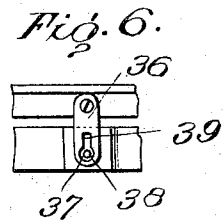
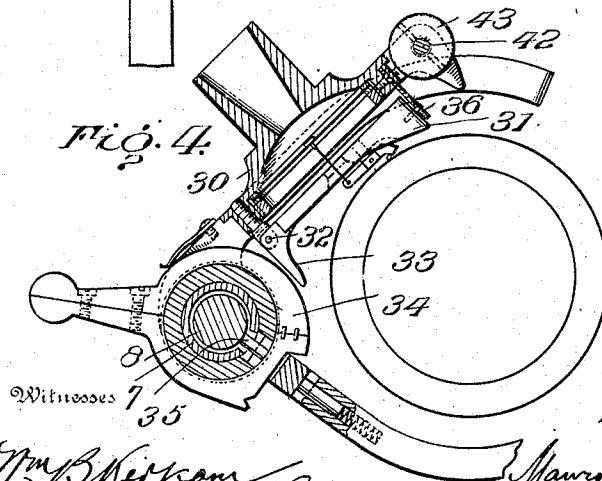
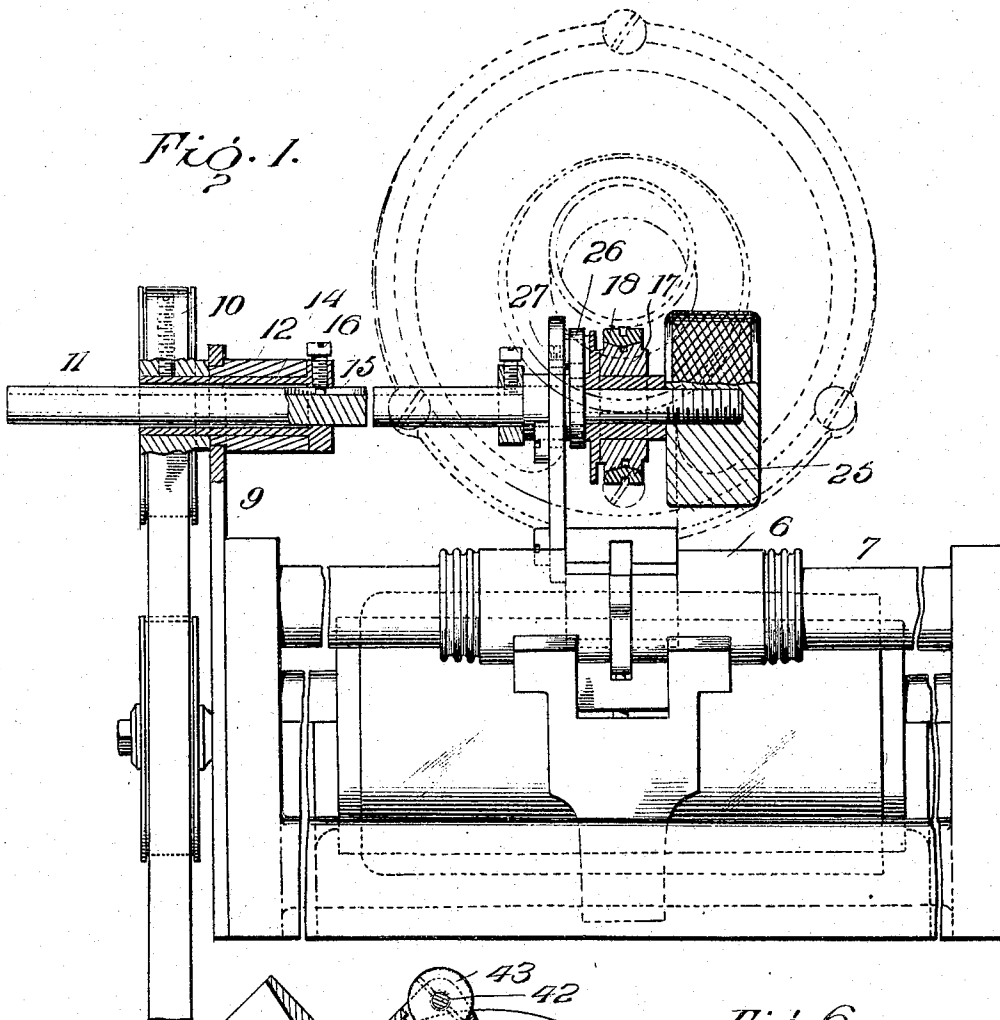


T. H. MACDONALD.
 PHONIC APPARATUS.
 APPLICATION FILED DEC. 21, 1904.

942,089.

Patented Dec. 7, 1909.
 2 SHEETS—SHEET 1.



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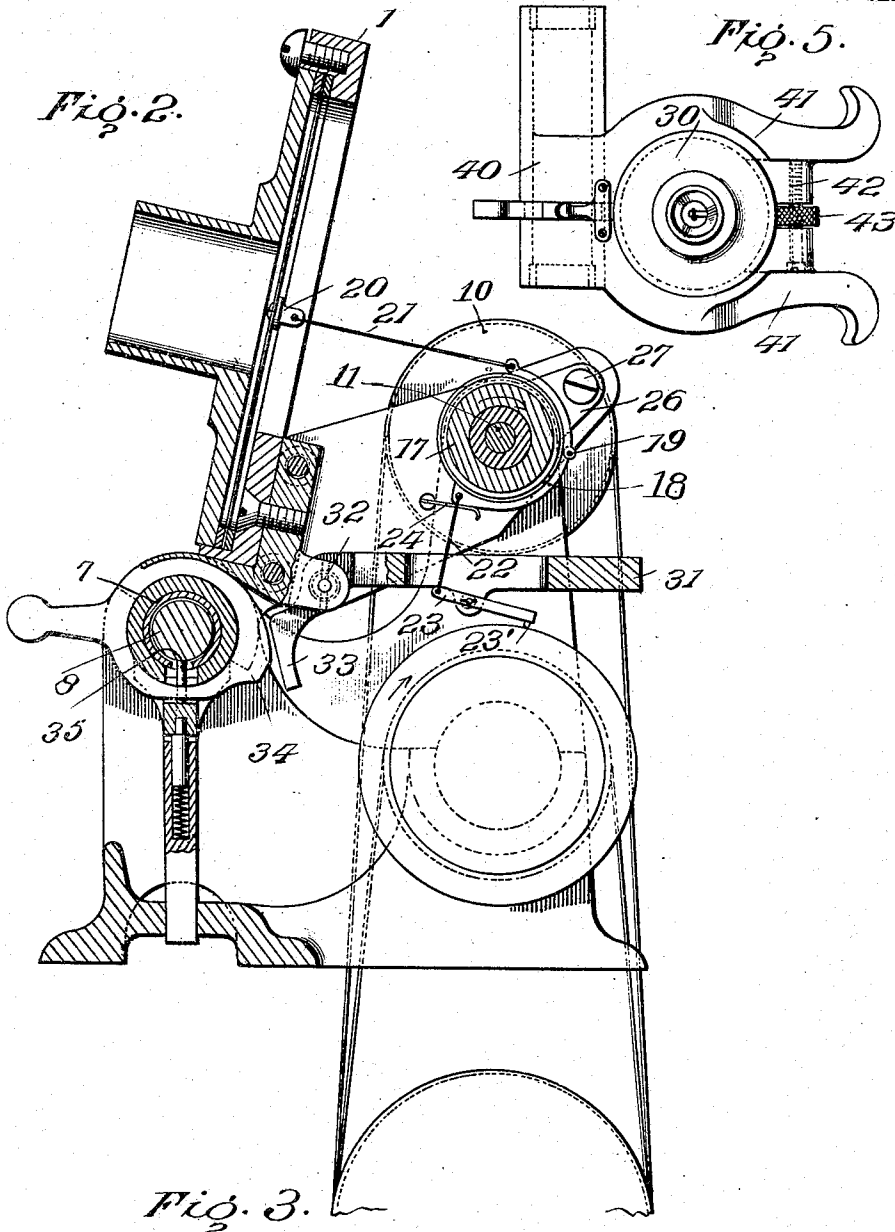


Fig. 5.

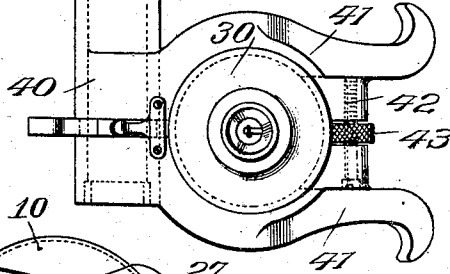
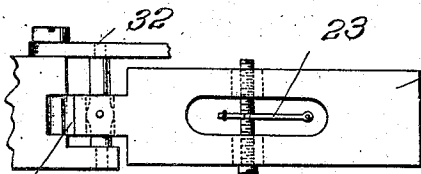


Fig. 3.



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UNITED STATES PATENT OFFICE.

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PHONIC APPARATUS.

942,089.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed December 21, 1904. Serial No. 237,857.

To all whom it may concern:

Be it known that I, THOMAS H. MACDONALD, a resident of Bridgeport, Connecticut, have invented a new and useful Improvement in Phonic Apparatus, which invention is fully set forth in the following specification.

This invention relates to machines for recording and reproducing sounds, and particularly to machines of the type wherein frictional force is employed to actuate a diaphragm or other secondary vibrating means, the sonorous vibrations being employed to modify such frictional force and to mold it, so to speak, into the form of sound waves. Apparatus of this type is described in U. S. Patent No. 678,566, granted July 16, 1901, to Daniel Higham.

The object of the present invention is to furnish mechanism for carrying out, in a practical way, the invention of said patent, and other improvements invented by said Higham which have not yet been made public, and which are shown herein although they are not of my invention.

The improvements constituting the present invention will be clearly understood from the following description, taken in connection with the accompanying drawings, wherein—

Figure 1 is a front elevation and Fig. 2 is a cross-section of a graphophone which, except as hereinafter pointed out, is or may be of any known or suitable type; Fig. 3 is a plan view of a detail; Fig. 4 is a view, with parts in section, of the combined weight-lifting and carriage feed-disconnecting means, embodied in a graphophone not employing the intermediate sound-amplifying means illustrated in the preceding figures. Fig. 5 is a front view of Fig. 4; and Fig. 6 is a detail of a reproducer embodying part of the invention.

The main object of the present invention is to provide for the mounting of the friction means upon the longitudinally-movable carriage which, in the graphophone and other leading machines, supports the recorder or reproducer. Heretofore it has been proposed to mount the friction means upon a fixed support, and to rotate and advance the mandrel carrying the record-cylinder.

In the drawings, the carriage 6, the tube 7 upon which the carriage is mounted and

freely slides, and the feed-screw 8 within the tube, are all constructed and operate in the usual manner.

The end plate 9 on the left end of the main frame is carried up to form a support for the pulley 10 and the shaft 11. The pulley 10 is carried by a sleeve 14 which is arranged to run in a fixed sleeve 12 which is fastened to the upright end 9 of the frame. Through this revolving sleeve 14 passes the shaft 11. The shaft has a spline-groove 15 cut in it as shown, in which the screw 16 in the revolving sleeve 14 engages. As the pulley 10 revolves it will therefore revolve the shaft 11, at the same time allowing the shaft freedom to slide back and forth with the carriage. On the other end of this shaft 11 is attached the friction-roll 17, which is provided with a shallow V-shaped groove, in which a friction shoe 18 is fitted. This shoe is hinged in the center at 19, as shown. One end of this shoe is attached to the center of the diaphragm at 20 by the link 21. To the other end is attached the link 22 which connects to the end of the ordinary or any suitable reproducer lever 23, as shown. A small spring 24 serves to keep the end of the shoe pressed against the friction roll 17. On the extreme end of the shaft 11 is placed the weight 25. The bearing of the sliding shaft 11 in the carriage is not fixed but is hung on a stirrup 26 which is pivoted on the screw 27. The action of the weight 25 therefore is to force down the carriage end of the shaft; this same weight acting as a constant pressure in the friction shoe effects an automatic adjustment of the friction by gravity.

The frame 1 in which the diaphragm is mounted is fixed to the carriage, and the carriage itself is not lifted, as heretofore, to disengage the stylus 23' from the record cylinder. Said stylus is, as shown, pivoted to a weight 31, which in turn is pivoted at 32 to the carriage, and has an extension 33 which contacts with the lifting cam 34 to lift the weight. The latter is constructed and operates in the usual way, so that, by depressing its handle the nut 35 is disengaged from the feed-screw 8, and the weight 31 simultaneously lifted.

This improvement may be usefully applied to machines in which the diaphragm is operated directly from the sound record without intermediate friction, or other

sound-amplifying, means. Such application of the said improvements is illustrated in Figs. 4 and 5. In these figures, the weight 31 is pivoted to the casing 30 at 32, and has an extension 33, which contacts with the lifting cam 34 to lift the weight. The pivoted weight 31 is provided with means for centering it when lifted by cam 34. This centering device consists of a thin metal plate 36 having a circular hole 37 through which passes the limit pin 38 (Fig. 6). Extending upwardly from this hole is a slot 39 into which the pin enters and by which the weight is centered when raised. When lowered, the size of the hole 37 allows to the pin 38 all play necessary for adjustment.

For the purpose of securely clamping the reproducer casing 30 in the lyre-shaped frame 40, there is provided between the two branches 41 thereof a screw 42, of which the head is connected to one branch and the point engages the other. In the middle of this screw is fastened a milled nut 43 which, when rotated either one way or the other, draws the branches together, or permits them to spring apart slightly. When the reproducer is to be placed in position in the frame, the nut is given a left-hand turn which permits the branches to slightly spring apart. The reproducer casing may then be dropped into position, and there securely clamped by imparting a right-hand turn to the nut 43, which causes the two sides of the lyre to be drawn slightly together.

The mounting of the friction roll on a shaft which has a swinging bearing so that it rests by gravity in the friction shoe, and the particular form of friction-means herein shown and described are not of my invention.

What is claimed is:

1. In a phonic apparatus, the combination with primary and secondary vibrating means, of intermediate friction means including a friction roll and shoe, a movable carriage supporting said friction means, and a shaft carrying said roll and having one bearing on said carriage and having a sliding connection with another bearing on a stationary part of the frame.

2. In a phonic apparatus, the combination with primary and secondary vibrating means, of intermediate friction means including a friction roll and shoe, a movable carriage supporting said friction means, a shaft carrying said roll and having a bearing on said carriage, a rotating sleeve having a bearing on the frame, and a connection whereby said shaft rotates with said sleeve but can slide freely therein.

3. In a phonic apparatus, the combination with primary and secondary vibrating means, of intermediate friction means including a friction roll and shoe, a movable carriage supporting said friction means, a

shaft carrying said roll, a bearing for said shaft pivoted on said carriage so that the roll rests by gravity against the shoe, another bearing on a stationary part of the frame, and a sliding connection between said shaft and one of said bearings.

4. The combination with the carriage and means for propelling the same, of a diaphragm mounted on said carriage, a weight pivoted independently of said diaphragm, and means for disengaging said propelling means and simultaneously lifting said weight independent of the diaphragm.

5. The combination with the carriage and means for propelling the same, of a diaphragm, a weight pivoted independently of said diaphragm, a stylus pivoted to said weight, friction means between said stylus and diaphragm, and means for disengaging said propelling means and simultaneously lifting said weight.

6. The combination with the diaphragm, of a pivoted weight, a stylus-lever pivoted to said weight, means for lifting said weight to disengage said stylus from the sound-record, and means for centering said weight when lifted.

7. The combination of a reproducer, a frame therefor comprising two resilient branches, means connecting said branches and operable at will to overcome the resiliency of said branches or permit the branches to move under the influence of said resiliency, as desired.

8. The combination of a reproducer, a frame therefor comprising two branches, a screw connecting said branches, and a nut fastened to said screw and adapted to be rotated in one direction to permit the branches to spring apart and in the other direction to draw the branches closer together.

9. In a phonic apparatus, the combination with primary and secondary vibrating means, of an intermediate friction device, and a movable carriage supporting said friction device.

10. In a phonic apparatus, the combination with primary and secondary vibrating means, of an intermediate friction device, and a movable carriage supporting said secondary vibrating means and said friction device.

11. In a phonic apparatus, the combination of primary and secondary vibrating means, means connecting the same, an intermediate movable friction device operating upon said connecting means, a movable carriage for supporting said friction device, and means for feeding said means and said carriage.

12. In a talking machine, the combination of a carriage and propelling means therefor, a diaphragm on said carriage, a stylus connected to said diaphragm, and means simultaneously disconnecting said propelling

means and lifting said stylus independently of the diaphragm.

13. In a talking machine, the combination of a movable carriage, means for propelling the same, a diaphragm mounted on said carriage, a pivoted weight also supported by the carriage, a stylus connected to said diaphragm and weight, and means simultaneously disconnecting said propelling means and turning said weight on its pivot independent of the diaphragm.

14. In a talking machine, the combination of a movable carriage and propelling means therefor, with a casing mounted on said carriage, a diaphragm supported by the casing, a pivoted weight, a sound record, a stylus connected to the weight and diaphragm and in operative relation with the record, and means simultaneously disconnecting said propelling means and lifting said weight independently of the diaphragm.

15. In a talking machine, the combination of a movable carriage, a sound box thereon containing a diaphragm, propelling means for said carriage, a sound record, a stylus connected to the diaphragm and in operative relation with said record, and means simultaneously disconnecting said propelling means and disengaging said stylus from the record independent of the sound box.

16. In a phonic apparatus, the combination of a phonographic record surface, means for rotating said surface, a carrier movable across said surface, a phonographic stylus and friction wheel carried by the carrier, a friction member connected to said stylus and pressing against the friction wheel, and means representative of sound vibrations for varying the friction between said friction member and friction wheel, substantially as set forth.

17. In a phonic apparatus, the combination of a traveling carriage, a friction wheel and phonographic-stylus carried thereby, a

friction member pressing on said wheel and connected to said stylus, means for driving said friction wheel and means representative of sound vibrations for varying the amount of friction between the friction member and friction wheel, substantially as set forth.

18. In a phonic apparatus, the combination of a rotating mandrel, a carriage movable longitudinally thereof, a phonographic-stylus and friction wheel carried by the carriage, a friction member pressing on said friction wheel and connected to said stylus, and common driving means for moving the carriage and rotating the friction wheel, substantially as set forth.

19. In a phonic apparatus, the combination of a rotating mandrel, a carriage movable longitudinally thereof, a phonographic-stylus and friction wheel carried by the carriage, a friction member pressing on said friction wheel and connected to said stylus, common driving means for moving the carriage and rotating the friction wheel, and means representative of sound vibrations for varying the friction between the friction member and friction wheel, substantially as set forth.

20. In a phonic apparatus, the combination of a primary vibrating stylus, a secondary vibrating diaphragm, means connecting the same, an intermediate movable friction device operating upon said connecting means, a movable carriage for supporting said friction device and a common feeding means for said carriage and said diaphragm, stylus and connecting means.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

THOMAS H. MACDONALD.

Witnesses:

C. B. INGALLS,
A. B. KEOUGH.