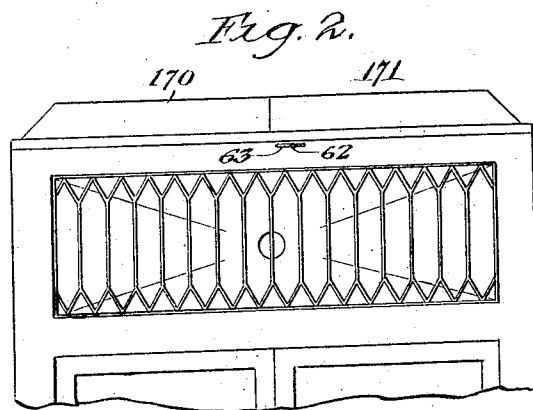
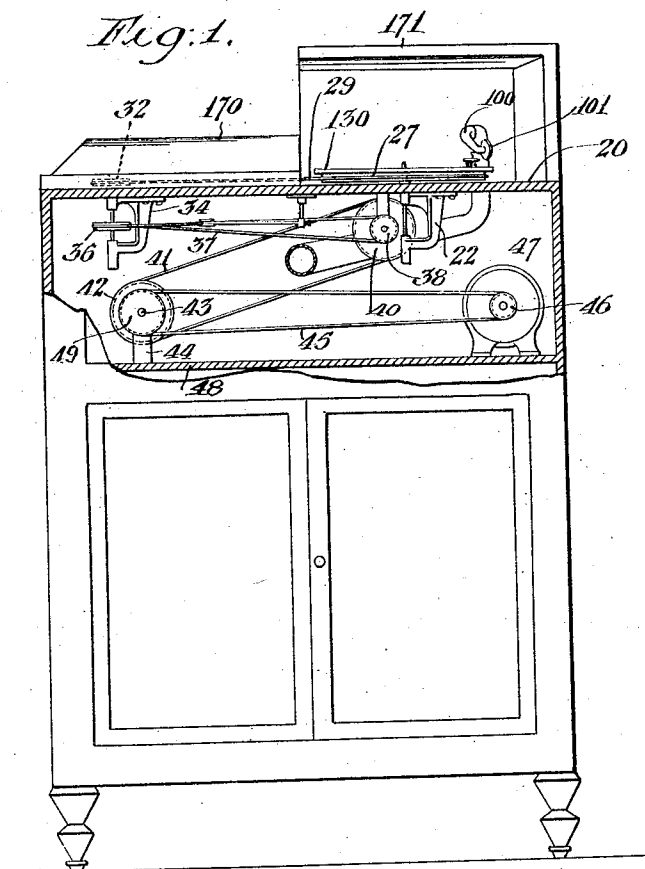


1,406,711.

L. R. WOLFF.  
 PHONOGRAPH.  
 APPLICATION FILED APR. 19, 1919.

Patented Feb. 14, 1922.  
 3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

Fig. 3.

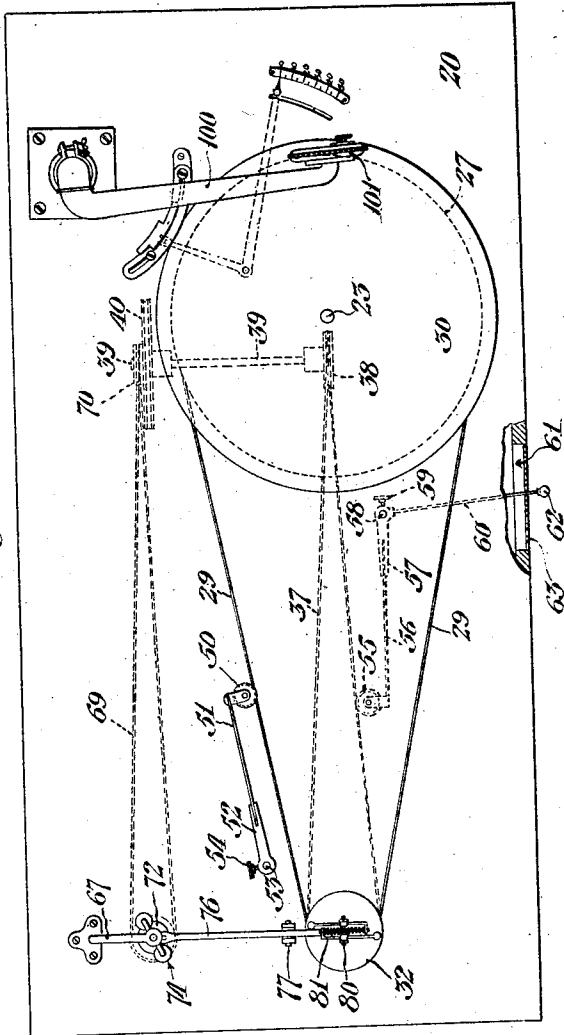
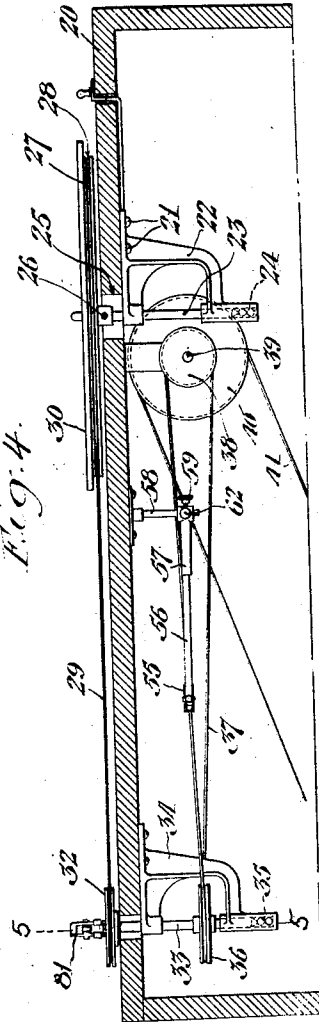


Fig. 4.



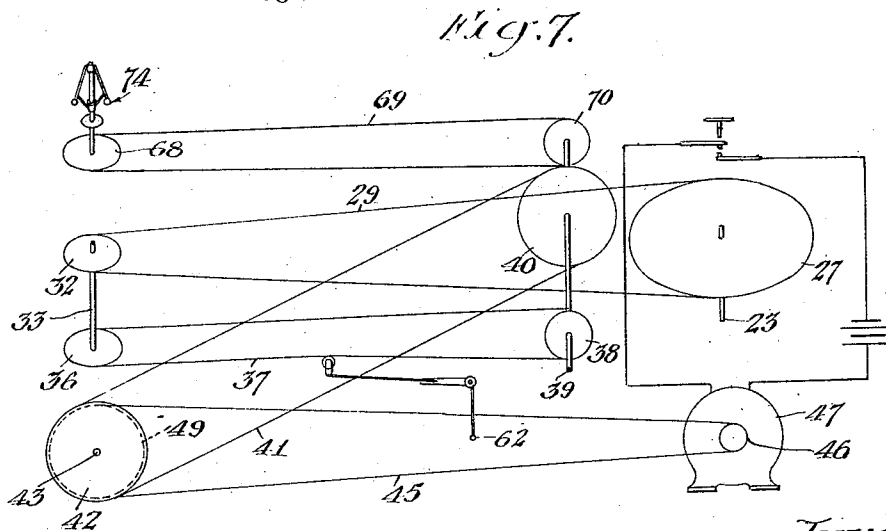
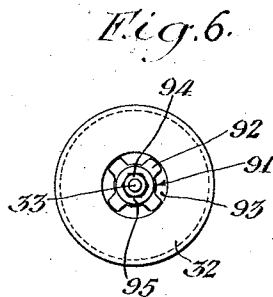
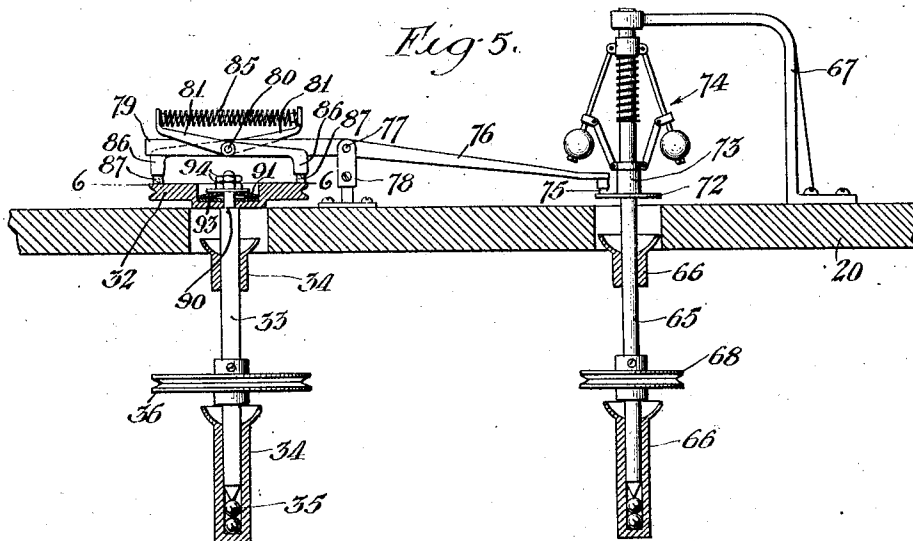
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Inventor  
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# UNITED STATES PATENT OFFICE.

LORENZ R. WOLFF, OF LOS ANGELES, CALIFORNIA.

## PHONOGRAPH.

1,406,711.

Specification of Letters Patent. Patented Feb. 14, 1922.

Application filed April 19, 1919. Serial No. 291,380.

*To all whom it may concern:*

Be it known that I, LORENZ R. WOLFF, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Phonograph, of which the following is a specification.

My invention relates to the class of machines used for the purpose of reproducing sound from records, the invention as hereinafter shown and described more particularly relating to the reproduction of sound from what is commonly known as a disc record.

One of the principal objects of my invention is to produce a phonograph, of simple form and construction, in which the record is elastically driven as distinguished from those machines in which the record is driven through the medium of gears and other positive driving mechanisms.

A further object of my invention is to produce a phonograph of simple form and construction in which the driving mechanism is so arranged that the reproducing needle is given a full opportunity to be acted upon by the record thereby producing a more natural tone or sound than that ordinarily produced when the record is positively driven.

Other objects and advantages will appear hereinafter from the following specification.

Referring to the drawings which are for illustrative purposes only,

Fig. 1 is a face view partly in section of a cabinet showing a machine mounted therein embodying a form of my invention. Fig. 2 is a face view of the upper portion of the cabinet. Fig. 3 is a plan view of a top portion of the cabinet showing a machine embodying a form of my invention. Fig. 4 is a vertical sectional view of the machine shown in Fig. 3. Fig. 5 is a vertical sectional view on line 5—5, Fig. 4. Fig. 6 is a plan view on line 6—6, Fig. 5, and Fig. 7 is a diagrammatic view showing the cable driving mechanism.

20 designates the top of a cabinet which in the form shown constitutes a supporting member for the machine, such supporting member having secured thereto on the under side by means of suitable screws 21 a bracket 22 in which is mounted a vertical shaft 23 freely rotatable in the bracket and having its

lower end resting upon a ball 24 so that the shaft 23 may rotate with as little friction as possible in the bracket. The shaft 23 extends through an opening 25 formed in the supporting member 20 and has secured thereto by means of a pin 26 a circular table 27, the edge of which is grooved as indicated at 28 to receive a driving cable or cord 29. The shaft 23 extends above the table 27 and forms a centering device for the disc record 30 which rests upon the table.

The cable 29 passes around a grooved pulley 32 which is secured to a shaft 33 mounted in a bracket 34 secured to the under side of the supporting member 20, the lower end of the shaft resting upon a ball 35 supported in the bracket 34. 36 designates a grooved pulley mounted on the shaft 33, which pulley 36 is driven by means of a cable 37 from a pulley 38 mounted upon a counter-shaft 39. The shaft 39 is driven through the medium of a large pulley 40 which in turn is driven by a cable 41 from a pulley 42 mounted on a shaft 43 mounted on a standard 44 on a partition 48 such shaft 43 being driven by a pulley 49 mounted thereon which in turn is driven by a cable 45 from a pulley 46 on a motor 47 which sets on the partition 48.

A tension device is placed on the cable 29 consisting of a shive 50 mounted on a flat spring 51, the flat spring 51 being secured in an arm 52 mounted on a pin 53 on the supporting member 20, the position of the arm on the pin 53 being regulated or adjusted by means of a set screw 54. The speed of the drive of the table 27 is regulated by a tension device consisting of a shive 55 mounted on a flat spring 56 which in turn is mounted in an arm 57, such arm 57 being mounted upon a pin 58 depending downwardly from the supporting member 20, being secured thereto by a set screw 59. The position of the shive 55 is manually regulated by a rod 60 which extends through an opening 61 in the side of the cabinet, having upon its outer end a knob 62 which may be conveniently grasped. The rod 60 is held in adjusted position by a tooth plate 63 which is set in the lower edge of the opening 61.

A governing device for the driving mechanism just described is provided which consists of a vertical shaft 65 mounted in brack-

ets 66 supported from the supporting member 20, the upper end of the shaft being mounted in a bracket 67 secured to the upper side of the supporting member 20.

5 The shaft 65 is provided with a grooved pulley 68 secured thereto, which pulley is driven by means of a cable 69 from a pulley 70 secured to the shaft 39. 72 designates a circular plate slidably mounted on the shaft  
10 65 and has attached to the upper end of the hub 73 formed thereon a ball governor 74 arranged to raise and lower the plate 72 according to the speed of the shaft 65. Resting upon the plate 72 is a friction pad 75  
15 supported in the end of an arm 76, such arm being pivotally mounted by means of a pin 77 in a bracket 78. One end 79 of the arm 76 extends beyond the bracket 77 and is provided with a pin 80 upon which is mounted  
20 scissor arms 81, the upper ends of the arms 81 being elastically held apart by means of a coiled spring 85 and the lower ends 86 of the arms 81 being provided with friction pads 87 which engage the upper face of the pulley  
25 32. The pulley 32 rests upon a shoulder 90 formed on the shaft 33 and is frictionally held thereon by means of a spring washer 91 having legs 92 resting upon a washer 93, suitable nuts 94 and a washer 95 being placed  
30 above the spring washer 91 to elastically hold the pulley 32 upon the shoulder 90 of the shaft 33.

The tone arm 100 may consist of any well known design as may also the reproducer 101 mounted on the end of the arm  
35 100, it being understood, however, that the tone arm 100 swings horizontally as is commonly done and that the arm 100 is connected to a horn indicated in Fig 2.

40 As shown in Figs. 1 and 2 the cabinet is provided with a lid made in two parts 170 and 171 so that the part 171 may be lifted when it is desired to change a record and set the mechanism without uncovering the  
45 driving mechanism mounted on the upper side of the supporting member 20.

The phonograph is operated in the following manner:

The motor is started as is ordinarily done,  
50 and a record having been placed upon the table, the reproducing mechanism is placed in contact with the record. After the record has been played the motor is stopped and the record removed as is usually done.

55 The governing of the speed of rotation of the record is regulated by the tension device heretofore described which engages the cable 37, but I arrange to automatically govern the speed of the driving mechanism  
60 through the governor 74 driven by the separate cable 69 as heretofore described and the friction device engaging the pulley 32, which device insures a steady drive of the table with the record thereon such as cannot be accomplished with the ordinary

methods of driving the record supporting table through the medium of gears and similar positive devices.

I claim as my invention:

1. A motor driven phonograph comprising a rotatable table for supporting a disc record, a plurality of pulleys, belts connecting said pulleys with said table and the motor, governing means connected to one pulley, frictional engagement means on another  
70 pulley and means for operating said frictional means by said governing means. 75

2. A motor driven phonograph comprising a rotatable table for supporting a disc record, a plurality of pulleys, belts connecting said pulleys with said table and the motor, shafts for mounting said pulleys, a governor mounted on the shaft of one pulley, a frictional engaging means engaging the pulley on another shaft, a plate carried on the  
80 said governor and an arm operated by said plate for operating said frictional engagement means. 85

3. A motor driven phonograph comprising a supporting member, a disc carrying table rotatably mounted on said supporting means, a series of shafts mounted on said supporting means, pulleys on said shafts, cables on said pulleys connecting said motor to said table, a governor on one of said  
90 shafts, a plate on said governor, a lever mounted on said supporting member, means on one end of said lever for frictionally engaging said plate, scissor arms pivotally mounted on the other end of said lever and  
95 means on said scissor arms for frictionally engaging a pulley on another shaft. 100

4. A motor driven phonograph comprising a supporting member, a disc carrying table rotatably mounted on said supporting  
105 means, a series of shafts mounted on said supporting means, pulleys on said shafts, cables on said pulleys connecting said motor to said table, a governor on one of said shafts, a plate on said governor, a lever  
110 mounted on said supporting member, means on one end of said lever for frictionally engaging said plate, scissor arms pivotally mounted on the other end of said lever, shafts for mounting said pulleys, a governor  
115 mounted on the shaft of one pulley a frictional engaging means engaging the pulley on another shaft, a plate carried on the said governor and an arm operated by said plate for operating said frictional engagement  
120 means. 125

5. In combination, a freely rotatable table arranged to carry a disk record, driving means, governing means, a flexible driving connection between said driving means and  
125 the governing means, and a flexible driving connection between the governing means and the table.

6. In combination, a freely rotatable table arranged to carry a disk record, driving  
130

means, governing means, a flexible driving connection between said driving means and the governing means, and a flexible driving connection between the governing means and the table, said table having a groove formed in the periphery thereof to receive said last named driving connection.

7. In combination, a freely rotatable table arranged to carry a disk record, driving means, governing means, a flexible driving connection between said driving means and the governing means, a flexible driving connection between the governing means and the table, said table having a groove formed in the periphery thereof to receive said last named driving connection, and elastic tension means engaging the driving connection between the governing means and said table.

8. In a phonograph, a horizontally arranged circular table for supporting a disk record, a freely rotatable shaft secured to said table for supporting the table, said table having a groove in the periphery thereof, a flexible cable engaging said groove, a pul-

ley for driving said cable, a shive engaging said cable, and means for elastically mounting said shive for placing an elastic tension on said cable.

9. In a phonograph, a horizontally arranged circular table for supporting a disk record, a freely rotatable shaft secured to said table for supporting the table, said table having a groove in the periphery thereof, a flexible cable engaging said groove, a shaft, a pulley fixed to said shaft for driving said cable, means for placing an elastic tension on said cable, a second pulley on said shaft, a cable engaging said second pulley, driving means for said last named cable, means for placing an elastic tension on said last named cable, governing means coacting with said shaft, and means for operating the governing means from said driving means.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 8th day of April, 1919.

LORENZ R. WOLFF.