

AUTOMATIC RECORD SHIFTING MECHANISM FOR PHONOGRAPHS.

Patented May 21, 1918.

1,236,767.



WITNESSES

R. A. Balderson
G. B. Blumling

INVENTOR

E. E. Brosius
4 Babcock, Bygones Paved
Outs.

E. E. BROSIUS.

AUTOMATIC RECORD SHIFTING MECHANISM FOR PHONOGRAPHS.

APPLICATION FILED MAR. 20, 1917.

Patented May 21, 1918.

3 SHEETS—SHEET 2.

1,266,767.

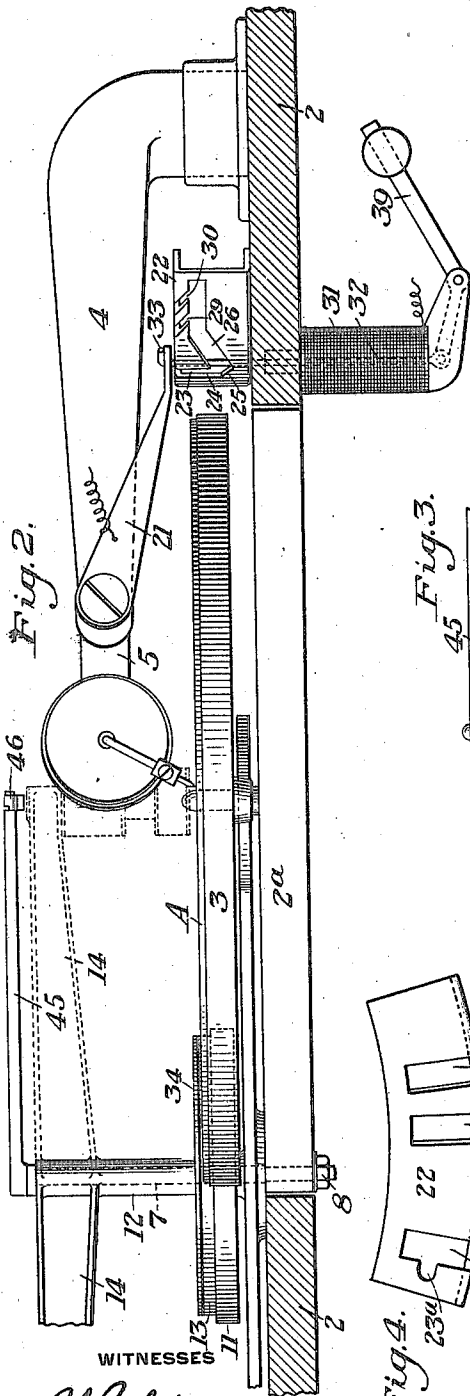


Fig. 2.

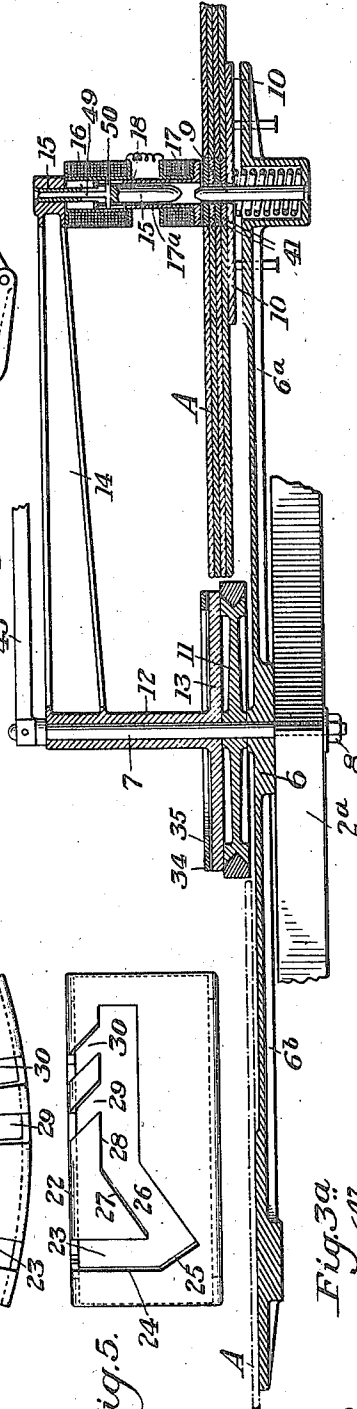


Fig. 3.

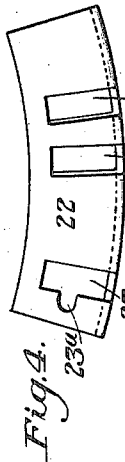


Fig. 4.

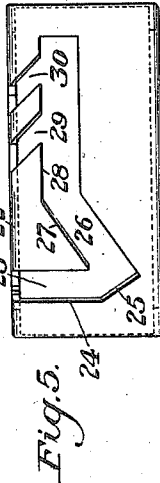


Fig. 5.

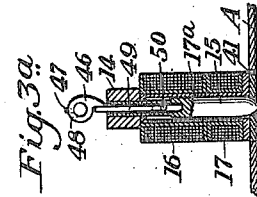


Fig. 3a.

INVENTOR

E. E. Brosius

W. B. B. Brosius
Attys.

R. A. Balderson
S. B. Blumling

E. E. BROSIUS.
 AUTOMATIC RECORD SHIFTING MECHANISM FOR PHONOGRAPHS.
 APPLICATION FILED MAR. 20, 1917.

1,266,767.

Patented May 21, 1918.
 3 SHEETS—SHEET 3.

Fig. 9.

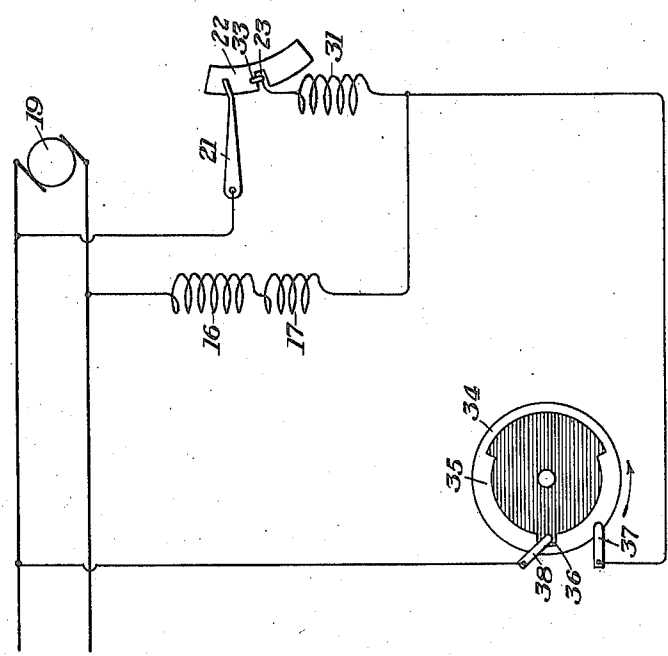


Fig. 6.

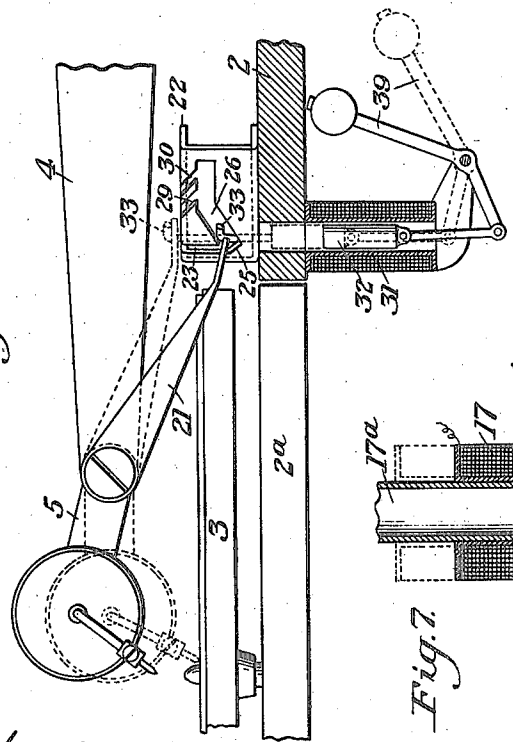


Fig. 8.

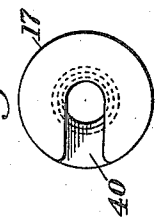
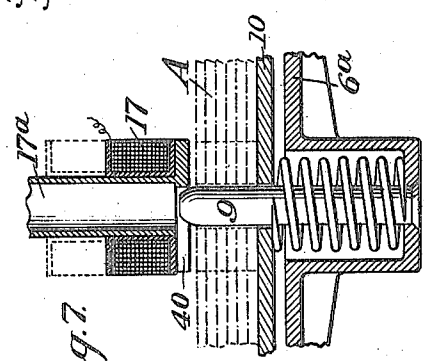


Fig. 7.



WITNESSES

R. M. Balderson
E. B. Blum

INVENTOR

E. E. Brosius
By Samuel Bymer Partridge
Att'y.

UNITED STATES PATENT OFFICE.

EDGAR E. BROSIUS, OF PITTSBURGH, PENNSYLVANIA.

AUTOMATIC RECORD-SHIFTING MECHANISM FOR PHONOGRAPHS.

1,266,767.

Specification of Letters Patent.

Patented May 21, 1918.

Application filed March 20, 1917. Serial No. 156,029.

To all whom it may concern:

Be it known that I, EDGAR E. BROSIUS, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Automatic Record-Shifting Mechanism for Phonographs, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view showing a phonograph equipped with my invention;

Fig. 2 is a sectional elevation of the same;

Fig. 3 is a section on the line III—III of Fig. 1 with the record-shifting arm swung to another position;

Fig. 3^a is a detail sectional view;

Figs. 4 and 5 are, respectively, a top and a front elevation of the slot plate;

Fig. 6 is a sectional elevation showing the solenoid and its connections for raising the needle;

Fig. 7 is a detail sectional view showing a portion of the record holder or magazine and the pick-up magnet;

Fig. 8 is a bottom plan view of the lower pick-up magnet;

Fig. 9 is a wiring diagram;

Fig. 10 is a partial plan view of one of the records.

My invention has relation to mechanism for automatically shifting the records of a phonograph, and is designed to provide a simple mechanism of this character by means of which a phonograph may be caused to play a plurality of records in succession without the necessity for manual attention.

My invention also provides mechanism of this character which is readily adapted to existing machines. My invention is applicable to all phonographs of the disk record type.

The nature of my invention will be best understood by reference to the accompanying drawings, in which I have shown the preferred embodiment thereof, and which will now be described, it being premised, however, that various changes can be made in the details of construction and arrangement of the several parts, without departing from the spirit and scope of my invention as defined in the appended claims.

In these drawings, the numeral 2 designates the top portion of a phonograph casing, 3 the revolving record-carrying disk or

support, and 4 the swinging reproducing arm having the reproducer 5 pivotally connected thereto. These parts may be, in general, of the usual form.

The numeral 6 designates a two-armed bracket which may be rigidly but detachably secured to the frame 2 by means of the post 7, secured by the nut 8. One arm 6^a of this bracket forms a support or magazine holder for a plurality of unplayed records A. It is preferably provided with a centering pin 9, for the records and with a spring-pressed follower 10 (as best shown in Fig. 3) the records being directly supported upon this follower. The other arm 6^b of the bracket 6 forms a support or detachable holder for the played records as they are moved out of playing position. Loosely journaled on the post 7 is a friction wheel 11, whose periphery is in frictional contact with the periphery of the disk 3. This friction wheel is constantly driven while the phonograph is in operation. 12 is a sleeve which is also loosely journaled on the post 7, and which carries a disk 13, at its lower end which rests in frictional contact with the upper surface of the disk 11. The sleeve 12 carries at its upper portion a horizontally extending record-shifting arm 14, which at its outward extremity is provided with a depending guide pin 15. Rigidly secured to the arm around this guide pin is a magnet 16 of the solenoid type. 17 is another magnet having its core portion 17^a extended upwardly within the solenoid magnet 16, as shown at 18. The pin 15 is made of sufficient length that when a record is held in the raised position by the magnets, it will enter the central hole of the record, and thus center the same.

The numeral 19 designates a driving motor of any suitable or usual type for the phonograph, said motor having a frictional wheel 20, in contact with the periphery of the disk 3. The current for energizing the solenoids 16 and 17 is most conveniently taken from the supply circuit for this motor, as best indicated in Fig. 9, but in the case of a spring-driven machine, may be derived from a battery.

The numeral 21 indicates a lever arm which is rigidly secured to the shank of the reproducer 5. This lever arm extends backwardly at one side of the reproducer arm 4, and is adapted to travel upon a slot plate 22, secured to the top 2 of the phonograph.

The plate 22 has therein the vertical slot 23, whose wall 24 is formed with an incline 25 at its lower portion. The lower portion of the slot 23 communicates with the oblique slot 26, having the oblique upper wall 27, terminating in the horizontal portion 28. Beyond this horizontal portion are the two oblique slots 29 and 30, which open through the top surface of the plate. 31 designates a solenoid whose core 32 extends upwardly through the frame portion 2 and also through the slot 23 of the slot plate, the latter having the offset 23^a therefor. At its upper end this extension terminates in the hook 33.

The end portion of the lever arm 21 and the hook portion 33, just described, constitute electric contacts for the purpose hereinafter described. In order to further control the circuit of the magnets 16 and 17, I provide the disk 13 with a contact which may be of the form shown in Fig. 9, and which has a continuous rim portion 34 and a semicircular extension 35, formed with the break 36. The brush or contact 37 engages the continuous rim portion 34, and another contact 38 engages the extension 35. As the circuits are arranged in Fig. 9, the contact 38 is connected with one side of the supply circuit for the motor 19, and the brush 37 is connected to the other side of such circuit, through the windings of the magnets 16 and 17.

The winding of the solenoid 31 is also arranged to be connected in series with the windings of the magnets 16 and 17 when the contact is made between the arm 21 and the hook 33, as shown in Fig. 9. The movable core member 32 of the solenoid 31 is provided with a weighted arm, as shown at 39. The lower face of the magnet 17 has a radial slot or groove 40 formed therein, as shown in Fig. 8, the purpose of this being presently described.

In the use of my invention, it is necessary to provide each record A with a central portion or plug 41, of magnetic material. I also preferably provide each record (see Fig. 10) with a leading-in groove 42 for directing the needle into the first active groove of the record, and with a leading-out groove 43, for carrying the needle out of the last active groove of the record to a point which will be at the same distance from the center of the record with all records.

The operation is as follows: A plurality of the records to be played are placed in the holder or magazine for unplayed records. The first record to be played may be either transferred from the magazine or it may be placed by hand upon the disk 3. The latter operation will be assumed. When this record has been played, the reproducer 5 will, by the leading-out groove 43, have been moved to the position shown in full

lines in Fig. 1. At this time, the end of the lever arm 21 comes underneath the hook 33, which closes the electric circuit for the magnets 16, 17 and 31. The energization of the magnet 31 causes it to pull its core downwardly, the hook 33 thereby pulling the end portion of the arm 21 downwardly through the slot 23 and on to the inclined wall 25. As the arm 21 is drawn down on to this inclined wall 25, it will be thereby moved to the right (looking at Figs. 2 and 5) and caused to be disengaged from the hook 33. The pulling down of the arm 21 will rock the reproducer 5 upwardly on its pivot to the position shown in full lines in Fig. 6, and the weight of this reproducer will hold the end of the arm 21 in contact with the oblique slot wall 27. This slot wall acts as a cam under the weight of the reproducer to cause the reproducer and its arm 4 to swing to the position shown in dotted lines in Fig. 1. This dotted position is approximately that required in order to commence playing the ten-inch record, so far as the distance of the needle with respect to the center of the disk 3 is concerned. The reproducer will be left in this position with the end of the arm 21 in engagement with the straight portion 28 of the slot 25 until a new record is brought into place.

While each disk is being played, the contact 38 will be on the break 36 of the contact portion 35, so that the magnets 16 and 17 will then be deenergized. When, however, magnet 31 is energized in the manner described, magnets 16 and 17 will also be energized. These magnets are at this time in the position shown in Fig. 3, the lower magnet 17 engaging the usual record-centering pin of the machine. This engagement holds the arm 14 against movement, although the disk 11 is constantly turning. As soon as the magnets 16 and 17 are energized, magnet 17 attracts the metallic center of the record and the magnet 16 lifts both magnet 17 and the record off from the centering pin. The arm 14 is now free to turn and commences to rotate under the driving action of the friction wheel or disk 11. As soon as the friction wheel or disk 11 begins to turn, the contact 38 will be actively engaged with the contact portion 35, to thereby maintain the energization of the magnets 16 and 17 after their circuit has been broken by the disengagement of the hook 33 from the arm 21. This disengagement deenergizes the magnet 31, and the counterweight 39 raises the hook 33 to its initial position. The arm 14 commences to turn and moves until its end is approximately over the center of the holder for played records. By this time, the contact 38 passes off from the end of the contact portion 35 and deenergizes the magnets 16 and 17. The record is now dropped upon

the holder. In order to insure the record's being removed, notwithstanding the action of any residual magnetism, the said holder 6^a may be provided with the wipers 44. The arm 14 now continues its rotation until its outer end reaches a position over the center of the magazine for unplayed records. When this position is reached, the contact 38 again engages the contact portion 35 and reenergizes the magnets 16 and 17. The uppermost record in the magazine is thereby attracted and lifted from the pin 9. It is for the purpose of accurately centering the record with respect to the pin 9 that I provide the groove 40 in the bottom face of the magnet 17. This groove will engage the centering pin and insure the record's being stopped with its central opening in exact registry with this pin. The continued movement of the arm 14 carries this record over the centering pin of the disk 3, and as this position is reached, the contact 38 passes on to the break 36 of the contact portion 35. At this time, the deenergization of the magnets 16 and 17 will cause the record to be dropped into engagement with the pin, and the magnet 17 will also be engaged with said pin to prevent further movement of the arm 14 during the playing of this record.

As the new record is thus brought into playing position, its edge strikes the needle and moves the reproducer farther away from the center of the record. If the record is a ten-inch record, the reproducer will be moved until the end portion of the arm 21 is in registry with the slot 29 of the slot plate. The weight of the reproducer will then move the arm upwardly through the slot 29 and thus lower the needle into playing position, as the record is dropped to place. If the record is a twelve-inch record, the reproducer will be moved still farther outwardly until the end of the arm 21 is in line with the slot 30 when the needle will be lowered. During this movement the arm will not move upwardly into the slot 29, because the record has not yet been dropped on the centering pin and will, therefore, hold up the member 5. Furthermore, the arm 21 is moved quickly past the narrow mouth of the reversely inclined slot 29. While it may not be necessary to provide the records with the leading-in grooves 42, I prefer to provide such grooves in order to insure a proper playing engagement with the needle of each record.

In order to insure the accurate centering of the records with respect to the centering pin of the record carrier of the phonograph, I may provide a positive stop for stopping the arm 14 at the proper position to bring the opening in the record directly over said pin. Such a form of stop is illustrated in the drawings, and is best

shown in Figs. 3 and 3^a. It consists of an arm 45, which is rigidly secured to the upper end of the post 7, and which extends laterally to a point above the central portion of the record carrier 3. Pivoted to the end of this arm is a cam-shaped pawl 46 capable of a swinging movement limited by the pin 47 and slot 48. 49 designates a pin having a T-head 50, at its lower end and engaging slots in the centering pin 15 and in the upward core extension 17^a of the magnet 17.

As each record is brought over the carrier 3, the magnet 17 is, of course, in its lifted position, and thereby raises the pin 49 into position to engage the pawl 46 in the manner shown in Fig. 3^a, thereby stopping the arm at this point. When the magnets 16 and 17 are deenergized, the pin 49 drops back into the position shown in Fig. 3, and the pawl 46 swings by gravity to a position such that when the magnets are again energized to pick up the played record, the pin 49 will escape said pawl, and the arm will be free to move around with the played record. While this device will not be necessary in all cases, it insures the exact centering of the records as they are dropped to playing position.

The operations just described are repeated for each record which is placed in the magazine for unplayed records, the played records being successively removed and the unplayed records being successively brought into playing position.

The advantages of my invention will be apparent, since it provides a very simple, comparatively inexpensive mechanism which can be readily adapted to existing phonographs and by means of which a plurality of records can be successively played without the necessity for manual interference. The moving parts are few in number and of a character not likely to get out of order. Care should, of course, be taken to properly insulate the electrical connections, these, however, being few in number and simple in character.

I claim:

1. The combination with a phonograph having a rotating risk record carrier, of a holder for unplayed records, another holder for played records, a member mounted to move in a circular path above said carrier and holders, and means carried by said member for engaging and lifting the records, and automatic means for controlling the engagement and disengagement of said means with and from the record, substantially as described.

2. Record-shifting mechanism for phonographs, comprising a movable shifting member, a record-lifting magnet carried thereby and movable therewith, and means controlled by movable parts of the phonograph for actuating said member and for controlling the

circuit of said magnet, substantially as described.

3. Record-shifting mechanism for phonographs, comprising a record-shifting member movable in a circular path, a holder for unplayed records, another holder for played records, both holders being arranged below and adjacent to the path of travel of said arm, a record-lifting magnet carried by said arm, an actuating connection between said member and a constantly moving part of the phonograph, and means controlled by the movement of said member and the phonograph parts for controlling the circuit of said magnet, substantially as described.

4. Record-shifting mechanism for phonographs, comprising a shifting magnet, a movable carrier for said magnet, and means for energizing and deenergizing said magnet at the proper times to pick up and release the records, substantially as described.

5. Record-shifting mechanism for phonographs, comprising a record shifting magnet, a carrier for said magnet movable in a circular path, an actuating connection between the carrier and a movable part of the phonograph, means whereby the carrier is held stationary while a record is being played, and means controlled by the phonograph parts and by the movement of the carrier for controlling the circuit of said magnet, substantially as described.

6. The combination with a phonograph having a rotating disk record carrier, of a holder for unplayed records, another holder for played records, a shifting member mounted to move in a circular path above said carrier, a record-shifting magnet mounted on said member, and another magnet also mounted on the member and arranged to lift the first named magnet, together with means for automatically controlling the circuits of said magnets, substantially as described.

7. The combination with a phonograph having a rotating disk record carrier, of a holder for unplayed records, another holder for played records, a shifting member mounted to move in a circular path above said carrier, a record-lifting magnet mounted on said member, and means for properly centering said magnet with respect to the holder for unplayed records, substantially as described.

8. The combination with a phonograph having a rotating disk record carrier, of a holder for unplayed records, another holder for played records, a shifting member mounted to move in a circular path above said carrier, a record-lifting magnet mounted on said member, and means for centering said member and magnet with respect to said record carrier, substantially as described.

9. The combination with a phonograph having a rotating disk record carrier, of a

holder for unplayed records, another holder for played records, a record-shifting member mounted to move in a circular path above said carrier, a driving connection between said member and the said record carrier, a record-lifting magnet mounted on said member, and means for automatically controlling the circuit of said magnet, together with means for holding said member and magnet in a stationary position while a record is being played, substantially as described.

10. The combination with a phonograph having a rotating disk record carrier and a centering pin, of a horizontally movable record-shifting member, a vertically movable record-lifting magnet, another magnet for lifting the first named magnet, means for automatically controlling the circuit of said magnets, and stop means controlled by the first named magnet for stopping said member in proper position with reference to the centering pin of the phonograph, substantially as described.

11. In record-shifting mechanism for phonographs, a horizontally movable record-shifting member, a record-lifting magnet carried by said member, another magnet also carried by said member and arranged to lift the first named magnet, and means for automatically controlling the circuits of said magnets, substantially as described.

12. Record-shifting mechanism for phonographs, comprising a holder for unplayed records, a record-shifting member movable above said holder, said holder having a centering pin, and a record-lifting magnet carried by said member, said magnet having a centering device arranged to coact with said pin, substantially as described.

13. In record shifting mechanism for phonographs, the combination with a horizontally movable record shifting member, and a shifting magnet carried thereby, of a magazine for unplayed records located below the path of movement of said member and magnet, said magazine having an upwardly pressed support for the records whereby the latter are automatically raised into the plane of action of the magnet; substantially as described.

14. Record-shifting mechanism for phonographs, comprising a horizontally movable shifting member, a record-lifting magnet carried thereby, another magnet for lifting the first named magnet, means for automatically controlling the circuits of said magnets, and means carried by said member for centering a record when lifted by said magnets, substantially as described.

15. In record shifting mechanism for phonographs, the combination with a movable record shifting magnet, and an energizing circuit for said magnet, of circuit closing means operated by the movement of the re-

producer arm of the phonograph to close the circuit of said magnet when a record has been played; substantially as described.

16. In record shifting mechanism for phonographs, the combination of a movable record shifting magnet, a stylus shifting magnet, the two magnets having related energizing circuits, and means controlled by the movement of the stylus carrier for controlling the circuit of the stylus shifting magnet and for partially controlling the circuit of the record-shifting magnet; substantially as described.

17. A composition phonograph record having a portion of magnetic material adapted to cooperate with a record shifting magnet, substantially as described.

18. A composition phonograph record having a central portion of magnetic material adapted to cooperate with a record shifting magnet, substantially as described.

19. The combination with a phonograph,

of disk records therefor having magnetic portions, a magnet arranged to attract said records and hold them while being moved into and out of playing position, an energizing circuit for said magnet, means for moving said magnet to transfer the records, and means for controlling the circuits of said magnets; substantially as described.

20. The combination with a phonograph, of disk records therefor having magnetic portions, a magnet arranged to attract said records and hold them while being moved into and out of playing position, an energizing circuit for said magnet, means for moving said magnet to transfer the records, and means for controlling the circuits of said magnets, together with stylus shifting mechanism forming a part of such means; substantially as described.

In testimony whereof, I have hereunto set my hand.

EDGAR E. BROSIUS.