

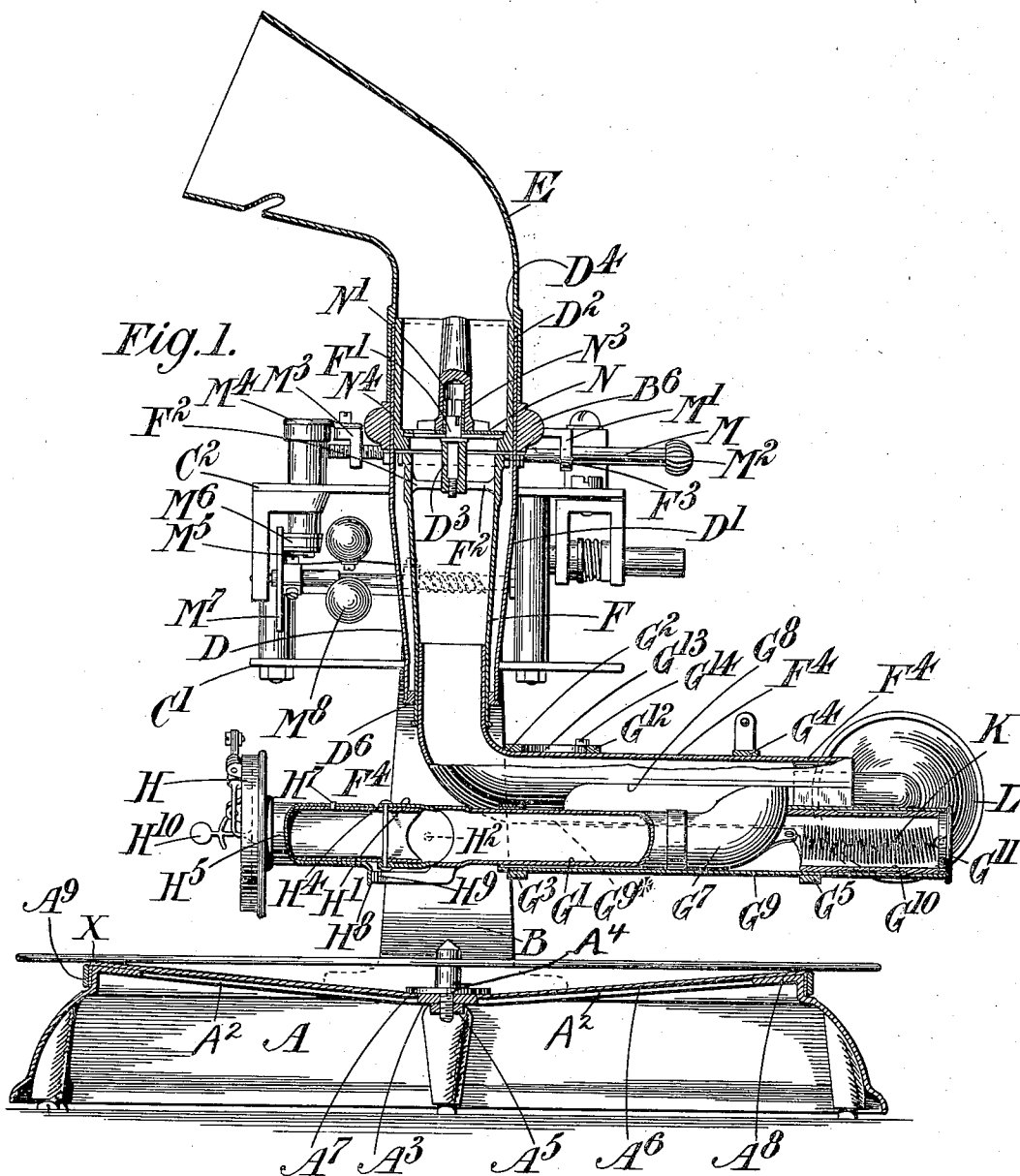
No. 860,878.

PATENTED JULY 23, 1907.

F. MYERS.
SOUND REPRODUCING MACHINE.

APPLICATION FILED MAY 3, 1906.

4 SHEETS—SHEET 1.



Witnesses:
W. H. Boulton
[Signature]

Inventor
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By W. H. Boulton
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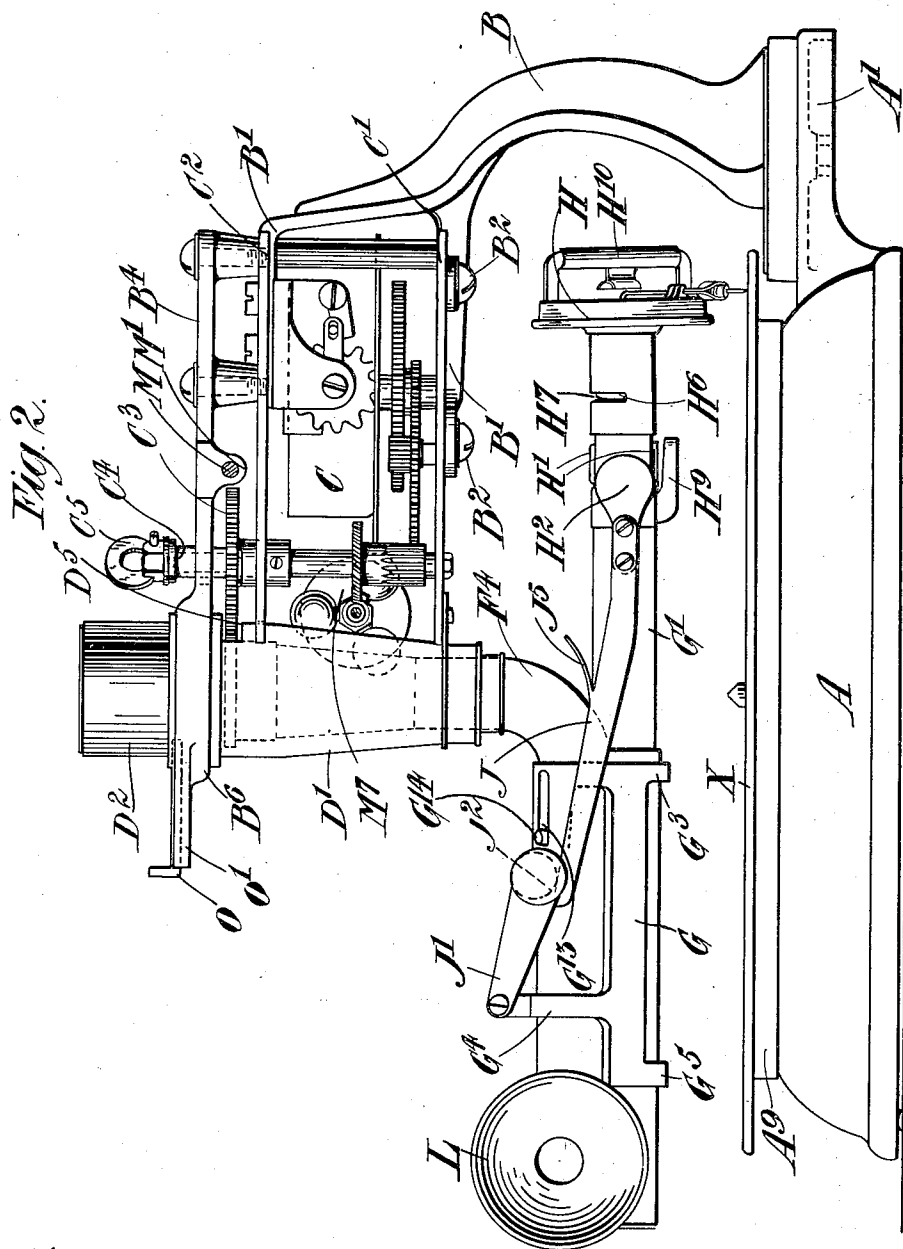
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4 SHEETS—SHEET 2.



Witnesses:

W. K. Banelin

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4 SHEETS—SHEET 3.

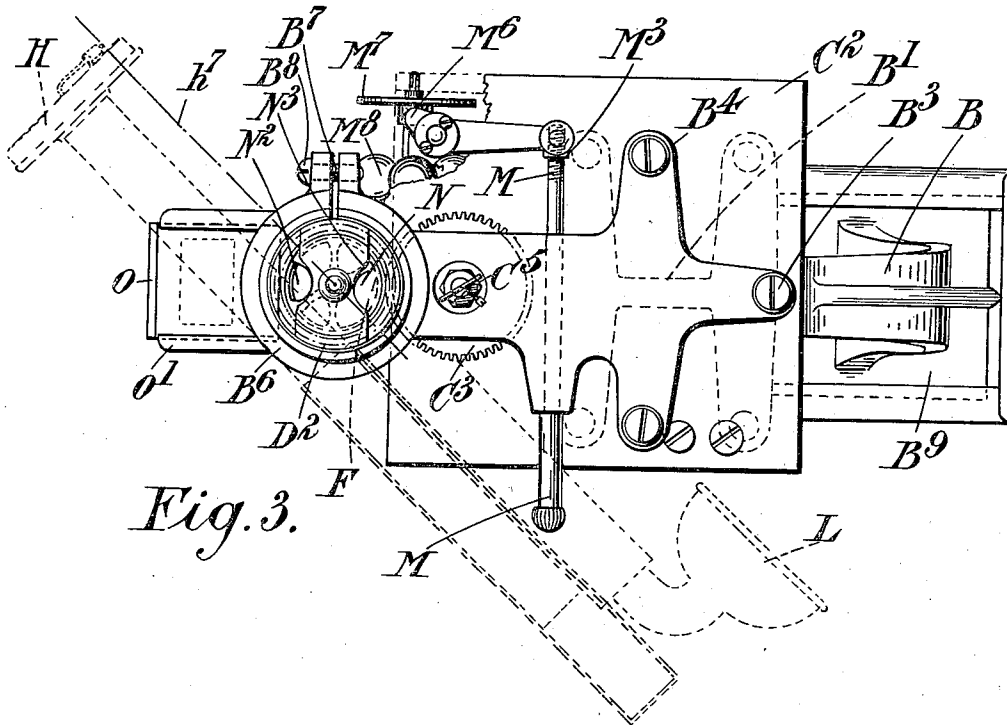


Fig. 3.

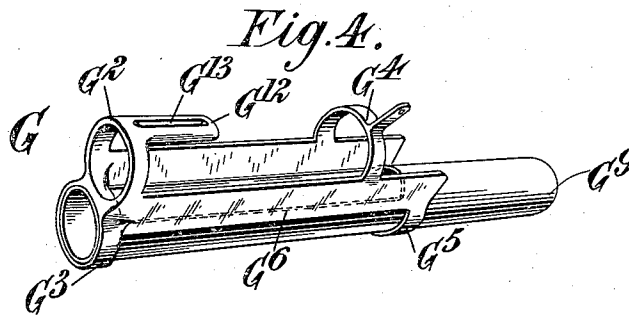


Fig. 4.

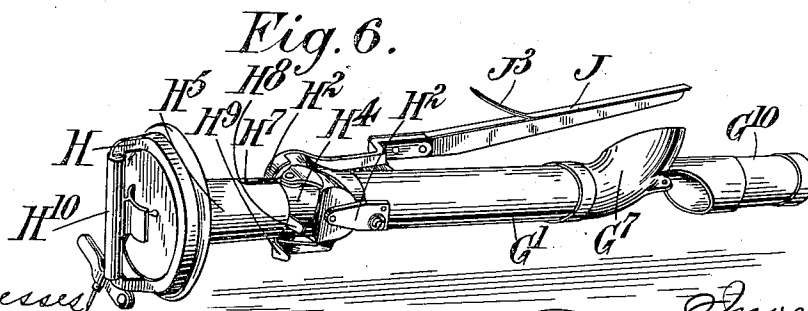


Fig. 6.

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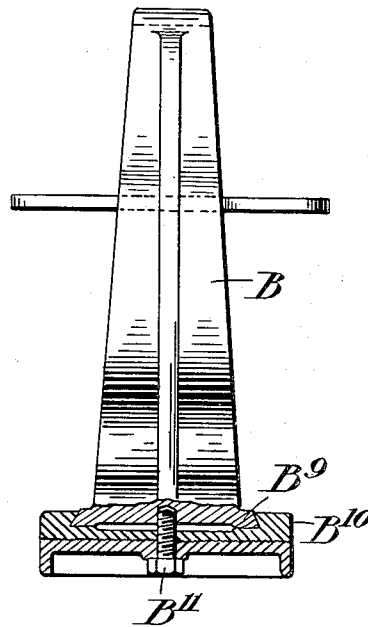
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4 SHEETS—SHEET 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

FREDERICK MYERS, OF LONDON, ENGLAND.

SOUND-REPRODUCING MACHINE.

No. 860,878.

Specification of Letters Patent.

Patented July 23, 1907.

Application filed May 3, 1906. Serial No. 315,060.

To all whom it may concern:

Be it known that I, FREDERICK MYERS, a citizen of the United States of America, residing at London, in England, have invented certain new and useful Improvements in Sound-Reproducing Machines, of which the following is a specification.

This invention is for improvements in or relating to sound-reproducing machines and has particular reference to those in which disk records are employed.

According to this invention the record, instead of being carried upon a table rotated by the motor, as heretofore, is supported upon a stationary table, while the sound-box travels in a circular path over the face of the record. One advantage of a machine constructed in this manner is that it is found to operate efficiently even when tilted considerably out of the normal level, whereas machines having a rotating record are rendered irregular in action or even inoperative under similar conditions. It will be understood that any support employed to carry the record is comprised by the term "table" hereinafter employed throughout the specification. The sound-box is driven by the motor but is also free to move laterally in a straight line and preferably in a path strictly radial to the record for the purpose of following the spiral groove therein in the well known manner. In disk machines at present on the market, the sound-box is carried on a pivoted arm and therefore cannot move in a straight line whether such line be radial or otherwise, but traverses a path constituting an arc struck from the pivot of the arm.

A further feature of this invention consists in utilizing the movement of the sound-box to provide a forced draft through the intake of the trumpet whereby the volume of the sound is increased and the quality improved.

In the accompanying drawings which illustrate one method of carrying out this invention—Figure 1 is a central vertical section of the machine viewed from the front; Fig. 2 is a side elevation of the same viewed from the right of Fig. 1; Fig. 3 is a plan of the machine; Fig. 4 is a perspective view of a detail; Fig. 5 is a rear elevation of the supporting bracket, and Fig. 6 is a perspective view of the sound-box and adjacent parts.

Like letters indicate like parts throughout the drawings.

The base A of the machine shown is circular except for a rear lug A¹ carrying a bracket B. The upper surface of the base is dished and for the sake of lightness it is perforated so that radial arms A² only are left connected to a central boss A³. In this boss a centering pin A⁴ is secured by a nut A⁵ and the base is covered by a piece of baize A⁶ held at the center by a washer or flange A⁷ on the pin A⁴. The baize is large enough to extend over the edge A⁸ of the base and is there secured by a ring A⁹ which is forced over the upper end of the base and grips the baize so that it is pulled tight

and securely held in place. The upper face of the base serves as the record table and a record X is indicated in place thereon. It will thus be seen that the record table is stationary and consequently the record is stationary, so that the sound-box must be operated to travel or move in relation thereto.

The upper end of the bracket B has a jaw B¹ in which a motor C of any convenient construction is mounted. The motor is secured by screws B² which pass through lugs on the lower member of the jaw B¹ and enter the bottom plate C¹ of the motor. The upper plate C² of the motor is secured to the upper jaw member B¹ by a screw B³ which in addition to fastening the upper plate, helps to hold in place an arm B⁴. The arm has three feet B⁵ which serve as distance pieces whereby the arm is lifted above the plate. The screw B³ passes through one of these feet and other screws B^{3*} are passed through the other two feet into the plate C² so that the arm is rigidly held in place. The forward end of the arm extends beyond the motor and is shaped to constitute a socket B⁶, split as shown at B⁷, and provided with a gripping screw B⁸ whereby the ends of the socket may be contracted to tighten it upon a sleeve D carried therein. The lower end of the sleeve tapers off in the form of a truncated cone, as shown at D¹, but the upper end is of uniform diameter.

Within the upper end of the sleeve a liner D² is mounted having a web D³ at its base. The upper end of the liner has a lip D⁴ adapted to engage a corresponding groove in the wall of the sleeve D. The lip projects slightly from the surface of the liner D² so that the upper end of the sleeve D springs out slightly as the liner is forced into place, until the lip comes opposite the groove in the sleeve, where it is securely held. A conical elbow-socket E takes over the upper end of the sleeve D and receives the trumpet commonly employed with these instruments.

Within the lower end of the sleeve D, a vertically rotatable tube F is mounted which constitutes the intake of the trumpet. Its upper end is open to the interior of the liner D², and thus the trumpet socket E, and its lower end communicates with the sound-box as hereinafter described. The intake F is suspended from the web D³ in the liner D² by a screw F¹. The screw is shouldered to rest upon the web and extends through the same and into a web F² in the upper end of the intake F. A toothed ring F³ surrounds the upper end of the intake and is rigidly secured thereto and gears with a toothed wheel C³ on the motor; the sleeve D is slotted as shown at D⁵, to admit the wheel C³. The lower end of the intake F extends beyond the sleeve D and receives a tubular elbow F⁴. This elbow constitutes a horizontal supporting arm for a sliding arm G¹. The sliding arm is carried on the elbow by a fitting G, shown in perspective in Fig. 4. This fitting is preferably cast and for convenience may

be described as comprising two double sockets G², G³ and G⁴, G⁵, respectively connected together by side plates G⁶. The sockets G², G⁴, take over the horizontal portion of the elbow F⁴ and the sockets G³, G⁵, have secured in them a tube G⁹ which receives and serves as a guide for the sliding arm G¹. The arm G¹ carries on that end within the tube an elbow G⁷, the mouth of which enters a slot G⁸ in the horizontal limb of the elbow F⁴; the slot extends along the limb a distance equal to the travel of the sliding arm G¹. The sliding arm has an extension G¹⁰ beyond the elbow G⁷, such portion constituting a steadying piece for the arm when the latter is advanced so that the elbow approaches near the end of the tube G⁹. The tube G⁹ is slotted, as shown at G*, to allow free movement of the elbow G⁷ as it traverses the slot G*.

On the free end of the arm G¹ the sound-box H is carried. This may be of any convenient construction and therefore does not require detailed description in this specification. It is not carried directly on the arm G¹, but is supported from the same by a connection of the Cardan joint type. This connection comprises a horizontal jaw-piece H² carried on the end of the arm G¹. In the jaw H² a vertical jaw-piece H¹ is pivoted, and within this jaw-piece is carried a tube H³ adapted to receive the corresponding tubular socket H⁵ of the sound-box. It will be seen that this joint permits free movement of the sound-box as it traverses the groove of the record and allows it to rest upon the record.

The operation of this machine is as follows:—The motor imparts motion to the wheel C³ which in turn rotates the vertical intake tube F by means of its engagement with the toothed ring F³ thereon. The end of the intake rotates freely in the cover D⁶ of the sleeve D and carries round with it the elbow F⁴. The fitting G and sliding arm G¹ move with the elbow and consequently the sound-box secured to the free end of the arm G¹ will, if left to itself, travel in a circular path. As is well known in these machines, the groove in the record is spiral and consequently the point of the sound-box needle must, as it traverses the groove, move laterally towards the center of the record; this movement is permitted by the sliding arm G¹ and is in a strictly radial direction, as indicated by the line h⁷, Fig. 3. It will be noted that the arm G¹ slides in a path parallel to a radial line drawn from the center of rotation, but its position is so adjusted that the needle point traverses the desired radial path. In machines in which the sound-box is carried on a swinging arm, this strictly radial movement, or any straight line lateral movement, is impossible, and it is found in practice that the records become injured by the movement of the needle in a curved instead of a radial path.

A further feature of this invention relates to means whereby the sliding arm is controlled in its endwise movement, as apart from some such control, the centrifugal action is found to be sufficient to throw the sound-box out of the groove in the record. The controlling means comprise a cam device whereby a yielding member is displaced as the arm G¹ is extended further from the fitting G, whereby the resistance to outward movement of the arm may be made proportionate to the degree of centrifugal action, whatever position the arm may occupy. This arrangement is shown clearly in Fig. 2. A cam J is secured to the arm G¹ at a point which

lies beyond the tube G⁹ even when the arm is in the withdrawn or central position and on the socket G⁴ of the fitting is pivoted a weighted arm J¹ carrying a roller J². The roller J² lies in the path of the cam J and as the arm G¹ is drawn outward away from the central position, the roller rides up the cam. It will be seen that the incline of the cam may be made such as to provide the desired resistance for the purpose of counteracting the centrifugal effect. Preferably the control of the arm G¹ is further effected by a spiral spring K mounted within the extension G¹⁰ of the arm. One end of the spiral spring is secured to the elbow G⁷ and the other end to a cap G¹¹ by which the end of the tube G⁹ is closed. Preferably the spring K is slack when the arm G¹ is at the central position as when the arm nears this position it is found that it has a tendency to run suddenly in towards the center so that the needle of the sound-box leaves the groove of the record. To further insure that this sudden sliding-in of the arm shall not take place, a second cam J³ may be mounted on the arm G¹. This cam inclines in a direction opposite to that of the cam J and also lies in the path of the roller J², so that the one weighted arm coöperates with both cams, but the cam J resists outward movement of the arm G¹, while the cam J³ resists inward movement of the same after the arm has passed a given point. It will be noted that in the drawings the cam J is shown as having a constant incline throughout its length so that it does not offer increasing resistance as the arm is moved farther outwards. This is because the spring is employed with it and the resistance of the spring increases as it is further extended but if desired the cam may have an increasingly steep incline as shown by the cam J³.

Another feature of this invention consists in the utilization of the movement of the sound-box to create a forced draft through the trumpet whereby the volume of sound may be increased. For this purpose a mouth-piece or funnel L is mounted in the free end of the elbow F⁴. The mouth of the funnel faces in the direction of rotation so that as the sound-box travels, air will be forced through the funnel and along the elbow F⁴ up through the intake F and socket E, whence it passes out through the trumpet.

The sound box H is preferably rotatable upon the part H⁴ of the Cardan joint, and its socket H⁵ is slotted as shown at H⁶ to engage the pin H⁷ on the part H⁴. The slot H⁶ is in the form of a bayonet-joint and allows limited rotation of the sound box, whereby the latter may be brought into either of the positions indicated. The working position is shown in Fig. 2, but when it is desired to insert a needle, the sound box may be turned into the position shown in Fig. 1, so that the needle-holder is raised. On the socket H⁵ of the sound-box is a lug or engaging piece H⁸ and a coöperating stop H⁹ is carried on the part H⁷ of the Cardan joint, but extends forward to the lug H⁸. These parts are so disposed that when the sound box is in the position shown in Fig. 1, the lug H⁸ bears against the stop H⁹ whereby the downward movement of the sound-box about the horizontal pivot of the Cardan joint is limited. This gives rigidity to the sound-box when the needle holder is in the raised position and renders it easier to handle. Conveniently a cross-bar or finger-piece H¹⁰ is secured across the face of the sound-box, and serves both to

protect the diaphragm and as a grip whereby the sound-box may be turned.

In order that the same machine may take both large and small records, the fitting G is made adjustable upon the horizontal portion of the elbow F⁴. On the socket G² is a lug G¹² slotted as shown at G¹³, and a pin G¹⁴ fast in the elbow F⁴ engages this slot. When the fitting is advanced to the limit of its movement in a direction towards the center of the machine, the apparatus is in position for taking large records, but when drawn back to the limit of its movement in the opposite direction as controlled by the slot G¹³ and pin G¹⁴, the arm G' is in the position for small records, as will be readily understood.

The wheel C³ of the motor and toothed ring F³ on the top of the intake F are preferably of fiber or some other material which is noiseless in operation. As such substances are not as strong as metal, it is probable that the teeth would be broken should the arm G' be suddenly stopped during its rotation without the motor being braked. For this purpose the wheel C³ is not carried fast upon its spindle, but is held friction-tight between a shoulder C⁴ thereon and a nut C⁵. The nut may be slackened or tightened as desired for the purpose of increasing or decreasing the degree of friction between the wheel and its driving spindle.

For controlling the motor a rod M is slidably supported in a lug M' on the arm B⁴. One end of the rod is provided with a head M² whereby it may be handled and the other end is screw-threaded and engages a pivoted lug M³ carried by a horizontal arm M⁴. The arm M⁴ is supported on one end of a vertical rock shaft M⁵ and at the lower end of this rock shaft is an eccentric brake-piece M⁶. The brake-piece is in proximity to a brake disk M⁷ forming part of the well known governor device indicated at M⁸. For starting the motor the rod M is pushed inwards, so that the brake-piece M⁶ is withdrawn from the disk M⁷ and for stopping the motor the rod is moved in the reverse direction. In addition to starting and stopping, however, the speed at which the motor runs may be controlled by rotating the rod M whereby it is screwed further in to or out from the pivoted lug M³. It will be seen that if when thus rotated the rod is kept home at its starting position, the arm M⁴ will still be turned about its vertical pivot so that the brake-piece M⁶ will be brought nearer to or further from the disk M⁷, whereby the governor will be checked in the well known manner.

A tremolo device may be used with this machine and comprises a disk N having a central socket N' adapted to take over the head of the screw F' whereby the intake F is supported. The disk N practically closes the top of the intake but it has a notch or orifice N² at one side. Over the disk fits a bridge-piece N³, but this does not come in contact with the disk and rests at its outer edges upon a ledge N⁴ formed in the interior of the liner D². The bridge-piece is thus stationary, whereas the disk N rotates with the screw F' so that the orifice N² appears first at one side of the bridge piece and then at the other, whereby the tremolo effect is obtained.

The volume of sound passing to the trumpet may be controlled by a sliding shutter O carried in guides O' conveniently formed in one with the socket B⁶. The shutter can be advanced a greater or less distance across

the liner D², whereby any degree of modulation may be obtained, as will be readily understood.

The bracket B is adjustably carried upon the lug A' of the base A. For this purpose the foot of the bracket is beveled as shown at B⁹, and these beveled portions take into a correspondingly undercut groove in a shoe B¹⁰, which rests upon the surface of the lug. The bracket is held in place by a screw B¹¹ extending through the lug A' and shoe B¹⁰ into the bracket, and the lug is slotted so that the bracket may be adjusted before the screw is finally tightened. Thus by sliding the bracket in the shoe B¹⁰ and rotating the shoe on the lug the center of the socket B⁶ can be readily brought into alinement with the center of the record table, and then the screw B¹¹ tightened so that it is rigidly secured in place. The under side of the shoe B¹⁰ and the upper surface of the lug are preferably roughened to provide a grip between these two parts.

1. In a sound-reproducing machine the combination of a stationary "record-table," a sound-box, means for carrying the sound-box round in a circular path above the "record-table" and in a plane approximately parallel thereto, means for permitting lateral movement of the sound-box, a trumpet, and a tubular connection between the sound-box and the intake of the trumpet the movable part connected with the sound box having an air inlet, whereby a forced draft is set up through the intake of the trumpet as the sound-box travels, substantially as set forth.

2. In a sound-reproducing machine the combination of a stationary "record-table," a sound-box, means for carrying the sound-box round in a circular path above the "record-table" and in a plane approximately parallel thereto, means for permitting lateral movement of the sound-box, a stationary trumpet, a swiveled tubular connection between the sound-box and the intake of the trumpet, and a flared mouthpiece or funnel carried by the movable part of the tubular connection and connected with the interior of such connection and facing in the direction of movement whereby a forced draft is set up through the intake of the trumpet as the sound-box travels, substantially as set forth.

3. In a sound-reproducing machine the combination of a stationary "record-table," a sound-box, an arm horizontal to and above the table and carrying the sound-box, means for rotating the arm about a vertical axis, and means for supporting the arm while permitting endwise movement of the same, substantially as set forth.

4. In a sound-reproducing machine the combination of a stationary "record-table," a sound-box, an arm horizontal to and above the table and carrying the sound-box, means for rotating the arm about a vertical axis, means for supporting the arm while permitting endwise movement of the same, and means for counterbalancing centrifugal action upon the sliding arm.

5. In a sound-reproducing machine the combination of a stationary "record-table," a bracket secured thereto and extending over the same, a tubular arm horizontal to the table and having a vertical extension whereby it is rotatably carried in the bracket, a second tubular arm parallel to the first such arm being slidably supported by the first mentioned arm and communicating with the interior of the same, means for preventing rotation of this second arm about its longitudinal axis, a sound-box carried by the second arm in such manner that the vibrations of the diaphragm are imparted to the air in the second tubular arm and thence to that in the first tubular arm, and means for rotating the latter arm about a vertical axis concentric with the vertical portion of the same, substantially as set forth.

6. In a sound-reproducing machine the combination of a stationary "record-table," a bracket secured thereto and extending over the same, a tubular arm horizontal to the table and having a vertical extension whereby it is rotatably carried in the bracket, a fitting having two parallel sockets one of which takes over the horizontal portion of

15 this arm whereby the fitting is carried thereon, a second tubular arm slidably mounted in the second socket of the fitting and communicating with the interior of the first arm, means for preventing rotation of this second arm in its socket, a sound-box carried by the second arm in such manner that the vibrations of the diaphragm are imparted to the air in the second tubular arm and thence to that in the first tubular arm, and means for rotating the latter arm about a vertical axis concentric with the vertical portion of the same, substantially as set forth.

10 7. In a sound-reproducing machine the combination of a stationary "record-table," a bracket secured thereto and extending over the same, a tubular arm horizontal to the table and having a vertical extension whereby it is rotatably carried in the bracket, a fitting having two parallel sockets one of which takes over the horizontal portion of this arm whereby the fitting is carried and can be moved endwise thereon, a second tubular arm slidably mounted in the second socket of the fitting and communicating with the interior of the first arm, means for preventing the rotation of this second arm in its socket, a sound-box carried by the second arm in such manner that the vibrations of the diaphragm are imparted to the air in the second tubular arm and thence to that in the first tubular arm, and means for rotating the latter arm about a vertical axis concentric with the vertical portion of the same, substantially as set forth.

20 8. In a sound-reproducing machine the combination of a stationary "record-table," a bracket secured thereto and extending over the same, a tubular arm horizontal to the table and having a vertical extension whereby it is rotatably carried in the bracket, a fitting having two parallel sockets one of which takes over the horizontal portion of this arm whereby the fitting is carried and can be moved endwise thereon, a stop to limit such endwise movement, a second tubular arm slidably mounted in the second socket of the fitting and communicating with the interior of the first arm, means for preventing rotation of this second arm in its socket, a sound-box carried by the second arm in such manner that the vibrations of the diaphragm are imparted to the air in the second tubular arm and thence to that in the first tubular arm and means for rotating the latter arm about a vertical axis concentric with the vertical portion of the same, substantially as set forth.

30 9. In a sound-reproducing machine the combination of a stationary "record-table," a bracket secured thereto and extending over the same, a sleeve secured to the bracket in a position vertical to the table, an inner vertical tube rotatably mounted within the sleeve and extending below the same where it has a horizontal tubular extension or arm, a sound-box carried by this extension, means for rotating the inner tube, and means for permitting lateral movement of the sound-box, substantially as set forth.

40 10. In a sound-reproducing machine the combination of a stationary "record-table," a bracket secured thereto and extending over the same, a sleeve secured to the bracket in a position vertical to the table, an inner vertical tube rotatably mounted within the sleeve and extending below the same where it has a horizontal tubular extension or arm, a sound-box carried by this extension, means for rotating the inner tube, means for permitting lateral movement of the sound-box, and a trumpet carried on the upper end of the vertical sleeve, substantially as set forth.

50 11. In a sound-reproducing machine the combination of a stationary "record-table," a bracket secured thereto and extending over the same, a sleeve secured to the bracket in a position vertical to the table, a laterally projecting support within the sleeve, an inner vertical tube mounted within the sleeve and extending below the same where it has a horizontal tubular extension or arm, means for rotatably suspending this inner tube from the support within the sleeve, a sound-box carried by the extension or arm of the tube, means for rotating the inner tube and means for permitting lateral movement of the sound-box, substantially as set forth.

60 12. In a sound-reproducing machine the combination of a stationary "record-table," a bracket secured thereto and extending over the same, a sleeve secured to the bracket in a position vertical to the table, a laterally projecting support within the sleeve, an inner vertical tube mounted within the sleeve and extending below the same where it

has a horizontal tubular extension or arm, a lateral projection within the inner vertical tube and near the upper end of the same, means for suspending the inner vertical tube by its lateral projection from the support within the sleeve such suspending means being situated in line with the central vertical axis of the tube and permitting rotation of the tube about such axis, a guide on the lower end of the sleeve whereby the lower end of the inner tube is maintained in the vertical position, means for rotating the inner tube, a sound-box carried by the extension or arm of the inner tube, and means for permitting lateral movement of the sound-box, substantially as set forth.

70 13. In a sound-reproducing machine the combination of a stationary "record-table," a bracket secured thereto and extending over the same, a sleeve secured to the bracket in a position vertical to the table, a laterally projecting support within the sleeve, an inner vertical tube mounted within the sleeve and extending below the same where it has a horizontal tubular extension or arm, means for rotatably suspending this inner tube from the support within the sleeve, a disk carried detachably by the inner vertical tube and closing the same except for an orifice in the disk, a bridge-piece carried by the stationary sleeve and extending across the disk on the outlet side of the sleeve but in proximity to the disk, a sound-box carried by the extension or arm of the tube, means for rotating the inner tube, and means for permitting lateral movement of the sound-box substantially as set forth.

80 14. In a sound-reproducing machine the combination of a stationary "record-table," a sound-box, an arm horizontal to and above the table and carrying the sound-box, means for rotating the arm about a vertical axis, a support for the arm which permits endwise movement of the same therein, a cam carried by one of these last mentioned elements, namely the support and the sliding arm, and a yielding member opposed to the cam and carried by that element which does not carry the cam so that as the arm advances the yielding member resists such advance but is displaced by the cam.

90 15. In a sound-reproducing machine the combination of a stationary "record-table," a sound-box, an arm horizontal to and above the table and carrying the sound-box, means for rotating the arm about a vertical axis, a support for the arm which permits endwise movement of the same therein, a cam carried by one of these last mentioned elements, namely the support and the sliding arm, a yielding member opposed to the cam and carried by that element which does not carry the cam so that as the arm is advanced in a direction away from the center of rotation, the yielding member resists to such advance but is displaced by the cam, and a spring connecting the sliding arm with its support and also opposing outward movement of the arm, substantially as set forth.

100 16. In a sound-reproducing machine the combination of a stationary "record-table," a sound-box, an arm horizontal to and above the table and carrying the sound-box, means for rotating the arm about a vertical axis, a support for the arm which permits endwise movement of the same therein, a cam carried by one of these last mentioned elements, namely the support and the sliding arm, a yielding member opposed to the cam and carried by that element which does not carry the cam, so that as the arm moves towards the center of rotation the yielding member resists such movement but is displaced by the cam, and a spring connecting the arm and its support and tending to oppose outward movement of the arm, substantially as set forth.

110 17. In a sound-reproducing machine the combination of a stationary "record-table," a sound-box, an arm horizontal to and above the table and carrying the sound-box, the connection between the arm and sound-box being such that the latter can be turned upon the arm about a center co-axial with that of the arm, means for permitting that end of the arm carrying the sound-box to hinge about a horizontal axis, a stop and a corresponding engaging piece one carried by the arm and the other by the sound-box and so disposed relatively to each other that when the sound-box is rotated to a given position the engaging piece and stop being brought into contact limit the movement of the sound-box about the horizontal hinge referred to, substantially as set forth.

18. In a sound-reproducing machine the combination of
a stationary "record-table," a bracket secured thereto and
extending over the same, a member rotatably mounted in
the bracket in a position vertical to the table and having
5 a horizontal extension or arm, a sound-box carried by this
extension, means for permitting lateral movement of the
sound-box, a motor carried by the bracket referred to, a
toothed wheel carried by the vertical rotatable member
in the bracket and engaging a toothed wheel of the motor
10 one of these wheels being of material other than metal,
and means for mounting one of the wheels friction-tight
upon its carrying member, substantially as set forth.

19. In a sound-reproducing machine the combination of
a stationary "record-table," a tubular arm horizontal to and

above the table, such arm being so shaped as to constitute 15
a tubular passage turned back upon itself, a sound-box
carried at one end of the arm in such manner that the
vibrations of the diaphragm are communicated to the air
within the arm, means for rotating the arm about a
vertical axis, and a vertical stationary trumpet having 20
a swivel connection with the arm and in open connection
with the interior of the same, substantially as set forth.

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

FREDERICK MYERS.

Witnesses:

A. J. FRENCH,
A. M. HAYWARD.