April 29, 1941. L. THOMPSON ET AL 2,240,321

TRANSCRIBING MACHINE

Filed Dec. 31, 1938 2 Sheets-Sheet 1

Fig.1.

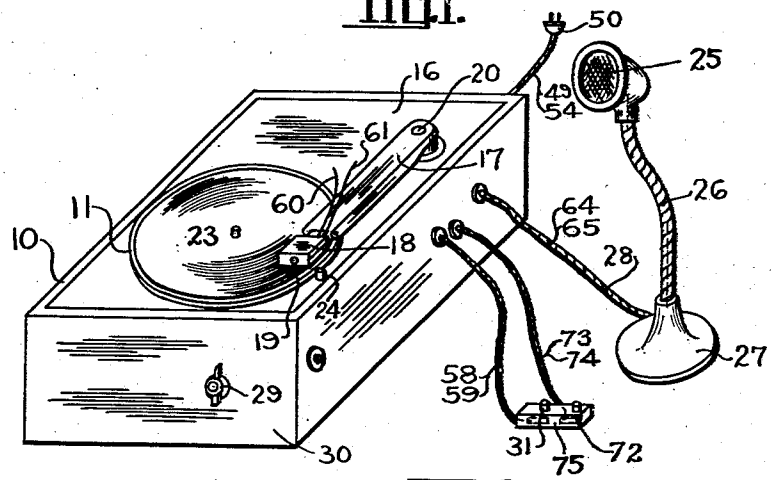


Fig.2.

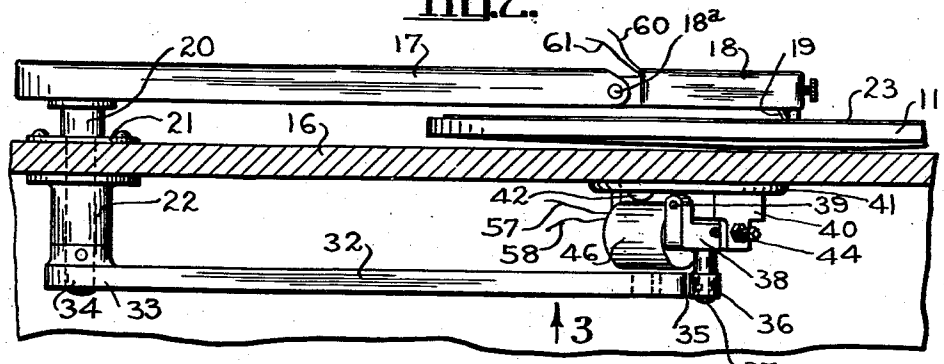


Fig.3.

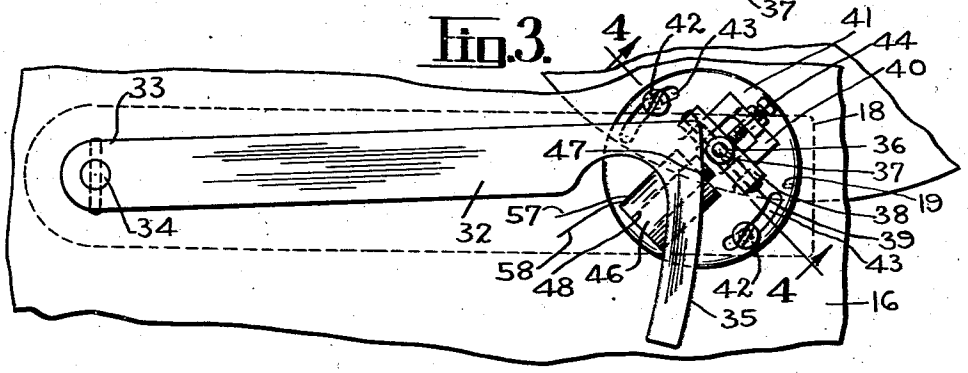
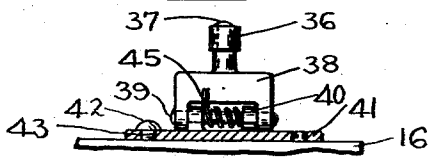


Fig.4.



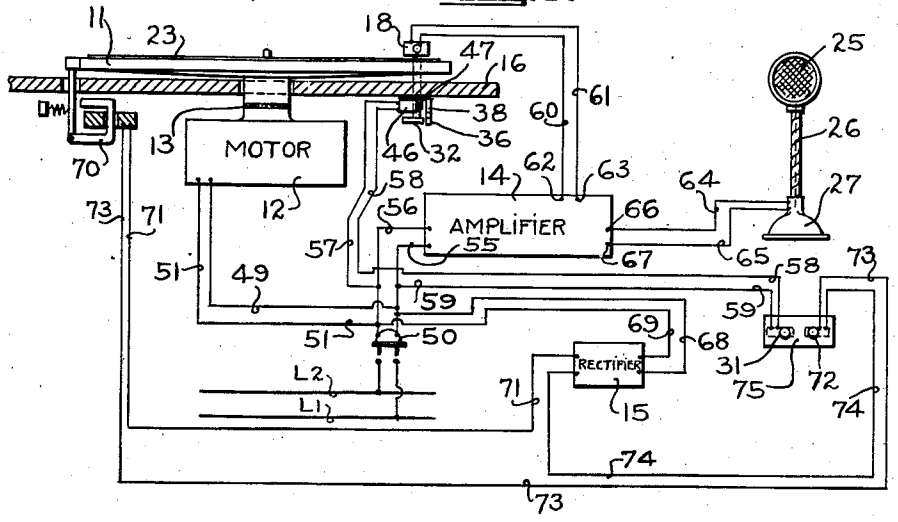
INVENTOR
Lincoln Thompson.
Robert L. Stone.
By H. G. Manning
ATTORNEY

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Fig.5.



INVENTOR
Lincoln Thompson.
Robert L. Stone.
By H. G. Manning
ATTORNEY

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2,240,321

TRANSCRIBING MACHINE

Lincoln Thompson and Robert L. Stone, Stamford, Conn., assignors, by direct and mesne assignments, to The SoundScriber Corporation, Stamford, Conn., a corporation of Connecticut

Application December 31, 1938, Serial No. 248,691

5 Claims. (Cl. 274—15)

This invention relates to improvements in sound reproduction, and more particularly to a phonograph machine for transcribing sound from thin disc records upon which dictated matter has been recorded in the form of a spiral sound groove.

The transcribing machine of this invention is particularly useful in reproducing speech from thin disc records, such as are disclosed in Thompson's copending patent application, Serial No. 245,944, filed December 15, 1938, patented May 14, 1940, under No. 2,200,866, which records are recorded in a dictating machine of the type shown and described in Thompson's copending application, Serial No. 248,690, filed December 31, 1938, and entitled "Disc dictating machine."

One object of this invention is to provide a disc record transcribing machine of the above nature having improved means to "step back" the reproducing arm over one or more sound grooves so as to permit the dictated matter recorded thereon to be replayed.

Another object is to provide a transcribing machine of the above nature having a solenoid device for back-spacing the sound pickup unit over one or more sound grooves on the record without raising the reproducing needle therefrom, or stopping the rotation of the turntable.

A further object of this invention is to provide an improved disc record transcribing machine of the above nature which will be relatively inexpensive to manufacture, simple in construction, compact, ornamental in appearance, and very efficient and durable in use.

With these and other objects in view, which will appear as the description proceeds, there has been illustrated in the accompanying drawings one form in which the invention may be conveniently embodied in practice.

In the drawings:

Fig. 1 is a perspective view of a transcribing machine embodying the features and principles of this invention, and showing a portable loudspeaker, and back-spacing control switch associated therewith.

Fig. 2 is a sectional view through the turntable and showing a side view of the reproducing arm and the step-back mechanism.

Fig. 3 is a bottom plan view of the step-back mechanism, looking in the direction of the arrow 3 of Fig. 2.

Fig. 4 is a sectional view of a portion of the step-back mechanism taken on the line 4—4 of Fig. 3, looking in the direction of the arrows.

Fig. 5 is a schematic view of the transcribing machine and the electrical circuits and controls associated therewith.

Referring now to the drawings wherein like reference numerals designate like parts throughout the several views, the numeral 10 indicates a rectangular casing upon which a turntable 11 is rotatably mounted, said turntable being driven by an electric motor 12 through a friction slipping disc 13 (see Fig. 5), as fully described in applicant's prior Patent Number 2,133,596 dated October 18, 1938.

The electric motor 12, together with a conventional form of vacuum tube amplifier 14 and an alternating current rectifier 15, is suitably disposed within the casing 10 below the casing top 16.

A reproducer arm 17, carrying a pickup head 18 pivoted on a horizontal pin 18a and a disc engaging needle 19, is swingably supported upon a vertical shaft 20 extending upwardly through the casing top 16. The shaft 20 is journaled in a plate 21 secured on the upper side of the casing top 16, and is also journaled in a bushing 22 secured to the undersurface of said casing top 16. The reproducer head 18 is hinged to its arm 17 in such a manner that the needle 19 may be manually raised from and lowered into engagement with a disc record 23, mounted on the turntable 11, and when not in use, may be seated upon a supporting cup 24 extending upwardly from the casing top 16 outside the turntable 11.

A conventional form of loudspeaker 25 is provided and is supported by a metallic flexible tube 26 secured to a table engaging base 27. The loudspeaker 25 is connected to the amplifier 14 in the casing 10 by a flexible two-wire cable 28, whereby the loudspeaker 25 may be disposed at any desired position, either close to or at a distance from the operator. Also, if desired, ear phones (not shown) may be substituted for the loudspeaker 25. The volume of sound emanating from the loudspeaker 25 may be controlled by means of a finger knob 29 conveniently mounted on the end wall 30 of the casing 10.

By employing a light weight pickup 18, it has been found that the reproducing needle 19 may be moved laterally across the sound grooves of the disc without raising it out of engagement therewith and without in any manner injuring the sound record. Consequently, in order to "step-back" the needle 19 one or more sound grooves, it is only necessary to provide means for swinging the reproducing arm 17 backwardly through the desired angle. For this purpose, provision is made of a pushbutton switch 31,

preferably mounted in a small flat block 75 which may be laid on the stenographer's table or on the floor whichever is most convenient.

As herein shown, the back-spacing or step-back means for the reproducer needle 19 comprises a horizontal L-shaped step-back arm 32 located under the casing top 16 and having its inner end 33 secured to the lower end 34 of the vertical shaft 20. The arm 32 extends from the shaft end 34 forwardly beneath the casing top 16 parallel with the reproducer arm 17. The free end of the arm 32 has an arcuate finger 35 extending substantially at right-angles to the arm 32, and being concentric with the axis of the shaft 20.

The finger 35 is adapted to be engaged by a roller 36, preferably of soft rubber, mounted upon a spindle 37, extending downwardly from a U-shaped soft iron bracket 38, said roller being disposed in alinement with said finger 35. The bracket 38 is hinged by a pin 39 to a yoke lug 40 depending from a circular plate 41, which in turn is rotatably and adjustably secured to a stationary part of the casing 10—in this instance, the underside of the casing top 16—as by screws 42 which pass through a pair of opposite circumferentially-elongated slots 43, formed in the plate 41.

A downward extension of the lug 40 supports an adjusting screw 44 which is screw-threaded therein and is adapted for use in limiting the movement of the swingable bracket 38 away from the step-back arm 32 under the urge of a coiled spring 45 surrounding the pin 39. As clearly shown in Fig. 4, the ends of the spring 45 react between the legs of the bracket 38 and the lug 40, and said spring serves to constantly urge the bracket 38 toward the screw 44 to normally maintain the roller 36 spaced from the arcuate end 35 of the arm 32.

In order to cause the roller 36 to suddenly strike the arcuate end 35 of the arm 32, provision is made of an electromagnet having an iron core 48 adjacent the pivoted bifurcated iron bracket 38 so that when said solenoid 46 is energized, the end 47 of the core 48 will attract the bracket 38 to cause the roller 36 to strike the arcuate end 35 of the arm 32 with a sudden blow.

To adjust the throw of the roller 36 and bracket 38, the plate 41 is mounted to swing about an axis which is substantially in line with the point of contact between the roller 36 and the arcuate end 35. By means of this construction, the angle of movement and throw of the roller 36 and brackets 38 may be accurately controlled, and hence, the resultant back-spacing of the arm 32 may be varied as desired.

Electrical circuits

As clearly shown in Fig. 5, the motor 12 is connected to a line wire L1 by a conductor 49 through a switch plug 50, and is also connected by a conductor 51 through the switch plug 50 to the line wire L2. The amplifier 14 is connected to the line wires L1 and L2 through the plug 50 by conductors 55 and 56. The solenoid 46 is connected through the plug 50 to the line wire L2 by a conductor 57 and by a conductor 58 to the switch 31 which in turn is connected through the plug 50 to the line wire L1 by a conductor 59.

The reproducer or pick-up head 18 is connected by conductors 60 and 61 to the input terminals 62 and 63, respectively, of the amplifier 14, and the loudspeaker 25 is connected by conductors 64 and 65 which are in the cable 26 to the output terminals 66 and 67, respectively, of the amplifier 14. The rectifier 15 is connected by conductors 68 and 69 to the line wires L1 and L2 respectively through the switch plug 50, and to a turntable "start and stop" brake device 70 by a conductor 71, said brake device 70 being of the form disclosed in Thompson's copending application, Serial No. 242,598, filed November 26, 1938. The braking device 70 is controlled by a push button switch 72 to which it is connected by a conductor 73, and the switch 72 is connected to the current rectifier 15 by a conductor 74. The push button switch 72 is preferably mounted in the block 75 with the switch 31 for either hand or foot actuation.

Operation

When it is desired to operate the transcribing machine to reproduce the sound recorded on a disc record 23, said record 23 will be placed on the turntable 11 in the usual manner, and the plug 50 will be inserted into the electric socket to connect the machine to the line wires L1 and L2. The vacuum tubes of the amplifier 14 and the rectifier 15 will thus be energized, and the motor 12 will be instantly started for rotating the turntable 11 and the disc record 23 thereon. The pick-up head 18 may then be manually lifted from its cup 24, swung over the disc 23, and the needle 19 placed in the desired sound groove therein, causing the reproduced sound vibrations to emanate from the loudspeaker 25.

In order to back-space the stylus 19 one or more grooves, for replaying part of the dictated matter, it is merely necessary for the operator to actuate the push button switch 31 by hand or by foot, whereby the solenoid 46 will be momentarily energized. This will cause the roller 36 to abruptly strike the arcuate end surface 35 of the step-back arm 32 and "kick" the reproducer needle 19 back over a number of sound grooves in the disc 23 depending upon the adjustment of the screw 42, the angle of the plate 41, and the momentum due to the mass of the iron bracket 38.

While there has been disclosed in this specification one form in which the invention may be embodied, it is to be understood that this form is shown for the purpose of illustration only, and that the invention is not to be limited to the specific disclosure, but may be modified and embodied in various other forms without departing from its spirit. In short, the invention includes all the modifications and embodiments coming within the scope of the following claims.

Having thus fully described the invention, what is claimed as new, and for which it is desired to secure Letters Patent is:

1. In a transcribing machine, a frame, a driven turntable in said frame, a disc record seated thereon, a needle holding reproducer head, a reproducer arm for carrying said head mounted in said frame to swing over said record, a step back arm connected with and spaced from said reproducer arm and mounted to swing therewith, said step-back arm having an arcuate end section located at substantially right-angles thereto, a striking member pivoted to said frame, manually operated means to force said striking member suddenly against said arcuate end section to back-space said head and needle a predetermined amount over said record, and means to adjust the angle and stroke of said striking member to vary the amount of back-spacing.

2. In a transcribing machine, a frame, a driven

turntable mounted in said frame, a disc record seated on said turntable, a needle holding reproducer head, a swingable reproducer arm journaled in said frame and carrying said head, a step-back arm connected with and spaced from said reproducer arm and mounted to swing therewith, said step-back arm having an arcuate end section located at substantially right-angles thereto, a striking member movably mounted on said frame, manually operated means to force said striking member suddenly against said arcuate end section to back-space said head and needle a predetermined amount over said record, and means to adjust the angle of said striking member to vary the amount of back-spacing.

3. In a transcribing machine, a frame, a driven turntable in said frame, a disc record carried thereby, a needle holding reproducer arm journaled in said frame and mounted to swing across said record, a step-back arm spaced below and connected with said reproducer arm and mounted to swing therewith, a roller carrying member pivoted to said frame, and magnetically operated means on said frame to attract said member and cause said roller to strike said step-back arm with sufficient momentum to back-space said reproducer needle a predetermined number of grooves.

4. In a transcribing machine, a driven turntable, a disc record seated thereon, a needle holding reproducer head, a swingable reproducer arm carrying said head, a step-back arm connected with and spaced from said reproducer arm and mounted to swing therewith, said step-back arm having an arcuate end section located at substantially right-angles thereto, a striking member, manually operated means to force said striking member against said arcuate end section to back-space said head and needle a predetermined amount over said record, and means to adjust the angle and stroke of said striking member to vary the amount of back-spacing.

5. In a transcribing machine, a driven turntable having a record seated thereon, a needle holding reproducer head, a swingable arm mounted to carry said head across said record, step-back means connected to said reproducer arm for swinging therewith, said step back means having an arcuate portion, and manually operated means having mechanical striking contact with said arcuate portion at an angle acute to a line tangent to said portion at the point of tengency, whereby said head and needle will be back-spaced a predetermined number of grooves on said record without lifting said needle from said record.

LINCOLN THOMPSON.
ROBERT L. STONE.