three spiral springs 10, and connections between the ends of these springs and the top-plate and motor respectively. The connection between each of springs 10 and the top plate 1, as shown comprises a headed screw 11 which is threaded into a boss 1' provided on the under side of the top-plate; the head of said screw being provided with an annular groove 11' and the upper end of the respective spring 50 being reduced and firmly seated in said groove. The connection between each spring 10 and the motor comprises latch means having a stud or plug 13 provided with a grooved head 12 and an 55

annular groove or cam surface 13' in its stem, and also having a suitable member or element adapted to coact with the said groove 13', for detachably connecting the stud to a horizontal plate 15 which is secured, as by bolts 16 and 17, to the motor frame 4'. The lower end of each spring 10 is also reduced and firmly seated or engaged with the groove in the head 12 of the respective stud 13. A vertical cylindrical opening 14 is provided in the plate 15 for each stud 13 and into which the stem of the stud normally extends. In this form of my invention, each of the members or elements which are adapted respectively to coact with the studs 13, consists of a spring-pressed ball 18 which is mounted in an opening 19 extending from the edge of the plate 15 to the opening 14 for the respective stud. Each opening 19 is closed at its outer end by a short adjustable screw 20 and has a coiled spring 21 disposed therein between the screw 20 and the ball 18. The degree of compression of spring 21 is, in each connection, so regulated by adjustment of screw 20, that the corresponding ball 18 is adapted to engage with the groove 13' of the respective stud 13 under such pressure as to provide a firm connection between the stud and the plate 15. Each of the openings 19 is preferably slightly reduced in diameter at its inner end to prevent dislodgment of the respective ball 18 therefrom.

From the foregoing it will be apparent that each of the balls 18 is biased to its operative or holding position, and that when all of the balls are in such position they will be engaged with the respective studs 13 under such pressure as to overcome the effect of the weight of the motor 4 and the parts directly associated therewith. Accordingly the motor will be resiliently suspended or supported from the top-plate 1 through the springs 10. A thumb screw 25 is threaded into each opening 14 in plate 15 from the lower end of such opening. To remove the motor 4 for servicing or any other purpose, it is merely necessary to raise the top-plate 1 about its hinge 3 and turn up on screws 25. These screws then positively effect such relative movement of the studs 13 and balls 18 that the latter will be disengaged from the grooves 13 and brought to inoperative position, whereupon the motor is released from its connection with the springs 10 and top-plate 1 and may be removed as a unit. To replace the motor, the screws 25 are merely backed up, and the motor is disposed with the openings 14 in plate 15 respectively engaged by the lower ends of studs 13 and pushed towards the top-plate 1 to the position shown in Fig. 1. The balls 18 thereupon snap into operative locking engagement with the studs.

The modified form of supporting device shown in Fig. 3, is similar in construction to each of the supporting devices shown in Fig. 1, except that the thumb screw 25 is omitted and the ball 18, spring 21 and screw 20 are replaced by a single screw 25' threaded into one of the openings 19 in plate 15 and having a rounded inner end adapted, upon turning said screw in one direction or the other, to be directly engaged with or disengaged from the groove 13' in the stud 13.

The modified supporting device shown in Fig. 4, comprises a pin or rod 26 extending through an opening 14' in plate 15 (which opening 14' corresponds to the opening 14 shown in Figs. 1 and 3) and having its upper end extending into the opening in one of the bosses 1' of top-plate 1, a nut or nuts 26' threaded onto the lower end

of rod 26, two spiral springs 10' and 10'' embracing rod 26 and respectively disposed between the boss 1' and plate 15 and between the nut 26' and plate 15, and latch means for detachably locking the rod to the top-plate. The latch means referred to comprises a screw 27 which is threaded into an opening 19' in the boss 1' and which has a rounded inner end adapted to coact with an annular groove 28 provided in rod 26 adjacent its upper end. It is apparent that when 10 rod 26 is positioned as shown and screw 27 is turned up, the inner end of the screw will engage groove 28 to thereby detachably lock the supporting device to the bed-plate 1. To release the motor supporting devices and thereby the motor, 15 from connection with the bed-plate, it is merely necessary to back up on the screw 27 of each supporting device.

Another modified motor supporting construction may comprise a plurality of connecting devices such as are shown in Fig. 5. Each of such connecting devices has the same form of spring 10 as employed in each of the supporting devices shown in Fig. 1, and the upper end of this spring is reduced and attached to the top-plate 1 in the 25 same manner as in the construction shown in Fig. 1. In this case however, the lower reduced end of spring 10 is firmly engaged with a groove in the head of a stud 32 which normally engages one opening 14 in plate 15, and the said opening has 30 a lateral extension 14''. Latch means are provided as follows:—The stem of stud 32 has an annular notch or abruptly terminated groove 34 and is adapted to be engaged by an element in the form of a pawl 30 which is disposed in the 35 opening 14 and its extension 14'' and is pivoted to the plate 15 at 31. The pawl 30 is provided with a cam surface 30' and is biased to its operative locking position by a spring-pressed plunger 33 mounted in a suitable opening provided in 40 plate 15 and communicating with opening 14. In supporting the motor from its support 1, the stud 32 of each of the connecting devices may be inserted in its proper opening 14 in the plate 15 whereupon the lower face of the stud 32 will 45 engage the cam surface 30' and force the pawl 30 away from the stud and against the action of the spring-pressed plunger 33 until the end of the pawl snaps over the end of the stud 32 into the 50 groove 34 so as to bring the cam surface 30' into engagement with the inclined bottom surface of the groove, which engagement is yieldingly maintained under the influence of the spring-pressed plunger 33. A screw 35 threaded into a suitable opening in plate 15 is adapted, 55 upon being turned in the proper direction, to positively move pawl 30 to inoperative position, when it is desired to release the motor from the top-plate for removal.

In the structure shown in Fig. 6, the plate 15 60 secured to the frame 4' of motor 4, is resiliently connected by a plurality of the springs 10 to an auxiliary supporting member or plate 40. The reduced ends of each spring 10, in this case, are respectively firmly engaged with grooves provided 65 in the heads of screws 41 and 42, which are similar to the screws 11 shown in Fig. 1 and are respectively threaded into the plates 40 and 15. The plate 40 is provided with a cylindrical projection 43 extending upwardly therefrom and 70 preferably formed integrally therewith and centrally thereof. The projection 43 normally engages fairly closely within a cylindrical recess 44 which extends upwardly from the lower face of a boss 45 provided on the top-plate or other 75

main support 1'' for the motor. Spring actuated latch means releasably secure the plate 40 and motor 4 to the top-plate 1'' at a single suspension point on the latter. The latch means in this case are identical with those shown in Fig. 1 and comprise a ball 18' disposed in an opening 19' extending through the boss 45 to the recess 44, a screw 20' being threaded into the outer end of said opening and a coiled spring 21' being disposed in the opening between screw 20' and ball 18'. The inner end of opening 19' is slightly reduced to prevent dislodgment of ball 18' therefrom. The projection 43 is provided with an annular groove or cam surface 46 adapted to be engaged by the ball 18'. A screw 47 is threaded through the end wall of recess 44 for coaction with projection 43. To render the latch means ineffective and to free plate 41 and the motor resiliently suspended from the latter, from connection with top-plate 1'', it is merely necessary to turn up on screw 47; and to re-establish such connection it is merely necessary to back up on screw 47 and push projection 43 into the recess 44. A spline connection 48 prevents the turning of projection 43 in the recess 44 and ensures the application of the motor to and the retention thereof in proper angular position relative to the top-plate.

It is to be understood that my invention is susceptible of embodiment in many forms other than those shown and specifically described herein without departure from the spirit of the invention or the scope of the appended claims.

Having now fully described my invention, I claim:

1. In a phonograph, in combination, a support, a motor, and means for resiliently supporting said motor from said support, said means including a latching device for quickly attaching and

detaching said motor in respect to said support, and said latching device comprising an element provided with a concave surface, a member adapted to engage said surface to hold said element in substantially fixed position, and means engaging said element, and adapted to force the latter at will from fixed position in respect to said member.

2. In a phonograph, in combination, a support, a motor, and means for resiliently and detachably connecting said motor to said support, said means comprising an element having a cam surface, a member adapted to engage said cam surface to maintain said element in substantially fixed position, and means engaging said element and adapted to force the latter from such fixed position.

3. In a phonograph, in combination, a motor support, a motor, and means for detachably suspending said motor from said support, said means comprising an element provided with a cam surface, a member adapted to yieldingly engage said surface to maintain said element in substantially fixed position, and means operable at will for forcing the cam surface of said element against said member to disconnect said member and element.

4. In a phonograph, in combination, a support, a motor, and means for supporting said motor from said support comprising a device connecting the motor and support, said device being adjustable to and from operative condition and comprising a spring-biased member, an element adapted to be yieldingly engaged by said member to maintain the device in operative condition, and means adjustable at will to engage and thereby force said element from such yielding engagement.

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