

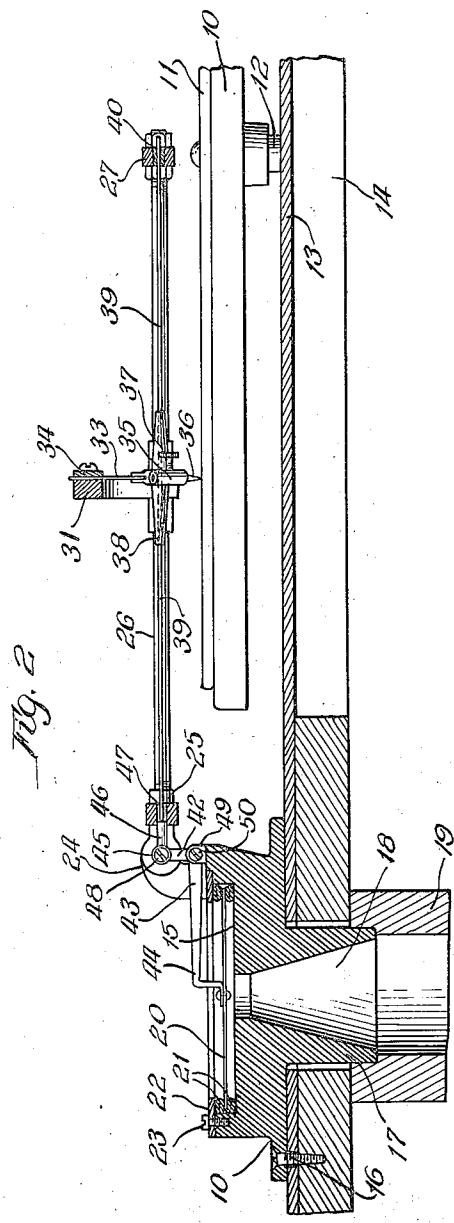
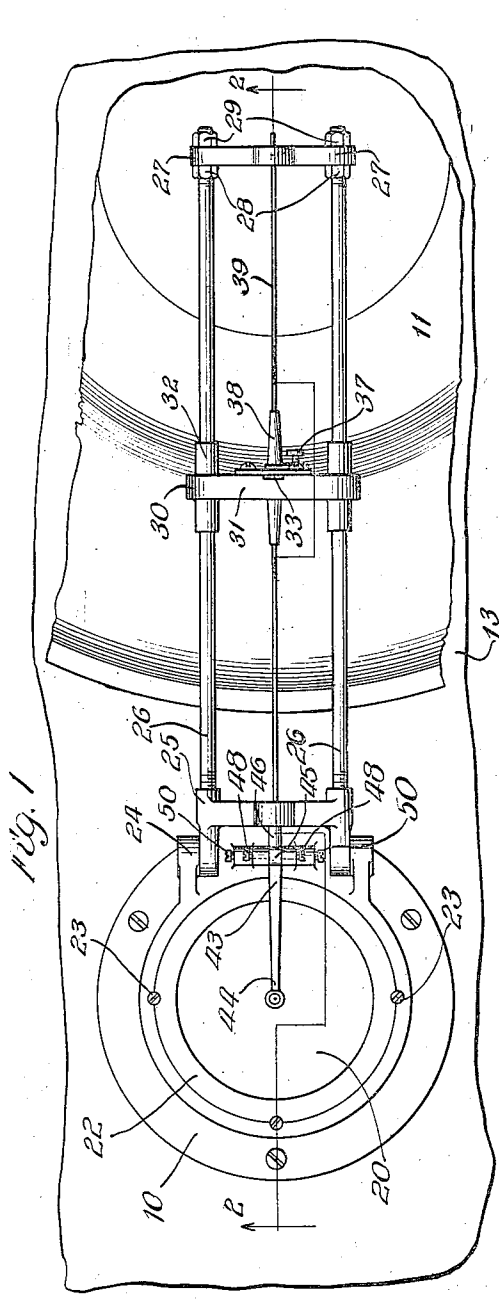
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J. W. BISHOP

PHONOGRAPH

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UNITED STATES PATENT OFFICE.

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PHONOGRAPH.

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To all whom it may concern:

Be it known that I, JOSEPH W. BISHOP, a citizen of the United States, residing at Muskegon, in the county of Muskegon and State of Michigan, have invented certain new and useful Improvements in Phonographs, of which the following is a specification.

This invention relates to phonographs and one object is to provide a construction in which the needle will move along a radius of the record during reproduction.

Another object of the invention is to provide a construction in which the customary tone arm and associated connections are eliminated.

Another object of the invention is to provide a structure in which the sound box can be fixed with respect to the record table.

A still further object of the invention is to provide a construction which will be more compact than is possible with devices in common use, and which will be less expensive to manufacture.

Further objects of the invention will become apparent as the description is read in connection with the accompanying drawing showing a selected embodiment of the invention in which—

Fig. 1 is a plan view of the device; and Fig. 2 is a longitudinal section on the line 2—2 of Fig. 1.

Referring to the drawing, 10 is a record table adapted to receive a record 11 and which may be rotated by the usual or any other suitable mechanism. The spindle 12 on which the table is mounted projects through a top plate 13 resting on a motor board 14. The sound box 15 is mounted on the top plate and secured thereto by the screws 16 or other suitable means. A tubular extension 17 on the sound box is equipped with the proper passage 18 and extends through the top plate and the motor board into communicative relation with the amplifier 19. The diaphragm 20 may be mounted in the sound box in any suitable manner. As I have shown it, the periphery is clamped between two yielding tubes 21; and a ring 22 secured in place by the screws 23 serves to clamp the rings 21 against the diaphragm.

The body of the sound box is provided with a pair of ears 24 to which a yoke 25 is pivoted on an axis at right angles to

the radius of the record table which intersects the axis of the sound box. A pair of guide bars 26 are attached to the yoke 25 and are connected at their free ends by a cross head 27 adjustably secured thereon by the nuts 28 and 29. A carriage 30 comprising a U-shaped body 31 has tubular bearings 32 slidably mounted on the guide rods 26. A spring 33 secured to the top of the carriage by screws 34 carries at its free end a needle support 35 in which the needle 36 may be secured by a screw 37. The needle support 35 is equipped with a relatively long tubular bearing portion 38 adapted to receive a rod or wire 39 having one end slidably supported in a bearing 40 in the cross head 27, and its other end connected with one arm 42 of a bell crank lever 43 having its other arm 44 connected with the diaphragm 20. The bearing 38 is preferably made of wood or similar material, while the rod is made of metal. The axis of the pivot 45 is co-incidental with the axis about which the yoke 25 swings. As shown, the rod 39 is equipped at its end adjacent to the bell crank 43 with a nipple 46, one end of which lies in a passage 47 in the yoke 25, and the other end is connected to the arm 42 by a pair of screws 48. The bell crank lever 43 is pivoted to a pair of ears 49 by screws 50.

In operation, the frame comprising the guides 26, the cross head 27, and the yoke 25 is raised slightly, and the carriage 31 moved along the guides 26 until the needle can be lowered onto the record at the outer portion of the record groove. The friction between the carriage and the guides, and between the bearing 38 and the rod 39 is very small, and the record groove acting upon the needle 36 will move the carriage and needle support along a straight line, toward the center of the record table. The vibrations of the needle will cause the bearing 38 to bind on the rod 39 sufficiently to transmit the vibrations through the bell crank lever 43 to the diaphragm 20 from which the sound waves proceed in the usual manner through the tubular extension 17 into the amplifier 19.

It will be seen that this structure permits me to entirely dispense with the swinging tone arm and its various attachments, and mount the sound box in a fixed position within the cabinet. The frame carrying the

needle can be made very cheaply and will require much less room than the tone arm of the usual construction. Furthermore, the needle traveling along a straight line co-incident with the radius of the record table will co-act with the record in much the same manner as the recording needle which made the record.

I am aware that changes in the form and proportion of parts, and in the details of construction of my invention may be made without departing from the spirit or sacrificing any of the advantages thereof, and I reserve the right to make all such changes as fairly fall within the scope of the following claims.

I claim:

1. In a device of the class described, a stationary sound box having a diaphragm therein, a rotatable record table, a needle adapted to travel along a radius of said table, and an operative connection between said needle and said diaphragm.

2. In a device of the class described, a stationary sound box having a diaphragm therein, a rotatable record table, a needle adapted to travel along a radius of said table, a guide for said needle pivoted on an axis at right angles to said radius, and an operative connection between said needle and said diaphragm.

3. In a device of the class described, a stationary sound box having a diaphragm therein, a rotating record table, a needle adapted to move along a radius of said table, a guide pivoted on an axis at right angles to said radius, a needle support carried by said guide, and means slidably engaged by said needle support for operatively connecting said needle with said diaphragm.

4. In a device of the class described, a stationary sound box having a diaphragm therein, a rotating record table, a needle adapted to move along a radius of said record table lying in the same plane as the axis of the sound box, a guide pivoted on an axis at right angles to said radius, a needle support slidably engaged with said guide, and means connected with said diaphragm and slidably engaged by said needle support

for operatively connecting said needle and said diaphragm.

5. In a device of the class described, a fixed sound box having a diaphragm therein, a rotating record table, a needle adapted to travel along a radius of said table, a guide pivoted on an axis at right angles to said radius, a needle support slidably mounted on said guide, and a rod operatively connected with said diaphragm and operably engaged by said needle support.

6. In a device of the class described, a fixed sound box having a diaphragm therein, a traveling needle, means connected with said diaphragm and slidably engaged by said needle for forming an operative connection between said needle and said diaphragm.

7. In a device of the class described, a fixed sound box having a diaphragm therein, a traveling needle, guide means for causing said needle to move in a right line, and means connected to said diaphragm and operatively engaged by said needle.

8. In a device of the class described, a stationary sound box having a diaphragm therein, a rotating record table, a needle adapted to move along a radius of said table, a guide pivoted on an axis at right angles to said radius, a needle support carried by said guide, and an operative connection between said needle and said diaphragm.

9. In a device of the class described, a stationary sound box having a diaphragm therein, a rotating record table, a needle adapted to move along a radius of said record table lying in the same plane as the axis of the sound box, a guide pivoted on an axis at right angles to said radius, a needle support slidably engaged with said guide, and an operative connection between said needle and said diaphragm.

10. In a device of the class described, a stationary sound box having a diaphragm therein, a rotatable record table, a traveling needle, a support for the needle, a guide for the support, and an operative engagement between said needle and diaphragm.

JOSEPH W. BISHOP.