

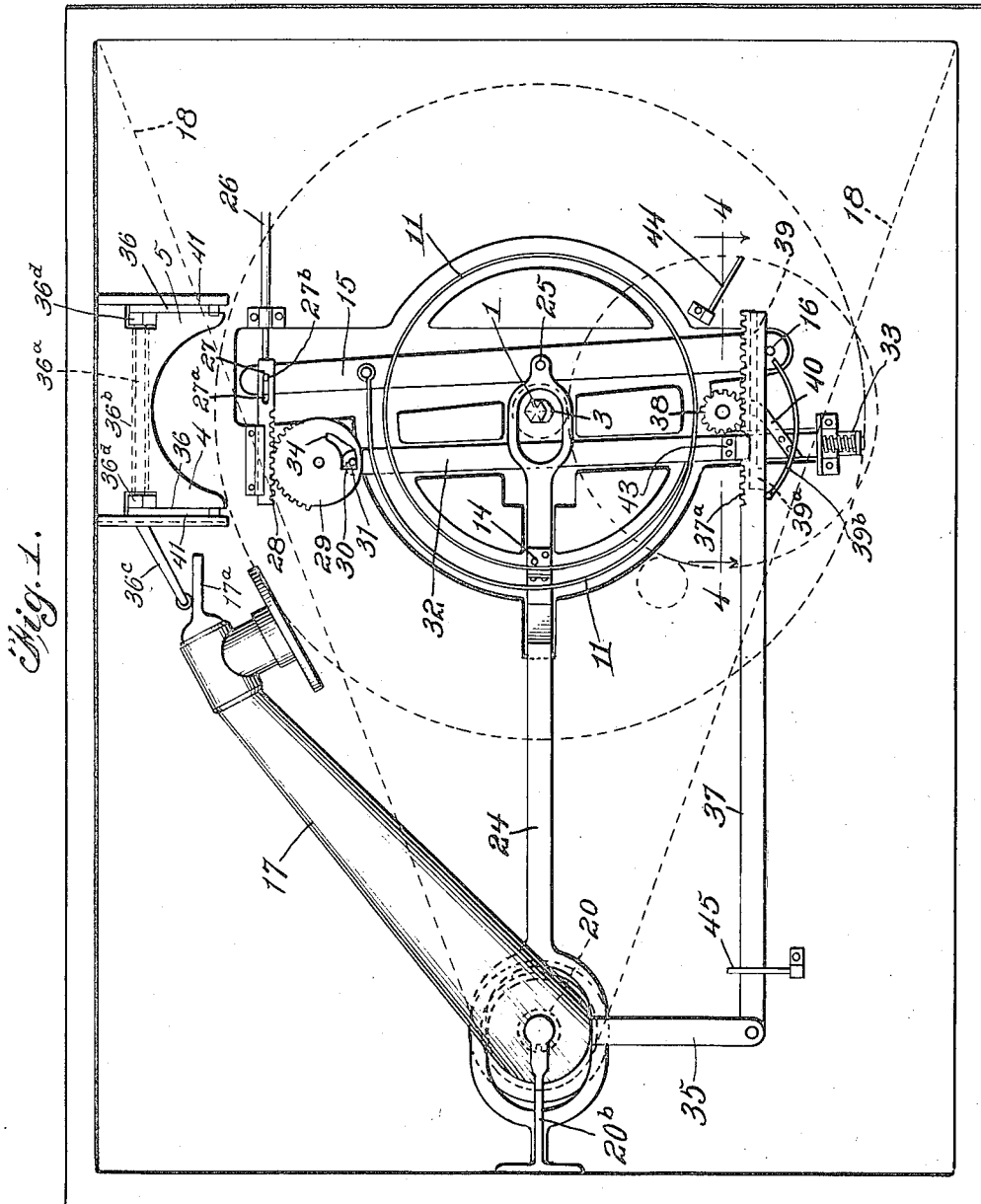
Sept. 25, 1923.

G. M. BOUMPHREY
SOUND REPRODUCING MACHINE

1,469,152

Filed Jan. 21, 1921

3 Sheets-Sheet 1



Inventor
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Sept. 25, 1923.

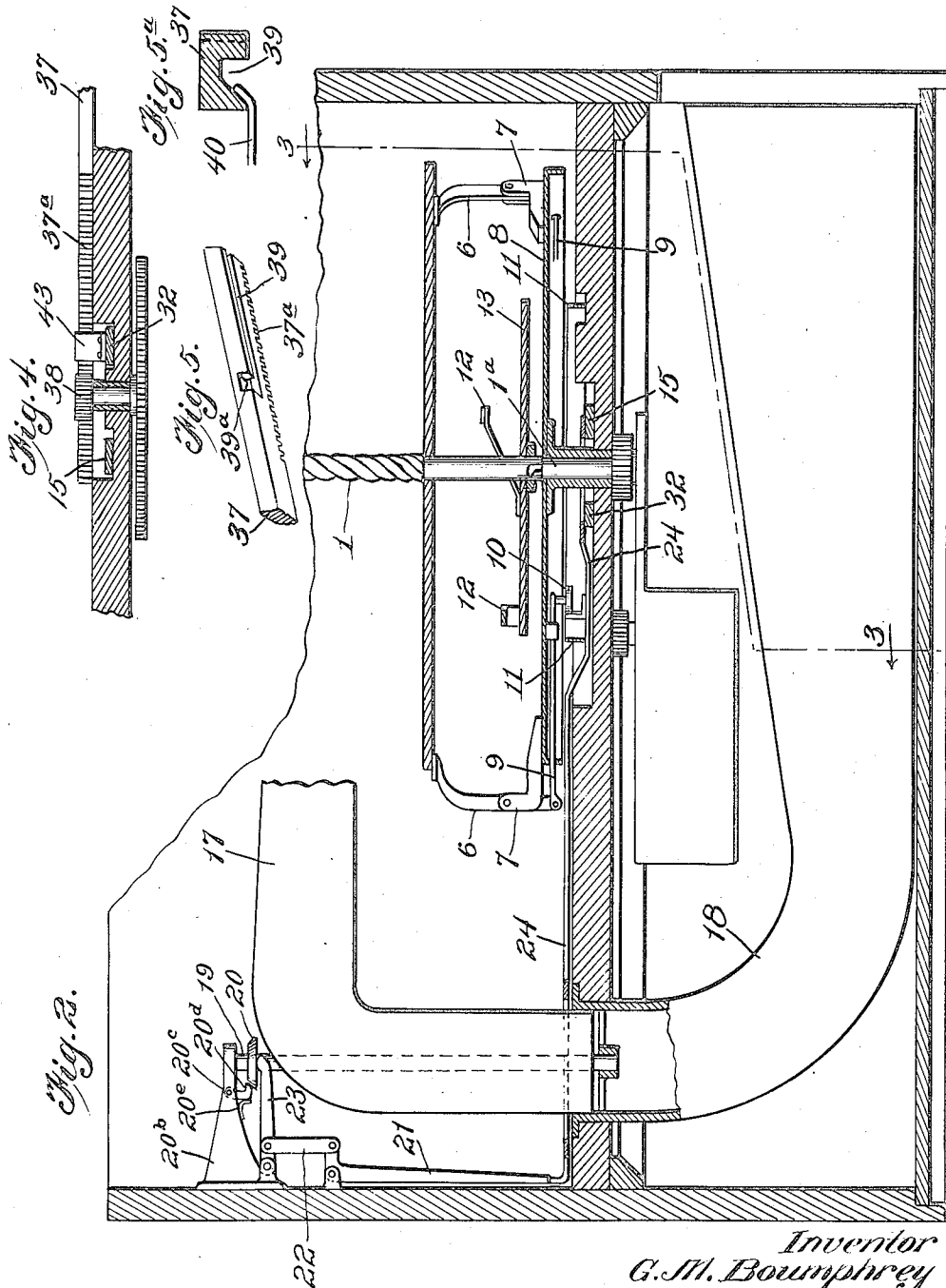
1,469,152

G. M. BOUMPHREY

SOUND REPRODUCING MACHINE

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3 Sheets-Sheet 2



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SOUND REPRODUCING MACHINE

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3 Sheets-Sheet 3

Fig. 3.

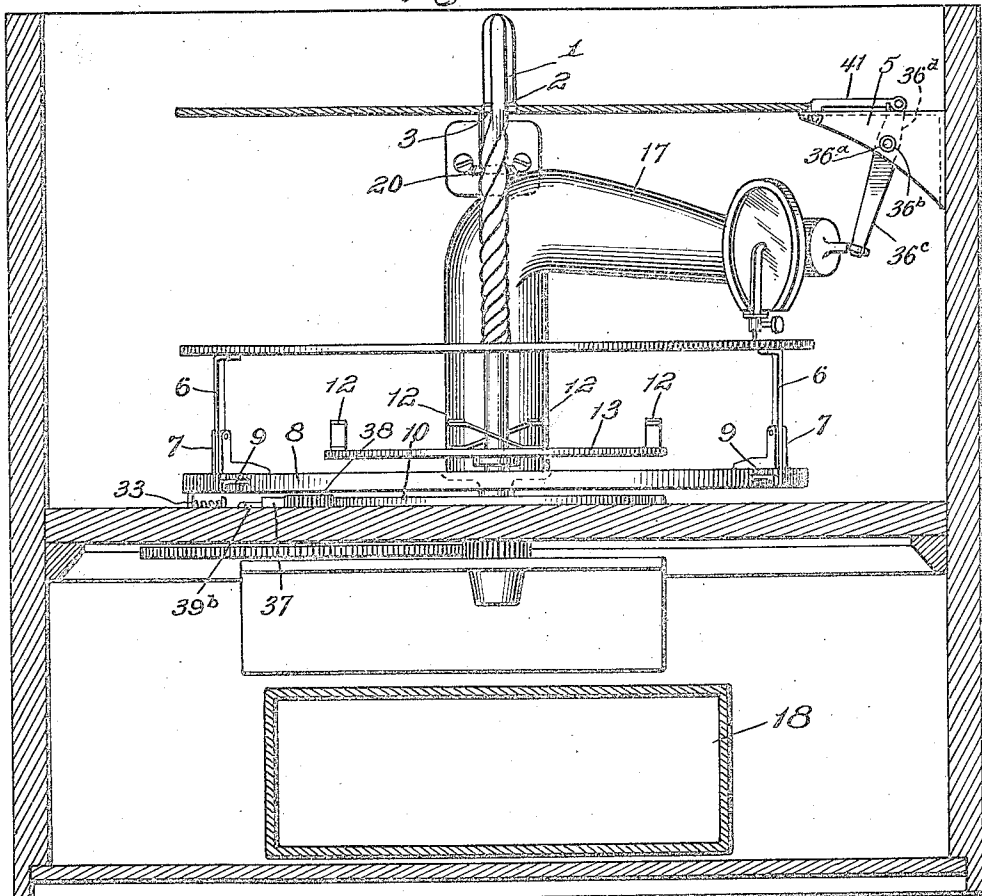


Fig. 8.

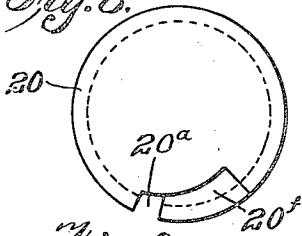


Fig. 9.

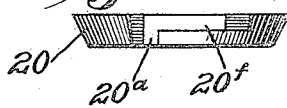


Fig. 6.

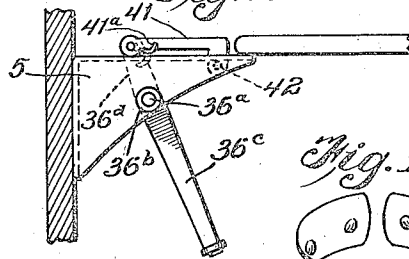


Fig. 10.

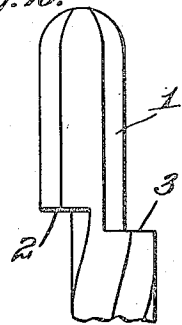


Fig. 11.

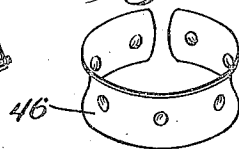
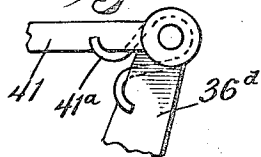


Fig. 7.



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UNITED STATES PATENT OFFICE.

GEOFFREY M. BOUMPHREY, OF BAYCLIFFE, LYMM, ENGLAND.

SOUND-REPRODUCING MACHINE.

Application filed January 21, 1921. Serial No. 438,982.

To all whom it may concern:

Be it known that I, GEOFFREY MAXWELL BOUMPHREY, a British subject, residing at Baycliffe, Lymm, in the county of Cheshire, England, have invented certain new and useful Improvements in Sound-Reproducing Machines, of which the following is a specification.

This invention relates to gramophones or sound-reproducing instruments using disc-shaped records and has for its object to provide mechanism adapted to be controlled from a distance, whereby a number of records may separately and in succession be automatically brought into position for playing, rotated and played, and then removed from action.

Broadly, the invention provides fixed means for supporting a number of records in a suitable position above the playing position of a record, release mechanism adapted to release the records one by one as required, feed-mechanism adapted to conduct the released record to the playing position, supporting means adapted to hold and rotate the record in playing position on the turn-table, and release-mechanism adapted to release the record at the requisite moment and cause it to be withdrawn out of action; it further provides mechanism adapted to raise the tone-arm so as to lift the needle from the record at the desired moment, and to rotate the tone arm outwardly out of the path of the record next to be conveyed to the turn-table, afterwards rotating the tone arm inwardly and then causing it to be lowered so as to place the needle upon the new record in a position suitable for commencing playing.

These mechanisms are caused to function automatically and at the proper moment to ensure continuous action, on the operation of distant controlling means which may be connected by a sheathed cable or the like to the mechanism, the said controlling means also operating the brake which stops the machine.

The invention in the preferred form is illustrated in the accompanying drawings, in which:

Fig. 1 is a plan with the turn table and record support removed.

Fig. 2 is a longitudinal vertical section of

the same, the turn table and record support being in place.

Fig. 3 is a section on line 3—3 of Fig. 2.

Fig. 4 is a section on line 4—4 of Fig. 1.

Figs. 5 and 5^a are perspectives and transverse sections respectively of the rod for operating the tone arm.

Fig. 6 is a detail in elevation showing the means for displacing the lowermost record of the pile for delivery to playing position.

Fig. 7 is a broken plan showing the spring connection between the push bar and operating lever of the record transferring means.

Fig. 8 is a bottom plan view of the disc collar for holding the tone arm in elevated position during its movement to inoperative playing position.

Fig. 9 is an edge view of the same.

Fig. 10 is an enlarged elevation of the upper end of the pillar for supporting the records, showing particularly the means for holding the lowermost record above playing position.

Fig. 11 is a perspective view of the thimble arranged to be inserted in the turn table spindle opening of the usual records to adapt such records for the present machine.

According to the preferred form of the invention, a number of records required to be played is placed in position on a central stationary pillar 1 which is stepped as shown at 2, Fig. 3, so that the lowest record is held up by the shoulder 3 and on the arms 4, 5 of a support or platform suitably mounted at the side of the machine. For the portion of its length between the shoulder 3 and the playing position of the record, the pillar 1 is polygonal in section, the angles of the polygon forming a spiral of intially-large, but gradually-diminishing pitch as it descends from the top. The upper portion is also polygonal but has no twist. Preferably, the section is hexagonal as illustrated. The pillar is detachably mounted in a socket in a base member 1^a fixed in the casing.

At playing level, the record is supported by padded arms 6 which are pivoted in brackets 7 mounted on the turn-table 8, and are provided with hinged extensions 9 carrying horizontal rollers 10 adapted to be engaged by a circular spring band 11 at the required moment so as to cause the arms 6 to tilt and allow the record to fall on to the

spring seats 12 carried by a plate 13 detachably mounted by bayonet joints on the base of the pillar 1.

The spring band 11 is anchored near one end to an adjustable saddle 14 Fig. 1 carried by the lever 24, and the other end is secured to the lever 15 which passes beneath the turntable and is pivoted at 16 to the supporting platform.

The tone-arm 17 is slidably and rotatably mounted axially in the neck of the horn 18 which is illustrated as of the internal type, and carried by a spindle 19 fixedly mounted thereto, the spindle having a fixed collar 20 by means of which it may be lifted on the suitable operation of the arm 21 by means of link 22, and lever 23 actuated by a member 24 hinged at the point 25 to the lever 15. The tone-arm carries at its free end a projecting arm 17^a for the purpose hereinafter described.

The collar 20 is bevelled as shown and carries a slot 20^a, Figs. 8 and 9; and the bracket 20^b supporting the upper end of the spindle 19 carries a spring controlled catch 20^c governed by a spring 20^e and having a bevelled nose 20^d which is adapted to be moved aside by the collar 20 during its lift, but to engage automatically beneath said collar and support the tone arm until the slot 20^a registers with the catch 20^c and permits the tone-arm to fall again. Preferably the underside of the collar has an undercut cam-shaped groove 20^f as shown in Figs. 8 and 9 and the nose of the catch projects inwardly beyond the limit of the slot 20^a, so as to prevent the tone-arm from falling when it is moving outwardly; but when it is moving inwardly the catch enters the groove 20^f and is forced backwards by the cam-shaped wall of said groove and allows the tone-arm to fall when the slot registers angularly with it.

The control mechanism preferably consists of a sheathed cable 26 secured to a sliding member 27 adapted to engage with the lever 15 by means of a pin 27^b and slot 27^a to pull the lever 24 over to the right of Fig. 1 when the cable is drawn outwardly to its full extent from the position shown. During the first part of its movement, a rack 28 formed in the sliding member 27 meshes with a pinion 29 which has a cam-shaped slot 30 in which is situated a pin 31 of the brake-lever 32 controlled by a spring 33, the slot 30 being shaped to withdraw the brake from engagement with a depending flange formed beneath the turntable when the cable is pulled outwardly to the right of the position shown in Fig. 1. The engaging surface of the slot 30 is recessed as shown at 34 so that the brake spring 33 cannot rotate the pinion 29 unless the said pinion is first moved by the rack 28. The above movement of the sliding member 27 does not move the lever 15 owing to the provision of the slot 27^a.

When however the cable is further moved outwardly, the lever 15 is now actuated so as to operate the changing mechanism, the rack 28 moving clear of the pinion 29 so that the brake is left in the withdrawn position described.

On the tone arm is mounted a lever 35 pivotally connected to a rod 37 of which the inner lateral face at the free end is provided with a rack 37^a adapted to engage a pinion 38 driven by the gramophone motor. The under-side of the rack is provided with a slot 39 in which may be seated the upturned tip of a spring 40 carried by the lever 32. But the inner face of the outer wall of the slot is bevelled so that the spring may be forced out of engagement therewith, in which circumstance it seats itself behind the rack and maintains it in engagement with the pinion so long as it remains so seated, the outer wall of the slot being cut away as shown at 39^a to permit of the re-entry of the spring into the slot as requisite. A spring lever 39^b mounted on the end of the lever 15 engages behind the rack and forces it into engagement with the pinion 38 when the lever 15 is suitably actuated. The brake rod 32 carries a guide 43 limiting the movement of the rack towards the pinion 38. In its extreme position the rack engages with and displaces an inclined leaf spring 44.

The arms 4, 5 form part of a sheet metal bracket shown separately at Fig. 6, having two parallel slots 36 in the upper surface, and a fixed spindle 36^a, the said spindle being provided with a spring-controlled rocking sleeve 36^b provided with an extension or tail 36^a projecting laterally into the path of the projection 17^a of the tone-arm 17. The sleeve 36^b carries two upstanding arms 36^d fixedly attached thereto, the arms being hingedly mounted at their upper ends to two sliding members 41, each having a downwardly extending nose lying in one of the slots 36. The sliding members 41 are situated above the level of the supporting surface of the bracket but extend approximately parallel thereto. Spring 41^a, Figures 6 and 7, situated in the hinges of the sliding members causes them to rise upwardly against the limit set by cross-pieces 42 housed in the said noses and engaging with the underside of the bracket adjacent the slots 36. The arrangement is such that when the tone-arm positively moves the tail piece 36^a against the action of its controlling spring, the sliding members 41 are pushed towards the pillar 1 and so push the lowest record off the supports 4, 5 and the shoulder 3. The next record then descends upon the members 41 which are depressed against the action of their hinge-spring 41^a but recover the position shown when the tone-arm has moved again towards the pillar 1 out of engagement with the tail piece 36^a.

The action of the mechanism is as follows:—

When it is desired to change a record, the brake being off, the control cable is further withdrawn to its outward position swinging the lever 15 to the right in Fig. 1, and is then immediately released whereupon it returns under the action of the spring 11 to the neutral position. The movement of the lever 15 causes the spring 11 to contract and operate the pivoted arms 6 by means of the rollers 10, thus allowing the record in the playing position to fall down on to the seats 12 under the action of gravity. The movement of the member 24 actuates the arm 21 and link 22 and causes the lever 23 to raise the tone-arm up from its playing position. It is maintained by the catch 20^c in the raised position. The spring lever 39^b at the same time forces the rack 37 into engagement with the pinion 38, and the spring 40 then seats itself behind the rack and maintains it in engagement. The pinion 38 engaging with the rack causes the rod 37 to move towards the right, thus rotating the tone-arm clear of the turn-table, and ultimately causing the arm 17^a to actuate the movable member 36^c, which operates the sliding members 41 so as to push the lowest record on the shoulder 3 and supports 4, 5 laterally until it is clear of the said shoulder and supports, whereupon it falls down the pillar 1 acquiring during its fall, a speed of rotation approximately equal to that of the turn-table owing to its engagement with the polygonal spiral. The next lowest record is prevented from being pushed forward by the upper part of the pillar 1.

The latter portion of the movement of the rod 37 towards the right actuates the leaf spring 44, and when at length the rod is moved so far that the spring 40 is adapted to re-enter the slot 39 through the recess 39^a, the spring 44, being inclined, disengages the rack from the pinion and forces the rod backwards, co-operating with the spring of the rocking shaft 36^b, to rotate the tone-arm back towards its playing position. During this movement, the nose of the catch 20^c has fallen in the groove 20^f the cam-shaped wall of which deflects the catch until on further backward rotation of the tone-arm it registers with the slot 20^a and allows the tone-arm to fall so as to apply the needle to the new record. The slot 20^a is so situated that the tone-arm is only allowed to fall when the needle is situated at the desired position relatively to the new record.

It will be seen that during the outward movement of the tone-arm the undeflected nose of the catch prevents the catch from entering the slot 20^a as in the return position.

A weak-leaf spring 45 is arranged to be engaged by the joint between the lever 35

and rod 36 when said rod has been moved in a direction to swing the tone arm beyond the record, that is, toward the right in Fig. 1. This spring 45 acts to compel a slight movement of the parts toward the left or in a direction to return the tone arm to starting position, thus insuring that the needle will come to rest at a point to engage the starting groove of the record.

When it is desired to stop the machine, the control is actuated as for record changing, but immediately after its return to the neutral position it is then pushed inwardly operating the sliding member 27. This releases the brake so as to apply the brake pad 80 to the underside flange of the turn-table; and owing to the previous record-changing actuation, the record last played will at this point have been released from its playing position and the spring 40 will be seated behind the rack 37^a. The tone arm however, will not have rotated sufficiently far to release another record from the shoulder 3 as the movement of the brake-rod 32 withdraws the rack out of engagement with the pinion owing to the provision of the guide 43. If it is desired to change the records, this may now be done, the played records being removed by lifting the pillar 1 from its seating 1^a and thus detaching the holder 13 from the bayonet slots in which it is held. When new records are set up in position, the brake is withdrawn by actuating the control to the neutral position, whereupon the rack re-engages the pinion and the release of the lowest record proceeds as described above. Alternatively the brake may be put on either during playing or after all the records have been played.

It will be understood that the invention includes modifications of the above preferred form. For instance, electrical means may, if desired, be employed in the control mechanism instead of the sheathed cable.

In order to adapt the invention to existing records, or to records suitable for use on other machines, a special thimble is preferably provided to adapt the usual circular central hole for use with the spiral thread or feather of the pillar. The said thimble comprises a spring 46 in the form of a broken ring having projections on its inner surface as shown in Fig. 11. The spring is compressed and inserted in the central circular hole of a record and attached by expanding. The projections then serve to engage with the flats or feather of the pillars 1 and impart rotation to the record during its fall. Further, adapters may be provided to accommodate records of smaller diameter enabling them to rest on the supports 4 and 5 and having a spiral groove adapted to move the stylus across their breadth and into the groove of the records.

Needles of the permanent or semi-perma-

ment type are employed so as to be serviceable for a number of records without changing.

I claim:—

5 1. In sound reproducing machines provided with record changing mechanism adapted to play a plurality of disc records in succession, the combination of stationary supports adapted to support a plurality of
10 unplayed records vertically above the playing position of a record, movable holders adapted to support and rotate a single record in its playing position, and means situated vertically beneath the playing position for supporting a plurality of played
15 records.

2. In sound reproducing machines provided with record-changing mechanism adapted to play a plurality of disc records in succession, the combination of stationary
20 supports adapted to support a plurality of unplayed records vertically above the playing position of a record, movable holders adapted to support and rotate a single record in its playing position, automatic means for laterally displacing for a short distance the lowest unplayed record so that
25 it is clear of the said supports and falls under gravity on to the said movable holders, and means situated vertically beneath the playing position for supporting a plurality of played records.

3. In sound reproducing machines provided with record-changing mechanism adapted to play a plurality of disc records in succession, the combination of a side
35 bracket and central pillar having a shoulder adapted to support a plurality of unplayed records vertically above the playing position of a record, movable holders adapted to support and rotate a single record in its playing position, automatic means for laterally displacing for a short distance the
40 lowest unplayed record so that it is clear of the said bracket and shoulder and falls under gravity down the said pillar on to said movable holders, means for imparting rotation to the said record during its fall and means situated vertically beneath the playing position for supporting a plurality
45 of played records.

4. In sound reproducing machines provided with record-changing mechanism adapted to play a plurality of disc records in succession, the combination of stationary
50 supports adapted to support a plurality of unplayed records vertically above the playing position of a record, movable holders adapted to support and rotate a single record in its playing position, automatic means for laterally displacing for a short distance the lowest unplayed record so that it is clear of the said supports and falls under gravity on to the said movable holders, means
55 situated vertically beneath the playing position

for supporting a plurality of played records, and distant controlling means adapted first to move the movable holders out of their operative position then to cause them to be restored thereto and subsequently to cause the displacement of the lowest unplayed record.

5. In sound reproducing machines provided with record-changing mechanism adapted to play a plurality of disc records in succession, the combination of a side bracket and central pillar having a shoulder adapted to support a plurality of unplayed records vertically above the playing position of a record, movable holders adapted to support and rotate a single record in its playing position, automatic means for laterally displacing for a short distance the lowest unplayed record so that it is clear of the said bracket and shoulder and falls under gravity down the said pillar on to said movable holders, means for imparting rotation to the said record during its fall, distant controlling-means adapted first to move the movable holders out of their operative position then to cause them to be restored thereto and subsequently to cause the displacement of the lowest unplayed record, and means situated vertically beneath the playing position for supporting a plurality of played records.

6. In sound reproducing machines provided with record-changing mechanism adapted to play a plurality of disc records in succession, the combination of a side bracket and central pillar having a shoulder adapted to support a plurality of unplayed records vertically above the playing position of a record, movable holders adapted to support and rotate a single record in its playing position, automatic means for displacing laterally for a short distance the lowest unplayed record so that it is clear of the said bracket and shoulder and falls under gravity down the said pillar on to said movable holders, the said pillar being formed with a spiral element adapted to rotate the record during its fall.

7. In a sound reproducing machine provided with record-changing mechanism adapted to play a plurality of disc records in succession, automatic means for lifting and rotating the reproducer clear of a record comprising a motor, a tone-arm adapted to swing about a vertical axis, a reproducer on said tone-arm a spindle attached to said tone-arm and coincident with said axis, a distant control adapted to cause said spindle to be raised, a radial lever projecting from said tone-arm, a lever hinged thereto terminating in a rack, a toothed pinion rotated by said motor, means adapted to engage said rack with said pinion on the actuation of the distant control so as to swing said tone-arm a predetermined distance outwardly of

the record, automatic means for arresting said tone-arm and swinging it inwardly again, and automatic means for lowering said spindle and tone-arm.

8. In a sound reproducing machine provided with record-changing mechanism adapted to play a plurality of disc records in succession, automatic means for lifting and rotating the reproducer clear of a record, comprising a motor, a tone-arm adapted to swing about a vertical axis, a reproducer on said tone-arm, a spindle attached to said tone-arm and coincident with said axis, a collar on said spindle, an arm adapted to raise said collar, a hinged lever adapted to operate said arm, a distant control adapted to operate said hinged lever so as to cause said tone-arm to be raised, a radial lever projecting from said tone-arm, a lever hinged thereto terminating in a rack, a toothed pinion rotated by said motor, the said rack being engaged with said pinion on the operation of the hinged lever by the distant control so as to swing said tone-arm a predetermined distance outwardly of the record in its raised position, automatic means for arresting said tone-arm and swinging it inwardly again, and automatic means for lowering said spindle and tone-arm.

9. In a sound reproducing machine provided with record-changing mechanism adapted to play a plurality of disc records in succession, automatic means for lifting and rotating the reproducer clear of a record comprising a motor, a tone-arm adapted to swing about a vertical axis, a spindle attached thereto and coincident with said axis, a reproducer on said tone-arm, a distant control adapted to cause said spindle to be raised, a radial lever projecting from said tone-arm, a lever hinged thereto terminating in a rack, a toothed pinion rotated by said motor, means adapted to engage said rack with said pinion on the actuation of the distant control so as to swing said tone-arm a predetermined distance outwardly of the record, automatic means for arresting said tone-arm and swinging it inwardly again, said means comprising a slot formed in the rack, a bevelled wall to said slot, a spring having an upturned end engaged in said slot, said upturned end being also adapted to seat itself behind the said wall, said wall being cut away to permit the re-entry of the upturned end of said spring into the slot and an inclined abutment spring substantially as described.

10. In a sound reproducing machine provided with record-changing mechanism adapted to play a plurality of disc records in succession, automatic means for lifting and rotating the reproducer clear of a record comprising a motor, a tone-arm adapted to swing about a vertical axis, a spindle at-

tached thereto and coincident with said axis, a reproducer on said tone-arm, a collar on said spindle, an arm adapted to raise said collar, a hinged lever adapted to operate said arm, a distant control adapted to operate said hinged lever so as to cause said tone-arm to be raised, a radial lever projecting from said tone-arm, a lever hinged thereto terminating in a rack, a toothed pinion rotated by said motor, the said rack being engaged with said pinion on the operation of a hinged lever by the distant control so as to swing said tone-arm, a predetermined distance outwardly of the record in its raised position, automatic means for arresting said tone-arm and swinging it inwardly again, and automatic means for lowering said spindle and tone-arm comprising an automatic hinged catch adapted to engage below the said collar in the raised position, a slot in said collar situated in a predetermined angular position, said slot being smaller in length than the nose of said catch, a recess on the underside of said collar, said recess having a cam-shaped wall adapted to force backwards the nose of said catch on the return movement of the tone-arm so that it allows the collar to fall on registering with said slot substantially as described.

11. In sound reproducing mechanism provided with record-changing mechanism adapted to play a plurality of disc records in succession, record holding and releasing means comprising a rotatable element, upstanding arms pivoted to said element, record-holding means at the upper end of said arms, radial inwardly-directed rods pivoted to the lower ends of said arms, a spring strip curved to a circle, the free end of said strip being connected to a control mechanism adapted to withdraw the said free end and reduce the size of the circle, means attached to said rods adapted to be engaged by said spring strip when the control mechanism is actuated so as to draw said rods inwardly and cause all the record holding means to be moved outwardly so as to be adapted to let fall a record held on said means.

12. In sound reproducing mechanism provided with record-changing mechanism adapted to play a plurality of disc records in succession, wherein unplayed records are allowed to fall one by one down to the playing position, a central pillar, a shoulder near the top of said pillar, a reverse shoulder at the opposite side of said pillar, said shoulders being separated in height by an amount approximately equal to and not less than the thickness of a record.

13. In sound reproducing machines provided with record-changing mechanism adapted to play a plurality of disc records in succession wherein unplayed records are allowed to fall one by one down to the play-

ing position, the combination with a spirally-formed central pillar down which the records fall, of means adapted to be fitted in the central hole of a record for operatively engaging the spiral of the pillar so as to impart rotation to the record during its fall.

14. In sound reproducing machines provided with record-changing mechanism adapted to play a plurality of disc records in succession wherein unplayed records are allowed to fall one by one down to the playing position, the combination with a spirally formed central pillar down which the records fall, of means adapted to be fitted in the central hole of a record for operatively engaging the spiral of the pillar so as to impart rotation to the record during its fall, said means comprising a spring strip having projections on its inner surface, and means for operatively engaging said strip with the inner edge of a record.

15. In sound reproducing machines provided with record-changing mechanism adapted to play a plurality of disc records in succession, a plurality of movable holders adapted to hold a record horizontally in the playing position, means for rotating said holders and record suitably for playing, means for moving said holders so that they are withdrawn outwardly from beneath said record, so as to let said record fall under the action of gravity, and means for supporting said record when it has fallen from the playing position.

16. In sound reproducing machines provided with record-changing mechanism adapted to play a plurality of disc records in succession, a plurality of movable holders adapted to hold a record horizontally in the playing position, means for rotating said holders and record suitably for playing, means for moving said holders so that they are withdrawn outwardly from beneath said record, so as to let said record fall under the action of gravity, a detachable central pillar passing centrally through said record, and means mounted on said pillar for supporting said record when it has fallen from the playing position.

17. In sound reproducing machines provided with record-changing mechanism adapted to play a plurality of disc records in succession, the combination of stationary supports adapted to support a pile of unplayed records vertically above the playing position of a record, movable holders adapted to support and rotate a single record in its playing position, means situated vertically beneath the playing position for supporting a plurality of played records, and means adapted to trip the movable holders to cause them to release the record held thereon and allow it to fall on the played-record holding-means.

18. In sound reproducing machines pro-

vided with record-changing mechanism adapted to play a plurality of disc records in succession, the combination of a central pillar and a lateral support adapted to support a pile of unplayed records vertically above the playing position of a record, movable holders adapted to support and rotate a single record in its playing position, automatic means for laterally displacing for a short distance the lowest unplayed record so that it is clear of the said pillar and support and falls under gravity on to the said movable holders, and means situated vertically beneath the playing position for supporting a plurality of played records.

19. In sound reproducing machines provided with record-changing mechanism adapted to play a plurality of disc records in succession, the combination of a side bracket and central pillar having a shoulder adapted to support a pile of superimposed unplayed records vertically above the playing position of a record, movable holders adapted to support and rotate a single record in its playing position, automatic means for laterally displacing for a short distance the lowest unplayed record so that it is clear of the said bracket and shoulder and falls under gravity down the said pillar on to said movable holders and means situated vertically beneath the playing position for supporting a plurality of played records.

20. In sound reproducing machines provided with record-changing mechanism adapted to play a plurality of disc records in succession, the combination of stationary supports adapted to support a pile of superimposed unplayed records vertically above the playing position of a record, movable holders adapted to support and rotate a single record in its playing position, automatic means for laterally displacing for a short distance the lowest unplayed record so that it is clear of the said supports and falls under gravity on to the said movable holders, means situated vertically beneath the playing position for supporting a plurality of played records, and distant controlling means adapted first to move the movable holders out of their operative position, then to cause them to be restored thereto and subsequently to cause the displacement of the lowest unplayed record.

21. In sound reproducing machines provided with record-changing mechanism adapted to play a plurality of disc records in succession, the combination of a side bracket and central pillar having a shoulder adapted to support a pile of superimposed unplayed records vertically above the playing position of a record, movable holders adapted to support and rotate a single record in its playing position, automatic means for laterally displacing for a short distance the lowest unplayed record so that it is

clear of the said bracket and shoulder and falls under gravity down the said pillar on to the said movable holders, distant controlling means adapted first to move the movable holders out of their operative position then to cause them to be restored thereto.

22. In sound reproducing machines provided with record changing mechanism adapted to play a plurality of disc records in succession, the combination of a side bracket and central pillar having a shoulder adapted to support a pile of unplayed records vertically above the playing position of a record, movable holders adapted to support and rotate a single record in its playing position, a sliding spring-hinged mem-

ber adapted to laterally displace for a short distance the lowest unplayed record so that it is clear of the said bracket and shoulder and falls under gravity down the said pillar on to said movable holders.

23. In sound reproducing machines provided with record changing mechanism adapted to play a plurality of disc records in succession, a motor, a brake, record changing mechanism, a sheathed cable adapted in one position to set into operation said brake and in another position said record changing mechanism, and an operating terminal for said sheathed cable.

In testimony whereof I affix my signature.

GEOFFREY M. BOUMPHREY.