

Sept. 23, 1941.

J. L. ROUTIN

2,256,578

TALKING MACHINE

Filed June 25, 1938

4 Sheets-Sheet 1

Fig. 1.

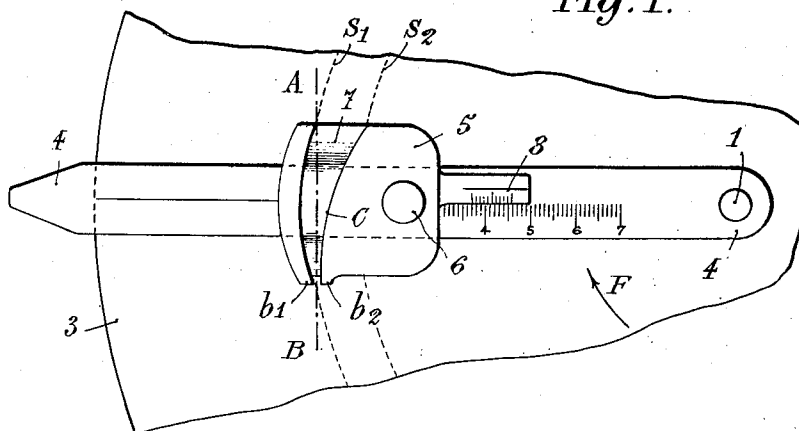


Fig. 2.

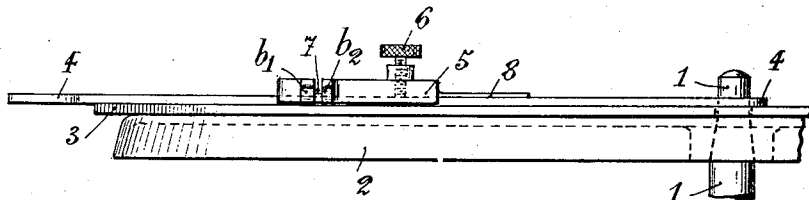
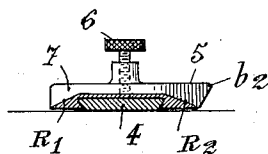


Fig. 3.



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Fig. 7.

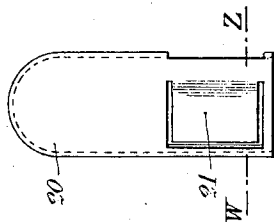


Fig. 8.

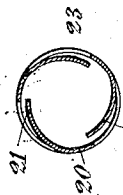


Fig. 6.

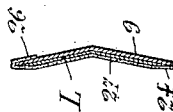


Fig. 9.

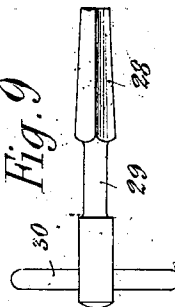


Fig. 4.

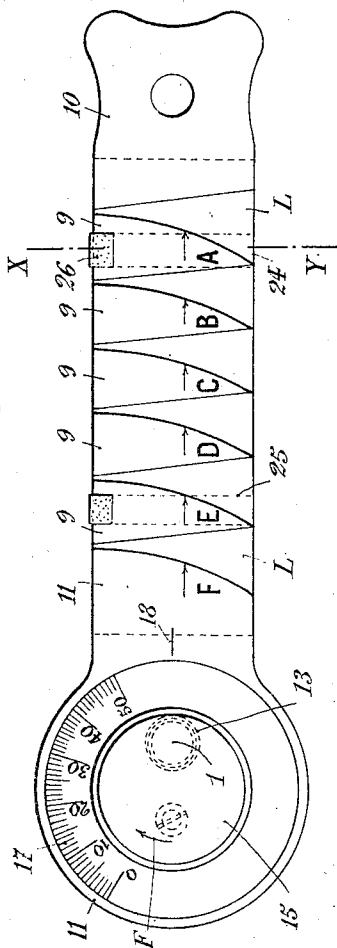
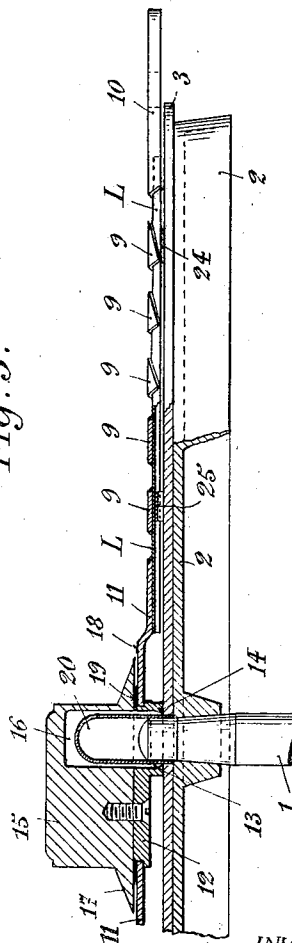


Fig. 5.



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Fig. 10.

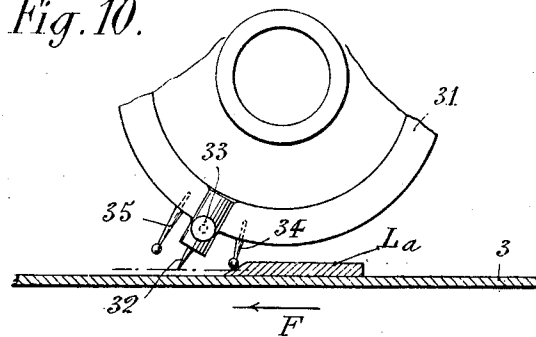


Fig. 11.

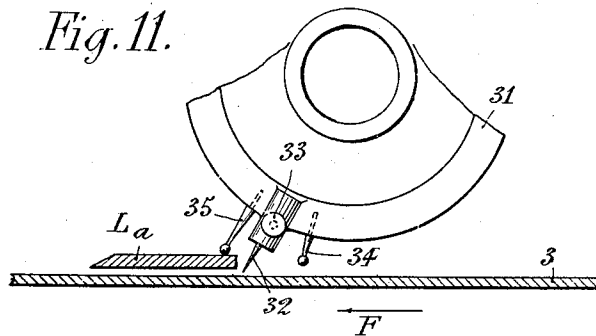
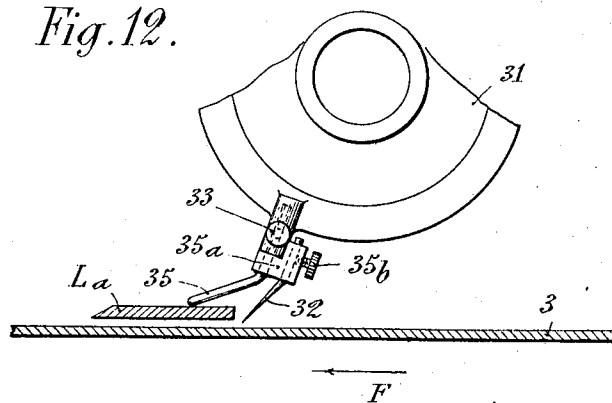


Fig. 12.



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Fig. 13.

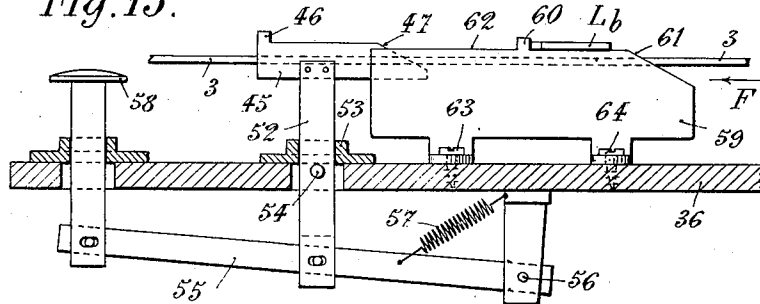


Fig. 14.

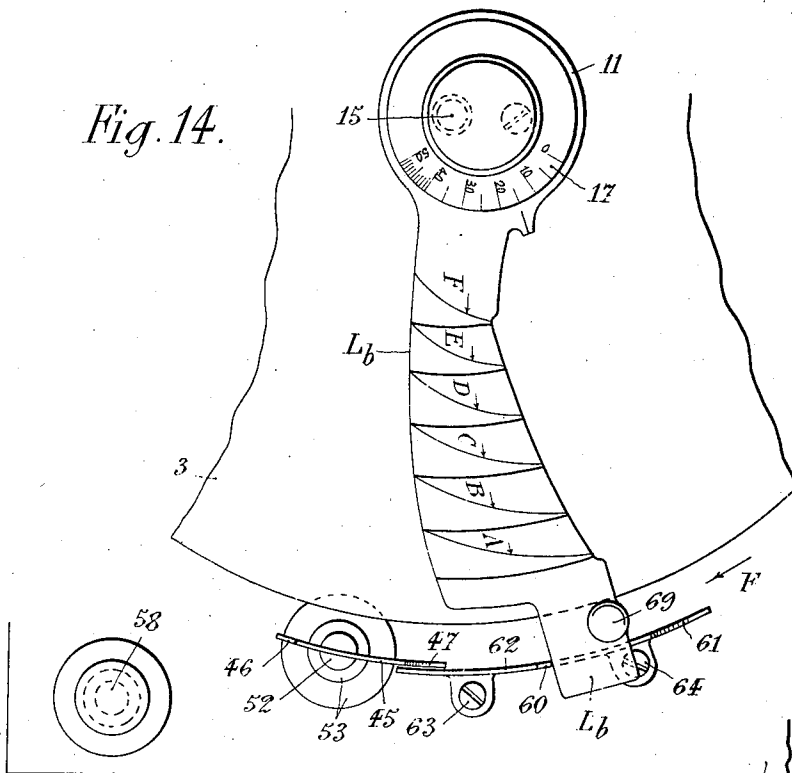
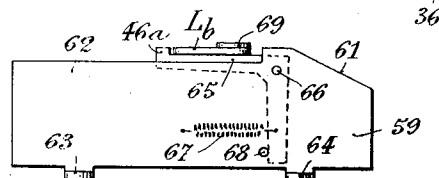


Fig. 15.



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TALKING MACHINE

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Application June 25, 1938, Serial No. 215,789

In France July 2, 1937

5 Claims. (Cl. 274—14)

The invention relates, in particular, to applications of talking machines (phonographs or pick-up) to the study of foreign languages by using the two principles of sub-dividing and repetition; and, the object of the invention is a device whereby, on the one hand, the audition of a disc may be quickly suspended at any time for any length of time, and, on the other hand, the renewal of the audition is assured at a pre-determined point of the recording.

In accordance with the invention, one uses for this purpose, in combination with a talking machine, an apparatus which obtains the repetition at any part whatsoever of the recording, characterized by the fact that it comprises a thin and rigid strip which is provided with guiding means permitting it to slide between the reproducing sound needle (or pick-up) and the disc in the direction of the rotation of the disc, the so-called strip being provided with a groove (or canal) with sides flared in the general form of a V, the ends of the flaring corresponding to two grooves on the disc defining the passage which is to be repeated, and the groove (or canal) being shaped in such a way as to bring the needle into the place in an outside groove of the disc.

Figures 1 and 2 schematically give an example of the invention, showing respectively in plan and elevation, how the invention is realized.

Figure 3 shows a section through A—B of Figure 1.

Figures 4 and 5 show respectively in plan and in elevation, with parts in section, a variation of the repeating apparatus shown in Figure 1.

Figure 6 shows a section along X—Y of Figure 4.

Figure 7 shows a detail of Figures 4 and 5.

Figure 8 shows a section along W—Z of Figure 7.

Figure 9 shows a tool for adaptation of the discs in the case where the arrangement shown in Figures 4 and 5 is used.

Figures 10 and 11 schematically show the devices which avoid all shock, between the needle and disc as well as between the repeater and needle.

Figure 12 shows a form of realization of one of the devices shown in Figures 10 and 11.

Figures 13 and 14 schematically show respectively in elevation and in plan a mechanism comprising two abutments arranged to stop the repeater respectively in the positions of silence and audition, the repeater being of a modified form.

Figure 15 shows a variation of the abutments

shown in Figures 13 and 14, which stop the repeater in the position of audition.

In Figures 1, 2 and 3, 1 designates the motor axis of the talking machine which turns in the direction indicated by arrow F, and on which is mounted the table 2 which supports a disc 3; 4 designates a thin and rigid strip, the one extremity of which has a hole in which is engaged the axis 1; 5 designates a slide mounted on strip 4, as is shown in Figure 3; 6 designates a screw which locks slide 5 to strip 4; 7 designates a groove in 5 and the shape of which is such that when the reproducing needle is in one of the grooves of the record disc between S1 and S2, in displacing by hand the slide 4 in the direction of the arrow F, one brings about firstly, because of the ramp R1 the raising of the needle; then, because of the curved side C, which acts as a cam, the return of the needle; and, finally, because of the ramp R2, the setting in place, without shock, of the needle on the disc, the setting in place which, because of the guiding of the points b1 and b2, is effected exactly on the record groove S1, regardless of the position which the needle occupied at the moment where it had been raised; 8 designates a vernier comprised of a graduated scale fixed to 5 which may be displaced before a graduation on 4.

In order to use the device just described, one proceeds in the following manner:

The slide 4 being immovable while held at its end between the thumb and the index finger of the right hand, one grasps the arm of the phonograph by the left hand and sets the strip and the arm of the phonograph in such a way that the reproducing needle comes to rest in groove 7. Taking care to avoid any stopping, one holds the end of the slide slightly raised as well during the period of audition as during the interval of silence.

This putting in place being done, the use comprises the following steps:

In order to obtain the audition, first of all turn the repeater strip slowly in the direction of the rotation of the disc until the needle is about one millimeter from the edge; then, let the strip rest on the disc and let it stay thus; finally, quickly remove the right hand in such a way as not to stop the strip—which is now turning with the rotation of the disc, before it strikes against the needle.

In order to suspend the audition, turn the strip by always holding it slightly raised, in such a way that the needle, after being engaged in

the groove 7 is held away from the disc. One thus again finds the position corresponding to the starting position.

It is clear that at the renewal of the audition, the repetition will be automatically assured each time since the duration of the preceding audition will not be in excess of the time as set for the needle to pass from record groove S1 to groove S2, because the needle will then rest in the groove and will be placed on the disc in record groove S1.

In Figures 4, 5, 6, 7, 8 and 9 where the parts of the phonograph are designated same as before, L designates a repeater strip constituted of a rectangular metallic section which has been slightly bent so that it is higher at the longitudinal center thereof and slopes laterally and downwardly from the center to the edges; 9, 10 and 11 designate pieces which are fixed on L and which delimit six grooves of generally V form designated A, B, C, D, E and F; 12 designates a cylindrical hub mounted to turn in 11 under light frictional engagement such as normally presents turning, and having an eccentric hole 13; 14 designates a socket member, the perforation of which is slightly conical, and which is integral with 12; 15 designates a button rigid with 12 and in which is a cylindrical flaring opening 16; 17 designates a graduated dial integral with 15 which is used in combination with a fixed index 18 traced on 11; 19 designates a washer of bent steel interposed between 11 and 17 to oppose to the rotation of 15 by the torque due to a predetermined frictional engagement between the parts; 20 designates a brass tube or hood closed at its upper end and having at its lower part three U shaped cuts, the metal between the sides of the U shapes being pressed to the inside to provide three incurved projections 21, 22 and 23 which are supported by three equi-distant surfaces on the free end of the shaft 1; 24 and 25 designate two bands of very thin and very supple leather which are fixed to L, in such a way that the parts which are interposed between the bevels or lateral slopes of L and the disc conserve all their suppleness; 26 and 27 designate the points of attachment used for 24; 28 designates a reamer permitting the enlargement of the orifice of the disc in such a way that its diameter is exactly equal to that of hood 20 and which is constituted of a piece of hard steel, the section of which is triangular and is a crescent from right to left; 29 designates a restricted piece which connects 28 to an operating handle 30.

It is obvious that for a determined setting of the repeater strip L, one may progressively displace the so-called strip in the direction of its length by turning the button 15; and, under the condition that the maximum amplitude of this displacement is slightly higher than the distance which separates two adjacent grooves, it will be evident that it is always possible after having selected the groove which is suitable, to regulate the apparatus so that the needle is placed at a predetermined distance from the center of the record disc. It is to be noted that with this form of realization, each marking will thus comprise the two indications of the groove and of the graduated dial.

Also, one sees that the use of the hood 20 always keeps at the same standard value the diameter and length of the end of the shaft on which the repeater should be mounted. One also sees that the use of the reamer allows operators

to very easily adjust the central perforation of the disc to the diameter of the hood, which assures an exact precision in the markings of the paragraphs on the record disc.

The adjunction of the socket 14 prevents the end of the eccentric ring 11 from striking against the disc, as soon as the handle 10 is raised.

The cylindrical flaring opening 16 of the button 15 and the conicity of the perforation of socket 14 prevents the raising of handle 10 from stopping the shaft by bearing against it.

The adjunction of the shoes of supple leather 24 and 25 avoids noise caused by the scratching of the strip L against the disc, as well as avoiding any deterioration of the surface of the disc.

The strip L is made by preference of steel and in order to avoid any deterioration of the surface by the needle point, the surface may be covered by a layer of chrome by electrolysis. For variation, the hardening of the surface may also be obtained by a layer of nickel-cobalt alloy, or even by tempering or nitriding.

The other parts of the repeater are made by preference of nickel steel and fixed to L by electric welding. For variation, this attachment may also be made by the help of rivets or eyelets.

One may use needles of the bent type which present notably the advantage of being more easily raised by the horizontal displacement of the section L.

In order to prevent the needle from sliding the length of the strip, it will suffice to cut fine saw teeth (not shown) along the edge on which the needle is raised. One can also, at the same time, shape this edge following the arc of the circle described by the needle, as shown in a later described modification.

In the schematic Figures 10 and 11, as before, 3 designates the disc and F the direction of its displacement. La designates a repeater strip in section; 31 designates the body of the reproducer; 32 designates the needle held by a screw 33; 34 designates a rod, attached to reproducer 31, which terminates in a blunt point and the length of which is regulated in such a way that it never bears on the disc and during the audition it is at a distance from the disc slightly less than the thickness of La; 35 designates a rod fixed on reproducer 31 which terminates in a blunt point and the length of which is regulated in such a way that it never bears on the disc and during the audition it is at a distance from the disc slightly greater than the thickness of La.

In Figure 10 which shows the position of the slide at the moment when it is going to suspend the audition, one sees that the adjunction of the rod 34 permits the raising of 31 before the slide La has reached the needle 32.

In order to use the rod 35, the manoeuvre which brings about the renewal of the audition should involve the following: firstly, progressive displacement of the slide La held raised in the direction of arrow F until 35 falls on La, which position is shown in Figure 11 and in which the needle point is a little below La; then progressive lowering of the slide La until the needle 32 is in contact with the disc; and, finally, at the beginning of the audition, release the slide to rotate with the disc.

It is clear that in operating, as just described, the rod 35 will act as a shock-absorber and will assure renewal of contact between the needle and the disc with more gentleness than if the hand directly touched the reproducer itself.

In this case, one will note that it is no more

necessary that the slide be bevelled along the edge which is the outlet of the needle.

The rod 34 will be engaged in the grooves, but the rod 35 will bear, from preference, on the surface of the divisions which separate the slots.

In order to permit regulation of their length, the rods 34 and 35 should be constituted of screws with blunt points, mounted on fixed parts of the reproducer.

For variation, one may, as is shown in Figure 12, mount the rod 35 in the housing of the reproducer reserved for the needle and fix on this rod 35, a piece 35a in which the needle will be fastened by a screw 35b; and this variation presents the advantage of the ensemble 35, 35a, 35b, the mounting of which on the reproducer may be easily effected by all operators.

In Figures 13 and 14, as before, 3 designates the disc which is displaced in the direction of the arrow F; Lb designates a repeater strip shaped, as described hereinafter; 36 designates the upper wall of the phonograph box; 45 designates an abutment constituted of a metallic section which comprises a stop shoulder 46 and a ramp of approach 47; 52 designates a cylindrical stem integral with 45 which can slide in socket 53 and which has a stop pin 54; 55 designates a lever which turns about 56 and which a spring 57 tends to raise until 54 strikes against 53; 58 designates a push-button which permits, by turning 55, the progressive lowering of abutment 45; 59 designates a second abutment constituted of a metallic section incurved following the arc of a circle concentric to the disc and which comprises a stop shoulder 60, a ramp of approach 61 and a guiding rail 62; 63 and 64 designate two tabs which attach 59 to 36.

For the realization of this particular application, the two sides of the repeater strip Lb which produce the raising and the lowering of the needle, have been shaped, as is shown in Figure 14, following the arc of a circle described by the point of the needle; and the ensemble is thus characterized as a tailed comet. Also the reproducer 31 (see Figure 11) should be provided with a shock absorber playing the role of rod 35 (see Figure 11).

The abutment 45 is mounted in such a way as to stop the strip in the position which is shown in Figure 11 and which corresponds to silence; and the abutment 59 is mounted in such a way as to stop the strip in a position which corresponds to audition.

In order to pass the strip from the position of audition to the position of silence one should first of all slightly raise Lb in order to pass it over the stop shoulder 60, then, after having placed it on the guiding rail 62 which keeps it away from the disc, one displaces it toward the left until it is stopped by 46.

In order to pass the slide from the silent position to the audition position, it suffices to press the push-button 58 until the stop shoulder 46 is below the surface of the disc; the slide is then taken up in the movement of rotation of the disc and comes, due to its inertia, to place itself in the position shown in Figure 14, against the stop shoulder 60 of the abutment 59.

In Figure 15, 65 designates a crank lever which may turn about axis 66 fixed at 59, and the horizontal arm of which has a stop 46a which replaces the stop 46 of Figures 13 and 14, while the vertical arm is constantly acted on by spring 67 to apply itself against an abutment 68; 69 designates a push button fixed to Lb.

This variation presents the advantage of avoiding the raising of the slide in order to pass over the stop shoulder 46a of the audition abutment; one sees in effect immediately that it suffices to press on 69 so that the horizontal arm of 65 is inclined and the stop 46a is lowered below the guiding rail 62.

What is claimed is:

1. A repeater device to be used with a sound-reproducing machine having a rotatable table carried by a spindle projecting above the table, the table carrying a grooved record disc along in its rotation, and a liftable reproducer including a needle for engagement in the grooves of the disc during reproduction, said repeater device comprising an elongated, narrow strip longer than the radius of the disc extending generally radially of the disc and having one end thereof provided with an opening pivotally engaging the spindle and having its other end formed with a handle to be grasped by the operator to permit raising it and swinging it about its pivot at will, means for supporting said end of the strip in raised position off the record in position to raise the needle off the record and in another position, during reproduction, entirely free of the reproducer and its needle, said strip carrying at least one transverse groove extending across the strip in its upper face and comprising guiding means cooperating with a part on the reproducer whereby to lift the needle and move it back at will, said groove having flaring sides, the distance between the sides at the flared end corresponding to the distance between two record grooves defining the maximum amplitude of the passage to be repeated, the sides of the groove being shaped to lead the needle, after it is raised by the strip engaging said part on the reproducer and in the swinging movement of the strip about its pivot, back into the outside groove of the selected passage, and means associated with said strip for regulating, at will, the distance of the groove from the spindle axis, whereby any selected short or long passage of the record may be repeated at will.

2. A repeater device to be used with a sound-reproducing machine having a rotary table supported and driven by a spindle projecting above the table, the table carrying a spirally grooved record disc along in its rotation, a liftable reproducer including a needle for engagement in the grooves of the disc during recording, said repeater device comprising an elongated narrow strip longer than the radius of the disc extending generally radially of the disc and having one end thereof provided with an opening pivotally engaging the spindle and having its other end formed with a handle to be grasped by the operator to permit raising it and swinging it about its pivot, at will, means for supporting said handle end of the strip, first, in a position in which it supports the reproducer with its needle raised off the disc, and second, in a position, during reproduction, entirely free of the grooved portion of the record and the reproducer and its needle, said strip having a series of transverse grooves in its upper face extending substantially the width of the grooved portion of the record disc, said grooves comprising guiding means cooperating with a part on the reproducer whereby to lift the needle off the record and move it back, each of said grooves having flaring sides and being disposed one after the other lengthwise of the strip and having their adjacent flared sides intersect along one margin of the strip and their narrow ends arranged in spaced relation along the

other margin of the strip, the grooves permitting, by proper manipulation of the strip, the repetition of any selected short or long portion of the record.

3. A repeater device to be used with a sound reproducing machine having a rotating table carried by a spindle projecting above the table, the table carrying a grooved record disc along in its rotation, and a liftable reproducer including a needle for engagement with the grooves in said disc, said repeater device being arranged, during reproduction, entirely free of the reproducer and its needle, being capable of repeating, at will, any desired part of the record disc and comprising an elongated, narrow strip longer than the radius of the disc, extending generally radially of the disc and having one end thereof provided with an opening pivotally engaging the spindle and having its other end formed with a handle to be grasped by the operator to permit raising it and swinging it about its pivot at will, said strip carrying at least one transverse groove in its upper face comprising guiding means cooperating with a part on the reproducer whereby to lift the needle off the record and move it back at will, said groove having flaring sides, the distance between the sides at the flared end of the groove corresponding to the distance between two record grooves defining the maximum amplitude of the passage to be repeated, the sides of the groove being shaped to lead the needle, after it is raised by the strip engaging said part on the reproducer and in the swinging movement of the strip about its pivot, back into the outside groove of the selected passage, and means associated with the strip for regulating, at will, the distance of said groove from the spindle axis, the means for regulating the distance of the groove from the spindle axis comprising a rotary member eccentric to the spindle axis and engaging the spindle through an opening in said member, said member being rotatably mounted in the adjacent end of the strip, the rotary adjustment of said eccentric shifting the strip and the groove carried thereby endwise.

4. A repeater device to be used with a sound reproducing machine having a rotating table carried by a spindle projecting above the table, the table carrying a grooved record disc along in its rotation, and a liftable reproducer including a needle for engagement with the grooves in said disc, said repeater device being arranged, during reproduction, entirely free of the reproducer and its needle, being capable of repeating, at will, any desired part of the record disc and comprising an elongated, narrow strip longer than the radius of the disc, extending generally radially of the disc and having one end thereof provided with an opening pivotally engaging the spindle and having its other end formed with a handle to be grasped by the operator to permit raising it and swinging it about its pivot at will, said strip carrying at least one transverse groove in its upper face comprising guiding means cooperating with a part on the reproducer whereby to lift the needle off the record and move it

back at will, said groove having flaring sides, the distance between the sides at the flared end of the groove corresponding to the distance between two record grooves defining the maximum amplitude of the passage to be repeated, the sides of the groove being shaped to lead the needle, after it is raised by the strip engaging said part on the reproducer and in the swinging movement of the strip about its pivot, back into the outside groove of the selected passage, and means associated with the strip for regulating, at will, the distance of said groove from the spindle axis, the means for regulating the distance of the groove from the spindle axis comprising a rotary member eccentric to the spindle axis and engaging the spindle through an opening in said member, said member being rotatably mounted in the adjacent end of the strip and being provided with a knob for rotating it, and a graduated scale carried by the knob and cooperating with an index on the strip for indicating the adjustment.

5. A repeater device to be used with a sound reproducing machine having a rotating table carried by a spindle projecting above the table, the table carrying a grooved record disc along in its rotation, and a liftable reproducer including a needle for engagement with the grooves in said disc, said repeater device being arranged, during reproduction, entirely free of the reproducer and its needle, being capable of repeating, at will, any desired part of the record disc and comprising an elongated, narrow strip longer than the radius of the disc, extending generally radially of the disc and having one end thereof provided with an opening pivotally engaging the spindle and having its other end formed with a handle to be grasped by the operator to permit raising it and swinging it about its pivot at will, said strip carrying at least one transverse groove in its upper face comprising guiding means cooperating with a part on the reproducer whereby to lift the needle off the record and move it back at will, said groove having flaring sides, the distance between the sides at the flared end of the groove corresponding to the distance between two record grooves defining the maximum amplitude of the passage to be repeated, the sides of the groove being shaped to lead the needle, after it is raised by the strip engaging said part on the reproducer and in the swinging movement of the strip about its pivot, back into the outside groove of the selected passage, and means associated with the strip for regulating, at will, the distance of said groove from the spindle axis, two circumferentially spaced supports being associated with the machine casing radially outwardly of the rotating table, said supports being arranged in cooperative relation with the strip to alternately engage the handle end of the strip, one positioned to hold the strip raised off the record disc and out of contact with the reproducer and its needle while the needle is in engagement with the disc, and the other positioned to hold the needle in raised position out of engagement with the disc.

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