

April 14, 1925.

1,533,561

A. LINDNER

RECORD PRODUCING DEVICE

Filed Sept. 17, 1923

2 Sheets-Sheet 1

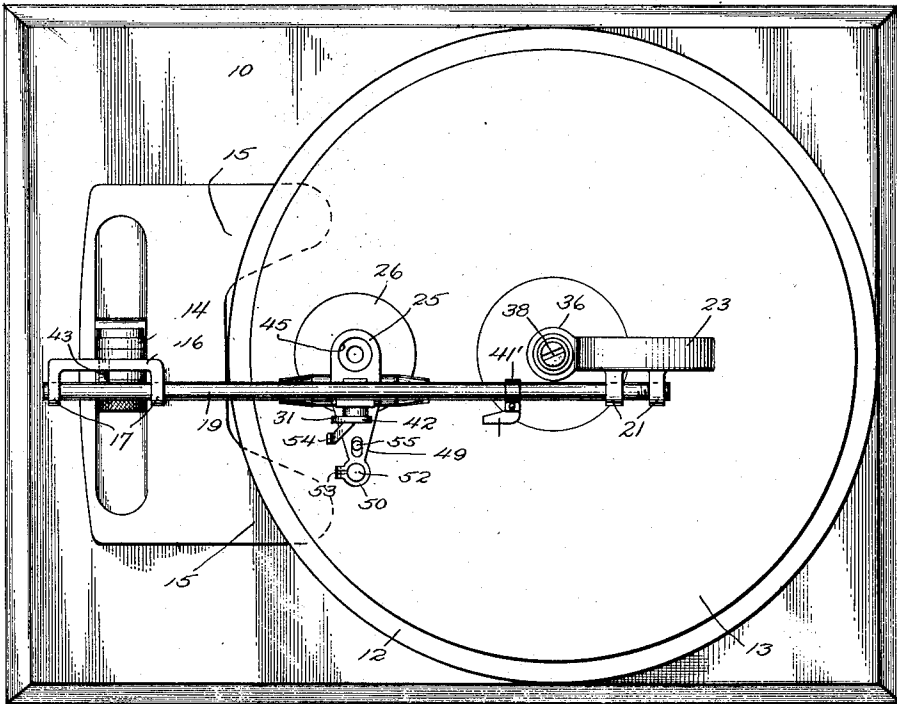


Fig. 1.

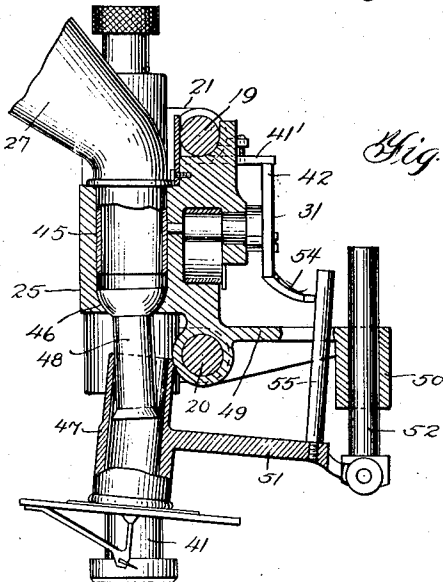


Fig. 2.

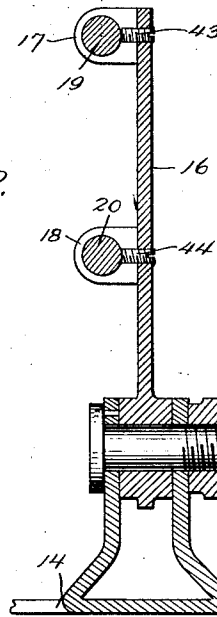


Fig. 3.

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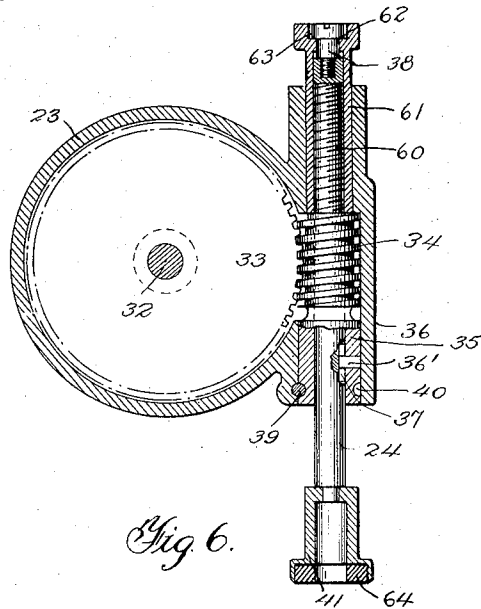
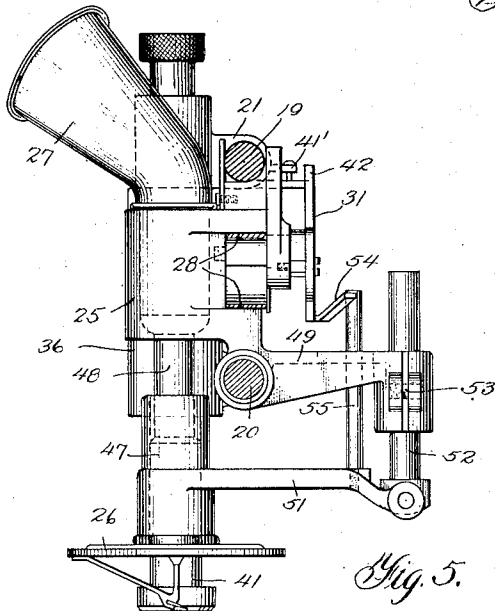
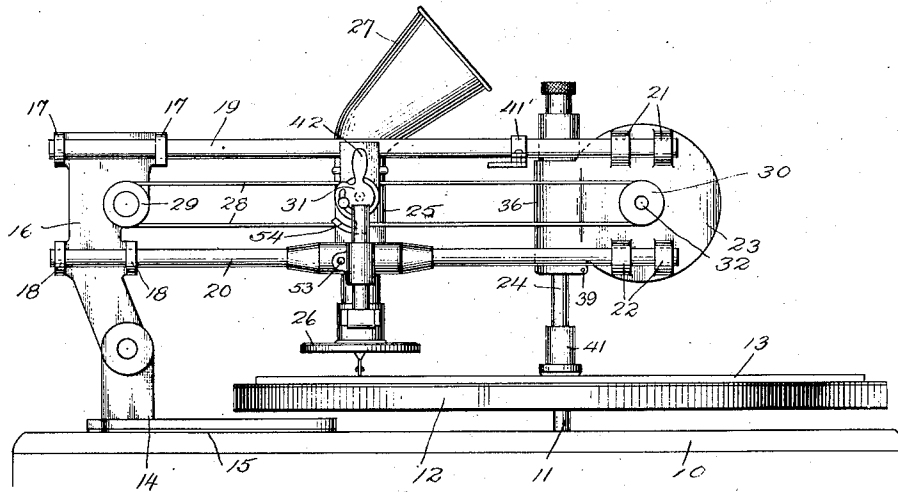
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Filed Sept. 17, 1923

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

ARTHUR LINDNER, OF NEWPORT NEWS, VIRGINIA, ASSIGNOR OF ONE-HALF TO RAYMOND M. BROWN, OF NEWPORT NEWS, VIRGINIA.

RECORD-PRODUCING DEVICE.

Application filed September 17, 1923. Serial No. 663,229.

To all whom it may concern:

Be it known that I, ARTHUR LINDNER, a citizen of the United States, residing at Newport News, in the county of Warwick, State of Virginia, have invented certain new and useful Improvements in Record-Producing Devices, of which the following is a specification.

The invention relates primarily to record producing devices, although it may also be applied to a sound reproducing machine.

One of the objects of the invention is to provide an improved means for positively conveying the sound box stylus, and parts connected thereto, across the face of the record disk at a speed proportional to the speed of rotation of the disk.

A further object is to provide a yielding drive for the sound box and the accompanying mechanism, in order to allow for abnormalities in the record and to avoid mechanical sounds where the device is used for sound reproducing.

Another object of the invention is to provide a yielding connection between the sound box and horn, where a horn is used.

A further object is to provide means for vertically adjusting the stylus or needle.

Still other objects are to provide tensioning means for the yielding driving mechanism, and to provide means for automatically releasing the sound box from the driving mechanism at a predetermined position.

An illustrative embodiment of the invention is shown in the accompanying drawings in which:—

Figure 1 is a plan view of the improved apparatus mounted on a suitable motor casing.

Figure 2 is detail view, partly in side elevation and partly in central vertical section, showing the yielding connection between the sound box and horn.

Figure 3 is a detail sectional view showing the stand upon which the sound box and operating mechanism are mounted.

Figure 4 is a side elevation showing the whole mechanism assembled.

Figure 5 is an elevation of the yielding connections shown in Figure 2.

Figure 6 is a central vertical section showing the connections between the disk rotating shaft and the belt which operates the sound box transversely of the record.

Referring particularly to Figures 1 and 4, the reference numeral 10 denotes a motor box of any suitable construction, through the top of which extends a main shaft 11 driven from any suitable source of power and carrying with it a rotating table 12 adapted to support a record disk 13.

The parts so far described may be of any desired construction and my invention is adapted to be applied thereto without modification of the existing structure.

The present invention comprises a stand 14 adapted to support the sound box and the accompanying mechanism, and carrying also a driving mechanism for moving the sound box across the record. The stand 14 rests upon the top of the motor box 10 and is preferably provided with feet 15 which project beneath the rotating table 12.

As shown, a bracket 16 is pivoted to the stand 14 and is provided with two pairs of ears 17 and 18, in which are supported guide rods 19, 20, arranged one above the other, and supported at their opposite ends two similar pairs of ears 21, 22, carried upon a gear casing 23, the weight of which is supported through a suitable rotating shaft 24, and other mechanism more fully described hereinafter, upon the projecting end of the main drive shaft 11. Slidably mounted upon the guide rods 19 and 20 is a carriage, designated generally by the reference number 25, which carries the sound box 26 and horn 27. This carriage is adapted to be moved across the record by means of a flexible endless belt 28, supported upon pulleys 29 and 30. The carriage may be secured to the belt by means of a clamp 31, or may be rendered independent of the belt by releasing the clamp.

As shown, the belt is driven by means of the pulley 30, which is mounted upon the shaft 32 of a gear wheel 33 (Fig. 6) mounted within the gear casing 23. The gear 33 is driven by means of a worm 34 meshing therewith and carried by a sleeve 35 revoluble within a vertical offset portion 36 of the gear casing. The shaft 24 is mounted within the sleeve 35 and is splined thereto by means of a key 36', which operates in a keyway 37 formed in the shaft. The shaft 24 is adapted to be adjusted vertically through a distance equal to the length of the keyway 37 and for this purpose its upper end is threaded

as at 60 and fits within a threaded adjusting sleeve 61. For turning the shaft 24 a screw 38 is screwed tight into the upper end of the shaft forming a rigid connection therewith.

5 The screw is provided with a shoulder 62 which fits within a recess 63 in the top of the adjusting sleeve. By turning the screw 38 the shaft 24 is adjusted vertically within the sleeve 61. In this manner the gear box and

10 the entire support can be raised or lowered to conform with the different heights of the turn table spindle ends, so that the sound box carriage will travel parallel with the record.

15 The sleeve 35 is held within the casing 36 by means of a locking pin 39, which fits in a groove 40 formed near the end of the sleeve.

At the end of the shaft 24 there is formed a nipple 41 adapted to engage the upper end of the disk rotating shaft 11, and thereby

20 transmit motion through the worm 34, gear 33, and belt 28 to the sound box carriage 25, which is therefore moved transversely of the record disk with a speed which is proportional to the speed at which the record is

25 being rotated.

The nipple 41 is preferably provided with a rubber friction ring 64 by means of which a non metallic friction connection is made

30 between the turn table spindle shaft 11 and the worm drive shaft 24.

When the sound box has been carried to a predetermined position it is desirable that it be automatically disengaged from the conveyor belt in order to prevent marring the

35 record. To this end a stop 41' in the form of a hook secured to the guide rod 19 is provided. When the carriage 25 has reached the limit of its travel the arm 42 of the clamp 31 strikes this stop, thereby releasing

40 the clamp and disengaging the carriage from the belt.

It is also desirable that the tension of the belt may be adjusted. For this purpose

45 adjusting screws 43, 44 are provided by means of which the bracket 16 carrying the pulley 29 may be adjusted with respect to the guide rods 19, 20, thus varying the distance between the pulleys 29 and 30, and

50 tensioning or slacking the belt.

Another important feature of the present invention is the yielding connection between the sound box 26 and horn 27, by

55 means of which the sound box is permitted to move in all directions without interfering with the position of the horn.

As shown in Figures 2 and 5, the horn 27 is secured in a socket 45 formed in the carriage 25. The bottom of the socket is

60 rounded as at 46. The sound box 26 is provided with an upwardly extending tubular projection 47 adapted to receive the lower end of a loosely mounted tubular connector 48, the upper end of which is enlarged to

65 fit the rounded portion 46 of the horn socket,

thus forming what is in substance a ball and socket joint between the sound box and horn.

In order that the sound box may move with the carriage 25 and be at the same time

70 adjustable relative thereto, the carriage is provided with a laterally extending bracket arm 49 having a socket 50 therein. An arm 51 is formed integral with the socket 45 of the sound box, this arm being hingedly connected at its outer end to an upright rod 52

75 which is adapted to fit in the socket 50, and to be secured in adjusted position by means of a clamping screw 53.

It is also desirable that the stylus carried

80 by the sound box be raised from the record disk when the sound box carrier 25 has reached the limit of its travel. According to the present invention this is accomplished automatically by the same mechanism, 85

which releases the carriage from the belt. As shown, the lever arm 42, which operates the clamp 31 is provided at its lower end with an outwardly curved arm or cam 54. When the lever arm 42 engages the stop

90 41', the cam arm 54 engages an upwardly extending post 55 formed rigid with the lateral arm 51 of the sound box, forcing it to the position shown in Figure 2, and thereby

95 raising the stylus from the record disk.

The invention has been described with great particularity for the purpose of illustration, but it is to be understood that it may be varied in many details without departing from the spirit of the invention

100 which is to be limited only by the following claims.

What I claim is:

1. In a sound reproducing and recording device, in combination, a rotatable record

105 disk, a transverse guide member mounted above said disk, a sound box carriage mounted upon said guide member, a traveling belt, releasable means for clamping said carriage to said belt, and a stop secured to

110 said guide member adapted to cooperate with said clamping means for releasing said carriage from said belt.

2. In a sound reproducing and recording device, in combination, a rotatable record

115 disk, fixed transverse guide rods mounted above said disk, a sound box carriage mounted upon said guide rods, means for moving said carriage transversely of said record disk, a stop for limiting the move-

120 ment of said carriage, and separate means operated by said stop for automatically rendering the sound box inoperative at the end of said transverse movement.

3. In a sound reproducing and recording

125 device, in combination, a sound box having an upwardly extending tubular projection, a sound box carriage having a horn receiving socket formed therein, said socket having a ball seat at its bottom, and a yielding

130

connection between said carriage and said sound box comprising a loosely mounted tubular connector, the upper end of which is enlarged and fits loosely in the ball seat of the horn socket, the lower end fitting loosely and rotatably into and slidable relatively to the tubular projection on said sound box, thus forming substantially a ball and socket joint between the sound box and horn.

4. In a sound reproducing and recording device, in combination, a rotatable record disk, a transverse guide member mounted above said disk, a sound-box carriage mounted upon said guide members, a sound box carrying a stylus, and yieldingly connected to said carriage, a belt, releasable means for clamping said carriage to said belt, a stop secured to said guide member, and adapted to engage said clamping member for disengaging said carriage from said belt at a predetermined point, and an upright arm rigidly secured with said sound box adapted to engage a cam on said clamping mechanism, whereby said stylus is ren-

dered inoperative when the sound box carriage is released from the travelling belt.

5. In a sound recording and reproducing device, including a record disk mounted for rotation upon a vertical drive shaft, a sound box carriage and means for transmitting motion from said drive shaft to said carriage including a second shaft threaded at its upper end, and having a nipple at its lower end adapted to fit over the upper end of said drive shaft, a sleeve rotatably mounted in a suitable casing surrounding an unthreaded portion of said second shaft, and having a key and slot connection therewith, gearing on said sleeve cooperating with suitable mechanism for driving said sound box carriage and means for vertically adjusting said second shaft comprising a threaded adjusting sleeve cooperating with the threaded portion of said shaft, a shoulder at the upper portion of said adjusting sleeve, and an adjusting screw cooperating with said shoulder and said shaft.

In testimony whereof I affix my signature.

ARTHUR LINDNER.