Sept. 30, 1924. 1,510,309

A. H. COLLIER ET AL

SPRING WINDING ATTACHMENT FOR TALKING MACHINES

Filed Dec. 2, 1922 2 Sheets-Sheet 1

Fig. 1.

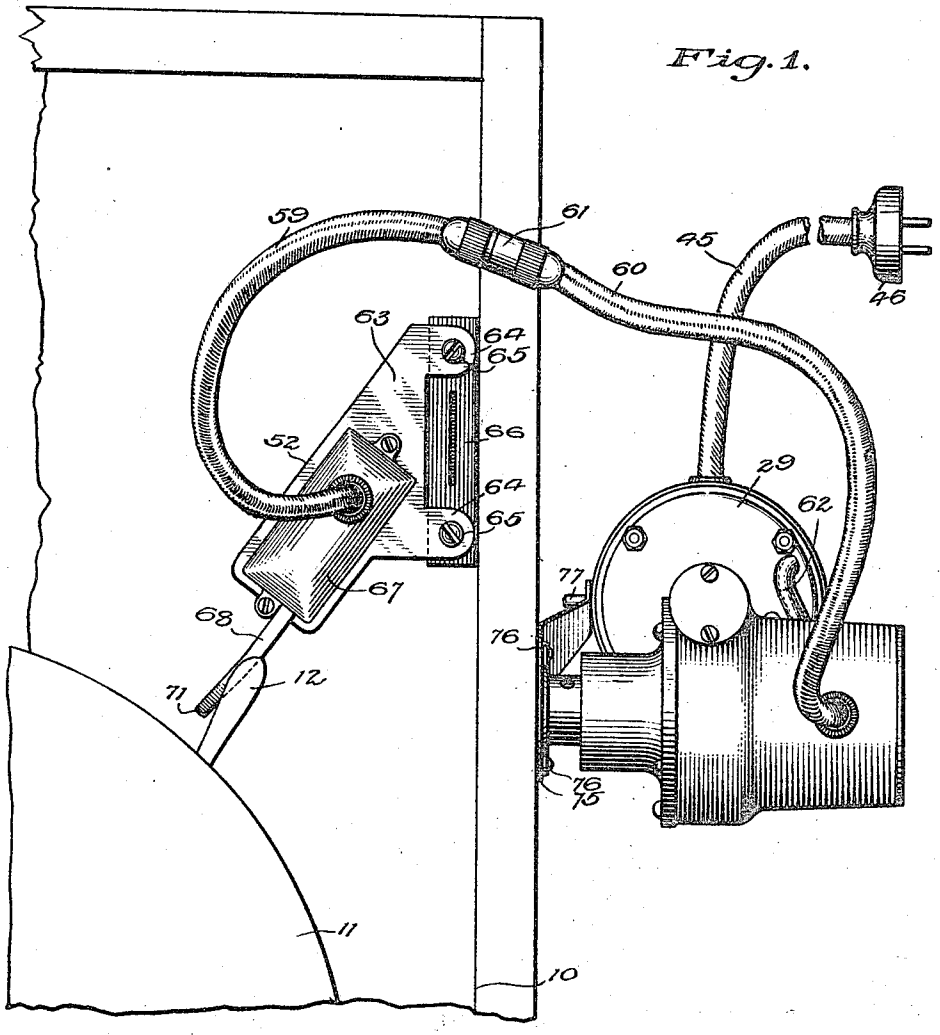
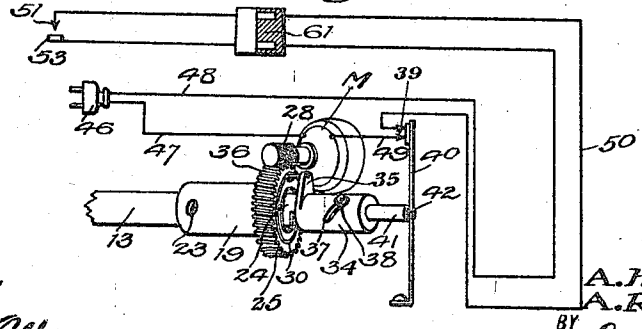


Fig. 5.



WITNESSES

E. A. Wilson

Hugh H. Alt

INVENTOR

A. H. Collier

A. R. Winkler

BY Munn & Co

ATTORNEYS

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Fig. 2.

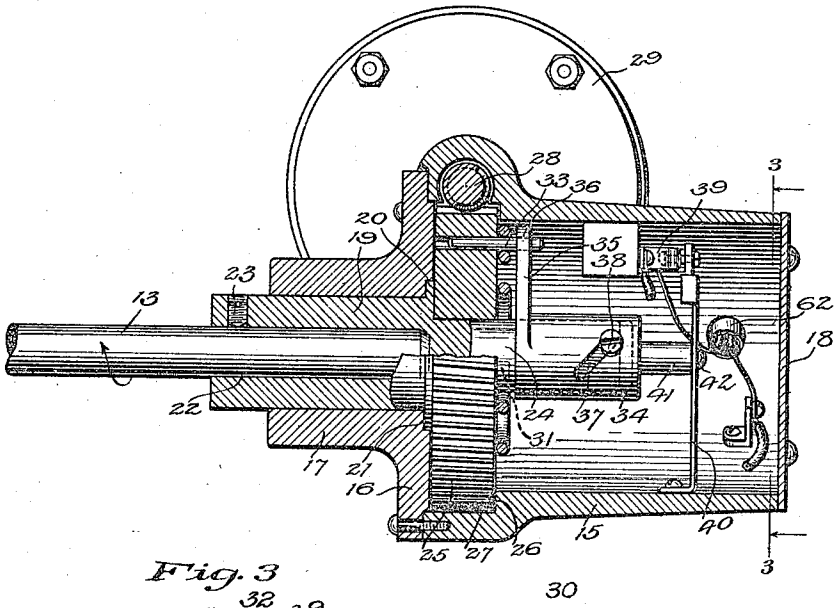


Fig. 3

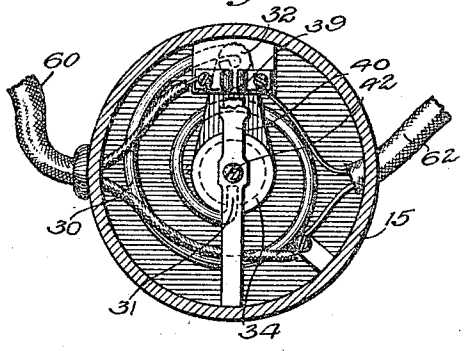
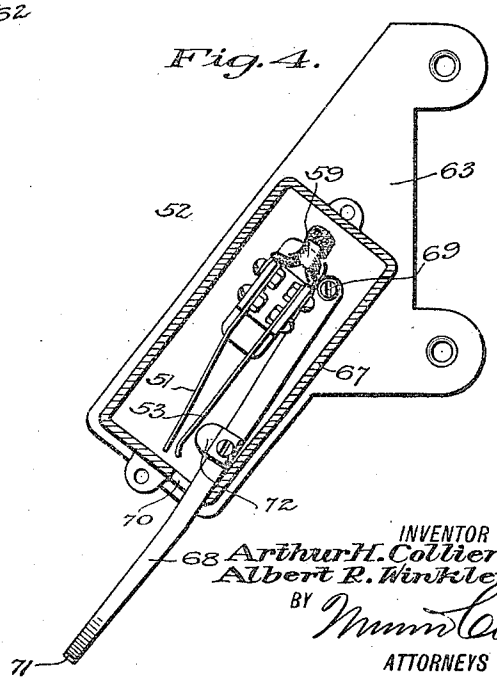


Fig. 4.



WITNESSES

E. A. Wilson

Hugh H. West

INVENTOR

Arthur H. Collier

Albert R. Winkler

BY Munn & Co

ATTORNEYS

Patented Sept. 30, 1924. 1,510,309

UNITED STATES PATENT OFFICE.

ARTHUR H. COLLIER AND ALBERT R. WINKLER, OF BAYONNE, NEW JERSEY.

SPRING-WINDING ATTACHMENT FOR TALKING MACHINES.

Application filed December 2, 1922. Serial No. 604,585.

To all whom it may concern:

Be it known that we, ARTHUR H. COLLIER and ALBERT R. WINKLER, citizens of the United States, and residents of Bayonne, in the county of Hudson and State of New Jersey, have invented a new and Improved Spring-Winding Attachment for Talking Machines, of which the following is a full, clear, and exact description.

This invention has relation to phonographs or talking machines and has particular reference to a means for automatically winding the spring motor of such machines.

The principal object of the present invention is to provide an extremely simple and inexpensive attachment for talking machines whereby the winding of the spring motor is automatically started after the playing of each record either by the manual or automatic stopping means which cuts off the rotation of the turntable.

As a further object the invention contemplates an attachment of the character described which is so constructed as to permit of the ready association or disassociation of the attachment with a standard machine.

As a still further object the invention contemplates a motor winding attachment which includes means for positively preventing the winding of the spring motor above a predetermined tension whereby overwinding or injury to the same is precluded.

With the above recited and other objects in view, the invention resides in the novel construction set forth in the following specification, particularly pointed out in the appended claims and illustrated in the accompanying drawings, it being understood that the right is reserved to embodiments other than those actually illustrated herein to the full extent indicated by the general meaning of the terms in which the claims are expressed.

In the drawings—

Figure 1 is a fragmentary plan view of a phonograph or talking machine with the attachment in applied position thereto.

Fig. 2 is a vertical sectional view through the winding unit.

Fig. 3 is a transverse section therethrough taken approximately on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged horizontal sectional view through the actuating unit.

Fig. 5 is a diagrammatic view illustrating the circuit and wiring of the device.

Referring to the drawings by characters of reference 10 designates a fragmentary portion of the cabinet of a talking machine or phonograph, 11 the turntable and 12 the turntable brake manipulating lever the movement of which in one direction manually accomplishes the starting of the turntable and the movement of which in the opposite direction accomplishes the application of the brake to the turntable and the stopping of the same. Various mechanisms have also been provided for automatically stopping the turntable upon the completion of the playing of the records, but inasmuch as these mechanisms effect the movement of the turntable brake manipulating lever for the purpose, it is immaterial whether the same is manually operated or automatically operated by the mechanism in so far as the invention is concerned.

The spring motor winding attachment which constitutes the invention operates in conjunction with a special winding shaft 13 for the spring motor which projects from one side of the cabinet or housing and said attachment includes a winding unit which consists of a casing 15 of substantially cylindrical formation, which is covered at the inner end by a cap 16 formed with a central bearing boss 17, the outer end being closed by a cover disk 18. A rotary stub shaft 19 extends through the bearing boss 17 and projects concentrically into the casing 15. The stub shaft is provided with an annular enlarged bead or flange 20 intermediate its end which is received by the rabbeted or recessed portion 21 at the inner juncture of the boss 17 with the cap 16 whereby the stub shaft is stopped against withdrawal through the bearing boss 17. The stub shaft is provided with a socket or bore 22 extending inwardly from its outer end which is designed to receive the outer end of the motor winding shaft 13 and a set screw 23 is employed for locking the outer end of the motor winding shaft in the socket or bore 22 whereby said motor winding shaft is operatively coupled with the stub shaft 19. The inner reduced end 24 of the stub shaft has loosely mounted thereon a worm gear 25 which abuts against the bead or flange 20 with the opposite side of its outer periphery operating against a shoulder 26 formed by the internal annular recess 27 provided adjacent the inner end of the casing 15. The worm gear 25 meshes with a

worm 28 on an electric motor shaft which is arranged in the depending motor housing 29 whereby said worm gear is driven from the motor. The worm gear is coupled to the stub shaft for driving the same by means of a heavy convolute spring 30 which is anchored or secured at one extremity 31 to the reduced extremity 24 of the stub shaft and is attached at its opposite end 32 to a pin 33 projecting from one side of the worm gear 25. A thimble 34 is mounted over the inner reduced end 24 of the stub shaft for limited rotary and axial movement. The thimble 34 is provided with a radial arm 35 which is apertured as at 36 to slidably receive the pin 33. A diagonal or helical slot 37 is formed in the thimble and a screw or pin 38 extends radially from the stub shaft extension 24 and into said slot to constitute means for limiting the axial and rotary movement of the thimble relative to the stub shaft 24. The convolute spring 30 normally operates to effect the inward axial and rotary movement of the thimble 34 toward the gear 25 which thimble due to the engagement of the outer end of the slot 37 with the pin 38 the thimble is limited in its inward rotary and axial movement. A switch is mounted in the casing 15, said switch consisting of stationary spaced contact elements 39 and a movable bridge arm 40. The movable bridge arm 40 is coupled to the thimble 34 for axial movement therewith by an extension 41 which is swiveled to the arm as at 42. When the thimble is axially moved inward under normal conditions by the spring 30, the switch elements 39 will be bridged by the arm 40, but are designed to be unbridged upon outward axial movement of said thimble as will be hereinafter set forth. The switch elements 39 are included in a circuit with the motor M which is arranged in the motor housing 29. The circuit includes a conduit 45 which leads from a plug 46 to the motor housing and through which insulated feed and return wires 47 and 48 extend. The feed wire 47 leads to the motor winding and a conduit wire 49 leads from said motor to one of the stationary contact elements 39. A conduit wire 50 leads from the other contact element 39 to the stationary element 51 of the starting unit 52. The movable arm or contact member 53 of the starting unit is connected directly to a section of the return wire 48 which extends through a conduit 59 together with the circuit wire 50. The conduit 59 is coupled to a second conduit 60 by a common form of coupling 61, said conduit 60 having extending therethrough the insulated conductor wire sections 50 and 48. The remaining section of the return wire 48 and the circuit wire 49 extend through a conduit 62 leading from the casing 15 to the motor housing 29. The plug 46 is adapted to be connected with a suitable socket from which a source of electrical energy is derived which furnishes the power for driving the motor. The starting unit 52 consists of a base plate 63 having apertured lugs 64 projecting from one side thereof, which lugs are designed to fit over and receive the screws 65 which fasten down the slotted plate 66, which plate 66 is provided on the usual phonograph. The base plate 63 supports the switch elements 51 and 53 of the circuit, which elements are covered by a housing 67. An actuating arm or switch arm 68 is pivoted as at 69 to the base plate within the housing and has one extremity protruding through a slot 70. The free end of the protruding extremity is turned upwardly as at 71 and said upturned end is disposed in the path of movement of the turntable brake manipulating lever 12. The switch or contact element 53 is normally out of engagement with the contact element 51 but is adapted to be flexed by the engagement of the projection 72 on the switch arm therewith whereby the same will engage the element 51 when the turntable brake manipulating lever 12 is thrown to a position to cut off or stop the turntable.

The usual escutcheon plate through which the motor winding shaft 13 extends is removed and an apertured arm 75 is secured therebeneath by screws or other fastening elements 76 which fasten the escutcheon plate to the side of the cabinet. The lower end of the arm is provided with an opening which receives a pin 77 projecting from the motor housing 29. By this arrangement the motor housing and the casing 15 are supported from the cabinet and against rotation.

In operation when the attachment has been applied to a phonograph as illustrated in the drawings, the shifting of the turntable brake manipulating lever to a position to cut off or stop the turntable engages the normally open or disengaged switch elements 51 and 53 by virtue of the engagement of the lever 12 with the upturned extremity 71 of the switch arm 68. This closes the circuit and allows the current to flow from the source of supply through the feed wire 47 to the motor, thence through the wire 49 to the normally bridged switch elements 39 in the casing 15, thence through the wire 50, switch elements 51 and 53 and return wire 48. The motor will thus drive the worm 28 which in turn drives the worm gear 25. The worm gear through the medium of the convolute spring 30 will drive the stub shaft 19 and rotate the spring motor winding shaft 13. When the tension of the spring motor is sufficient to overcome the tension of the convolute spring 30 the worm gear 25 will be relatively rotated with respect to the stub shaft 19. This relative rotation between the worm gear and the

stub shaft will effect a relative rotary movement of the thimble with respect to the reduced extension 24 of the stub shaft thus causing the thimble to move axially outward and away from the worm gear by virtue of the pin and slot connection 38 and 37. The axial movement of the thimble with respect to the stub shaft extension 24 will cause the movable bridge arm 40 to be disengaged from the stationary switch elements or contacts 39 thus breaking the circuit at this point to cut off the motor. The parts will remain in this position until the turntable brake manipulating lever is again manipulated to start the machine. This will effect the disengagement of the switch element 51 and 53 of the starting unit 52, thus opening the circuit at this point. After the turntable has been rotated by the spring motor sufficiently to reduce the tension of the spring motor below the tension of the convolute spring 30, said convolute spring 30 will automatically unwind and exert sufficient tension to return the thimble 34 to normal position. The swiveled connection 42 between the thimble extension 41 and the movable bridge arm 40 will thus return the arm 40 to bridging position with respect to the stationary contact elements 39 whereby the device is set for the next winding operation.

We claim:

1. An attachment for phonographs comprising an electric motor operatively coupled with the spring motor for winding the same when the electric motor is in operation, a normally opened circuit including said electric motor and a source of electrical energy, a circuit closing element in said circuit at one point, operable upon shifting of the turntable brake to braking position for closing said circuit to actuate the electric motor, and means located at another point in said circuit for automatically opening the circuit to cut off the electric motor when the spring motor is wound to a predetermined tension, said means being operable when the turntable brake is released and the circuit is open at the first point, to reestablish the circuit at the latter point, by the reduction in the tension of the spring due to a partial unwinding of the same.

2. An attachment for phonographs for rewinding the spring motor thereof to a predetermined tension after each operation of the machine comprising a stub shaft connected with the spring motor winding shaft, a worm gear mounted thereon for independent rotation, an electric motor having a worm on the shaft thereof meshing with the worm gear, a normally open circuit including said electric motor and a source of supply, a circuit closer in said circuit operable upon shifting of the turntable brake manipulating lever to braking position for closing the circuit to actuate the electric motor, and means for automatically breaking said circuit to cut off the motor when the spring motor is wound to a predetermined tension, said circuit breaking means consisting of a circuit breaker in the circuit, a thimble on the stub shaft, a helical groove in the thimble, a pin in the stub shaft extending into said helical groove, a radial arm on the thimble, a pin on the worm gear extending through the radial arm, a connection between the thimble and the circuit breaker, and a convolute spring connected respectively at one end to the worm gear and at its opposite end to the stub shaft whereby when the spring motor tension becomes greater than the tension of the convolute spring the worm gear and thimble will be rotated independently of said stub shaft to effect an axial movement of the thimble and the movement of the circuit breaker to circuit breaking position.

3. An attachment for phonographs for rewinding the spring motor thereof to a predetermined tension after each operation of the machine comprising a stub shaft connected with a spring motor winding shaft, a worm gear mounted thereon for independent rotation, an electric motor having a worm on the shaft thereof meshing with the worm gear, a normally open circuit including said electric motor and a source of supply, a circuit closer in said circuit operable upon shifting of the turntable brake manipulating lever to braking position for closing the circuit to actuate the electric motor, and means for automatically breaking said circuit to cut off the motor when the spring motor is wound to a predetermined tension, said circuit breaking means consisting of a circuit breaker in the circuit, a thimble on the stub shaft, a helical groove in the thimble, a pin in the stub shaft extending into said helical groove, a radial arm on the thimble, a pin on the worm gear extending through the radial arm, a connection between the thimble and the circuit breaker, and a convolute spring connected respectively at one end to the worm gear and at its opposite end to the stub shaft, whereby when the spring motor tension becomes greater than the tension of the convolute spring the worm gear and thimble will be rotated independently of said stub shaft to effect an axial movement of the thimble and the movement of the circuit breaker to circuit breaking position, and whereby when the turntable brake manipulating lever is thrown to a position to release the turntable the circuit closer will be open and subsequent unwinding of the spring motor below the tension of the convolute spring will effect the movement of the thimble and the circuit breaker to its closed position.

ARTHUR H. COLLIER.
ALBERT R. WINKLER.