H. B. McNULTY.

PHONOGRAPH.

APPLICATION FILED SEPT. 14, 1916.

1,238,168.

Patented Aug. 28, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

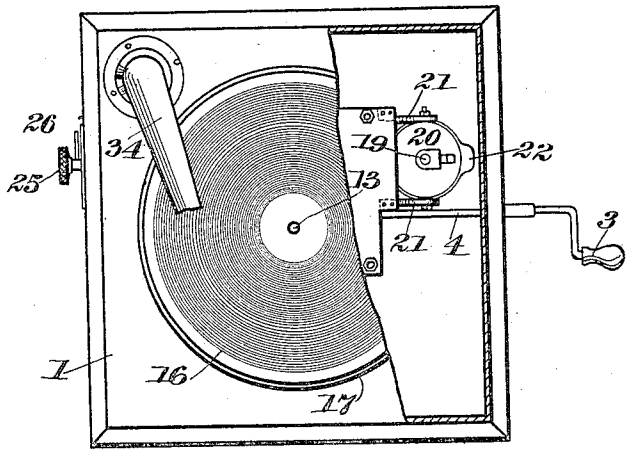


Fig. 2.

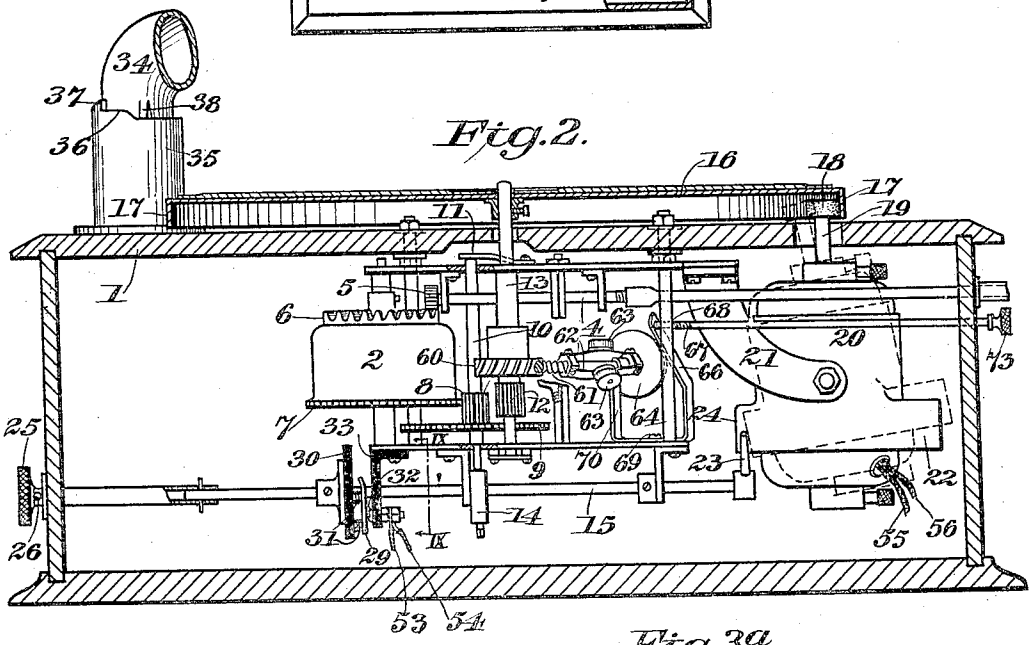


Fig. 3.

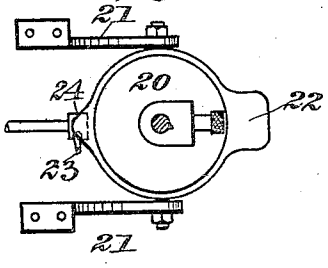
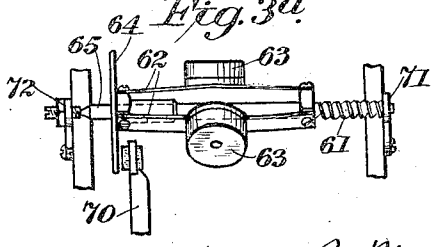


Fig. 3a.



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2 SHEETS—SHEET 2.

Fig. 4.

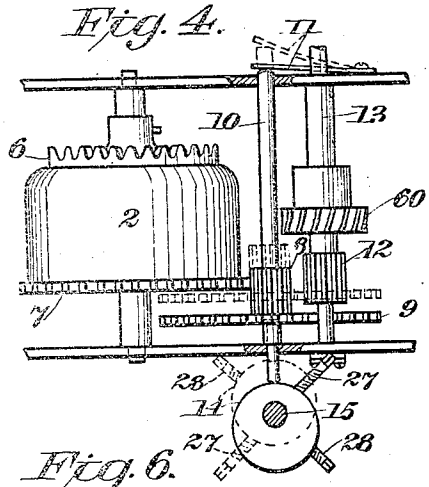


Fig. 5.

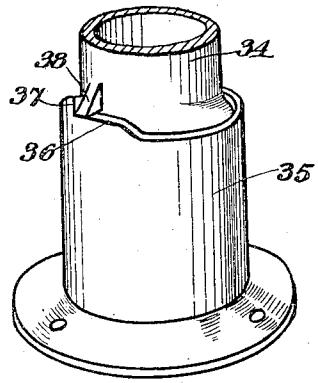


Fig. 6.

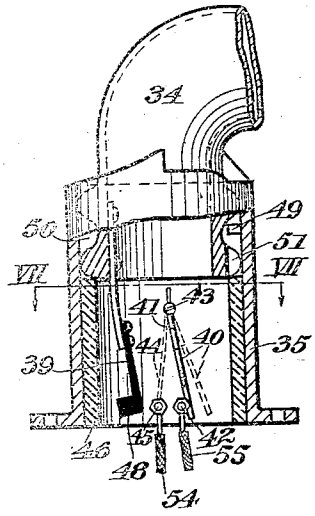


Fig. 7.

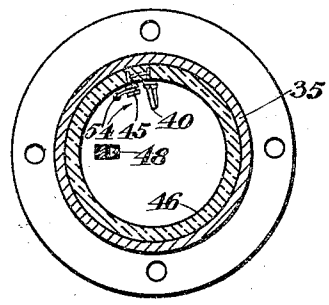


Fig. 8.

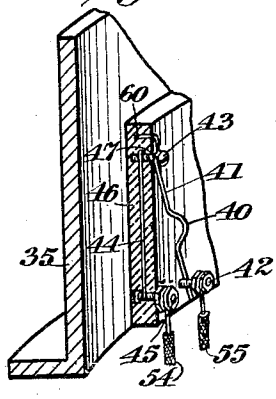


Fig. 9.

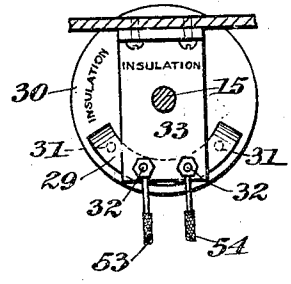
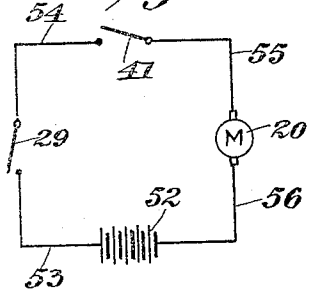


Fig. 10.



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UNITED STATES PATENT OFFICE.

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PHONOGRAPH.

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Application filed September 14, 1916. Serial No. 120,048.

To all whom it may concern:

Be it known that I, HARRY B. McNULTY, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Phonographs, of which the following is a full, clear, and exact specification.

This invention relates to phonographs or talking machines, especially to the means for rotating the record carrier, and has for its object to provide a phonograph with two different means of power which may be interchangeably utilized for rotating the record carrier. The special aim of the invention is to provide a phonograph with a spring motor and an electric motor both built into the machine and either adapted to drive the record carrier but only one being capable of operating at a time. Thus, when the purchaser's home is equipped with electric lights, the phonograph may be driven by the electric motor, whereas the spring motor may be utilized at any time when the machine is to be used where electric current is not accessible. Subsidiary objects will appear as the description proceeds.

The invention will be first hereinafter described in connection with the accompanying drawings, wherein similar reference characters are used to designate corresponding parts throughout the several views, and then more specifically defined in the claims at the end of the description.

In the drawings:—

Figure 1 is a broken plan view of a phonograph equipped with two means of power and otherwise constructed substantially in accordance with this invention.

Fig. 2 is a broken vertical section through the machine on a larger scale and clearly showing the two motors and means for interchangeably throwing one of them in and the other one out of driving connection with the turn table.

Fig. 3 is a detail plan view of the electric motor and the means for swinging it to disengage its driving pulley from the flange on the turn table.

Fig. 3ª is a detailed view of the governor.

Fig. 4 is a detail vertical section at right angles to that of Fig. 2, showing the means for throwing the spring motor in and out of driving connection with the turn table post.

Fig. 5 is a detail perspective view of the stationary collar in which the tone arm is rotatably fitted.

Fig. 6 is a broken vertical section of the same showing the automatic switch carried by said collar and tone arm for breaking the circuit to the electric motor when the tone arm is turned to one side off of the turn table.

Fig. 7 is a horizontal section on the line VII—VII of Fig. 6.

Fig. 8 is a fragmentary perspective of a part of the stationary collar, showing the wiring to the switch carried thereby.

Fig. 9 is a detailed section on the line IX—IX of Fig. 2, showing the primary switch controlling the electric motor and which is opened or closed as the spring motor is thrown in or out of driving connection with the turn table post, and

Fig. 10 is a diagrammatic view of the circuit to the electric motor, showing the primary and secondary switches which are carried by the rock-shaft and tone arm respectively.

In the casing 1 of the phonograph there is operatively mounted a spring motor 2 of any well known make, said spring motor being adapted to be wound up by means of a crank 3 on the end of a shaft 4 carrying a pinion 5 at its other end meshing with the gear surface 6 on the spring motor. A gear 7 on the spring motor meshes with a small pinion 8 integral with a large gear 9 and mounted fast on a vertically movable post 10, Figs. 2 and 4. The post 10 is normally held down by a leaf spring 11 engaging its upper end in the position shown in Fig. 2 with the large gear 9 out of mesh with the small pinion 12 on the turn table post 13. The lower end of the post 10 rests upon a cam 14 on a rock-shaft 15, whereby said post may be raised to bring the gear 9 into mesh with the pinion 12 when it is desired to utilize the spring motor for driving the turn table 16.

The turn table has a depending peripheral flange 17 engaged by a soft rubber roller 18 on the armature shaft 19 of the electric motor 20 which is pivoted to swing between arms 21 depending from a part of the casing of the machine. The motor 20 has a weighted projection 22 on its outer face which serves to normally hold the roller 18 in engagement with the flange 17 on the turn table and cause said roller to adjust itself to take

care of any irregularities in said flange. When the parts of the machine are in the positions shown in Fig. 2 (solid lines), the turn table will be driven by the electric motor and the spring motor will be disengaged from the turn table post.

To disengage the roller 18 from the flange of the turn table when the spring motor is thrown into driving connection with the turn table post, the rock-shaft 15 is provided with a laterally extending pin 23 adapted to engage a rounded knob 24 on the inner face of the motor 20, Figs. 2 and 3, so that when the rock-shaft is turned to raise the post 10 on the cam 14 for connecting up the spring motor with the turn table post 13, the pin 23 will ride up the knob 24 and swing the electric motor sufficiently to separate the roller 18 from the flange of the turn table, as indicated in dotted lines in Fig. 2. The rock-shaft 15 is fitted with an operating handle 25 and may also have a pointer or indicator 26 for showing on the outside of the casing 1 whether the machine is set to run by the electric motor or the spring motor.

As illustrated in Fig. 4, the cam 14 has two radially projecting pins 27 and 28 of different sizes and disposed at right angles to each other. The longer pin 27 serves as a stop to limit the turning of the rock-shaft in one direction, while the shorter pin 28 limits the turning of the rock-shaft in the other direction.

In order to automatically cut off the current to the electric motor when the rock-shaft is turned to throw said motor out of driving connection and the spring motor into driving connection with the turn table, a switch 29 (hereinafter referred to as the primary switch) is mounted on a disk 30 of insulating material carried by the rock-shaft, Figs. 2 and 9. This switch 29 is in the form of an arcuate plate and is pressed by springs 31 into contact with a pair of spaced contacts 32 carried by a fixed bracket 33 also of insulating material. When the rock-shaft is turned to the right to throw out the spring motor and throw in the electric motor, as shown in Fig. 2, the switch plate 29 will be brought into engagement with both of the contacts 32 as shown in Fig. 9, thus closing the circuit through said contacts. When the rock-shaft is turned to the left to throw out the electric motor and throw in the spring motor, the switch plate 29 passes off of one of the contacts 32 and thereby breaks the circuit to the electric motor.

When the machine is being operated by the electric motor it is advantageous to have a secondary switch for automatically breaking the circuit when the tone arm is swung to one side for the purpose of changing needles. As illustrated in Figs. 5 and 6, the tone arm 34 is swiveled in a stationary collar 35 suitably secured to the casing 1 of the machine, and the secondary switch is carried by said collar and operated by a finger carried by the tone arm. The upper edge of the collar 35 has a raised portion 36 terminating in an abrupt shoulder 37. The tone arm has a projecting lug 38 resting upon said upper edge of the collar, and as said tone arm is swung around to one side of the turn table the lug 38 rides up onto the raised portion 36, thereby elevating the arm sufficiently to permit the needles to be changed, as will be readily understood. As the lug 38 is brought into engagement with the stop shoulder 37, a depending finger 39 carried by the tone arm, Figs. 6 and 7, will engage the projecting loop 40 of the resilient switch member 41 and move it away from the binding post 42, thus breaking the circuit which as illustrated in Fig. 8 normally runs through said binding post 42, switch member 41, fastening screw 43 therefor, wire 44 and second binding post 45. The wire 44 is embedded in and the switch member 41 is mounted on a lining 46 of insulating material on the inside of the collar 35. The screw 43 engages an eye 47 formed in the switch member 41, and the extremity 60 of said member is bent inward and embedded in the insulating lining 46 for holding the member normally in contact with the binding post 45. The end of the finger 39 is preferably made of insulating material as shown in Fig. 6, and is only arranged in the path of the loop 40 when the lug 38 rides up onto the raised portion 36 of the upper edge of the collar 35. At all other times the head 48 of the finger 39 is below the level of said loop 40, as shown in Fig. 6.

The tone arm 34 may be detachably connected to the collar 35 by means of an inwardly extending pin 49 on the collar normally fitting in an annular groove 50 in the exterior of the tone arm. An axial groove 51 runs from the lower end of the tone arm into the annular groove 50 to permit the pin 49 to pass into and out of the latter groove when the tone arm is inserted into and withdrawn from the collar.

The diagrammatic view of the electric circuit shown in Fig. 10 indicates the source of current supply as a generating battery 52 from one side of which a conductor 53 leads to the primary switch 29. A conductor 54 leads from the primary switch to the secondary switch 41, and from thence a conductor 55 leads to the electric motor 20, said motor being connected to the other side of the battery by another conductor 56.

Any suitable governor may be used for controlling the speed of the record carrier or turn table. The form of governor shown in Figs. 2 and 3[a], consists of axially extending spring arms 62 carrying weights 63 and con-

nected at one end to a worm 61 meshing with a worm gear 60 on the turn table post 13, and at the other end attached to a disk 64 slidable axially along the shaft 65 journaled in an upright 72. The worm 61 is journaled in another upright 71, and when the governor is rotated rapidly through the worm gear on the turn table post meshing with the worm 61, the weights 63 cause the spring arms 62 to bow outwardly due to centrifugal force and slide the disk 64 into contact with the arm 70 of an adjustable lever pivoted at 69 and having another arm 66 engaged by the threaded end 68 of an adjusting screw 67 having a knob 73 projecting from the casing. When the knob 73 is turned to press the arm 66 of the lever inward, the arm 70 will be advanced toward the disk 64 and cut down the speed of the turn table, and vice versa.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a phonograph, the combination with a record carrier, of a spring motor, movable gears for coupling up the spring motor to drive the record carrier, and a rock-shaft for moving said gears.

2. In a phonograph, the combination with a record carrier, of a spring motor, movable gears for coupling up the spring motor to drive the record carrier, a pivotally supported electric motor normally in driving connection with the record carrier, and a rock-shaft for moving said gears and swinging the electric motor out of driving connection.

3. In a phonograph, the combination with a record carrier, of a spring motor, movable gears for coupling up the spring motor to drive the carrier, means for normally holding said gears out of driving connection, a pivotally supported electric motor normally in driving connection with the record carrier, a rock-shaft, a cam on said shaft for moving the gears into driving connection, and means also carried by said shaft for swinging the electric motor out of driving connection at the same time.

4. In a phonograph, the combination with a record carrier, of a spring motor, movable gears for coupling up the spring motor to drive the carrier, a pivotally supported electric motor normally in driving connection with the record carrier, a rock-shaft for simultaneously moving said gears into driving connection and swinging the electric motor out of driving connection, and a circuit breaker controlling the electric motor and mounted on said rock-shaft for breaking the circuit when said electric motor is swung out of driving connection.

In testimony whereof I have signed my name to this specification.

HARRY B. McNULTY.

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