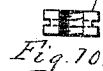
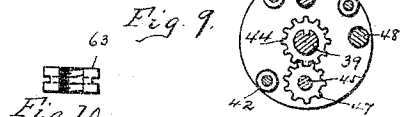
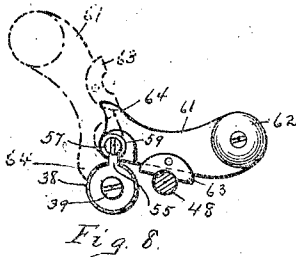
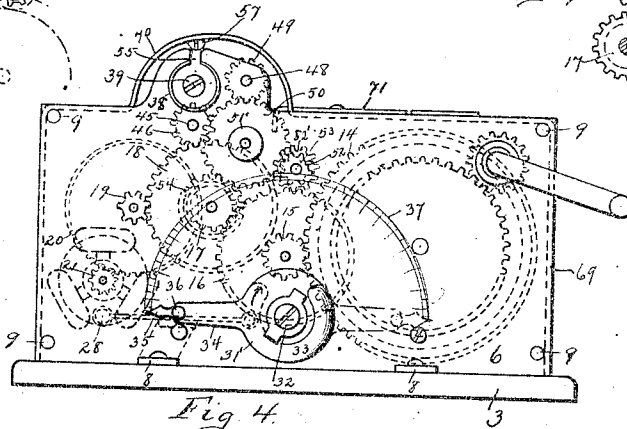
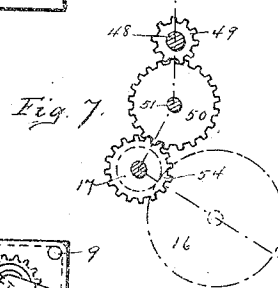
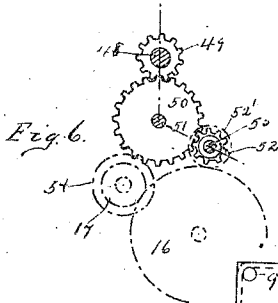
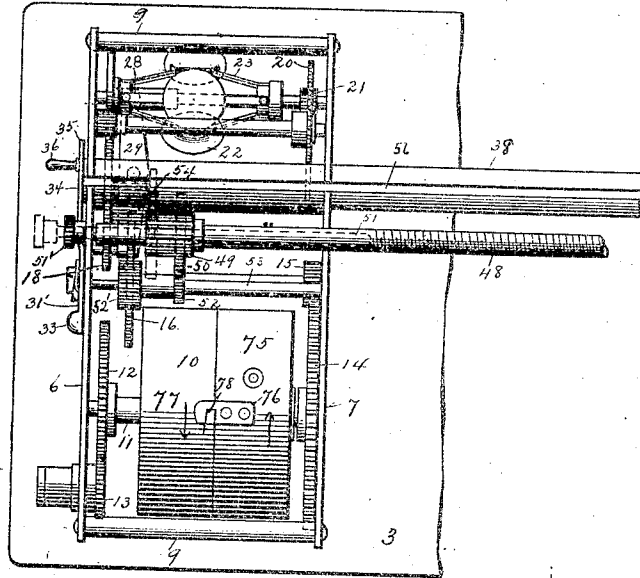
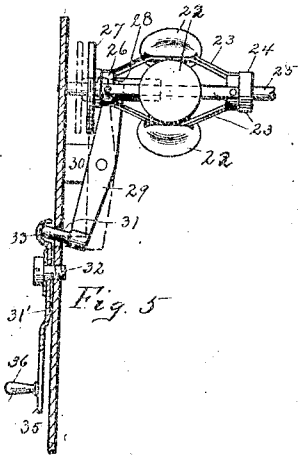


1,077,973.

Patented Nov. 11, 1913

3 SHEETS—SHEET 2.



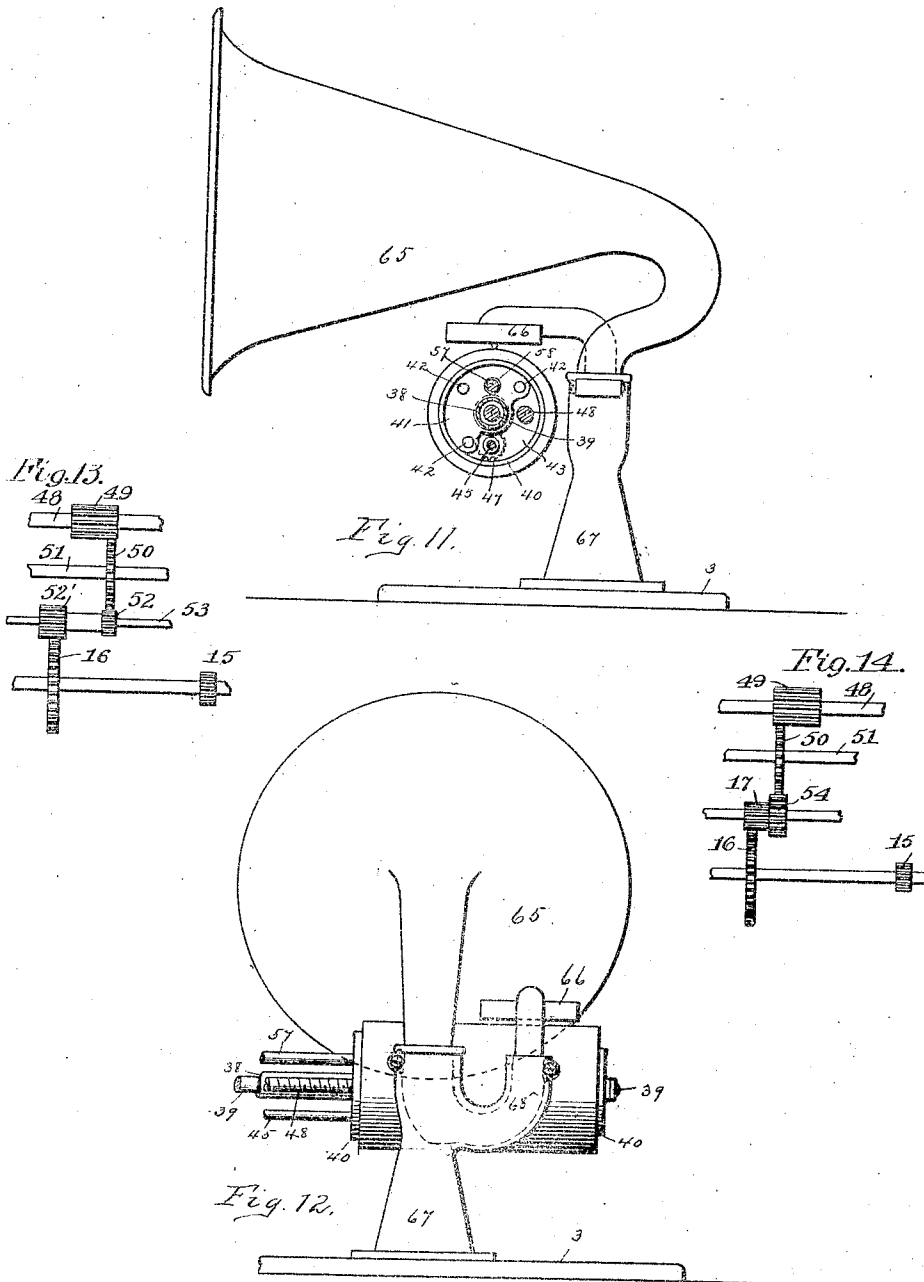
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 PHONOGRAPH.
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 3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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PHONOGRAPH.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PLINY CATUCCI, a citizen of the United States, residing in the city of Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Phonographs, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it pertains to make, construct, and use the same.

The objects of my invention are to make certain improvements in the details in the construction of phonographs, and more particularly, to provide a feed mechanism whereby so-called 2-minute and 4-minute cylinder records may be reproduced upon the same instrument, by means of a very simple and effective change in the transmission gears; to provide simple and effective means for engaging, disengaging, and shifting the record feed; to provide simple and effective means for starting, stopping, and governing the speed of the device; and in general, to improve the construction, in the direction of simplicity and reduction of cost of cylinder phonographs.

In carrying out my invention, I make use of the structures illustrated in the accompanying drawings, or their equivalents.

Figure 1 represents a side elevation of the phonograph, and its containing box with the amplifying horn and reproducer or sound box omitted. Fig. 2 is a top plan view of the same. Fig. 3 is a top plan view of the spring motor with the guard removed to show the gear trains in detail. Fig. 4 is an end elevation, partly in section, of the spring motor. Fig. 5 is a detail plan, partly in section, of the starting, stopping, and governing device. Fig. 6 is a detail of the record feed train for operating a two minute record. Fig. 7 is a detail of the record feed train for operating a four minute record. Fig. 8 is an end view of the record feed showing the feed nut in dotted lines as disengaged from the feed screw. Fig. 9 is a section on line 9—9, Figs. 1 and 2 of gear drive for the record mandrel. Fig. 10 is an under plan view of the half nut which engages the record feed. Figs. 11 and 12 represent the sound box and horn support. Figs. 13 and 14 illustrate respectively the two minute and four minute gear trains.

Similar reference numerals refer to like parts throughout.

In the drawings, 1 represents the containing case which is provided with a cover 2 upon the under side of which is rigidly secured the base 3 in such a manner that when said cover 2 is lifted off the case 1 and inverted, it may rest upon the case with the operating mechanism exposed as shown in Fig. 1.

All of the working parts of the machine are mounted upon the base 3 as shown. The two upright plates 6 and 7 are rigidly secured to the base by the laterally extending lugs 8 and rigidly connected together by the spreaders 9 located at each corner of the plates. These plates 6 and 7 serve as bearings for the gear train shafts—journal holes being drilled through them at the proper points for the journals of the gear shafts of said train.

The motor spring box 10, its shaft 11, winding gears 12 and 13, driving gear 14 and associated parts are of the usual type and need no detailed description. The gear train 15, 16, 17, 18, 19, 20, and 21, leading from the drive gear to the governor is also of the usual type and need not be further described than to say that its purpose is to progressively increase the speed of the gears from the motor drive gear 14 to the governor gear 21 that the latter will run at a relatively high speed.

The governor consists of the three weights 22 mounted upon the flat springs 23, the latter being rigidly secured at one end to the fixed collar 24 on the governor shaft 25. The other ends of the springs 23 are rigidly secured to the sliding sleeve or collar 26 on the shaft 25. The sleeve 26 is provided with a friction disk 27, for cooperation with the regulating friction brake 28 the latter being secured to the extremity of a pivoted lever 29 mounted upon the stud 30 as shown in Fig. 5. The opposite end of the lever 29 is provided with a stud 31 which projects through an aperture in the side plate 6 where it impinges upon the inner face of the oscillating cam disk 31', the latter being centrally pivoted to the side plate 6 at 32. The cam disk 31' is provided with a circular cam face 33 graduated from nothing to a maximum so that in the position shown in Fig. 4 the cam face will depress

the lever 29 and its friction brake 28 against the inner face of the governor brake disk 27, and thereby stop the governor and consequently, the motor.

5 As the disk 31' is rotated in the direction of the arrow, the pressure upon the stud 31 will be relieved and consequently the brake 28 will permit the rotation of the governor shaft at a speed proportional to the turning of the disk 31', up to the maximum of 180°. I provide the disk 31' with a radial arm 34 and pointer 35 and also with the small handle 36. I may also mark upon the face of the side plate 6 a circular scale 15 37 for coöperation with the pointer 35. In this manner the tempo and key of a musical selection may be regulated to suit the musical taste and judgment of the operator; or the tempo may be marked upon the record itself and the pointer 35 set to the corresponding number upon the scale 37.

In the upper edges of the plates 6 and 7 is rigidly secured the carrier tube 38 within which is secured the sliding mandrel shaft 39 carrying at its outer end the overhanging record mandrel 40. At the outer end of the tube 38 is rigidly secured the mutilated circular plate 41 having the short spacing studs 42 projecting from its outer side. To these studs 42 is secured the circular plate 43, both plates being concentric with the tube 38. Splined upon the shaft 39 and located between the plates 41 and 43 is the gear 44 the construction being such 35 that the rotation of the gear 44 will rotate the shaft 39 and the mandrel 40 and at the same time, permit the sliding back and forth of the shaft 39.

Located just beneath the tube 38 is the 40 record mandrel driving shaft 45 journaled at one end in the plate 6 and at its other end in the plate 43. Mounted upon this shaft 45 adjacent to the plate 6 is the gear 46 meshing with the gear 18 of the gear train heretofore referred to, while at the opposite end of the shaft 45 is the gear 47 meshing with the splined gear 44 upon the mandrel shaft 39. It will now be obvious that the operation of the motor train will rotate the 50 record mandrel and that the speed of such rotation will be governed by the governing device in the manner heretofore described.

It now remains to describe the means for feeding the mandrel with its record laterally 55 to permit coöperation of the record with the stylus of a stationary sound box—either a recorder or reproducer.

Up to a recent date, manufacturers of phonograph records made only what are 60 known as 2-minute records; i. e., records requiring only two minutes for their complete rendition. With the late mechanical refinements, however, the record helices on cylindrical records have been doubled, so as 65 to permit the playing of four-minute rec-

ords. This would, ordinarily, require a separate machine for each kind of record. My improved feeding device, however, obviates this necessity and by a simple shifting mechanism, I am able to shift, instantly 70 from one feed to the other, and thus permit the operator to use either the old style 2-minute record, or the new-style 4-minute record. This is obviously a great advantage, for the operator may have accumulated a 75 large number of the 2-minute records which would be useless upon a four-minute machine. In order to accomplish these ends, I journal the screw feed shaft 48, at one end in the upward projection upon the plate 6 80 and its other end in the circular plate 43 so that said feed shaft shall lie parallel with the sliding mandrel shaft 39. This shaft is threaded for the greater portion of its length as shown, and has mounted at its end 85 near the plate 6 the broad faced gear 49 which meshes with the larger idle gear 50, the latter being mounted upon the sliding shaft 51. The gear 50 is located in position to mesh either with a gear 52 on the shaft 90 53 or with a gear 54 on the same shaft with and adjacent to gear 17, according to whether the sliding shaft is pushed in or pulled out. The gear 52 is rigidly mounted 95 on the shaft 53 and said shaft has also rigidly mounted thereon the gear 52' which latter is always in mesh with the gear 16. The button 51' is secured to the outer end of the shaft 51 as a means for sliding it back and forth.

The gear 54 is just double the diameter of 100 the gear 52, so that when the screw feed shaft 48 is driven through the train 16, 52', 52, 50 and 49, it rotates half as fast as when driven through the train 16, 17, 50 and 49 resulting in feeding the record mandrel 105 through its entire travel in four minutes, whereas by the direct drive through the train 16, 52', 52, 50 and 49 it completes its whole travel in 2 minutes.

In order to connect up the sliding mandrel shaft 39 with the feed screw 48, I provide the following structure: The shaft 39 at its end remote from the mandrel; that is, adjacent to the motor mechanism; has 115 a swiveled stud 55 projecting through a longitudinal slot 56 in the carrier tube 38 and from this stud 55 extends the rod 57 parallel with said tube 38 and guided through an aperture 58 in the plates 41 and 43, extending some distance into the hollow of 120 the mandrel 40. Spaced apart and rigidly secured to this rod 57 are the two collars 59 and 60, between which is located the frame 60' pivoted upon the rod 57. This 125 frame 60' is provided with an arm 61 carrying the weights 62 at its outer end and the half nut 63 swiveled to its lower edge for engagement with the feed screw 48. The arm 61 is provided with a rearward 130

extension 64 for engagement with the carrier tube 38 whenever the arm is thrown back, as shown in the dotted lines in Fig. 8, to disengage the half nut 63 from the feed screw 48.

As a means for carrying the amplifying horn 65 and the sound box 66, which may be of any desired or preferred type, I mount the standard 67 upon the base 3 said standard having U-shaped branch 68 to receive the sound box while the horn is supported in the upper end of the standard.

It is to be understood that the U-shaped branch is hollow as shown in the dotted lines, so as to afford a passage from the sound box 66 to the horn 65.

As a means for protecting the motor from dust, I may provide a sheet metal guard 69 to conform with the general contour of the plates 6 and 7 arching the same over the tube 38 as shown at 70, Fig. 4.

Upon the upper side of the guard 69 is located the pivoted index pointer 71 (Fig. 2) said pointer having a bifurcated rear extension which extends through the aperture 72 and straddles the gear 50 so that as the latter is shifted to either 2- or 4-minute position the fact is indicated by the pointer 71.

The spring box 10 contains a valuable improvement in construction. In phonographs, it is common to mount a pair of springs in tandem upon the main shaft; i. e., one of the springs is connected by its inner end to the winding shaft and its outer end to the inside of the flange of the corresponding half spring box; the other spring being oppositely directed is connected at its outer end to the inside of the flange of its half spring box and its inner end to a sleeve mounted upon the winding shaft, said sleeve having rigidly mounted upon it the main drive gear such as 14. It has been the custom to fasten the half spring boxes together by means of a series of straps overlapping the adjacent flanges of the half boxes, either riveting such straps or screwing them down upon the flange. I find this is both unnecessary and inconvenient, and my improvement consists in providing one of the half boxes 75 with a strap 76 riveted down and overlapping the flange of the other half box 77, as shown. The adjacent flange of the other half box 77 is provided with a hook 78; which, when the two half boxes are brought together, will engage the strap 76 and since the springs within the box are always under tension, the hook 78 will always remain in engagement with the strap 76. When it becomes necessary to separate the half boxes 75 and 77 for the purpose of repair or otherwise, it is only necessary to remove the spring box and winding shaft 11, from the side plates 6 and 7, twist the half boxes in the direction of the arrows

when the half box 75 with its sleeve and the gear 14 will slide free from the shaft. I have not illustrated the interior arrangements of the springs as it is common with spring motors where a plurality of springs in tandem are mounted upon a single winding shaft. My improvement of the spring box 10 resides wholly in providing the readily detachable means for connecting the half boxes 75 and 77. In practice, I use two or more of these hooks 76 and 78 upon the half boxes.

It will be seen that by the construction illustrated and described, I am able by the simple insertion of the sliding shaft 51 with its gear 50 meshing alternately with the gears 52 and 54, both taking their motion from the gear 16 of the main driving train, to utilize in the same machine both the old 2-minute records and the new 4-minute records; and that by the simple governing disk 311, I am able to govern the speed of the motor from "stop" up to the maximum speed of which the machine is capable. The simple disengaging and shifting device for the record feed is also a great advantage in quickly shifting the record for repetition of a selection or any part thereof.

I claim:

1. In a phonograph, the combination of a motor gear train, with a sliding record driving shaft and a record feeding shaft, means for detachably connecting said shafts together to cause the feeding shaft to feed the driving shaft in the direction of its axis, a stationary carrier tube in which said driving shaft is mounted to slide, and means connected with said motor gear train for changing the relative speed of said feeding shaft with respect to said driving shaft.

2. In a phonograph, the combination with a motor gear train, a record driving shaft driven from said gear train, a stationary carrier tube in which said driving shaft is mounted to slide, a record feeding shaft lying parallel to said driving shaft, a broad faced gear upon said feeding shaft, a sliding shaft having a gear thereon in constant mesh with said broad faced gear, and capable of alternately meshing with gears in said train having different rates of rotation.

3. In a phonograph, the combination of a motor gear train, a record mandrel, a record mandrel shaft upon which said mandrel is mounted, a stationary carrier tube in which said mandrel shaft is longitudinally slidable, a pair of spaced supporting plates secured upon the free end of said tube, a gear located between said plates and splined to said mandrel shaft, and driving connections between said gear and the motor gear train.

4. In a phonograph, the combination of a motor gear train, a longitudinally slidable

record mandrel shaft driven from an intermediate gear of said train, a stationary carrier tube in which said record mandrel shaft may both rotate and slide, a screw feed shaft capable of being driven from either one of two gears in said train and a detachable connection between said mandrel shaft and said feed screw shaft whereby said mandrel shaft may be longitudinally fed at different relative rates of travel.

5. In a phonograph, the combination of a motor gear train with a record driving shaft and a record feeding shaft, a stationary carrier tube in which said driving shaft is mounted to slide and which supports one end of said feed shaft, with means for relatively increasing the rotation of said feeding shaft with respect to said driving shaft, and means for governing the rate of rotation of said record driving shaft.

6. In a phonograph, the combination of a motor gear train with a sliding record driving shaft and a record feeding shaft, a stationary carrier tube in which said driving shaft is mounted to slide and which supports one end of said feeding shaft, means for detachably connecting said shafts together to cause the feeding shaft to feed the driving shaft in the direction of its axis, and means connected with said motor gear train for changing the relative speed of said feeding shaft with respect to said driving shaft, and means for governing the rate of rotation of said record driving shaft.

7. In a phonograph, the combination with a motor gear train, a record driving shaft driven from said gear train, a record feeding shaft lying parallel to said driving shaft, a stationary carrier tube in which said driving shaft is mounted to slide and

which supports one end of said feeding shaft, a broad faced gear upon said feeding shaft, a sliding shaft having a gear thereon in constant mesh with said broad faced gear and capable of alternately meshing with gears in said train having different rates of rotation, and means for governing the rate of rotation of said record driving shaft.

8. In a phonograph, the combination of a motor gear train, a record mandrel, a record mandrel shaft upon which said mandrel is mounted, a stationary carrier tube in which said mandrel shaft is longitudinally slidable, a pair of spaced supporting plates secured upon the free end of said tube, a gear located between said plates and splined to said mandrel shaft and driving connections between said gear and the motor gear train, and means for governing the rate of rotation of said record mandrel shaft.

9. In a phonograph, the combination of a motor gear train, a stationary carrier tube, a record mandrel shaft longitudinally slidable in said tube and driven from an intermediate gear of said train, a screw feed shaft capable of being driven from either one of two gears in said train and a detachable connection between said mandrel shaft and said feed screw shaft whereby said mandrel shaft may be longitudinally fed at different relative rates of travel, and means for governing the rate of rotation of said record mandrel shaft.

This specification signed and witnessed this 16th day of Nov. 1910.

PLINY CATUCCI

Witnesses:

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