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G. DELCHEF

2,313,193

AUTOMATIC PHONOGRAPH

Filed March 13, 1940

Fig. 2

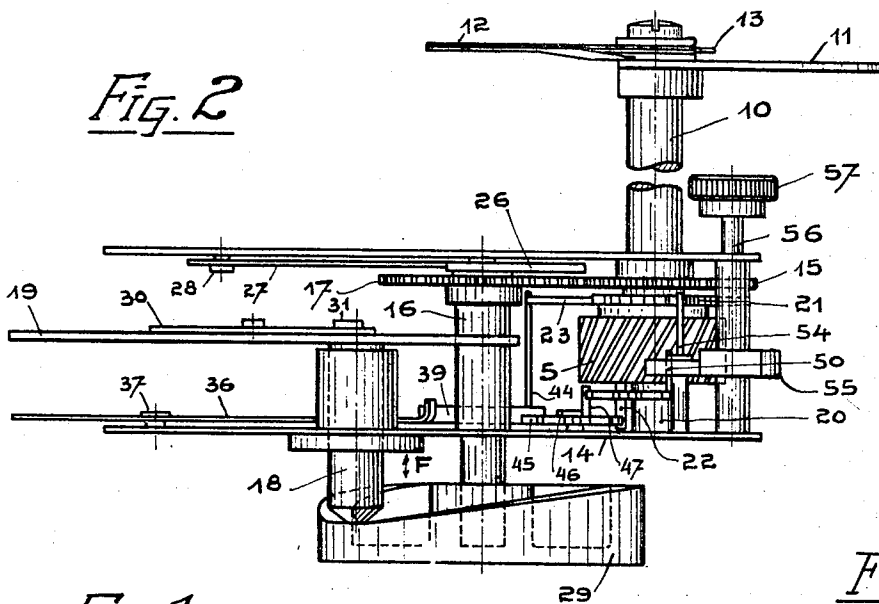


Fig. 1

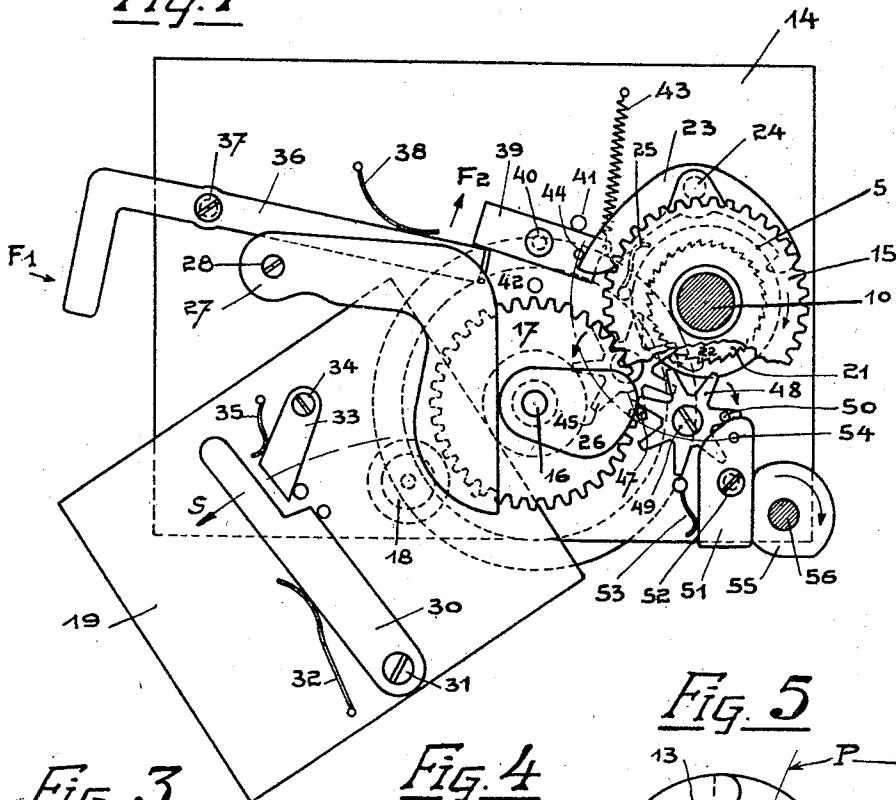


Fig. 7

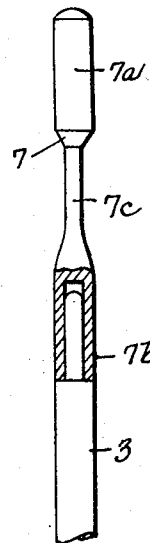


Fig. 3

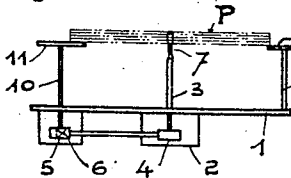


Fig. 4

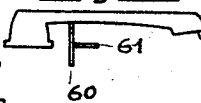


Fig. 5

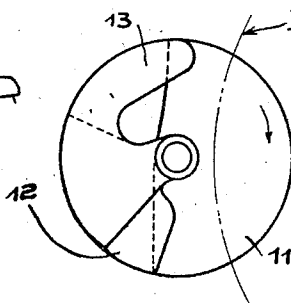
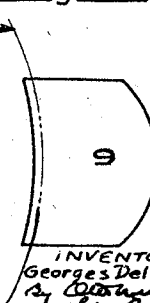


Fig. 6



INVENTOR:
Georges Delchef
By *Delchef*
his ATT.

UNITED STATES PATENT OFFICE

2,313,193

AUTOMATIC PHONOGRAPH

Georges Delchef, Brussels, Belgium; vested in the
Alien Property Custodian

Application March 13, 1940, Serial No. 323,719
In Belgium March 23, 1939

1 Claim. (Cl. 274—10)

My present invention relates to an apparatus for changing automatically phonograph records or other sound reproducing means.

The main object of the invention is to allow the user to introduce, if he so desires, a relatively long silence between the audition of two successive records.

Another object is to make it possible to effect the automatic change of records by simple means and to secure a good preservation of said records.

With those objects in view, my invention consists in the special arrangements and combinations of parts as hereinafter fully described and pointed out in the appended claims.

On the annexed drawing:

Figure 1 is a plan view of one part of the record changing device.

Figure 2 is an elevation of said part.

Fig. 3 is a small scale diagrammatic elevation of the whole record changing assembly.

Fig. 4 is an elevational view of the tone arm on a reduced scale.

Figs. 5 and 6 are top plan views of the two spaced record supporting members, respectively, and

Fig. 7 is a full scale elevation partly in section, of the upper part of the turntable spindle and of the centering spindle.

As shown in the drawing, a plate 1 (Figure 3) supports a motor 2 the shaft of which is provided with a pinion 4 and drives a wheel 5, for example by means of a worm 6.

The turntable spindle 3 carries a centering spindle 7 projecting coaxially upwardly from the turntable spindle 3 and having an upper and a lower portion, 7a and 7b, of a diameter equal to that of the turntable spindle 3, and an intermediate portion 7c of reduced diameter merging gradually into said lower portion 7b. The spindle 7 serves to center the stack of records to be supplied and to guide each record as it drops upon the turntable (not shown) of the phonograph. A stationary shaft 8 carried by plate 1 is provided with a supporting segment 9 for the records P to be played.

Wheel 5 can rotate freely upon a shaft 10 upon which a cut-out segment 11 is secured, said segment being disposed at the same level as the upper end of the intermediate portion 7c of the spindle 7. Above the segment 11 and angularly offset relative thereto, a resilient blade 13 (Fig. 2) is secured to the shaft 10 at a distance from the segment 11 equal to the thickness of a record, said blade 13 being adapted to separate for audition the lowermost record from the stack of

records. An inclined plate 12 leads down from the blade 13 to the segment 11.

A gear box 14 secured to plate 1 contains: (1) shaft 10 upon which is secured a toothed wheel 15; (2) a shaft 16 carrying a wheel 17, and (3) a shaft 18 sliding in the direction shown by arrow F and having secured to it a plate 19.

Wheel 5 is carried by a bushing 20 (Fig. 1) resting on plate 14. Wheel 5 has rigidly secured thereto a ratchet wheel 21 and a pin 22. Wheel 15 carries a pawl 23 pivoting in 24 on said wheel and being provided with a spring 25 which urges the pawl 23 into engagement with the ratchet wheel 21.

With the cooperation of parts 5—21—23—15, motor 2 can thus drive shaft 10 bearing the phonograph record supporting and selecting device.

Besides wheel 17 meshing with wheel 15, shaft 16 carries a cam 26 which is adapted to operate a lever 27 pivoting in 28. Shaft 16 carries further another cam 29 which causes shaft 18 to slide as shown by arrow F. Above mentioned plate 19 carries a lever 30 pivoting at 31 and provided with a spring 32. It carries also a pawl 33 pivoting at 34 and provided with a spring 35. A lever 36 pivoting at 37 and provided with a retracting spring 38 is adapted to change the position of a pawl 39 pivoting in 40 between abutments 41 and 42 and provided with a spring 43. Said pawl 39 comprises a rod 44, which when abutting pawl 23 causes the disengagement of the latter from the teeth 21.

The device comprises furthermore a toothed wheel 45 rotating about shaft 46 and carrying a pin 47 and a toothed wheel 48 which rotates about shaft 49 and carries a pin 50. A pawl 51 rocking about a shaft 52 and provided with a spring 53 further carries a rod 54. The position of said pawl 51 depends upon the position given to a cam 55 secured upon a shaft 56 provided with a controlling knob 57 operated manually. Similarly to rod 44, rod 54 is adapted to disengage the clutch system 4—21—23—15.

The working of the device is as follows:

The supply of records is placed on the supports 11 and 9 and is centered by the upper portion 7a of the spindle 7. A record is placed on the turntable of the phonograph (not shown).

Motor 2 is started and drives wheel 5, the pin 22 of which drives wheel 45; the latter in turn, by means of its pin 47, drives wheel 48 carrying pin 50.

Pawl 23 being unclutched from the teeth 21

under the action of rod 44, shaft 10 is not driven by wheel 5.

At the end of the audition of a record, the pin 61 with which rod 60 of the phonograph arm is provided acts upon lever 36 as shown by arrow F₁ and produces its rocking. This causes pawl 39 to rock (as shown by arrow F₂) and moves rod 44 away from pawl 23 which under the action of spring 25 engages the teeth 21 of wheel 5. Said pawl 23 is consequently connected to wheel 5 so as to drive shaft 10 to which it is secured.

Consequently, shaft 10 starts rotating with wheel 5. Wheel 15 drives wheel 17. Lifting cam 29 rotates with shaft 16 and lifts sliding shaft 18 which bears plate 19. Plate 19 by acting upon rod 60 of the phonograph arm lifts the latter from the turntable. Cam 26 pushes soon thereafter upon lever 27 which latter by acting laterally upon rod 60 causes the arm to move to the outside of the turntable. By this lateral movement, rod 60, which moves along line S, pushes away pawl 33 and swings lever 30 compressing thereby spring 32.

Concurrently, resilient blade 13 separates from the stack the lowermost record plate. The cut out segment 11 advances from underneath said record and releases it. Owing to the fact that the released record is disposed on the intermediate thin portion 7c of spindle 7, it can assume a slightly inclined position and slide off the edge of the stationary support 9, but when it reaches the lower portion 7b of the centering spindle 7, it is recentered and returned to horizontal position.

As cam 26 ceases operating lever 27, retracting spring 32 is allowed to take the phonograph arm back against pawl 33, while plate 19 sinks under the control of lifting cam 29. The phonograph arm is thus brought in the proper position to start the record to be played.

This series of operations takes a little less than one revolution of wheels 15-17. At the end of the revolution, pawl 23 engages rod 44; their engagement causes the clutching out and shaft 10 is no longer driven by wheel 5.

If rod 54 of pawl 51 has previously been brought in the trajectory of pawl 23 on account of a change of position of cam 55 operated manually, the above mentioned operations will be suspended. This interruption should preferably take place after the record to be played has sunk down onto the truntable. As wheel 5 carrying pin 22 continues rotating, the operations of record changing will be resumed automatically when the pin 50 rocks pawl 51. Rod 54 will thus be pushed away and allow pawl 23 to be again driven by wheel 5 until completion of one revolution of wheel 15.

The duration of the suspension of the record changing mechanism will thus be a function of the speed reduction between wheels 4, 45 and 48.

This device enables the user to provide at his convenience a silence of the proper length between each audition of records.

What I claim is:

In a driving arrangement for a record changing device having a shaft to be rotated through a predetermined angle for each record changing operation, the combination of a continuously rotated element, a first coupling member forming part of said element, a second coupling member secured to said shaft, a spring urging said second coupling member into engagement with said first coupling member, means to disengage said second coupling member from said first coupling member when said shaft is in a first predetermined angular position, means to render said disengaging means inoperative at the end of each rendition of a record, a member adjustable to an operative position and to an inoperative position for disengaging said second coupling member from said first coupling member in an angular position of said shaft other than said first angular position, manual control means for said disengaging member, means to render said member, after its adjustment to operative position, temporarily inoperative, and a speed reducing gear between said element and said last mentioned means for rendering said member inoperative.

GEORGES DELCHEF.