T. AHEARN.

RESETTING DEVICE FOR PHONOGRAPHS.

APPLICATION FILED FEB. 28, 1917.

1,340,358.

Patented May 18, 1920.

3 SHEETS—SHEET 1.

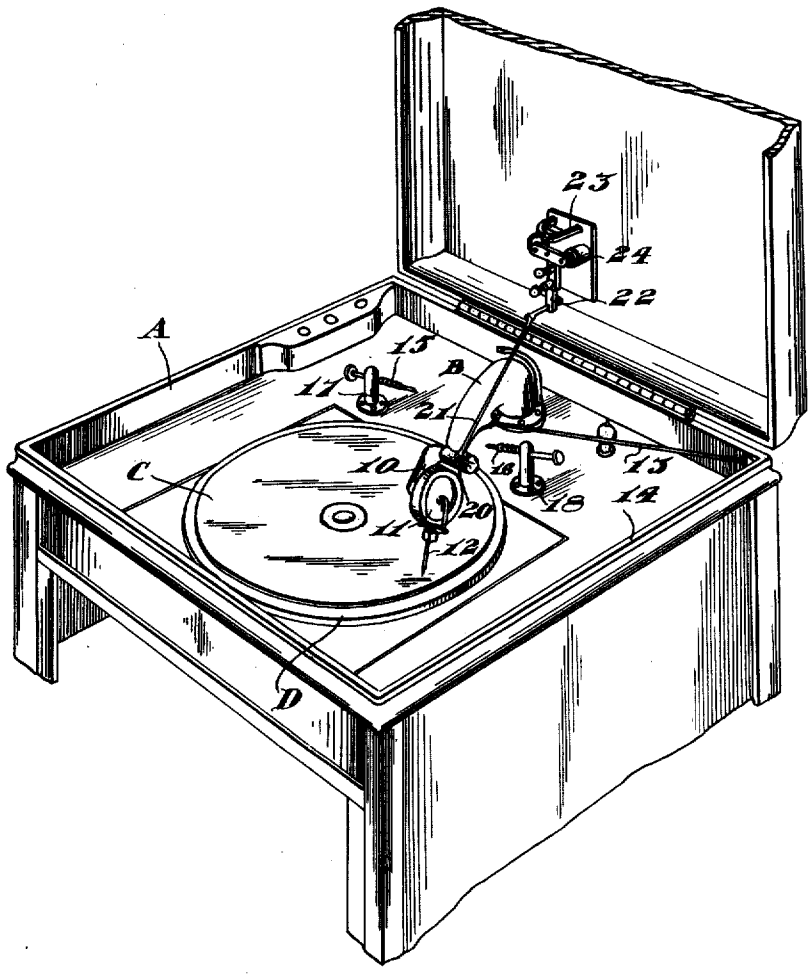


Fig. 1.

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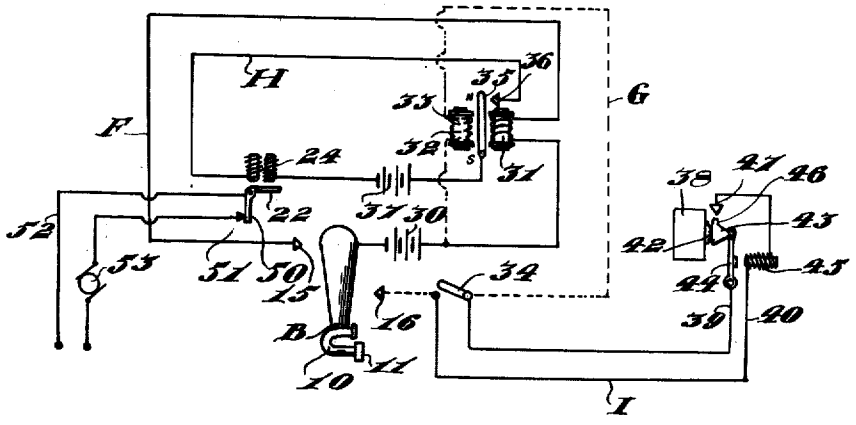
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3 SHEETS—SHEET 2.

Fig. 2.



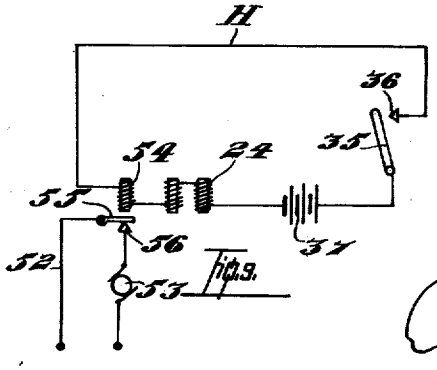


Fig. 3.

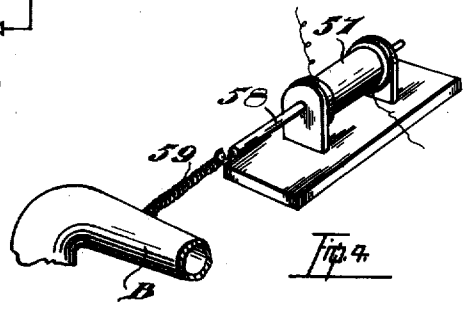


Fig. 4.

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3 SHEETS—SHEET 3.

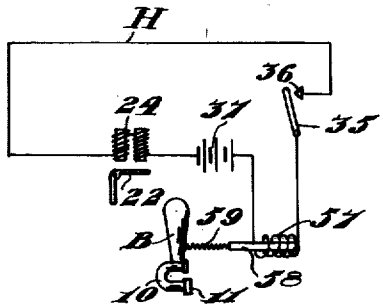


Fig. 5.

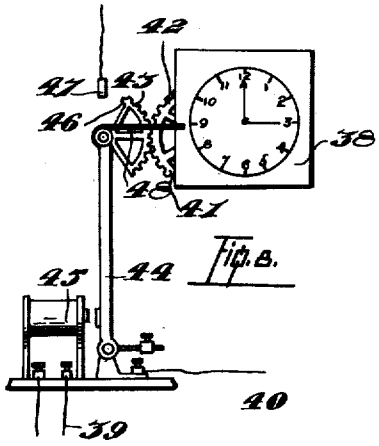


Fig. 8.

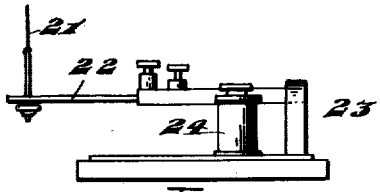


Fig. 6.

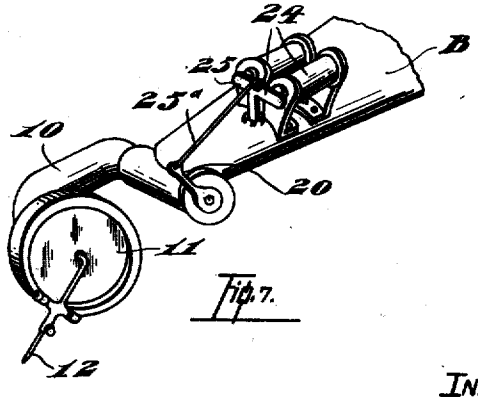


Fig. 7.

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UNITED STATES PATENT OFFICE.

THOMAS AHEARN, OF OTTAWA, ONTARIO, CANADA.

RESETTING DEVICE FOR PHONOGRAPHS.

1,340,358. Specification of Letters Patent. Patented May 18, 1920.

Original application No. 1,250,751, filed January 16, 1917. Divided and this application filed February 28, 1917. Serial No. 151,481.

To all whom it may concern:

Be it known that I, THOMAS AHEARN, a subject of the King of Great Britain, and resident of the city of Ottawa, in the Province of Ontario and Dominion of Canada, have invented certain new and useful Improvements in Resetting Devices for Phonographs, of which the following is a specification.

This invention relates to improvements in resetting devices for phonographs, and the objects of the invention are to provide a simple and effective device adapted to lift the stylus when it reaches near the end of a record and reset it at the beginning thereof. A further object of the invention is to enable the resetting to be effected immediately and continuously, or at given intervals.

Further objects are to generally simplify and improve the mechanism to enable the various parts thereof to better perform the functions required of them.

The invention consists essentially of the improved construction hereinafter described in detail in the accompanying specification and drawings.

In the drawings,

Figure 1 is a perspective view of a portion of a talking machine embodying the present invention.

Fig. 2 is a diagrammatic view of the electric circuit.

Fig. 3 is a diagrammatic view of an alternative form of one of the circuits.

Fig. 4 is a perspective detail of an alternative form of a device for returning the tone arm to normal position.

Fig. 5 is a diagrammatic view of an alternative form of one of the electric circuits.

Fig. 6 is a side view of the lifting magnet.

Fig. 7 is a perspective view showing an alternative form of the lifting device for the sound box.

Fig. 8 is a detail in the elevation of the timing device.

In the drawings like characters of reference indicate corresponding parts in all the figures.

Referring to the drawings A represents a sound reproducing machine or talking machine of any well known type the construction of which does not form part of the present invention. The talking machine is provided with the usual swinging tone arm B adapted to swing from side to side above the record C, which is carried on the rotating table D. The end of the tone arm B carries the sound box tube 10 and sound box 11, which carries the stylus or needle 12, the sound box tube being pivotally connected to the tone arm B, whereby it may be lifted therefrom in a well known manner, when it is desired to reset or change the stylus.

Means are provided adapted to return the tone arm automatically to its starting position whenever the stylus is raised from the record. The means I have shown in Fig. 1 comprises an elastic cord or spiral spring 13 extending from the side of the tone arm to the side of the cabinet 14, the strength of the spiral spring or elastic cord being sufficient to move the tone arm when the stylus is raised, but insufficient to move it when the stylus is in contact with the record.

15 and 16 represent adjustable contacts provided on opposite sides of the tone arm and supported from suitable standards 17 and 18; these contacts are adapted to engage the tone arm when in position at the beginning and at the end of a record respectively and are included in the electric circuits hereinafter described.

The adjustability of the contacts to accommodate different size records is provided for by constructing them in the form of screw threaded pins extending transversely through suitable threaded perforations in the standards 17 and 18.

Electric operating means are provided for raising the stylus. The means I have illustrated in Fig. 1 comprise a lever 20 connected to the rotatable portion of the sound box tube, a link or wire 21 extending from the lever to an armature 22 which is pivotally mounted in the bracket 23 and controlled by a pair of electromagnets 24.

The contact 15 is included in what may be termed a resetting circuit F, shown in Fig. 2, and including suitable electrical conductors, a battery 30, one of the electromagnets 31 of a polarized relay 32. By tracing this circuit it will be observed that the circuit just completed is immediately broken by the tone arm moving away from contact 15. The momentary completion of this circuit causes the armature 35 of the polarized relay to be attracted by magnet 31 which still remains attracted to 31 by the force of the permanent magnet of the polarized relay.

Thus the circuit which includes the magnets 24 for lifting the stylus remains closed against 36, until the armature is attracted in the opposite direction by electromagnet 33 of the polarized relay.

The other electromagnet 33 of the polarized relay controls the movements of the armature 35, which being polarized will remain either toward 31 or 33 dependent upon which electromagnet of the polarized relay last attracted it and vice versa. When the electromagnet 31 is energized the armature will be brought toward 31 and notwithstanding that the circuit of electromagnet 31 has been broken the permanent magnetism will retain the armature sufficiently intimately to maintain the lifting circuit H complete and unbroken.

It will be seen that when the magnet 33 is energized the armature 35 will be drawn away from the contact 36.

The electromagnets 24 are adapted when energized to lift the armature 22 which, when raised, will lift the stylus 12 through the link 21 and lever 20.

The operation of the circuits and elements so far described are as follows:

When the tone arm reaches near the end of the record it will engage the contact 15. This will complete the circuit F through the contact conductor, magnet 31 of the polarized relay 33, battery 30 and tone arm B.

The magnet 31, when energized, will move the armature 35 into engagement with the contact 36 completing the lifting circuit H, thereby energizing the magnets 24, moving the armature 22 which will lift the stylus as explained before.

In returning to normal position the tone arm will engage the contact 16 and this, if the switch 34 is closed, will complete the returning circuit G through the tone arm contact 16, magnet 33, and battery 30, which will draw the armature 35 away from the contact 36 breaking the lifting circuit and permitting the stylus to drop by gravity to normal position on the record and continue the playing of the piece.

It will be seen that by reason of the fact that the armature of polarized relay 32 is polarized (*i. e.* under the influence of a permanent magnet), the armature 35 will remain at either one side or the other, against 31 or 33, according to which set of magnets has been last energized.

The polarized relay may be of any suitable form, well known in the art, (such as for instance that manufactured by the J. H. Bonnell & Co., Park Place, New York city, U. S. A.).

The table D carrying the record will move continuously actuated by the usual motor of the talking machine.

When it is desired to allow intervals to elapse between the repetition of the operation, a time circuit I is provided having leads connected to opposite sides of the switch 34, these leads extending to a suitable timing device 38. This timing device, which may be of any suitable character well known in the art, is adapted at intervals to connect the conductors 39 and 40 and thereby connect opposite sides of the switch 34 or in effect close the switch temporarily.

The form of timing device I have shown is that previously invented by me and shown in my United States Patent No. 329,874 of 1885, and includes a clock work mechanism 41 which operates a gear 42 meshed with a segmental gear 43 pivotally mounted on an armature 44, which itself is pivotally mounted in advance of an electromagnet 45. The segmental gear carries a contact 46 adapted when raised by the clock work mechanism to engage a fixed contact 47. When this is done the circuit is completed through the magnet 45 which draws the armature and segmental gear away from the gear 42 which permits the segmental gear to move under the influence of the spring or elastic 48 extending between the segment and the fixed support.

The details of this clock work mechanism are, however, more fully described in my aforesaid Patent No. 329,874 of 1885.

In using the timing device, it is necessary, first to move the switch 34 to open position. It will then be seen that, when the tone arm is returned to the position against the contact 16, as previously explained, the circuit G will not be completed until the timing device operates to move the segment 43 into engagement with the contact 47. This may be caused to take place at any desired interval and when it does take place the stylus will drop and the operation of the sound reproducer will continue.

When the talking machine is operated by an electric motor, it may be found desirable to save power by cutting out the motor during the interval when the machine is not operated. Electromagnetic means may be provided for this. In Fig. 2 I have shown an extension 50 on the armature 22 adapted normally to engage a contact 51, a circuit 52 including the motor 53 being completed through the extension 50 of the contact 51. When the armature 22 is raised, it is adapted to move the armature 50 away from the contact 51 and thus break the motor circuit, which will however, be completed again when the armature 22 is allowed to drop by breaking of the circuit H as previously explained.

In Fig. 3 I have shown an alternative method of breaking the motor circuit. In this figure the circuit H is shown to include an electromagnet 54 controlling an armature 55 which coöperates with a contact point 56. When the magnet 54 is energized, it is

adapted to lift the armature from the contact point 56 and thus break the motor circuit 52.

In Fig. 4 I have shown an alternative means for returning the tone arm to normal position. These means include a solenoid 57 having a movable core 58 connected by a spring 59 or other means to the tone arm. The solenoid 57 will be included in the lifting circuit H, whereby when the tone arm moves into contact with the contact 15, the solenoid will be energized to draw the tone arm back to normal position.

In Fig. 5 I have shown diagrammatically the electric connections for the modification shown in Fig. 4.

Fig. 7 shows an alternative form of the invention in which the lifting magnets 24 are placed directly on the tone arm and are adapted, when energized to draw a movable armature 25 inwardly, the armature being connected to the lever 20 by a link 25^a, the operation of the mechanism being in other respects the same as already described.

It is thus seen that the arrangement of electric circuits and elements described enable a given record to be played either continuously or repeated automatically at given intervals of time.

As many changes could be made in the above description and many apparently widely different embodiments of my invention within the scope of the claims constructed without departing from the spirit or scope thereof, it is intended that all matter contained in the accompanying specification and drawings shall be interpreted as illustrative and not in a limited sense.

What I claim as my invention is:

In a sound reproducer and in combination an oscillatable movable element forming part of the sound reproducing mechanism, electrically operated resetting means therefor including a resetting circuit, a lifting circuit, a circuit changing device having a movable member adapted, in one position to complete the lifting circuit and in another position, to break the same, and a return circuit adapted to be completed by the oscillatable movable element when it returns to the starting position and including a part of the circuit changing device, whereby, when the return circuit is completed, the circuit changing device will be moved to break the lifting circuit, and time mechanism for holding the return circuit open for determined intervals of time.

In witness whereof I have hereunto set my hand.

THOMAS AHEARN.