N. GREY.

PHONOGRAPH.

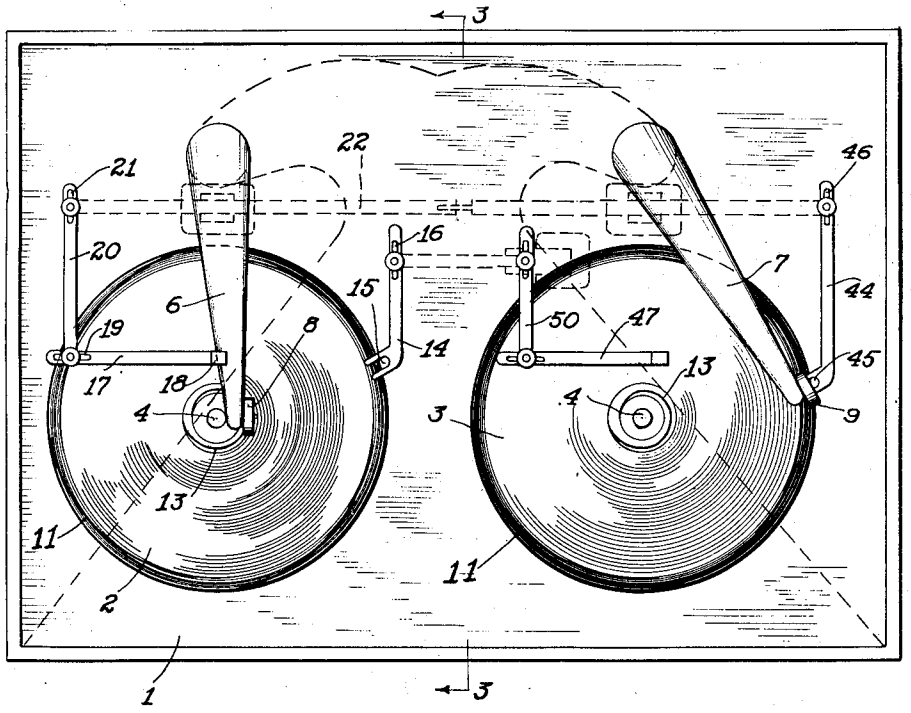
APPLICATION FILED JAN. 22, 1920.

1,361,718.

Patented Dec. 7, 1920.

2 SHEETS—SHEET 1.

FIG. 1



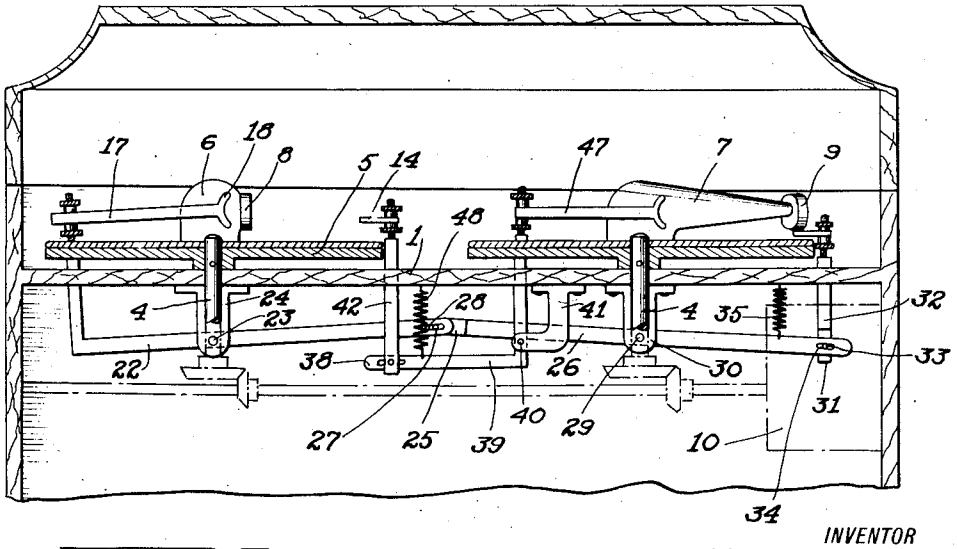


FIG. 2

INVENTOR

Nicholas Grey

BY

Harry Jacobs

ATTORNEY

N. GREY.

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2 SHEETS—SHEET 2.

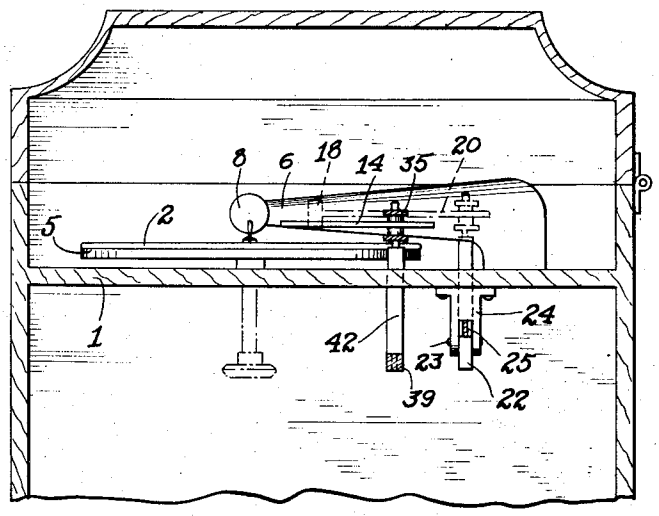


FIG. 3

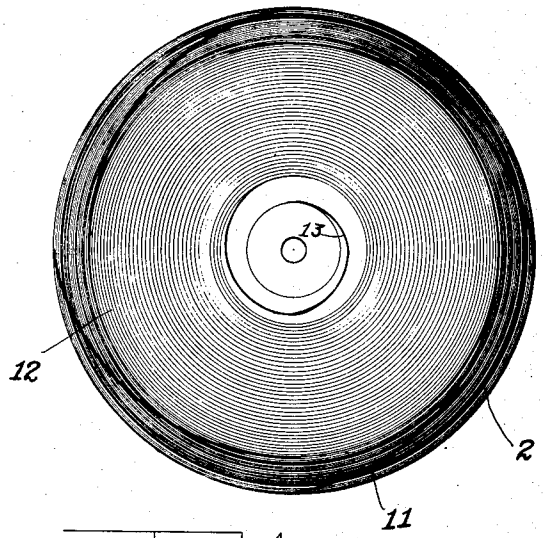


FIG. 4

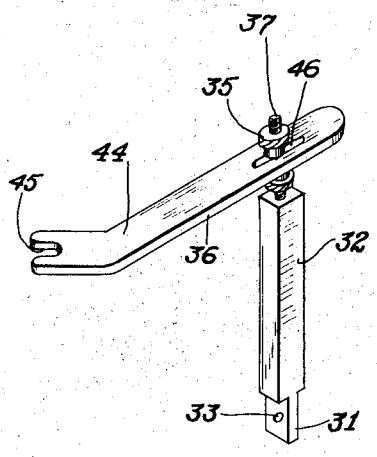


FIG. 5

INVENTOR

Nicholas Grey

BY

Harry Jacobs

ATTORNEY

UNITED STATES PATENT OFFICE.

NICHOLAS GREY, OF NEW BRUNSWICK, NEW JERSEY.

PHONOGRAPH.

1,361,718. Specification of Letters Patent. Patented Dec. 7, 1920.

Application filed January 22, 1920. Serial No. 353,154.

To all whom it may concern:

Be it known that I, NICHOLAS GREY, citizen of the United States, and resident of New Brunswick, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Phonographs, of which the following is a specification.

This invention relates to sound reproducing machines, and to the disk records adapted for use with said machines.

The object of this invention is the provision of simple means operated by the tone arm of the machine, for continuously playing records in succession without interruption of the sound, while the change is being made from one record to another.

A further object of this invention is the provision of a disk record for speeding up the action of the mechanism which operates to shift the playing from one record to another.

For the accomplishment of the aforesaid and other objects, I employ the mechanism shown in its preferred form in the accompanying drawings, in which,

Figure 1 is a plan view of my invention.

Fig. 2 is a vertical, longitudinal section and partial elevation of the same.

Fig. 3 is a vertical transverse section of the same on line 3—3 of Fig. 1.

Fig. 4 is a plan view of one of my improved records.

Fig. 5 is a perspective view of one of the diaphragm holding arms, and of the means for adjusting the same.

This invention is a modification and improvement of my previous application, dated December 24, 1919 Serial Number 347,165, to which reference is hereby made.

In the practical embodiment of the present invention, the table 1 of a cabinet is provided with two sets of the usual sound reproducing mechanism for playing records 2 and 3. Said records are rotated in the usual manner, not necessary to be here described in detail, through turntables 5, shafts 4, and suitable driving mechanism operatively connecting said shafts to motor 10. The reproducing diaphragms or sound boxes 8 and 9, carrying the usual needles, are supported by tone arms 6 and 7 respectively, of the type in common use, which tone arms are pivoted at the larger ends thereof. The record 2 is of the usual disk type, but has additional spiral grooves 11, of comparatively large pitch, leading from the outer circumference thereof to the playing grooves 12. While said grooves 11 are shown few in number, it is understood that as many as is desirable may be ued. Additional spiral grooves 13 also of steep pitch, lead from the innermost of playing grooves 12, to the edge of the blank spot, generally provided for label, in the center of said record 2.

Diaphragms 8 and 9 are supported respectively in their inoperative positions by adjustable holders 14 and 44 having slots 15 and 45 respectively in one end thereof, through which the playing needles of the diaphragms are inserted, the other ends of holders 14 and 44 being slotted at 16 and 46 for longitudinal adjustment. In their normal positions, holders 14 and 44 are raised sufficiently to prevent the needles of diaphragms 8 and 9 from coming in contact with records 2 and 3. Means are provided, however, for lowering one diaphragm into engagement with the outermost grooves of the record thereunder when the other diaphragm has finished the playing of the other record, at which time the last mentioned diaphragm is very near the center of its record and just coming into engagement with grooves 13.

Said lowering means comprises adjustable outstanding arm 17, having arcuate segment 18 shaped to fit tone arm 6 at one end thereof, and slotted at its other end at 19 for connection with the other elements of said lowering means. An adjustable rearwardly extending link 20 is attached at one end to outstanding arm 17, and at its other end, through slot 21 therein, is connected to bent lever 22, which passes through a suitable opening in table 1. Said lever 22, is pivotally supported at 23, by bracket 24, attached to the under side of table 1, and is mortised at one end to receive a tongue 25 of lever 26. Said tongue 25 has a pin 27 therein engaging slots 28 in the mortised end of said lever 22. Lever 26 is pivotally mounted at 29 by bracket 30 attached to the underside of table 1, and is mortised at one end to receive tongue 31 of upstanding member 32. Pin 33 in tongue 31, engages slots 34 in the mortised end of lever 26, whereby lever 26 and member 32 are operatively connected. A spring 35 connects lever 26 with the under side of table 1, whereby member 32 is normally held in its highest position.

Holder arm 44 is suitably connected to member 32 at 46 by means of nuts 35 and 36 on opposite sides of said holder 44, and mounted on the threaded portion of said member 32, similar nuts being used to connect outstanding arm 17 to link 20 at 19, and link 20 to lever 22 at 21. Holder arm 14 is carried by upstanding member 42 which is mortised at its lower end to receive the end 38 of bent lever 39, which is pivotally supported at 40, by bracket 41 attached to the under side of table 1, the upright portion of said lever 39 passing through said table and supporting link 50 and therethrough outstanding arm 47, which link and arm are similar respectively to link 20 and arm 17, and are similarly adjustably connected. Spring 48 connects lever 39 to the under side of table 1 and acts to hold member 42 normally in its highest position.

The operation of my improved mechanism is as follows:

It being desired to play record 3, after record 2 has been completely played, diaphragm 9 is swung so that the needle thereof projects through slot 45 of holder 44, without touching record 3. Diaphragm 8 is now similarly placed in holder 14, and record 2 starts revolving. By depressing holder 14, the needle of diaphragm 8 is caused to engage the surface of the record at the outer portion, thereof for a short interval of time, until one of grooves 11 of the rotating record catches the needle. When this occurs, the diaphragm 8 and tone arm 6 are rapidly brought nearer the center of record 2 out of engagement with holder 14, the needle thereupon engaging playing grooves 12.

Spring 35 tending to keep that end of lever 26 which is connected with member 32 in its highest position, thereby retains the other end 25 in its lowest position, whereby the end of bent lever 22, which is connected by link 20 to outstanding arm 17, is also held in its highest position so that arcuate segment 18 is thereby forced into that position in which it is closest to holder 14. As tone arm 6 nears the center of record 2, it gets closer to segment 18, until, at the time record 2 has been completely played, said arm 6 engages said segment 18.

When the needle of diaphragm 8 enters one of the grooves 13, and is thereby brought quickly to the center of record 2, the motion of said diaphragm and tone arm 6, is transmitted through segment 18 to arm 17 and therethrough, by means of link 20, levers 22 and 26, to member 32, which is pulled down against the action of spring 35, thereby lowering the needle of diaphragm 9 on to record 3, and beginning the playing of said record, which, in the meantime, has been started rotating.

Diaphragm 8 is now brought back by hand to holder 14, spring 48 acting to keep the needle off record 2 and to hold outstanding arm 47 in that position in which it is nearest holder 44, when tone arm 7 nears the center of record 3, it acts in the same way as has been described for the action of tone arm, 6, whereby the playing of a record substituted for record 2 can be begun. It will be seen that the operation of the shifting mechanism is positive and certain.

Adjustment vertically, longitudinally and transversely for records of varying diameters is provided in the various connections.

What I claim is:—

1. In a device of the class described, a pair of record supporting devices, a pair of sound reproducing devices, a pair of arms adapted to hold said sound reproducing devices above said record supporting devices, a second pair of arms extending above the respective record supportng devices and each adapted to be engaged by one of the sound reproducing devices to lower the arm supporting the other sound reproducing device, for the purpose set forth.

2. In a device of the class described, a pair of turntables, a pair of sound boxes, a pair of arms adapted to engage and hold said sound boxes in raised position, a second pair of arms extending above the respective turntables, and an operative connection between the respective arms of one pair with those of the other whereby movement of the first pair by the said sound box lowers the other pair.

3. In a device of the class described, a pair of turntables, a pair of sound boxes, a pair of arms adapted to engage and hold said sound boxes in raised position, a second pair of arms extending above the respective turntables, and an operative connection between the respective arms of one pair with those of the other whereby movement of the first pair by the said sound box lowers the other pair, said connection including a series of levers extending under the said turntables.

4. In a device of the class described, a pair of turntables, a pair of sound boxes, a pair of arms adapted to engage and hold said sound boxes in raised position, said arms having slotted ends adapted to freely support said sound boxes, and a second pair of arms extending above the respective turntables and each adapted to be moved by one of the sound boxes to lower the arm supporting the other sound box, for the purpose set forth.

5. In a device of the class described, a disk record having a set of spiral grooves of steep pitch near the outer edge thereof, and a second set near the center thereof, and having playing grooves connecting the two sets of steep spiral grooves, a sound reproducing mechanism, an outstanding arm arranged

for operation by said reproducing mechanism when said mechanism engages the innermost spiral grooves of said record, a holder arm, a second record, a second reproducing mechanism supported by said holder arm normally out of contact with said second record, levers operatively connecting said outstanding arm with holder arm for lowering said holder arm and the reproducing mechanism supported thereby, when the outstanding arm is moved by said first mentioned reproducing mechanism.

6. In a device of the class described, a pair of turntables, a pair of sound boxes, a pair of vertically movable arms adapted to hold said sound boxes in raised position, and a pair of horizontally movable arms each adapted to be engaged by one sound box to lower the arm supporting the other sound box.

7. In a device of the class described, a pair of turntables, a pair of sound boxes, a pair of vertically movable arms adapted to hold said sound boxes in raised position, and a pair of horizontally movable arms each adapted to be engaged by one sound box to lower the arm supporting the other sound box, said vertically movable arms having slotted ends on which the sound box rests freely.

Signed at New Brunswick, in the county of Middlesex and State of New Jersey, this 14th day of January A. D. 1920.

NICHOLAS GREY.