R. L. GIBSON.

SOUND REPRODUCING MACHINE.

APPLICATION FILED DEC. 22, 1906.

993,980.

Patented May 30, 1911.

2 SHEETS—SHEET 1.

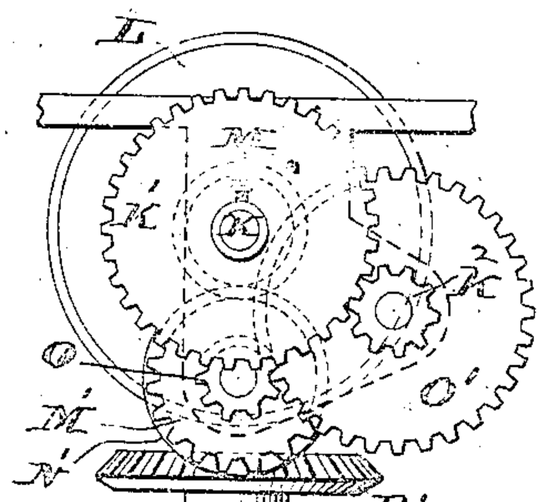

FIG. 3

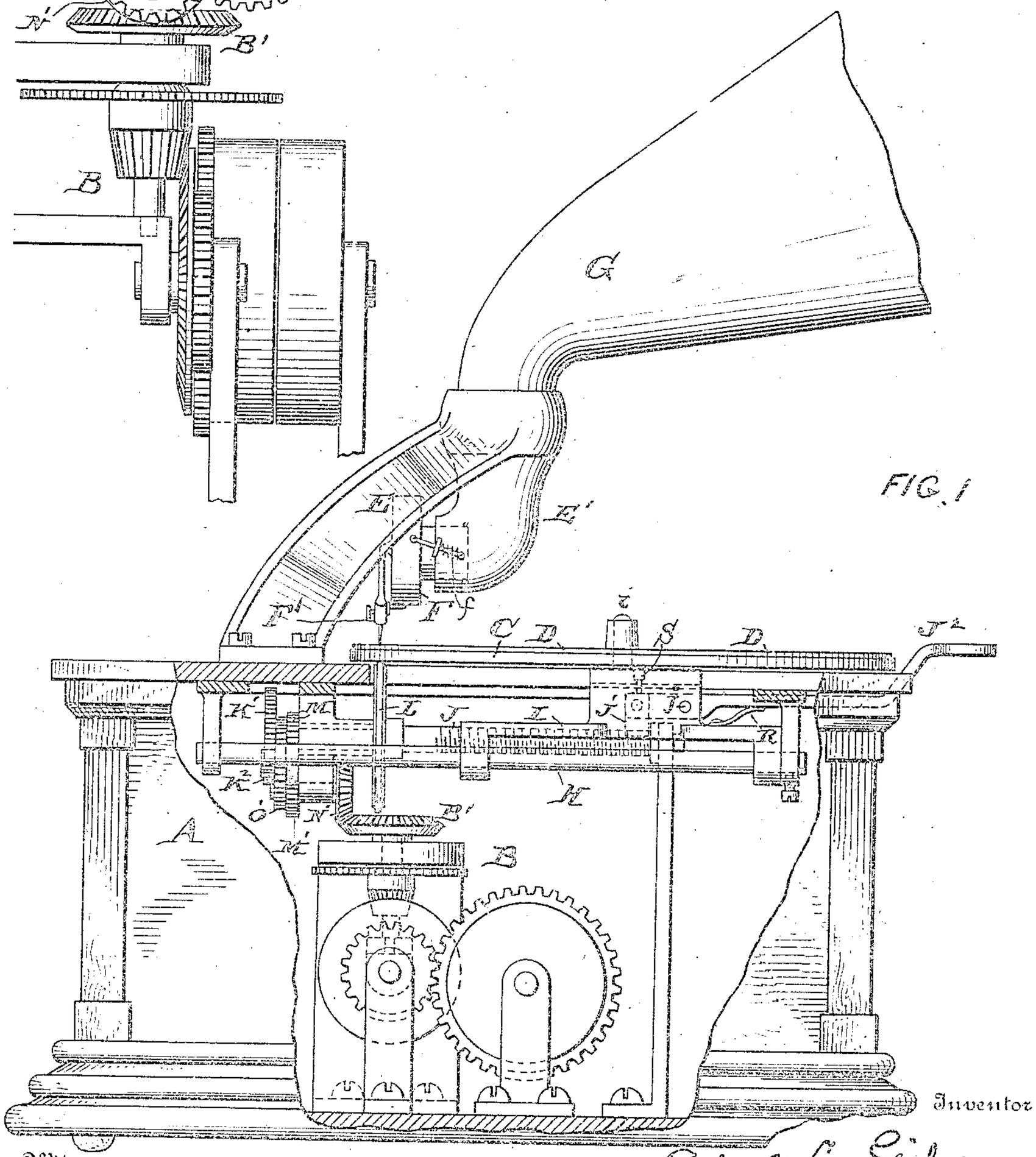

FIG. 1

Witnesses

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R. L. GIBSON.

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2 SHEETS—SHEET 2.

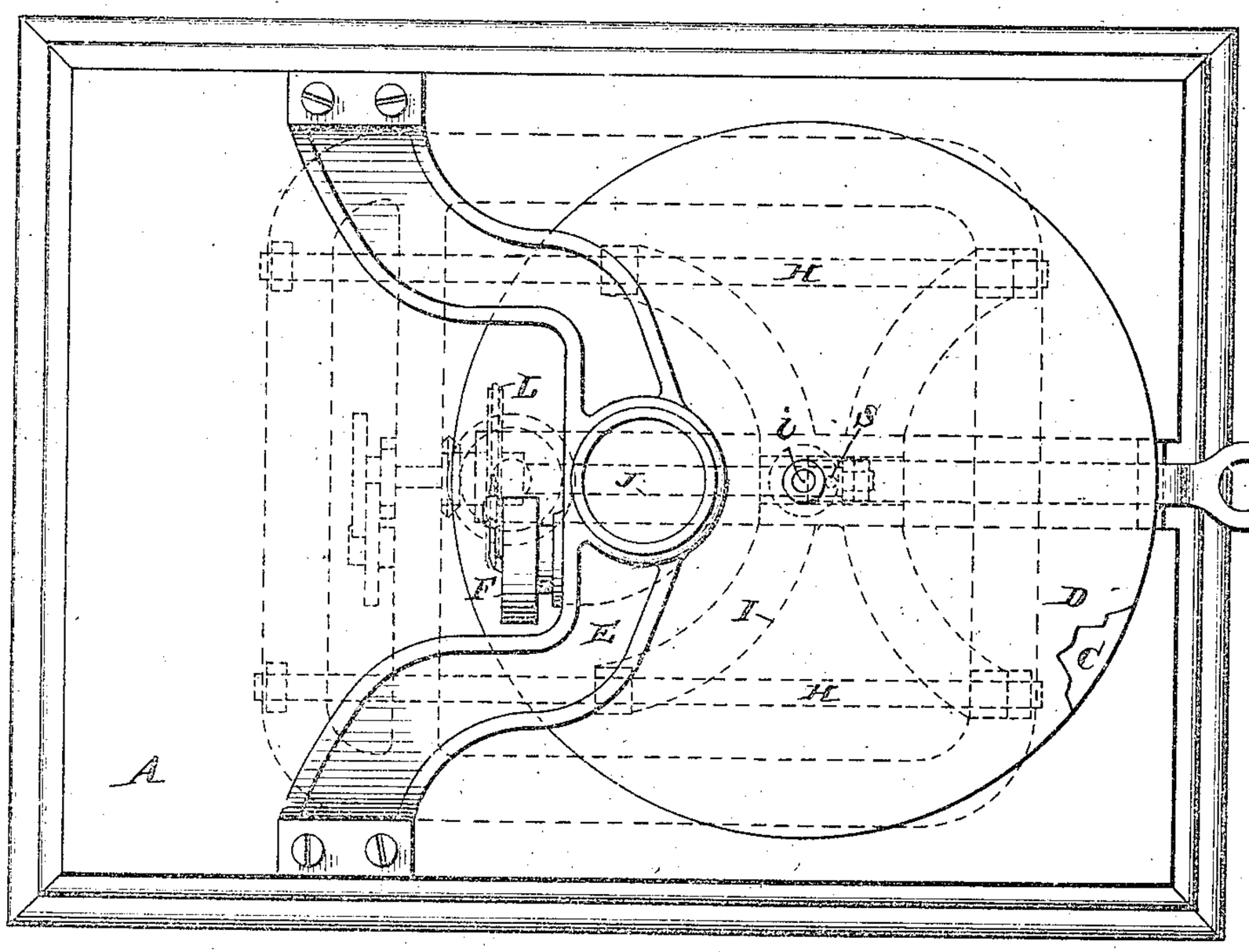

FIG. 2

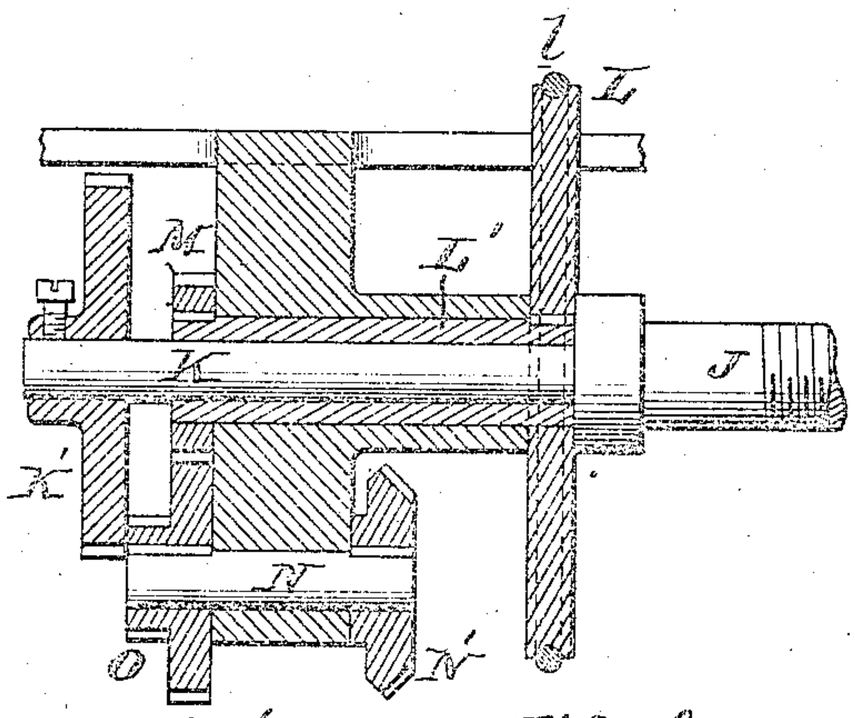

FIG. 4

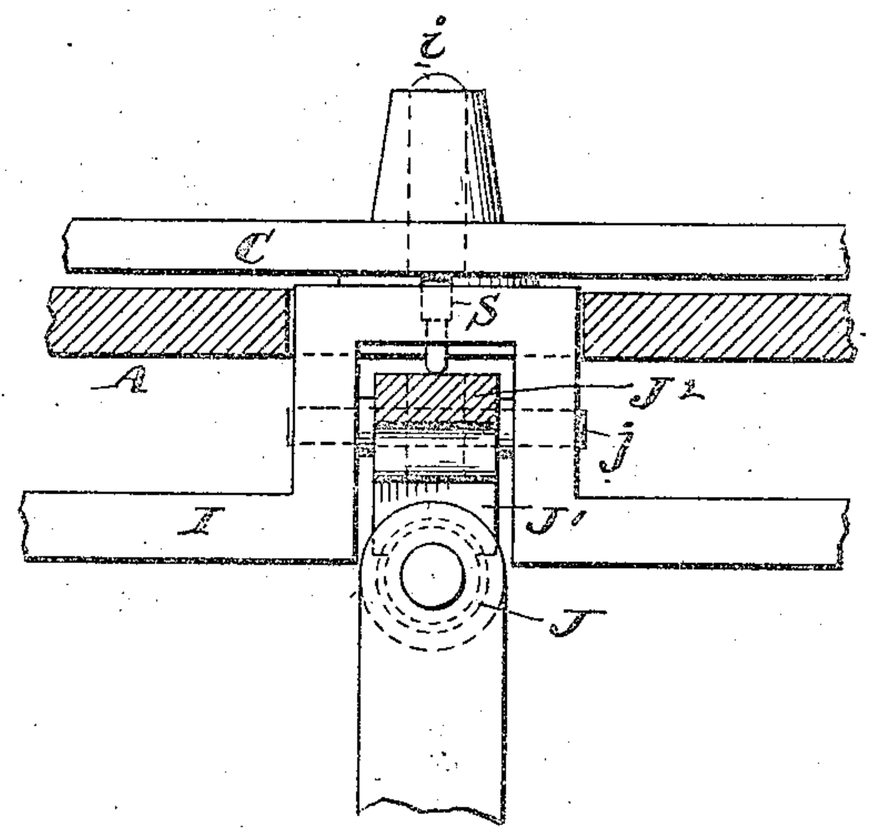

FIG. 5

Witnesses:

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UNITED STATES PATENT OFFICE.

ROBERT L. GIBSON, OF PHILADELPHIA, PENNSYLVANIA.

SOUND-REPRODUCING MACHINE.

993,980. Specification of Letters Patent. Patented May 30, 1911.

Application filed December 22, 1906. Serial No. 349,013.

To all whom it may concern:

Be it known that I, ROBERT L. GIBSON, of the city and county of Philadelphia, State of Pennsylvania, have invented an Improvement in Sound-Reproducing Machines, of which the following is a specification.

My invention has reference to sound reproducing machines and consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings which form a part thereof:

The object of my invention is to provide a construction of machine which is adapted to employ a record tablet in disk form and which, in the operation of the record groove upon the stylus, will cause said record groove to travel in contact with said stylus at a uniform speed throughout the entire length of the groove.

My object is also to provide a construction of machine in which the sound box shall remain normally stationary while the record tablet is caused to travel under it to bring the different portions of the record groove in succession into operative position with respect to the stylus.

My invention consists of means for rotating a record table and simultaneously therewith shifting the axis of rotation relatively to a stylus of a sound box whereby successive portions of the record groove are brought into operative position with the stylus and whereby the sound box may be relatively stationary with respect to the record tablet.

My invention also consists of the combination of a rotating support for a record tablet combined with a sound box and stylus, and means for rotating the support of the record tablet with a gradually varying speed whereby the speed of travel of the record groove is substantially constant.

My invention also comprehends other features of construction in a sound reproducing machine, which, together with the features above specified, will be better understood by reference to the drawings, in which:

Figure 1 is a side elevation of a sound reproducing machine with a portion broken away to show the interior and embodying my improvements in its construction; Fig. 2 is a plan view of the same; Fig. 3 is an end view through a portion of the gearing and motor devices; Fig. 4 is a sectional elevation through a transmitting gearing and driving mechanism for the record tablet support; and Fig. 5 is a sectional view of the detail for connecting and disconnecting the record tablet support with the transmitting gearing.

A is the case of the machine.

B is the power motor of the usual spring type.

C is the turn-table upon which the record tablet disk D is supported.

E is the bridging bracket carried upon the upper part of the case and having a horizontal tubular extension E'.

F is the sound box having its stylus F' resting in contact with the record tablet D, and G is the horn or amplifier carried upon a vertical tubular aperture of the bracket E.

The character of the record tablet adapted for use in connection with my improved machine is of a construction in which the record groove is so formed in different parts of the spiral that the speed of travel of the disk must be varied approximately in a continuous manner while the stylus travels from one end of the spiral groove to the other so that the surface speed of the groove under the stylus is substantially constant.

The turn table or support C is pivoted upon a pin *i* extending upwardly from a sliding carriage I which is guided horizontally upon the guide rods H H. A rotating feed screw J is arranged between the parallel guides H H and is driven by the spring motor B through gearing, to be later described.

J^2 is a lever which is pivoted at *j* to the carriage I and has its inner end hinged to a half nut J' which engages the threads of the screw J when forced down upon it under the action of the spring R operating upon the lever J^2. By depressing the free end of the lever J^2 the nut J' may be raised from the screw and, when in this position, the turn-table C and its carriage I may be shifted freely upon the guides H. This action is facilitated by raising the turn-table C from off the driving wheel L by the raising of the pin S which is carried by the frame I and is acted upon by the inner end of the lever J^2. Normally the turn-table C does not touch the pin S so that the said pin does not interfere with the free rotation of the turn table. The turn-table is smooth upon its under side and normally rests upon the rotating driving wheel L, this wheel being driven by the spring motor in any suit-

able manner. In the particular illustration shown, the wheel L is secured upon a sleeve L′ journaled upon an extension K of the screw shaft J and is rotated by means of gears M M′, shaft N, beveled gears N′ and B′ connecting with the spring motor B. The screw shaft J is provided at its rear end with a spur gear K′ which meshes with a pinion K^2 on the shaft N and by means of which gears the feed screw shaft J is rotated with a much slower speed than the sleeve L′ and its driving wheel L. Any other suitable construction of gearing or manner of driving the parts J and L may be employed, as will occur to anyone skilled in the art, the mechanism here shown being merely an example of devices which may be suitably employed. The driving wheel L may be provided on its periphery with rubber, as at *l*, if so desired.

The sound box F may be of any suitable construction and may have an adjustable rotation on a horizontal axis in the end of the tubular arm E′ so as to be able to turn the stylus up or down with respect to the record tablet, to permit the changing of the record tablets and also to bring the stylus into normal adjustment. A spring *f* may be employed for holding the stylus point in contact with the record tablet or elevated from the same according as to the adjustment of the sound box whether for playing or when changing the record tablets.

The operation of my improved machine will now be understood: The machine being in the position shown in Fig. 1, and having just completed the reproducing of sound from a record tablet, the stylus of the sound box is turned upward by rotating the sound box, the record tablet D is removed and a new record tablet is placed in position. The motor is then put into operation. The sound box is then rotated into position to bring the stylus into contact with the record groove of the tablet. By the combined rotation of the feed screw J and the driving wheel L, the turn-table is rotated and at the same time its axis of rotation *i* is shifted longitudinally with respect to the sound box and stylus so that the surface speed of travel of the record groove under the stylus remains substantially constant. This continues until the record tablet has been, together with the turn-table, shifted to bring the end of the record groove under the stylus and which has completed the reproduction of the sound from the record groove of that particular tablet. The lever J^2 is then depressed and the carriage I and turn table pulled again to position shown in Fig. 1 and a new record disk tablet substituted for that from which sound was before reproduced.

The result of reproducing sound from a record tablet in the manner herein referred to, namely one in which the record groove is so formed and the machine so operated that uniform or constant speed of travel of the record groove under the stylus is insured, results in a more perfect articulation or production of sound than where the surface speed of travel of the record groove is constantly varying as in the case of the gramophone instruments as they are commercially constructed and operated. It will be seen, however, that an ordinary gramophone record tablet would not be suitable for use in a machine of the character herein described because the speed of travel of the turn-table carrying the record disk is constantly changing and hence would cause the gramophone record to travel at a rate of speed which would be inconsistent with that employed when producing the master record from which it was made; and consequently, the record tablets for my improved machine must be specially made and adapted for a machine of this character only.

While the construction shown is excellently adapted for the purposes of my invention, I do not confine myself to the details, as these may be considerably varied without departing from the principles of my invention.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a machine for reproducing sound, the combination of a rotating turn-table for the sound record tablet, a sliding frame in which the turn-table is journaled on a vertical axis and by which it may be shifted, mechanical feeding devices for feeding the sliding frame uniformly, power mechanism for directly rotating the turn-table independently of the feeding devices, means attached to the sliding frame for simultaneously disconnecting the turn-table from the feeding devices and from the power mechanism which rotates it and provided with an extension forming a handle by which the frame may be moved when freed from the feeding mechanism, a sound box, and a fixed support above the turn-table in which the sound box is journaled.

2. In a machine for reproducing sound, the combination of a rotating turn-table for the sound record tablet, a sliding frame in which the turn-table is journaled and by which its axis may be shifted, mechanical feeding devices for feeding the sliding frame uniformly, means extending beyond the turn-table for mechanically connecting the sliding frame with the feeding devices or disconnecting it therewith and directly moving the sliding frame independently of the feeding devices, a fixed frame arranged above the turn-table, and a sound box having a tubular part journaled in the fixed frame on an axis parallel to the turn-table but to one side of the plane of travel of the axis of

the turn-table and having the stylus point arranged to make contact with the record tablet upon the turn-table approximately in the vertical plane of the travel of the axis of the turn-table.

3. In a machine for reproducing sound, the combination of a turn-table for the record tablet, a sliding frame upon which the turn-table is journaled, a stationary bracket extending over the sliding frame and turn-table and provided with a tubular passage above the turn-table terminating at one end in an upright opening and at the other end in a horizontal opening, a sound box rotatably journaled in the horizontal opening of the bracket and with its diaphragm at right angles to the line of travel of the turn-table and sliding frame, and an amplifying horn supported from the vertical opening of the bracket.

4. In a machine for reproducing sound, the combination of a turn-table for the record tablet, a sliding frame upon which the turn-table is journaled, a stationary bracket extending over the sliding frame and turn-table and provided with a tubular passage terminating at one end in an upright opening and at the other end in a horizontal opening laterally disposed to a vertical plane through the central line of travel of the turn-table, a sound box journaled in the horizontal opening of the bracket and with its diaphragm at right angles to the line of travel of the axis of the turn-table and sliding frame, means for holding the sound box in an adjusted position with the stylus point in operative connection with the record on the turn-table and also out of such position when desired, and an amplifying horn supported from the vertical opening of the bracket.

5. In a machine for reproducing sound, the combination of a turn-table for the record tablet, a relatively stationary sound box and stylus, feeding means independent of the turn-table and its rotating means for slowly moving the axis of the turn-table toward the sound box, means for rotating the turn-table with a speed which gradually increases whereby the surface speed of travel of the record groove of the tablet under the stylus will be substantially constant, and means for connecting or disconnecting the turn-table with the means for rotating it and without removing the turn-table.

6. In a machine for reproducing sound, the combination of a turn-table for the record tablet, a relatively stationary sound box and stylus, means independent of the turn-table and its rotating means for slowly moving the axis of the turn-table toward the sound box, means for rotating the turn-table with a speed which gradually increases whereby the surface speed of travel of the record groove of the tablet under the stylus will be substantially constant, and means for connecting or disconnecting the turn-table with the means for moving the axis of the turn-table toward the sound box.

7. In a machine for reproducing sound, the combination of a turn-table for the record tablet, a relatively stationary sound box and stylus, means independent of the turn-table and its rotating means for slowly feeding the axis of the turn-table toward the sound box, means for rotating the turn-table with a speed which gradually varies whereby the surface speed of travel of the record groove of the tablet under the stylus will be substantially constant, and means for simultaneously arresting the rotation of the turn-table and for disconnecting it from the feeding means and adjusting it relatively to the sound box.

8. In a machine for reproducing sound, the combination of a fixed frame having a tubular part provided with vertical and horizontal openings, a horn extending from the vertical opening of the tubular part, a turn-table arranged below the tubular part, means for rotating the turn-table and feeding it relatively to the tubular part, and a sound box loosely held so as to be rotatably supported by the horizontal opening of the tubular part on an axis parallel to the turn-table and said sound box having a stylus adapted for contact with a record tablet on the turn-table.

9. In a machine for reproducing sound, the combination of a frame having a tubular part provided with vertical and horizontal openings, a horn extending from the vertical opening of the tubular part, a turn-table arranged below the tubular part, means for rotating the turn-table and feeding it relatively to and from the tubular part, a sound box loosely held so as to be rotatably supported by the horizontal opening of the tubular part on an axis parallel to the turn-table and at right angles to the diaphragm and having a stylus adapted for yielding contact with a record tablet on the turn-table, and hand operated devices extending beyond the turn-table for arresting the rotation of the turn-table and shifting it relatively to the sound box.

10. In a machine for reproducing sound, the combination of a frame having a tubular part provided with vertical and horizontal openings, a horn extending from the vertical opening of the tubular part, a turn-table arranged below the tubular part, means for rotating the turn-table and feeding it relatively to the tubular part, a sound box loosely held so as to be rotatably supported by the horizontal opening of the tubular part on an axis parallel to the turn-table and at right angles to the diaphragm and having a stylus adapted for yielding contact with a record tablet on the turn-table,

hand operated devices extending beyond the turn-table for arresting the rotation of the turn-table and shifting it relatively to the sound box, and a spring device for holding the stylus of the sound box down to the record tablet on the turn-table or in an elevated position as desired.

11. In a machine for reproducing sound, the combination of a bracket having a tubular part directly over the turn-table formed with vertical and horizontal openings, a horn carried by the bracket and in connection with the vertical opening, a sound box carried by the bracket and connected with the horizontal opening thereof, a rotating turn-table for the record tablet arranged below the tubular part of the bracket, and means for feeding the turn-table transversely to the sound box.

12. In a machine for reproducing sound, the combination of a bracket having a tubular part directly over the turn-table formed with vertical and horizontal openings, a horn carried by the bracket and in connection with the vertical opening, a sound box carried by the bracket and connected with the horizontal opening thereof, a rotating turn-table for the record tablet arranged below the tubular part of the bracket, means for feeding the turn-table transversely to the sound box and uniformly toward the bracket and sound box, and hand device for moving the turn-table away from the said bracket and sound box.

In testimony of which invention, I hereunto set my hand.

ROBERT L. GIBSON.

Witnesses:

R. M. HUNTER,

R. M. KELLY.