

Jan. 5, 1943.

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2,307,259

PHONOGRAPHIC REPRODUCING DEVICE

Filed Sept. 11, 1941

2 Sheets-Sheet 1

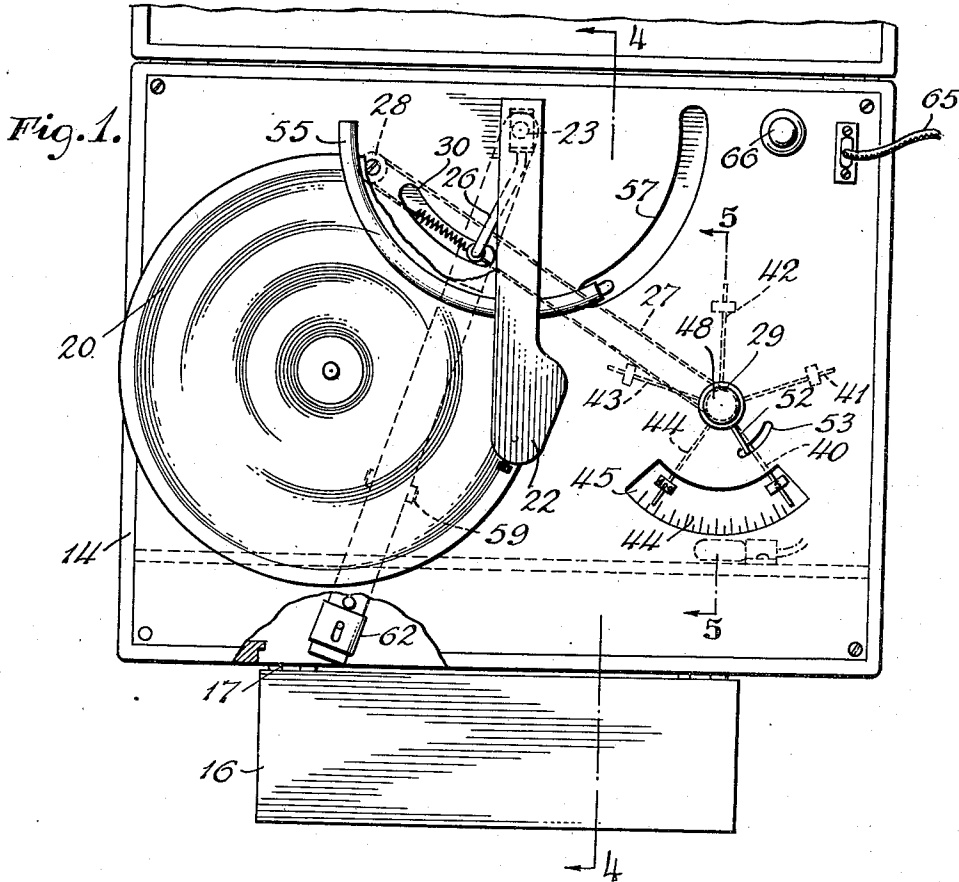
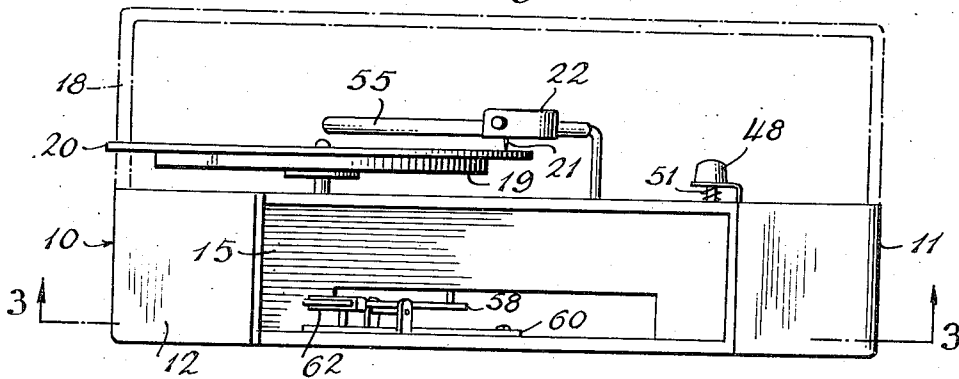
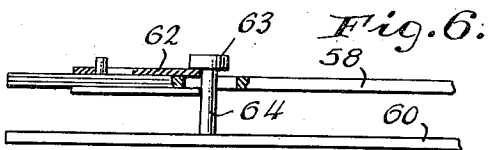


Fig. 2.



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2 Sheets-Sheet 2

Fig. 3.

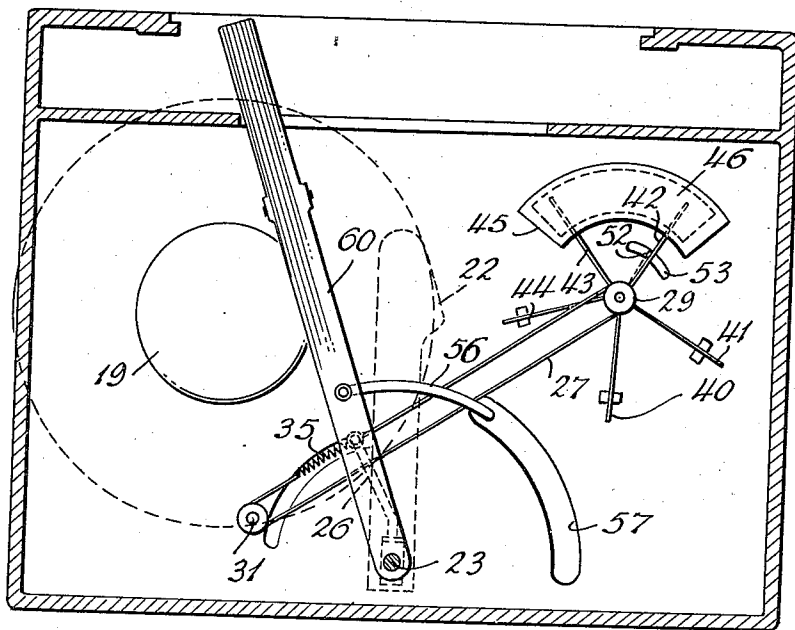


Fig. 4.

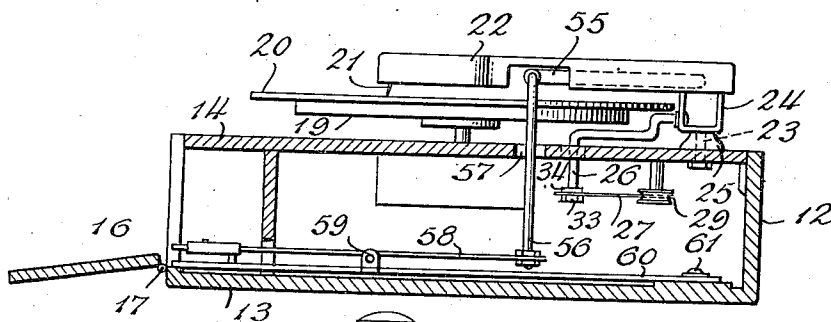
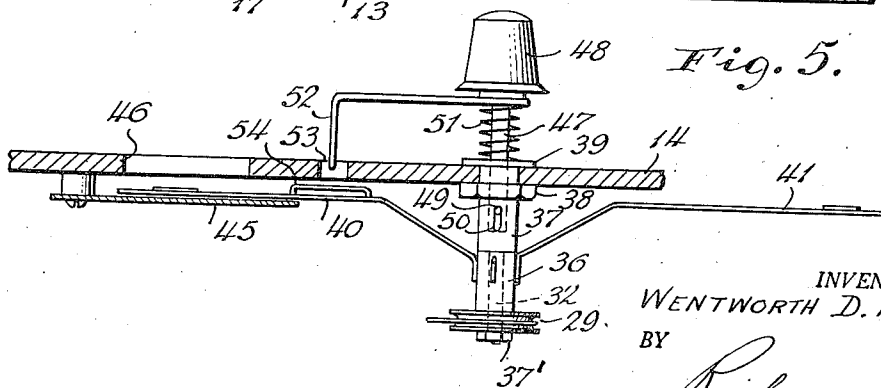


Fig. 5.



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PHONOGRAPHIC REPRODUCING DEVICE

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Application September 11, 1941, Serial No. 410,364

5 Claims. (Cl. 274—1)

This invention relates to phonographic reproducing devices and more particularly to a mechanism for reproducing and repeating selected parts of the sound record and for indicating the position of the reproducing stylus on the same.

One or the principal objects of the invention is to provide a phonographic device which will facilitate the study and analysis of sound records of speech and music and other subjects requiring auditory perception, such as languages.

A more particular object is to provide a manually controlled mechanism for placing the pick-up reproducer on any selected part of the record and which is equipped with indicating means actuated by oscillation of the reproducer to indicate the exact position of the reproducer stylus on the sound record.

A further object is to provide manually operable means for lifting the tone arm and reproducer stylus from the sound record and returning the tone arm to its selected starting position and lowering the stylus into the respective sound groove and which will support the tone arm in an elevated position with the reproducing stylus out of contact with the record.

Another object is to provide a tone arm unit equipped with a rotary indicator or pointer actuated by the tone arm for indicating on a fixed dial having numbered graduations corresponding to the grooves of the sound record the exact position of the stylus on the record.

Still a further object is to provide a mechanism for synchronizing the starting position of the tone arm with the starting position of the indicator arm.

Other objects and advantages inherent in the invention will become apparent from the following detailed description given in conjunction with the accompanying drawings which illustrate a preferred embodiment of the invention.

It will be understood, however, that this disclosure is by way of example only and the invention may lend itself to a variety of expressions within the scope of the appended claims:

In the drawings:

Figure 1 is a top plan view of a phonographic device, according to the invention, with the cover removed;

Figure 2 is a front elevation;

Figure 3 is a section along the line 3—3 of Figure 2;

Figure 4 is a section along the line 4—4 of Figure 1, and

Figure 5 is a section along the line 5—5 of Figure 1.

Figure 6 is a detailed view of the locking mechanism for the lifting mechanism drawn to an enlarged scale.

Throughout the drawings, the same reference characters indicate the same or analogous parts.

The device according to the invention comprises in terms of broad inclusion a conventional device for reproducing a disc phonograph record employing either "head-phones" or a loudspeaker for audible reproduction of the sound. A lifter mechanism makes it possible to remove the reproducer arm from the record at any time by depressing a lever. When the lever is released, the reproduction will continue from the point where it was stopped by the raising of the reproducer arm. Any part of the record may be repeated by moving the lever mechanism sideways. While the lever is held down, the reproducer arm may be set to any position desired on the record. A dial, graduated to correspond with the grooves on the record, indicates the position of the reproducer arm and the stylus at all times. By noting the reading on the dial, the stylus may be set instantly to reproduce any desired part of the record.

Referring in greater detail to the drawings, 10 indicates generally the cabinet, comprising vertical side wall members 11 and end wall members 12, a bottom panel 13 and a top panel 14. One of the end walls is provided with an opening 15 and a corresponding door 16 which is hinged at 17 to the bottom panel 13. The cabinet may also include a hinged cover 18.

Within the cabinet are housed the motor, if the device is run by power, the amplifiers and other mechanism pertinent to a phonographic device. None of these mechanisms are shown in the drawings, however, since they do not constitute part of the instant invention.

The phonograph or sound reproducing machine includes a turntable 19 actuated by an electric or other motor (not shown), and which can be switched on and off from the current coming through the lead 65 by means of the switch knob 66. The turntable is adapted to receive a sound record 20 having the usual feed grooves which are engaged by the stylus 21 of the tone arm 22. The arm 22 is mounted on the pivot 23 on the panel 14 by means of the hub 24 and the spacer 25. It will be understood that the tone arm 22 will be carried inwardly over the record when the latter is rotated by virtue of the spiral arrangement of the feed grooves.

The tone arm 22 may be of any conventional

construction and a detailed description thereof is deemed unnecessary.

To the hub 24 of the tone arm 22 is fixed the dial drive bar 26. This bar 26 is bent to bring its field of movement into line with the transmission belt 27 which runs about the idling pulley 28 and the pointer pulley 29. An arcuate slot 38 is provided in the panel 14 for accommodation of the arm 26. The pulleys 28 and 29 are mounted on spindles 31 and 32 depending from the top panel 14.

The transmission belt 27 is pulled through a screw-threaded hole in the end of the bar 26, and a washer and nut 33 and washer 34 tightened down upon it to prevent it from slipping.

A tension spring 35 is inserted into the transmission belt to take up any slack.

The pulley 29 is fixed to the hub 30 and which is rotatable about the spindle 32. The pulley and the hub are connected to the spindle by means of the nut 37. The spindle 32 is provided with an enlarged hollow portion 37 which is anchored in the panel 14 by means of the nut 38 and the washer 39. The hollow section 37 forms an abutment for the hub 36.

On the hub are also mounted a plurality of dial pointers 40, 41, 42, 43 and 44, which move across a dial segment 45 visible through a slot 46 in the panel 14. The dial is provided with graduations corresponding to the grooves in the record 20 in the particular embodiment shown in the drawings. The scale is the equivalent of 100 grooves. The pointer 40 is marked the "starting pointer." The pointers are so arranged that when the starting pointer 40 is opposite "100" on the dial segment, the "100" pointer 41 will appear opposite "0". When the pointer 41 is opposite "100," the "200" pointer 42 will appear opposite "0," and so on. Thus the use of five pointers permits the reading of "0" through "500" on a scale which shows only "0-100."

The dial mechanism operates, as follows: as the tone arm travels across the record 20, a certain distance or a number of grooves, the drive bar will travel a corresponding distance. The transmission belt 27 also moves a corresponding distance. The circumference of the dial pulley 29 has been calculated to be equal to this distance. Thus the maximum movement of the head of the tone arm 22 across a conventional 12 inch record will cause the dial pulley to make one complete revolution.

A spindle 47 is reciprocable within the sleeve section 37 and is provided with a knob 48. The spindle 47 is provided with a pin 49 which moves in the slot 50 on the sleeve section 37. The spindle 47, as well as the knob 48, are held in projected position by means of the spring 51. It will be understood that the knob 48 may be pressed downward against the tension of the spring 51 within the limit of the slot 50.

The spindle 47 is provided with a hook 52 which can be moved within the slot 53 by turning the knob 48. The hook 52 can be depressed deeper into the slot by depressing the knob 48 and it will then engage the projection 54 on the indicator pointer 40. By virtue of this construction, the starting indicator pointer 40 can be set exactly at "0." The setting is accomplished by depressing the knob 48 and adjusting the hook 52 opposite "0." When the tone arm is moved across the record by hand, the indicator pointer will rotate with it until the projection 54 of the starter arm 40 is engaged by the hook 52. Further movement of the tone arm will simply cause the

transmission belt 27 to slip about the pulley 29 while the indicator pointers are held stationary.

The means for raising and lowering the tone arm and its needle with respect to the disc record comprises an arcuate, horizontal support member 55 which is adapted to engage the underside of the tone arm 22. The support member 55 is covered with a rubber sleeve or similar cushioning material to insure good contact and prevent slipping when the tone arm is moved to a new position. The support member 55 is joined to a bent bar 56 which is accommodated in the slot 57 and connected to the lever 58. The lever 58 is pivoted at 59 to the bar 60 for up and down movement. The bar 60 is, in turn, pivoted at 61 for movement in a horizontal plane in the opening 13 in the front of the cabinet.

The pivot point 61 is at the same point that the tone arm 22 is pivoted to the panel 14. This causes the support member 55 to swing through the same arc as the tone arm when the lifter mechanism swings from side to side. The arcuate support member 55 is long enough so that no matter what the position of the lifter mechanism, whether extreme right or extreme left of the slot, or any intermediate position, and no matter what the position of the tone arm and the head, the supporter member will always be beneath the tone arm. Thus the lever 58 together with the bar 60 provides a universal connection so that the supporter member can be moved simultaneously sideways and up and down. Slight pressure on the lever 58 will lift the needle off the record.

The lifter mechanism may be held in its raised position by means of a sleeve 62 which is slidable on the end of the lever 58. When it is desired to keep the needle in a position raised above the record, the sleeve 62 is simply pushed by the thumb of the operator beneath the head 63 of the bolt 64 which is connected to the bar 60.

The operation of the lifter mechanism will be apparent from the foregoing description. When the lever 58 is depressed, the supporter member 55 rises. In so doing, it lifts the tone arm enough so that the needle will be out of contact with the record. If the lever 58 is released without moving the bar 60, the needle will be returned to the record at the same point. On the other hand, if the bar 60 is moved together with the lever 58 when the latter is in depressed position, the head of the tone arm 22 can be returned to a new position on the record. Since the arm 60 is pivoted directly below the pivot of the tone arm 22 and the dial drive bar 26, the latter will be swung through the same arc as the lifter mechanism. It will be understood that any movement of the tone arm from side to side will be reproduced exactly by the drive bar 26. This movement will be transmitted through the pulleys 28 and 29 and the transmission belt 27 to the dial pointers, which latter will indicate the movement on the scale of the dial plate 45.

What is claimed is:

1. In a device for reproducing a disc phonograph record, a reproducer arm pivoted at one end to swing across said record, a drive bar pivoted jointly with said reproducer arm, a dial having graduations corresponding to the grooves of said record, and an indicator mechanism controlled by said drive bar to move across said dial and means for restraining the movement of said indicator mechanism when said reproducer arm is moved across said record whereby said indi-

cator mechanism may be adjusted with respect to said reproducer arm.

2. In a device for reproducing a disc phonograph record, a base, a reproducer arm pivoted at one end to said base to swing across said record, a pair of spaced pulleys on said base and a transmission belt for said pulleys, a drive arm pivoted jointly with said reproducer arm to swing between said pulleys, said drive arm being connected to said transmission belt whereby said belt will be moved by said reproducer arm during the playing operation, a dial adjacent one of said pulleys, having graduations corresponding to the grooves of said record, and a pointer arm carried by said last-mentioned pulley and rotatable therewith to move across said dial to indicate thereon the number of grooves traversed by said reproducer arm.

3. In a device for reproducing a disc phonograph record, a base, a reproducer arm pivoted at one end to said base to swing across said record, a pair of spaced pulleys on said base and a transmission belt for said pulleys, a drive arm pivoted jointly with said reproducer arm to swing between said pulleys, said belt will be moved by said reproducer arm during the playing operation, said drive arm being connected to said transmission belt, a dial adjacent one of said pulleys, having graduations corresponding to the grooves of said record, a pointer arm carried by said last-mentioned pulley and rotatable therewith to move

across said dial to indicate thereon the number of grooves traversed by said reproducer arm, a manually operable universal lever mounted on said base below said record, a support carried by said lever for engaging said reproducer arm in any position on said record, whereby said reproducer arm may be raised out of contact with and reset on said record at will.

4. In a device for reproducing a disc phonograph record, a reproducer arm pivoted at one end to swing across said record, a drive bar pivoted jointly with said reproducer arm, a dial having graduations corresponding to the grooves on said record, an indicator mechanism controlled by said drive bar to move across said dial, said indicator mechanism and said dial being arranged to indicate the number of grooves traversed and means for restraining the movement of said indicator mechanism when said reproducer arm is moved across said record, whereby said indicator mechanism may be adjusted with respect to said reproducer arm.

5. In a device for reproducing a disc phonograph record, a lifter mechanism for raising the tone arm out of contact with the record, said lifter mechanism comprising a universal lever mounted for articulation below said record, a vertical support carried by one of the arms of said lever, said support having a lateral extension for engaging the tone arm in any position on said record.

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