G. L. BULLOCK.

REPEATING ATTACHMENT FOR SOUND REPRODUCING MACHINES.

APPLICATION FILED JUNE 25, 1919.

1,405,751.

Patented Feb. 7, 1922.

2 SHEETS—SHEET 1.

FIG. 1.

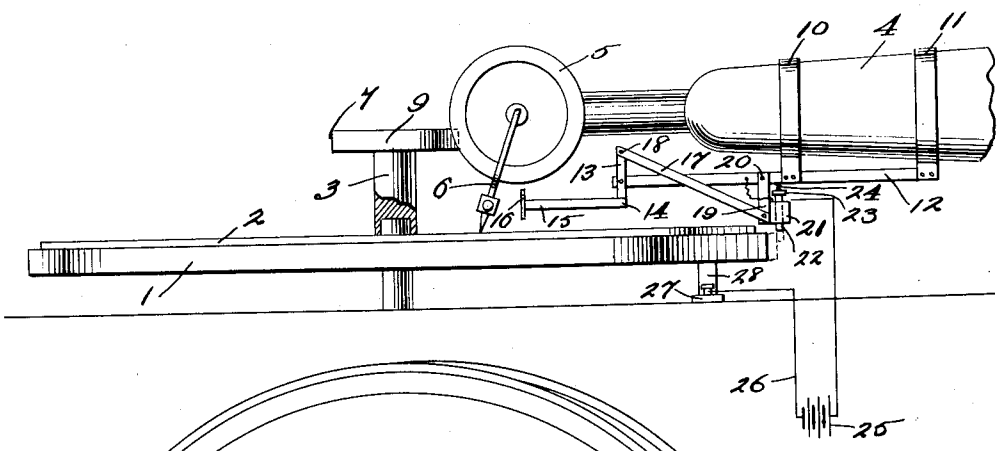
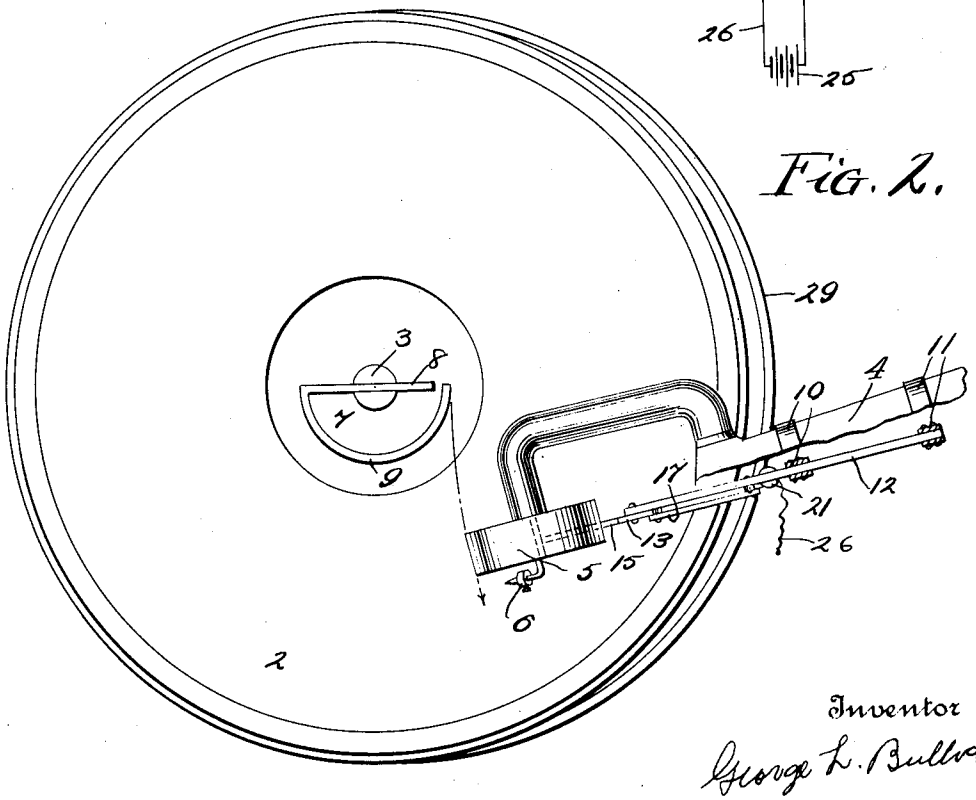


FIG. 2.



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2 SHEETS—SHEET 2.

FIG. 3.

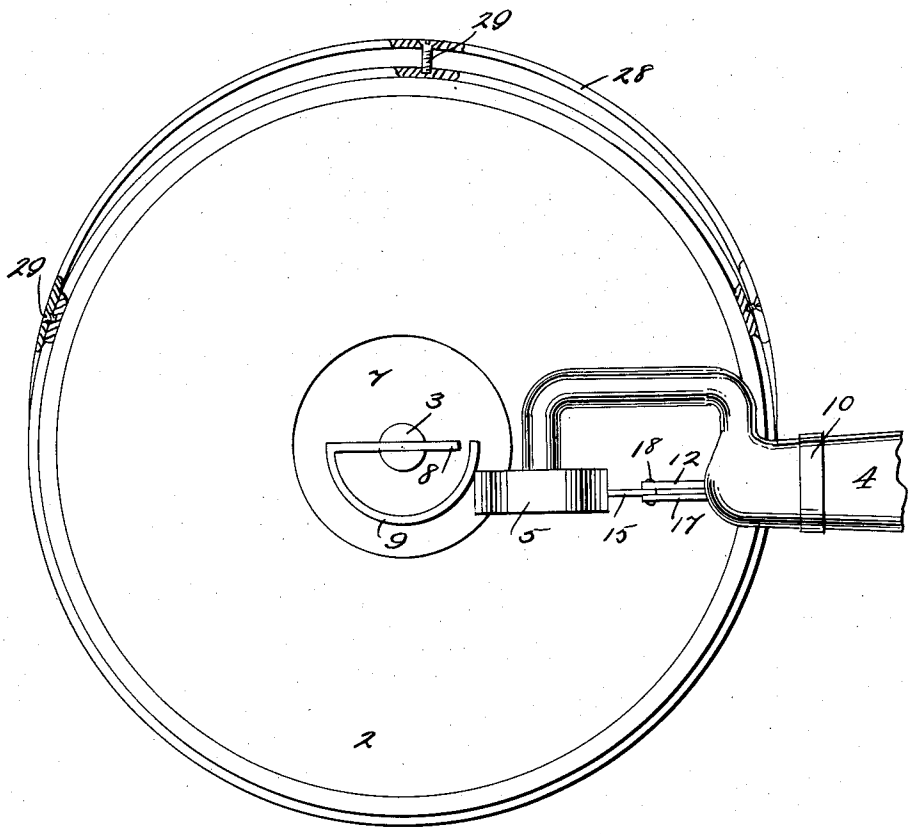
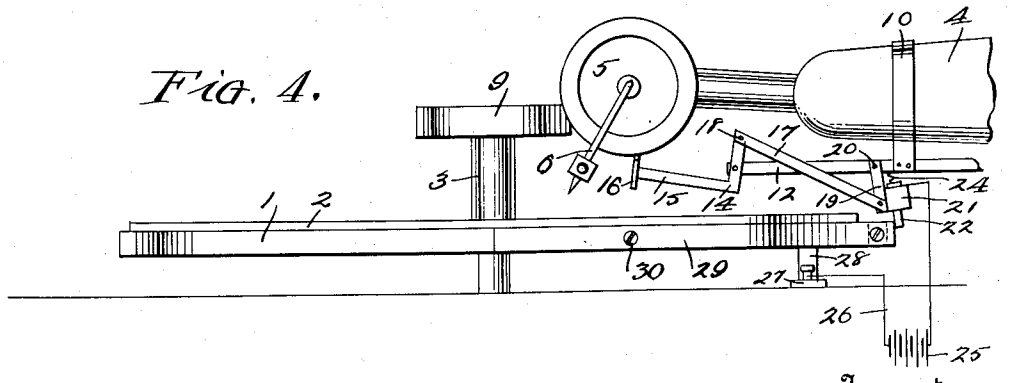


FIG. 4.



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UNITED STATES PATENT OFFICE.

GEORGE L. BULLOCK, OF LOUISVILLE, KENTUCKY.

REPEATING ATTACHMENT FOR SOUND-REPRODUCING MACHINES.

1,405,751. Specification of Letters Patent. Patented Feb. 7, 1922.

Application filed June 25, 1919. Serial No. 306,670.

To all whom it may concern:

Be it known that I, GEORGE L. BULLOCK, a citizen of the United States, residing at 2513 Magazine St., Louisville, and State of Kentucky, have invented certain new and useful Improvements in a Repeating Attachment for Sound-Reproducing Machines, of which the following is a specification.

This invention relates to repeating attachments for phonographs and other sound reproducing machines.

The primary object of the invention is to provide an efficient and generally improved mechanism for automatically returning the sound box and stylus of the phonograph to its initial or starting point after completion of the record being played so that the playing will be automatically repeated.

Another object of the invention resides in the provision of an electro-mechanical mechanism for returning the reproducing stylus to its starting point and further in the specific construction and arrangement of such mechanism.

With these and other objects in view, reference will now be had to the accompanying drawings, in which drawings:—

Figure 1 is a side elevational view showing the necessary parts of the phonograph and the manner of attaching my invention thereto;

Figure 2 is a top plan view of the construction shown in Figure 1, certain parts in this view being broken away to disclose other parts;

Figure 3 is a view similar to Figure 2 but showing the sound box in a different position, and

Figure 4 is a side elevational view of the device as shown in Figure 3.

Referring to the drawings by numerals, 1 designates the turn table, 2 the record, and 3 the centering post for the record carried by the turn table. The reproducing horn, sound box, and stylus are indicated respectively by the numerals 4, 5, and 6.

In carrying out my invention, I provide, for attachment to the post 3, a contact 7. This contact as shown to advantage in Figure 2, is made from a single strip of suitable metal, either round or flat and preferably resilient. This strip is bent as shown in Figure 2 to provide a straight arm portion 8 which extends transversely through the record post near the top of the latter, and a semi-circular curved portion 9 which is disposed upon one part of the post as shown.

Surrounding the reproducing horn 4 in spaced relation to one another are a pair of split bands 10 and 11. The split ends of each of these bands are disposed below the horn, and secured to opposite sides of a longitudinally extending bar 12, the ends of the band 11 being fastened to one end of the bar and the ends of the band 10 to an intermediate portion.

Pivoted to the free or forward end of bar 12 is a vertical arm 13 of a bell crank lever 14. The horizontal arm 15 of this lever extends forwardly in a plane below that of the bar 12 and is provided at its extremity with an enlarged head 16 for engagement with the sound box 5 as will be later explained.

One end of a bar 17 extending diagonally to the bar 12 is secured as at 18 to the upper end of the arm 13. The opposite end of this bar 17 is secured to the lower end of a short vertical supporting arm 19, the latter having its upper end pivoted to bar 12 as indicated at 20. A magnetic coil 21 is supported by the arm 19 and has extending therethrough a core 22. At its upper end this core is provided with a head 23 to which is attached one end of a coil spring 24. The opposite end of this spring is attached to the bar 12. The magnetic coil 21 is electrically connected with the bar 12 and with one pole of a battery 25, the other pole of said battery being connected, by a lead wire 26 with the binding post 27 of the contact 28 engaging the under face of the turn table 29.

As shown clearly in Figures 2, 3, and 4 of the drawings, the turn table 1 is provided around its edge with a suitable cam surface 29. This cam surface extends around said edge for a distance of approximately one-half of the circumference of the turn table and is composed preferably of a single strip of suitable material secured to the turn table by means of screws 30 as shown.

In operation, when the record has been completed, the sound box 5 engages the contact 7 thus closing the curcuit to the battery 25. The current passes from the battery through the contact 28, turn table 1, and record post 3 to the contact 7. From the contact 7 the current returns to the battery through the sound box, reproducing horn, and the repeating mechanism carried by said reproducing horn, including the magnetic coil 21. The magnetic coil 21 becoming energized by the passage of current therethrough pulls down upon the head 22 of the

core 23 thus lowering the lower end of this core into engagement with the cam surface 29 of the turn table. As this cam surface revolves past the lower end of the solenoid it forces the latter to swing outwardly with the supporting post 19, as shown in Figure 4, until the enlarged portion 16 of the arm 17 engages the sound box 5 and lifts the reproducer and stylus 6 out of engagement with the record. When this has been accomplished, further outward movement of the solenoid in this direction is prevented and its frictional engagement with the cam 29 is such that the core will revolve with the same, carrying with it the reproducing horn and sound box and thus returning the stylus to its starting point. When the stylus has been returned to its starting point the thickest portion of the cam will be permitted to pass beyond the core without causing further movement of the latter and the gradual decreasing thickness or slope of the cam will permit the stylus to be gradually lowered to the record so that playing of the record will again be repeated. As the circuit to the battery is broken at the time the stylus is again lowered to the record, the spring 24 will withdraw the lower end of the solenoid 22 from engagement with the cam 29 until the sound box 5 again engages the contact 7 upon completion of the record.

Having thus fully described my invention, I claim:

1. In a phonograph having a turntable, a tone arm, and sound box, a repeating attachment including a cam member carried by the turntable, lifting means carried by the tone arm for engagement with the sound box to lift the stylus out of engagement with a record after playing of the latter has been completed and return said stylus to its starting point, and electrical means for automatically establishing connection between the cam member and lifting means to provide for the operation of the latter.

2. In a phonograph having a turntable, a tone arm, and sound box, a repeating attachment including a cam member attached to and revolving with said turntable, lifting mechanism carried by the tone arm and engageable with the sound box of the machine to raise the stylus out of engagement with the record and return said stylus to its starting point, a magnetic coil carried by said lifting means, a core controlled by said coil adapted upon the closing of an electrical circuit to be brought into engagement with said cam arm to set the lifting means into operation.

3. In a phonograph having a turntable, tone arm, and sound box, a repeating attachment comprising a cam member, carried by the turntable, a bar suspended from the tone arm, a bell crank lever pivoted to the forward end of said bar and having one arm thereof disposed for engagement with the sound box to lift the stylus from the record upon completion of the latter, a second bar connected at one end to the other arm of said bell crank lever, a magnetic coil pivotally suspended from said first bar and having pivotal connection with the other end of said second bar, and a core controlled by said coil and adapted at times to be lowered into engagement with said cam member to set said lifting mechanism into operation to return the stylus to the starting point.

4. In a phonograph having a turntable, tone arm, and sound box, a repeating attachment comprising a cam member carried by the turntable, a longitudinally extending bar suspended from the tone arm, a bell crank lever pivoted to one end of said bar and having one of its ends disposed for engagement with the sound box to lift the stylus out of engagement with the record and to return said stylus to its starting point, a second bar pivotally suspended from said first bar, a connection between the lower end of said second bar and the other arm of said lever, a magnetic coil carried by said second bar, a core controlled by said coil and resiliently suspended from said first bar, a contact supported above the turntable of the machine, said core being adapted upon the closing of an electrical circuit to engage said cam member thereby setting said lifting mechanism into operation.

5. In a phonograph having a turntable, tone arm, and sound box, a repeating attachment comprising a cam member carried by the turntable, a contact carried by the center post of said turntable, a bar suspended from the tone arm, a bell crank lever pivoted to one end of the said bar and having one arm disposed for engagement with the sound box to raise the reproducing stylus out of engagement with the record upon completion of the latter, a magnetic coil pivotally suspended from said bar, an operating connection between said coil and the other end of said crank lever, a core controlled by said coil adapted at times to be lowered into engagement with said cam member to raise the reproducing stylus out of engagement with the record by means of said bell crank lever and to return said stylus to its starting point.

In testimony whereof, I have affixed my signature in the presence of two witnesses.

GEORGE L. BULLOCK.

Witnesses:
BESSIE L. SHEARER,
J. L. PEARSON.