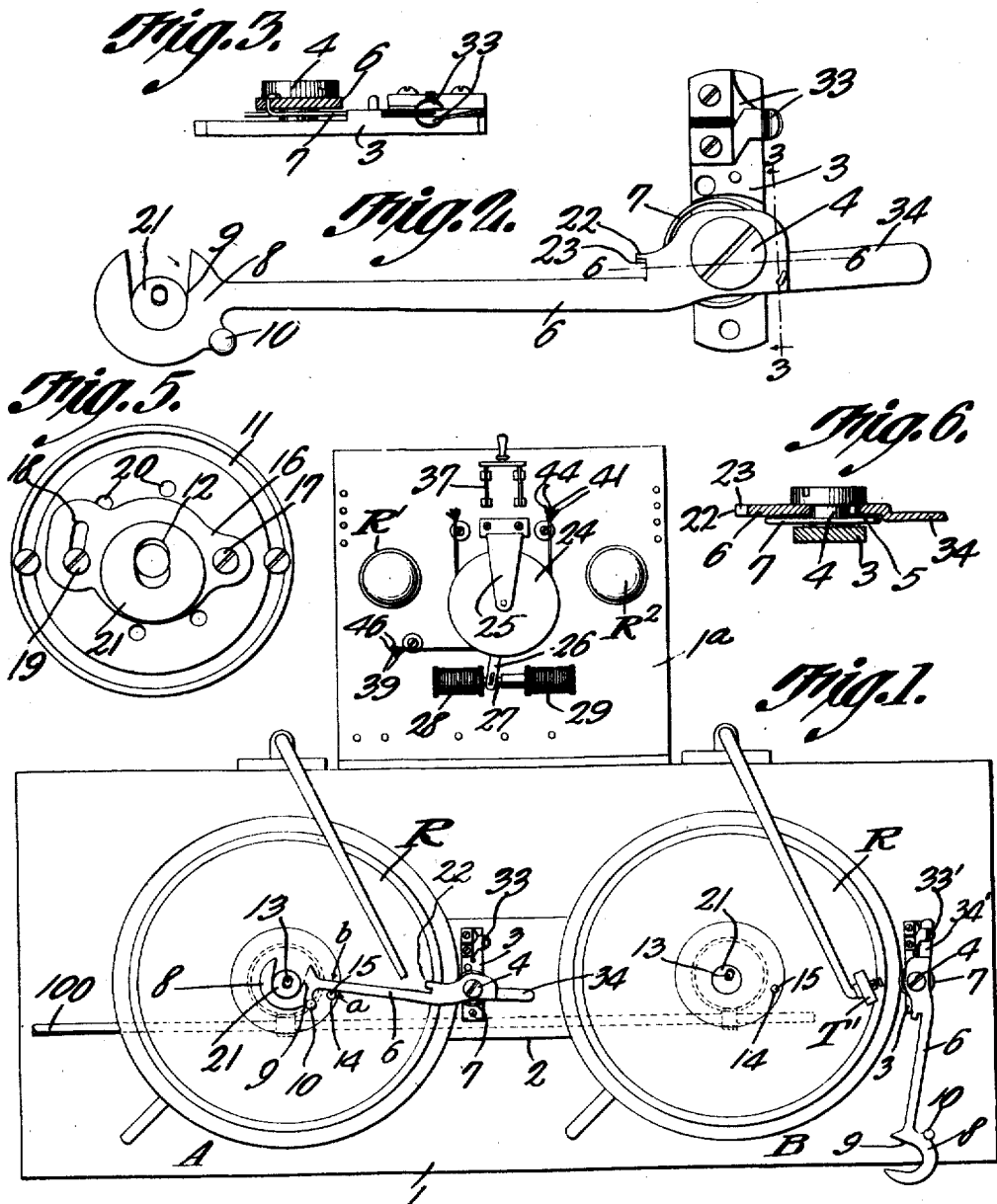


C. W. EBELING.
 STYLUS POSITIONING AND CIRCUIT CONTROLLING MEANS FOR SOUND REPRODUCING MACHINES.
 APPLICATION FILED OCT. 30, 1913.

1,138,646.

Patented May 11, 1915.
 3 SHEETS—SHEET 1.



Witnesses

J. R. Tomlin
S. Willson

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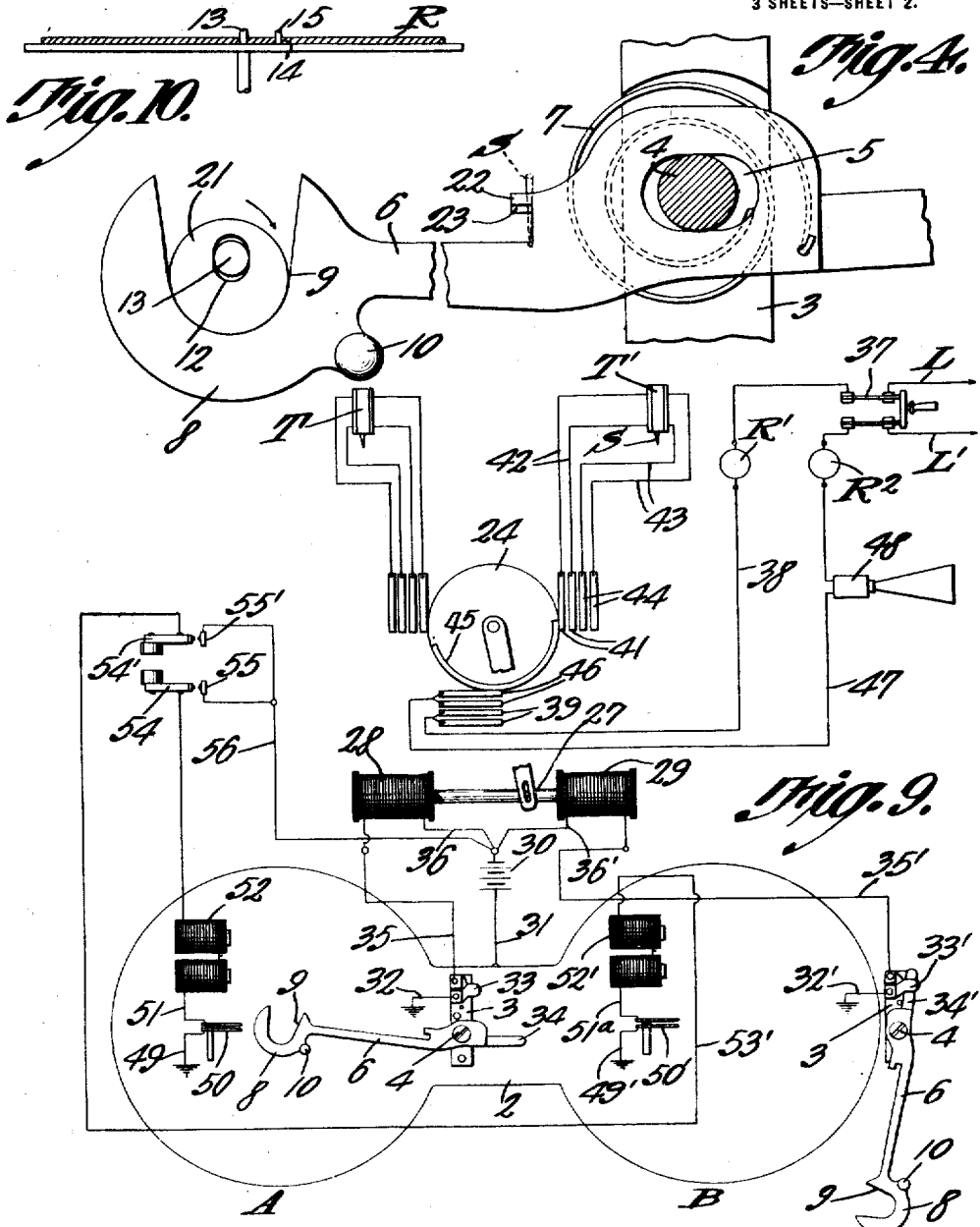
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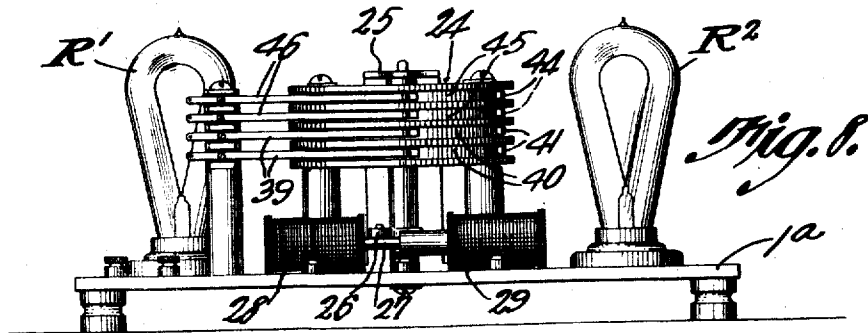
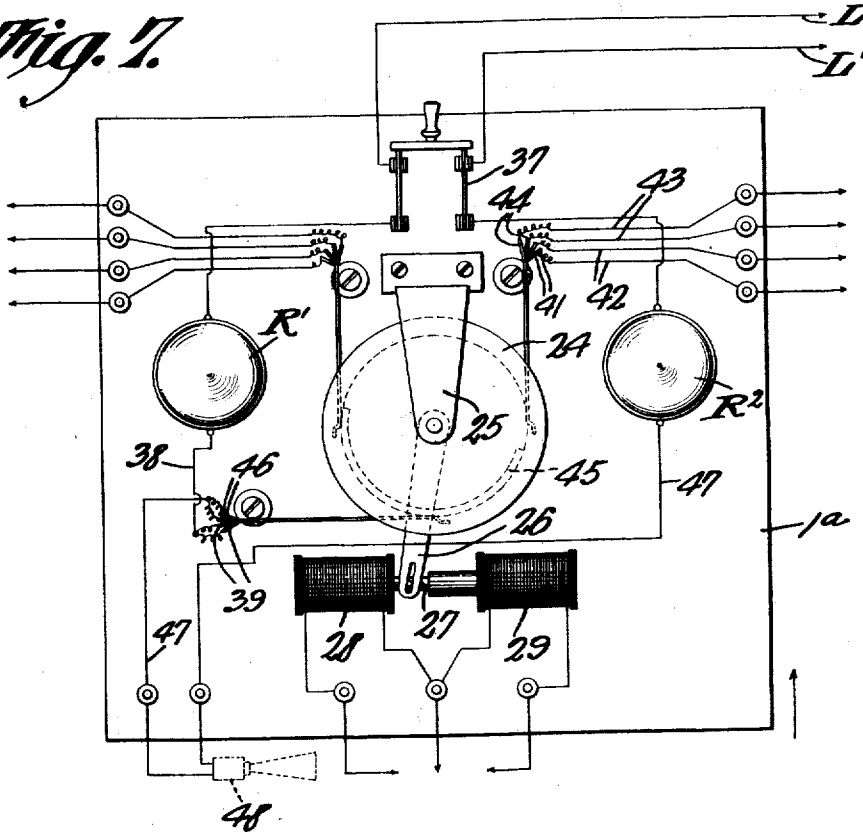
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3 SHEETS—SHEET 3.

Fig. 7.



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UNITED STATES PATENT OFFICE.

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STYLUS-POSITIONING AND CIRCUIT-CONTROLLING MEANS FOR SOUND-REPRODUCING MACHINES.

1,138,646.

Specification of Letters Patent.

Patented May 11, 1915.

Application filed October 30, 1913. Serial No. 798,296.

To all whom it may concern:

Be it known that I, CHARLES W. EBELING, a citizen of the United States, residing at Wheeling, in the county of Ohio and State of West Virginia, have invented a new and useful Stylus-Positioning and Circuit-Controlling Means for Sound-Reproducing Machines, of which the following is a specification.

10 The present invention relates to improvements in a stylus positioning and circuit controlling means for sound reproducing machines, one object of the present invention being the provision of means, which will properly guide the stylus to the phonic groove of the record at the initial rotation of the sound record carrier, said means being automatically released and moved out of the path of the stylus and from above the record to simultaneously close an electric circuit for electrically connecting a telephonic transmission means including the reproducer of the sound reproducing machine.

25 The present invention is especially applicable to sound reproducing machines used in connection with motion picture projectors, and more particularly to the structure set forth in my co-pending application filed even date herewith Serial No. 798,295 and also the main invention as shown in the application for patent of Harrison W. Rogers, filed February 7, 1913, Serial No. 746,890, the present mechanism being the result of experimenting with the mechanisms set forth in the above two applications, it being necessary only in the present instance to attach a device at the center of the record in combination with a pivoted arm capable of a slight sliding movement adjacent the record, the arm and the means carried by the record co-operating to move the stylus toward the beginning of the phonic groove during the initial starting of the record and to release the stylus guiding arm at such point so that it is automatically swung out of the path of the record and from thereabove to automatically close the circuit to the telephonic transmission device of the sound reproducing machine.

50 With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that

changes in the precise embodiment herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings—Figure 1 is a top plan view of the complete mechanism for guiding the stylus and controlling the circuit. Fig. 2 is a top plan view on an enlarged scale of the stylus controlling and guiding arm. Fig. 3 is a section taken on line 3—3 of Fig. 2. Fig. 4 is a view similar to Fig. 2 on an enlarged scale with the pin head removed to show the elongated slot to permit the longitudinal movement of the stylus guiding arm. Fig. 5 is a top plan view of the record carrying means for actuating and releasing the arm. Fig. 6 is a section taken on line 6—6 of Fig. 2. Fig. 7 is an enlarged top plan view of the selecting switch for the talking circuit and the solenoid for actuating the same. Fig. 8 is a front elevation thereof looking in the direction of the arrow Fig. 7. Fig. 9 is a diagrammatic view of the electrical circuit used in connection with the present invention and including the electrical circuit controlled by a moving film in a projector. Fig. 10 is a sectional view of a record disk upon its carrier illustrating the method of insuring the proper positioning thereof upon the carrier and also its positive rotation with the carrier.

Referring to the drawings, the numeral 1 designates a table or support, upon which is mounted the casing 2 carrying the sound reproducing mechanisms A and B, two in the present instance being shown and adapted to be operated by means of the driving shaft 100, which may be driven by a motor or from the projector mechanism (not shown) of a motion picture machine.

Adjacent to each mechanism A or B, is secured a plate 3, which by means of the pin or screw 4 forms a pivot through the instrumentality of the elongated slot 5 for the stylus guiding and controlling arm 6. This arm 6 as clearly shown, is adapted to be normally held in the position shown in connection with the machine B by means of the spring 7, while the headed end 8 is provided with the peculiar shaped recess 9 and with the operating knob or handle 10, by means of which the arm 6 may be manually moved from the position shown in connection with the machine B to the position as shown in connection with the machine A.

Adapted to be used in connection with the arm 6, and carried by the disk record R, centrally thereof, is a metal plate 11 having the central aperture 12 adapted to aline with the central aperture of the record, and receive the reduced upper end 13 of the centering pin of the record carrier. The record R is further provided with an aperture 14 adapted to fit upon a second pin 15 also carried by the record carrier, said pin 15 cooperating with the pin 13 to hold the record R against independent rotation of the carrier and at the same time constitute a means for assisting when the record R has moved one full revolution from the position shown at the machine A Fig. 1 to engage the opposite side *b* of the arm 6 to free the same from the cam or eccentric 21 which is carried by the plate 16, and the detailed construction of which will presently appear. In assembling the record for use, the pin 13 enters the aperture 12 of the disk 11 while the pin 15 enters the aperture 14 of the record R, the arm 6 being assembled so that the recess 9 embraces the cam 21, the pin engaging the arm 6 at the point *a* when the record is ready to be started. It is therefore evident, that when the record rotates and the pin 15 is brought to engage the arm 6 at contact *b*, that the rotating carrier will have a tendency to move the arm 6 away from the engagement with the cam 21, and thus free it to the action of the spring 7 which quickly snaps the same to assume the position shown in connection with the machine B, Fig. 1.

The eccentric or cam 21 is carried by the plate 16, which by means of the screw 17, the elongated slot 18 and the screw 19 in connection with several of the apertures 20 of the disk 11 is properly adjusted to impart as the record R is rotated, the desired longitudinal movement to the arm 6 so that the stylus S resting upon the inclined face 23 of the lug 22 of the arm 6 adjacent the pivoting point thereof, will be moved inwardly toward the beginning of the phonic groove of the rotating record R and by the time that the pin 15 engages point *b* of the arm 6, be placed in such groove and consequently be out of the position to be engaged by the projection 22 as the arm 6 is released from the cam 21 and is thrown by its spring 7 to the position as shown in connection with the machine B.

When the parts are assembled as in the position shown in Fig. 1, machine A, the eccentric 21 has a peculiar pulling action upon the head 8, so as to slightly hold the arm 6 against the tension of the spring 7, such tension being increased, as the record R is rotated and the cam 21 is moved to pull inwardly upon the arm 6 to place the stylus S in the phonic groove, the pin 15 at the desired point and approximately after the record has made a full rotation, engaging the

arm as before stated at contact *b* and thus disengaging it from the cam 21 so that the arm 6 may be moved entirely from over the record and throw its circuit closing arm 34 between the insulated switch members 33 to close a circuit, the purpose of which will presently appear.

Where the present device is used in connection with an electrical telephonic means for transmitting from the record R, a single transmitter is employed with each record, there in the present instance being two transmitters T'—T', and as it is desirable to maintain the circuit to the respective transmitters open until the stylus S has been positioned within the beginning of the phonic groove of the record R, the switch composed of the members 33 and 34 is provided for actuating means for operating a rotary or oscillatory switch 24. This switch 24 is composed of a cylinder or spool of insulation mounted in the bracket 25 upon the base 1^a, an arm 26 being connected to the axis thereof to be operated by means of the solenoid controlled rod 27 which is oscillated at the proper time by means of the respective solenoids 28 and 29 mounted upon the base 1^a.

The circuits controlled by the respective switches 33—34 of machine A and 33'—34' of the machine B, are clearly shown in diagram in Fig. 9. The circuit controlled by the switches 33—34, includes the battery 30, the conductor 31, the metal casing 2, the conductor 32, one of the contacts 33, the switch 34, the other contact 33, the conductor 35, the solenoid 28, and the conductor 36. Thus when the solenoid 28 is energized, the switch 24 is oscillated to assume the position as shown in the diagram to place in circuit the transmitter T of machine A.

The circuit controlled by the switch 33'—34' includes the battery 30, the conductor 31, the casing 2, the conductor 32', the switch 33'—34', the conductor 35', the solenoid 29 and the conductor 36'. Thus when the switch of the machine B is closed, the solenoid 29 oscillates the oscillatory switch 24, and thus connects the transmitter T' of the machine B in circuit.

In order to fully set forth the telephonic circuit, the circuit to the transmitter T' will we described, and includes the two line wires L—L' which feed direct current through the switch 37 to the conductor 38, the two supported metal contacts 39, which are in engagement with the segmental metal plates 40 of the switch 24, which when the switch 24 is in the position as shown in Fig. 9 are in contact with the two metal plates 41, the conductor 42, the transmitter T', the conductors 43, the two upper metal contact plates 44, the two upper metal segmental plates 45 of the switch 24, the two metal contact plates 46, the conductor 47, and the

amplifying receiver 48. It has been found desirable to connect in series with the conductors 38 and 47, resistance lamps R' and R².

5 It will thus be seen that when the switch 33—34' is thrown to the position as shown in machine B in Fig. 9, the stylus S being properly positioned in the phonic groove, that the switch 24 will be moved to the position as therein shown to thus energize the circuit including the transmitter T, so that the instant the portion of the groove that contains the sound record is engaged by the stylus S, the sound reproduced thereby will be transmitted through the electrical circuit and amplified in the device 48. By this means, the grating of the stylus S upon the rotating record up to a point of the closure of the switches 33—34 and 33'—34' is rendered inaudible and thus the objections to such grating sound is removed, such circuit for the sound reproducing or telephonic means being closed only when the sound reproducing portion of the groove is reached.

In diagram is shown two electromagnets 52—52', which in the co-pending application control the means for selectively connecting either one of the machines A or B to the driving shaft 100, a single battery source as the battery 30 being employed for this purpose and the circuit to each electromagnet being as follows: The battery 30, the conductor 31, the casing 2, the conductor 49, the switch 50, the conductor 51, the electromagnet 52, the pivoted member 54 controlled by the film of the projector and the stationary contact 55, and the conductor 56. This circuit is controlled for connecting machine A, the circuit for controlling machine B being, the battery 30, the conductor 31, the conductor 49', the switch 50', the conductor 51', the electromagnet 52', the conductor 53', the film controlled switch members 54'—55', and the conductor 56. Thus with two sound reproducing machines A and B, the same may be controlled successively to be started and stopped through the instrumentality of the film and as more particularly set forth in detail in the co-pending application mentioned above.

What is claimed is:

1. In a sound reproducing machine, a sound record carrier, a stylus, means for moving the stylus transversely of the phonic groove of a record to direct the stylus to the phonic groove of such record, and means actuated by the record carrier for displacing said stylus moving means after the stylus has been placed in the phonic groove of the record.

2. In a sound reproducing machine a sound record carrier, a stylus, a stylus positioning means movable transversely of the phonic groove of a record supported by said

carrier during the rotation of the carrier to direct the stylus to the phonic groove of such record, and means actuated by the record carrier for displacing said stylus positioning means after the stylus has been guided to the phonic groove of the record.

3. In a sound reproducing machine, a sound record carrier, a stylus, a pivotally displaceable stylus positioning means mounted for movement transversely of the phonic groove of a record supported by said carrier, means actuated by the carrier for imparting transverse movement thereto during the rotation of the carrier, and means actuated by the carrier for displacing the stylus positioning means after the stylus has been directed to the phonic groove of the record.

4. In a sound reproducing machine, a sound record carrier, a stylus positioning means, a circuit closer, and means actuated by the carrier for controlling the stylus positioning means and the circuit closer.

5. In a sound reproducing machine, a sound record carrier, a stylus, a stylus positioning means movable transversely of the phonic groove of the record supported by said carrier during the rotation of the carrier to direct the stylus to the entrance of the phonic groove of such record, means actuated by the record carrier for displacing said stylus positioning means after the stylus has been guided to the phonic groove of the record, and a circuit closer actuated by the stylus guiding means.

6. In a sound reproducing machine, a sound record carrier, a stylus, a pivotally displaceable stylus positioning means mounted for movement transversely of the phonic groove of a record supported by said carrier, means actuated by the carrier for imparting transverse movement thereto during the rotation of the carrier, means actuated by the carrier for displacing the stylus positioning means after the stylus has been directed to the phonic groove of the record, and a circuit closer actuated by the stylus positioning means.

7. The combination with a rotary sound record carrier, an electrical telephonic apparatus including a stylus operated transmitter, and a switch for opening and closing the circuit of said apparatus, of a swingingly mounted arm disposed for movement above the sound record, coöperable means carried in the free end of said arm and by the sound record for imparting a longitudinal movement to the arm during the rotation of the sound record carrier and record, a stylus holding and guiding means carried by the arm for placing the stylus in the phonic groove of the record when the arm is moved inwardly, and means carried by the record carrier for releasing the arm to permit such arm to close the switch.

8. The combination with a rotary sound

record carrier, an electrical telephonic apparatus including a stylus operated transmitter, and a switch for opening and closing the circuit of said apparatus, of a swing-
 5 ingly mounted arm disposed for movement above the sound record, coöperable means carried in the free end of said arm and by the sound record for imparting a longitudinal movement to the arm during the rota-
 10 tion of the sound record carrier and record, a stylus holding and guiding means carried by the arm for placing the stylus in the phonic groove of the record when the arm is moved inwardly, a switch closing member
 15 carried by the arm, and a spring connected to the arm for insuring the closure of the switch when the arm is released from the record.

9. The combination with a rotary sound
 20 record carrier, two record receiving pins carried thereby, and a stylus actuated transmitter mounted for movement above and in contact with the phonic groove of a record supported by the carrier, of a stylus guid-
 25 ing means, including a swingingly mounted arm having a hooked free terminal, a cam actuated by the carrier for engagement with the hooked terminal of the arm, whereby as
 30 the carrier is rotated, the arm has an inward and outward longitudinal movement imparted thereto, and means carried by the arm for receiving the stylus of the trans-
 35 mitter and directing the stylus into the phonic groove as longitudinal movement is imparted to the arm, the hooked terminal of the arm being freed from the cam when en-
 40 gaged by one of the pins during the rotation of the carrier.

10. The combination with a rotary sound
 40 record carrier, two record receiving pins carried thereby, and a stylus actuated transmitter mounted for movement above and in contact with the phonic groove of a record supported by the carrier, of a stylus guid-
 45 ing means, including a swingingly mounted arm having a hooked free terminal, a cam actuated by the carrier for engagement with the hooked terminal of the arm, whereby as the
 50 carrier is rotated, the arm has an inward and outward longitudinal movement im-
 55 parted thereto, means carried by the arm for receiving the stylus of the transmitter and directing the stylus into the phonic groove as longitudinal movement is imparted to the arm, the hooked terminal of the arm being freed from the cam when engaged by

one of the pins during the rotation of the carrier, and a spring connected to said arm for throwing the same to one side of the record carrier when released by the pin. 60

11. The combination with a rotary sound record carrier having a central pin, a second pin carried thereby intermediate of the center pin and its periphery, and a trans-
 65 mitter having a stylus for engagement with the phonic groove of a record supported by the carrier, of means for placing the stylus in the phonic groove of a record, including a plate, a pin carried thereby, an arm pro-
 70 vided with an elongated slot that fits upon the pin, the free end of said arm being provided with a hook for movement to and from the center of the carrier, and a cam
 75 actuated by the carrier for engaging the hook, whereby as the carrier is rotated, the cam imparts longitudinal movement to the arm, for placing the stylus in the phonic
 80 groove of a record, the second pin of the carrier after the carrier has rotated a prede-
 85 termined distance, engaging the arm to free its hooked terminal from the cam.

12. The combination with a rotary sound record carrier having a central pin, a second pin carried thereby intermediate of the center pin and its periphery, and a trans-
 85 mitter having a stylus for engagement with the phonic groove of a record supported by the carrier, of means for placing the stylus in the phonic groove of a record, including a plate, a pin carried thereby, an arm pro-
 90 vided with an elongated slot that fits upon the pin, the free end of said arm being provided with a hook for movement to and from the center of the carrier, a cam actuated by the carrier for engaging the hook,
 95 whereby as the carrier is rotated, the cam imparts longitudinal movement to the arm for placing the stylus in the phonic groove of a record, the second pin of the carrier
 100 after the carrier has rotated a predetermined distance engaging the arm to free its hooked terminal from the cam, and a spring for moving the arm from above the record when the arm has been moved from engage-
 105 ment with the cam.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES W. EBELING.

Witnesses:

SELINA WILLSON,
 NELLIE HERNDON.