

J. HARRIS.
SOUND RECORDING AND REPRODUCING MACHINE.

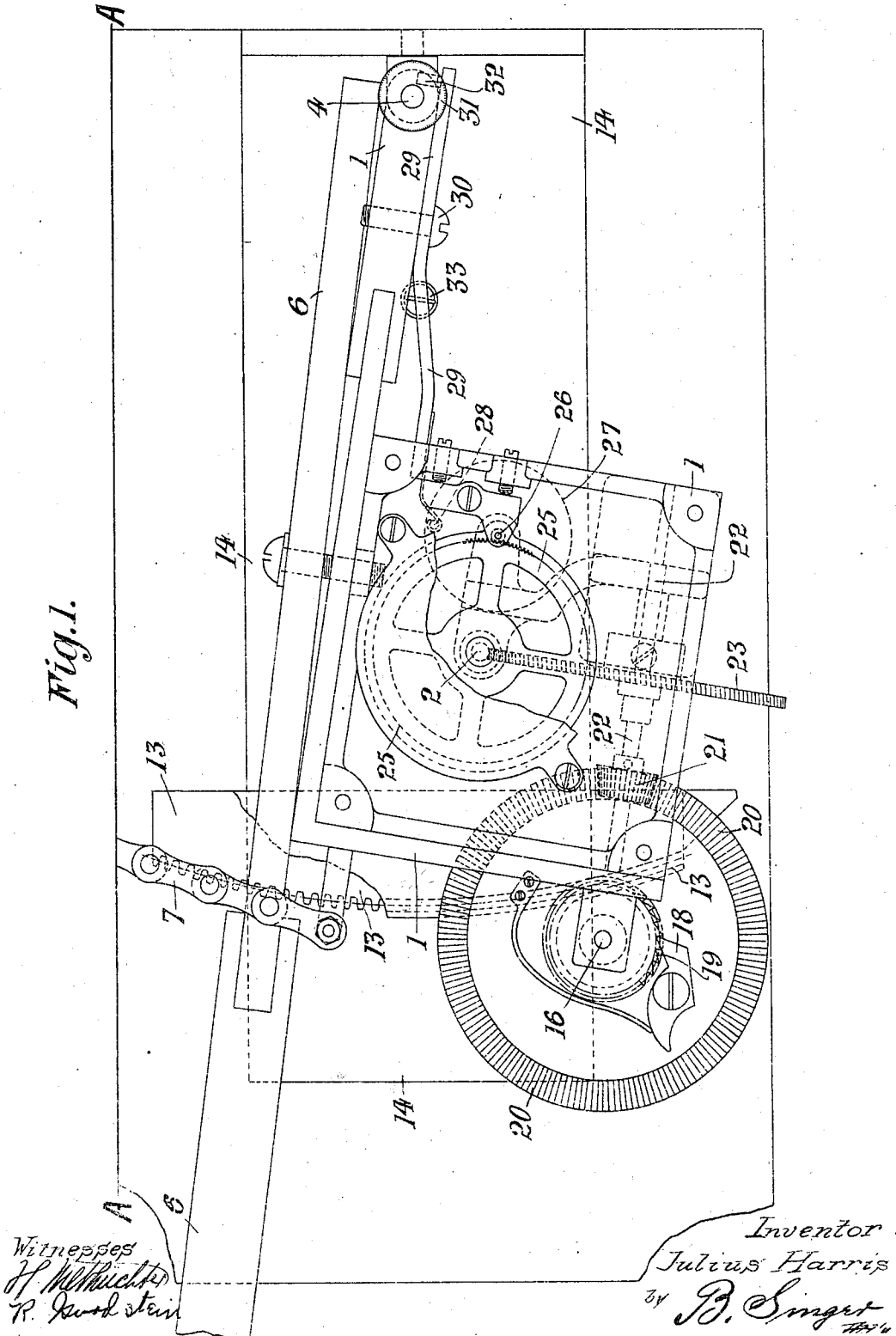
APPLICATION FILED SEPT. 2, 1909.

Patented Apr. 18, 1911.

5 SHEETS—SHEET 1.

989,707.

Fig. 1.



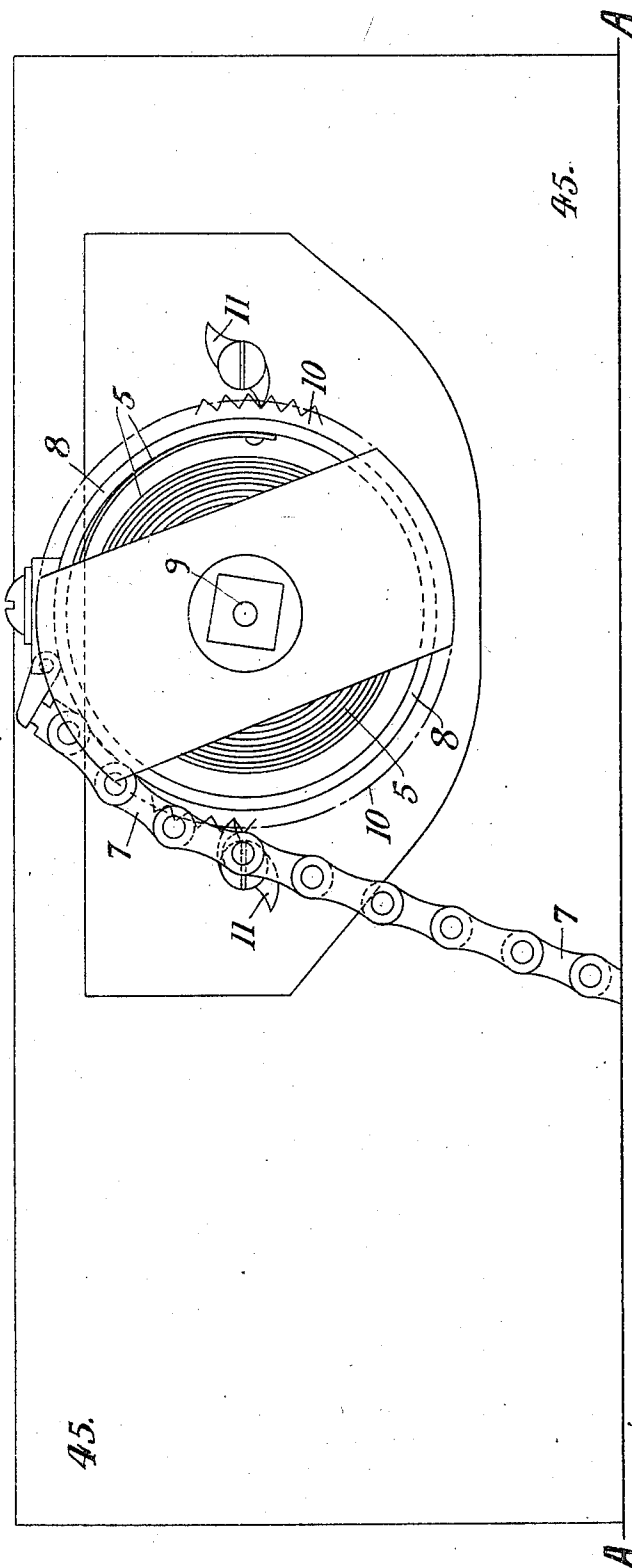
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5 SHEETS—SHEET 3.

FIG. 1A



Witnesses
H. M. Kuchler
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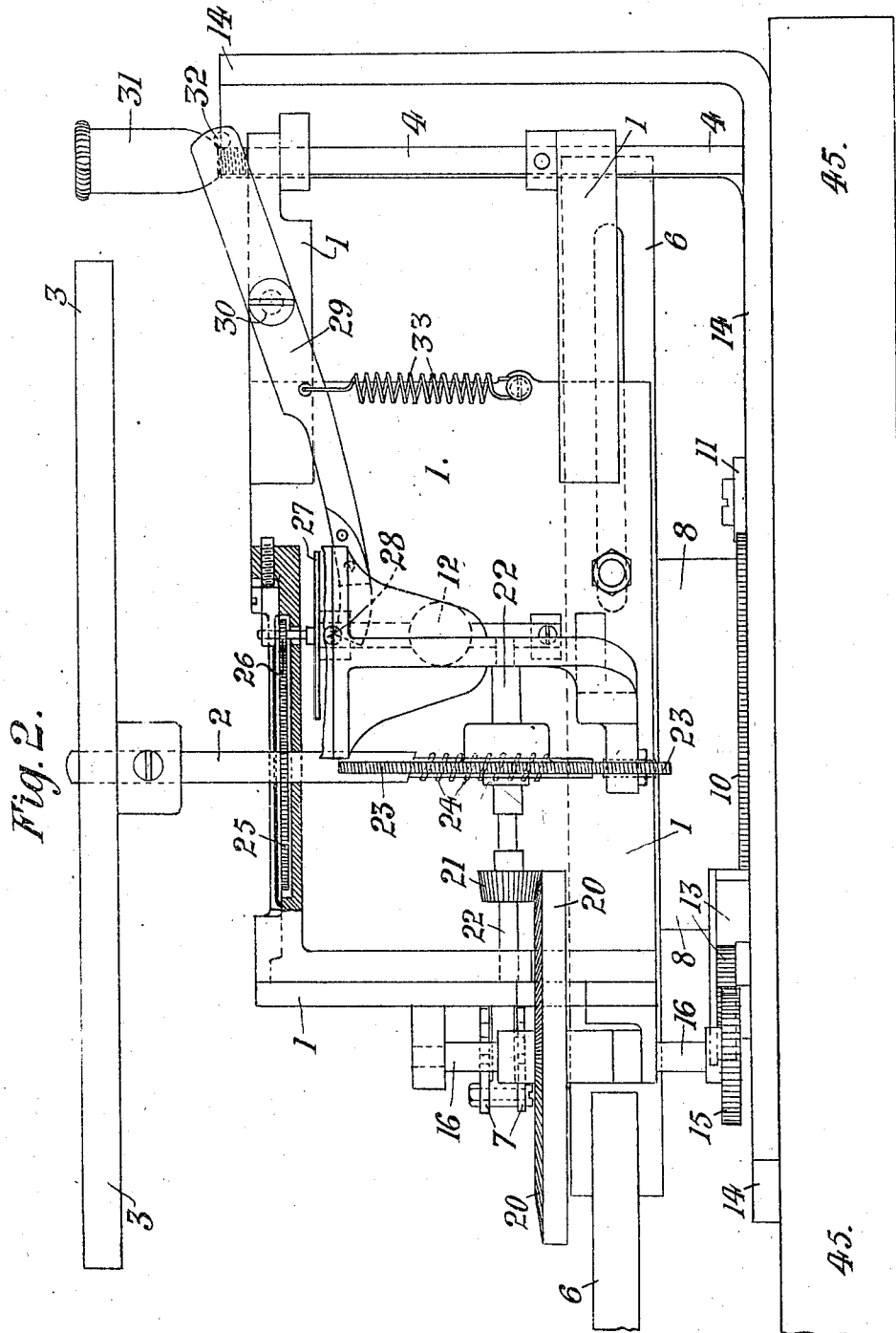
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6 SHEETS—SHEET 3.



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Fig. 3.

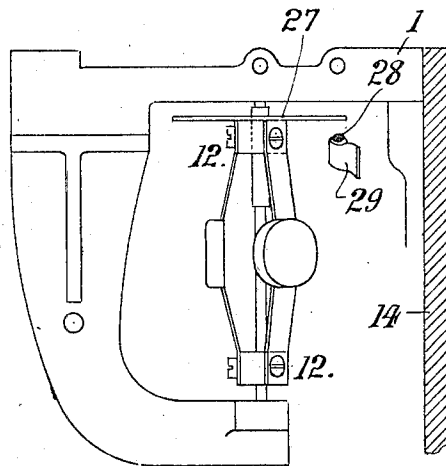


Fig. 4.

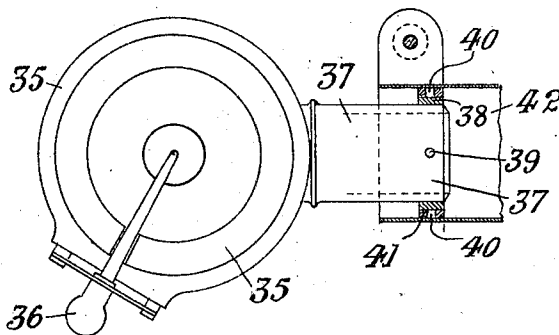
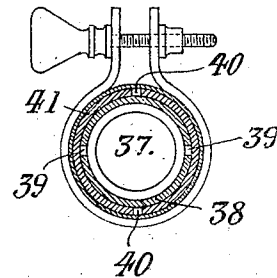


Fig. 5.



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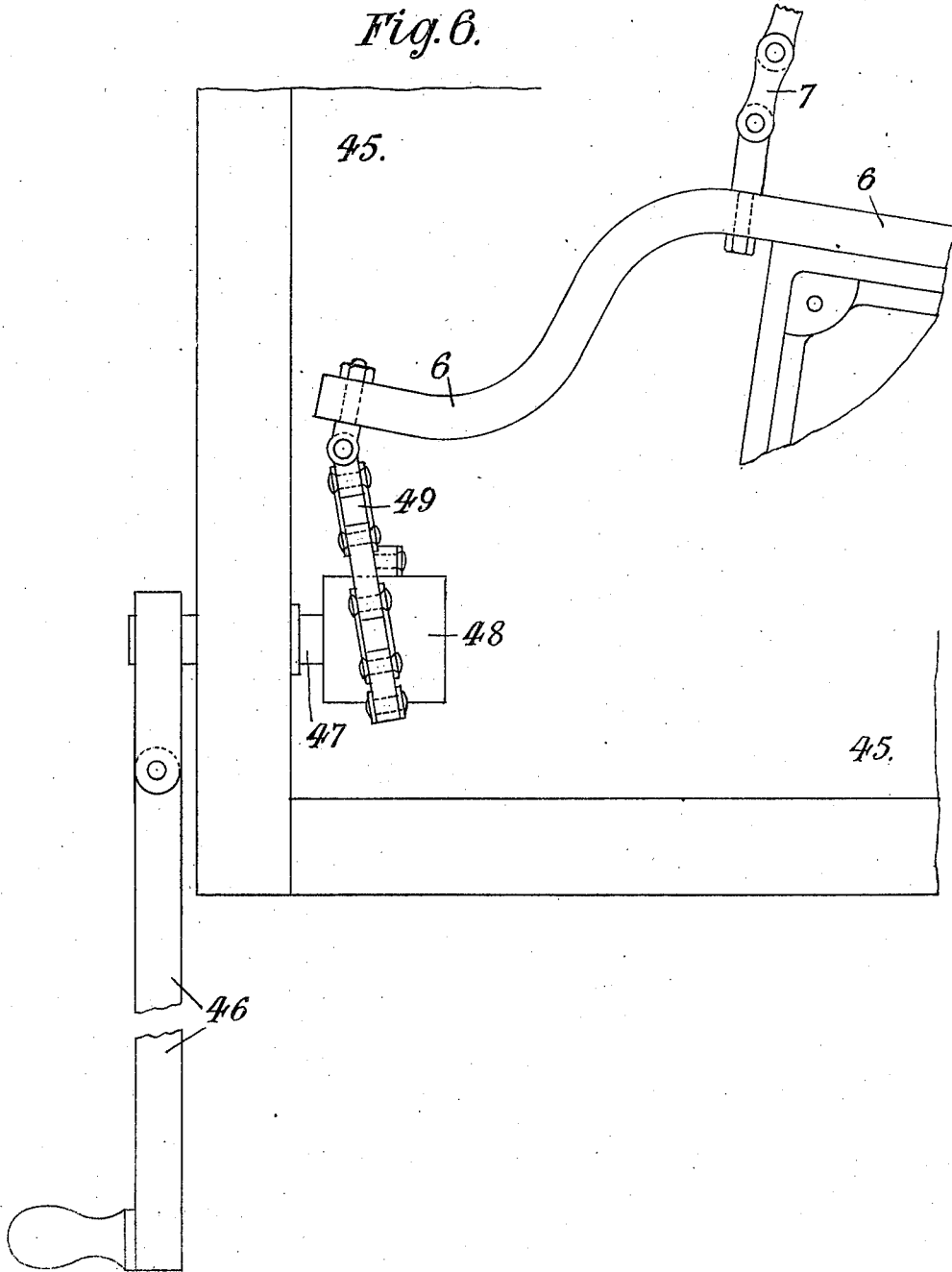
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5 SHEETS—SHEET 5.

Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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SOUND RECORDING AND REPRODUCING MACHINE.

989,707.

Specification of Letters Patent.

Patented Apr. 18, 1911.

Application filed September 2, 1909. Serial No. 515,960.

To all whom it may concern:

Be it known that I, JULIUS HARRIS, a subject of the King of England, residing at Liverpool, in the county of Lancaster, England, have invented a new and useful Sound Recording and Reproducing Machine, of which the following is a specification.

This invention has reference to phonographs, gramophones, and other similar auto-musical instruments, and instruments driven by spring motors, and especially those in which the records are of the disk type, and the general object of the invention has been to provide improvements in connection with such instruments by which they are more easily worked and at the same time the mechanism is simple, inexpensive, and effective, and capable of giving uniform and reliable results or effects, both in the taking of records, and in playing them.

This invention will be described with the aid of the accompanying drawings, which illustrate an auto-musical instrument of the character herein referred to, and in which the improvements hereunder are comprised.

In these drawings, Figure 1 is a plan of one part, and Fig. 1^A a plan of the other part of the improved mechanism, and Fig. 2 is an elevation partly in section of the improved mechanism. Figs. 3, 4, and 5 are details hereinafter described, and Fig. 6 shows a part of the hand actuating means.

1, generally designates a rocking frame; 2 is a spindle on which the record table 3 is mounted; 4 is a pivoted spindle on which the frame 1 is mounted and about which it rocks; and 5 is the usual spring motor which is wound up by the movement of the frame.

The frame 1 has connected with it a lever 6, which is actuated by hand in the manner hereinafter described; and the frame is connected with the spring motor 5 by a chain 7, one end of which is connected up with the frame itself, and the other with the case 8 of the spring motor 5; while one end of the spring is connected to the case, and the other with an arbor 9, which has fixed on it a toothed pawl wheel 10, which is held against rotation in one direction by the pawls 11.

The frame 1 carries gearing by which motion is imparted to the records disk and the

mechanism connected with the same through a fixed curved rack 13, which is attached to the carrier bed 14 of the machine, and is held stationary thereon. This rack serves to operate the gearing carried by the frame 1, through a part of the said gearing engaging with such rack and being caused to travel over it by the spring motor 5 which is connected with the frame 1 by the chain 7.

The gearing carried by the frame comprises a tooth wheel 15 which engages with the curved rack 13, and as the frame is moved by the spring motor 5 through the chain 7, the tooth wheel 15 is rotated by the teeth of the curved rack 13, and the spindle 16 of the tooth wheel also rotated, and such rotation of the spindle 16 is transmitted to the bevel wheel 20 through the medium of a ratchet wheel 19 fixed to the spindle 16 and a spring pressed pawl 18 attached to the wheel 20, and which engages with the teeth of the said ratchet wheel 19.

The ratchet wheel 19 and spring pressed pawl 18 are provided for the purpose of enabling the spring motor 5 being wound without operating the gearing, that is, when the frame 1 is rocked on its spindle 4 away from the spring motor 5 the gearing carried by the frame is "freed", that is, the spindle 16 and ratchet wheel 19, rotate freely owing to the pawl 18 slipping over the teeth of the ratchet wheel.

The rotation of the bevel wheel 20 transmits motion to the bevel pinion 21, and spindle 22, and the spindle 22 rotates the spiral tooth wheel 23, and a worm 24 on the record disk table spindle 2; thus motion is imparted to the said toothed wheels and spiral and worm gearing, by causing the tooth wheel 15 to move over and in engagement with the stationary rack 13 by the spring motor 5, and the record is rotated at the required speed, which is regulated as next described.

The speed of rotation of the disk and its spindle 2 is regulated by the governor device 12 more particularly shown in Fig. 3. This device is of the well known character and is driven through the tooth wheel 25 mounted on the record table spindle 2, and a tooth pinion 26 gearing therewith and mounted on the spindle of the governor de-

vice 12. The governor device comprises weighted spring arms which in rotation fly or move outwardly from the spindle of the governor device, and pull or move downwardly a disk 27 on to the end 28 of a lever 29, which is pivotally mounted at 30. The position of the end 28 of the lever 29 relatively to the disk 27, is regulated by a thumb regulating nut 31, which screws on to the upper end of the spindle 4, (on which the frame 1 is carried,) and has a conically shaped lower end which acts directly upon a pin 32 attached to the outer end of the lever 29. The end 28 of the lever 29 is normally pulled away from the disk 27 by the spring 33, attached at one end to the lever 30, and at the other end to a part of the casing, and when the end 28 is to be moved toward the disk, the nut 31 is screwed farther on to the screw threaded end of the spindle 4, and rocks the lever 29 about its pivot 30 in such a manner as to move the end 28 of the lever toward the disk 27. The end 28 serves as a braking device for the disk 27, that is, when the disk 27 is pulled downwardly by the weighted spring arms of the governor, the disk bears against the end 28, and the speed of rotation is checked or reduced thereby.

The end of the lever 29, may have an anti-friction roller or ball upon it, which works in connection with the under side of the disk 27.

The sound box is mounted on gimbals as shown in Figs. 4 and 5, to give lateral play or movement and the proper adjustment and the needle will be pressed onto the record disk 10 by gravity, or by a slight spring.

The gimbals consist of an inner ring 38, to which the sound box tube 37 is connected by pins 39; and the ring 38 has pins 40 on it, which are mounted in the outer ring 41 directly connected with the trumpet tube 42, which will be fixed or stationary, and is without a sound arm. By this arrangement, it will be noted that the sound box 35 will have lateral play as well as vertical play, and the needle is free to follow the impressions of the disk readily and accurately.

With regard to the spring 5, this may be of a single type, or consist of two or more laminae or springs.

The whole apparatus and parts described are mounted upon a suitable box, table or base 45; and the actuating lever 6 is preferably operated by a hand crank lever 46 on the outside of the box, which is connected up with the lever 6 through a spindle 47, a drum or wheel 48 upon it, and a chain 49 which wraps around the drum. By moving this lever 46, say about half a revolution, the frame 1 will be completely moved from its terminal position to the starting position, that is, it will be fully set, so that upon re-

lease; the complete action of the mechanism and record table will follow.

The winding of the motor spring, and the setting of the instrument generally, is effected by rocking or moving the frame or part carrying the spindle on which the record table is mounted, away from the spring motor; and when this frame is released, the spring which has been wound up returns or moves back the frame, and drives through the said toothed and other gearing and the stationary rack, the record spindle and record disk.

As the frame and gear are moved or actuated by the spring motor the disk will be moved relatively to the style or needle of the sound box; and the record will traverse therefor under the style or needle.

What is claimed is:—

1. In a sound reproducing or recording machine, a power motor, a record disk table, and a movable record table carrying part, having a flexible connection with the motor, whereby the latter is wound up when said part is moved in one direction, and said part is moved in the opposite direction by the motor when the latter is released.

2. In a sound reproducing and recording machine; the combination of a spring motor; a fixed toothed rack, a rockable frame on which are mounted a table for carrying the record, a spindle connected with the table, a governor device, and gearing for transmitting motion to the spindle including a toothed wheel which engages with the fixed rack, and a ratchet device; flexible means connecting the frame with the spring motor; and means for moving the frame away from the spring motor.

3. In a sound reproducing and recording machine; the combination of a spring motor; a fixed curved toothed rack; a rockable frame on which are mounted a record carrying table fitted with a spindle, a governor device, and gearing connected with the said spindle and which includes a ratchet device and a toothed wheel which engages with the fixed curved rack; a chain connecting the frame to the spring motor; means for rocking the frame away from the motor; and means for regulating the braking action of the governor device.

4. A sound reproducing and recording machine, comprising a spring motor; a stationary curved rack; a rockable frame comprising a record carrying table fitted with a spindle, a spring governor device, having a braking disk, and gearing which includes a ratchet device and a toothed wheel which engages with the curved rack; a chain connecting the frame to the spring motor; a hand actuated means for rocking the frame away from the spring motor; a spring ac-

5 tuated braking lever having means for regulating the position of the lever relatively to the braking disk of the governor; a sound box; and means for supporting the sound box over the record table including gimbals which enable the sound box to move both vertically and horizontally, and comprise concentrically disposed rings fitted with

horizontally and vertically disposed pins and bearings.

In testimony whereof I affix my signature in presence of two witnesses.

10

JULIUS HARRIS.

Witnesses:

SOMERVILLE GOODALL,
DONALD COULTER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
