March 13, 1928. 1,662,584

C. MOCCIA

TALKING MACHINE

Original Filed Jan. 2, 1924 2 Sheets-Sheet 1

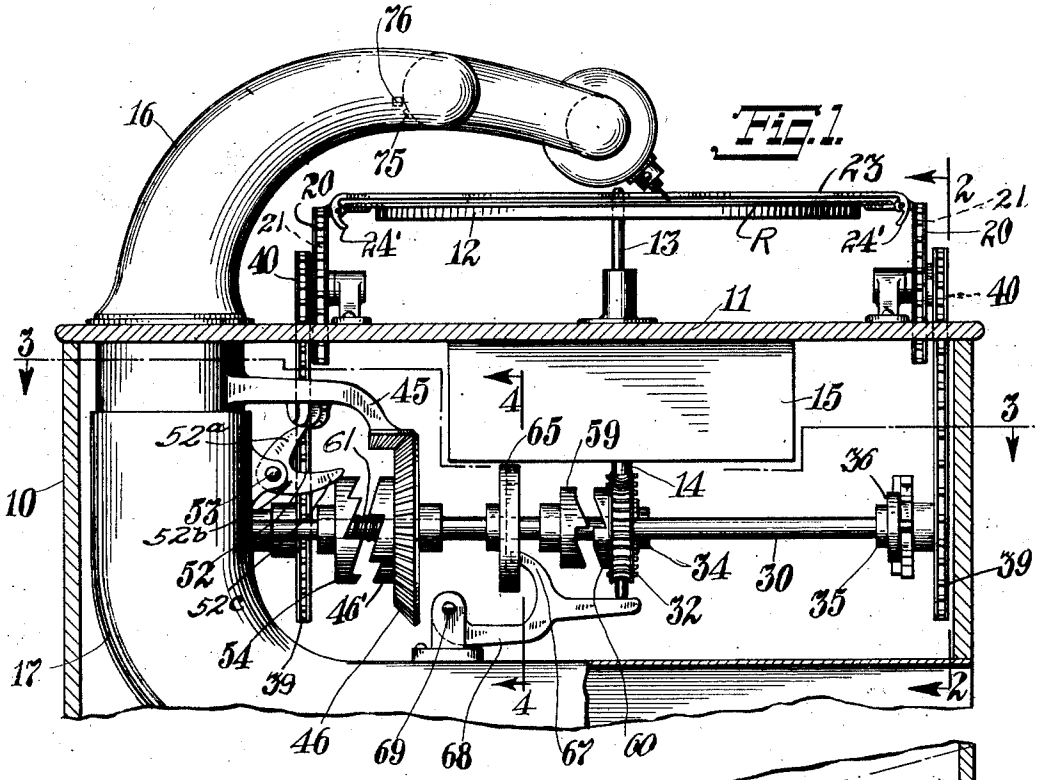


Fig. 1.

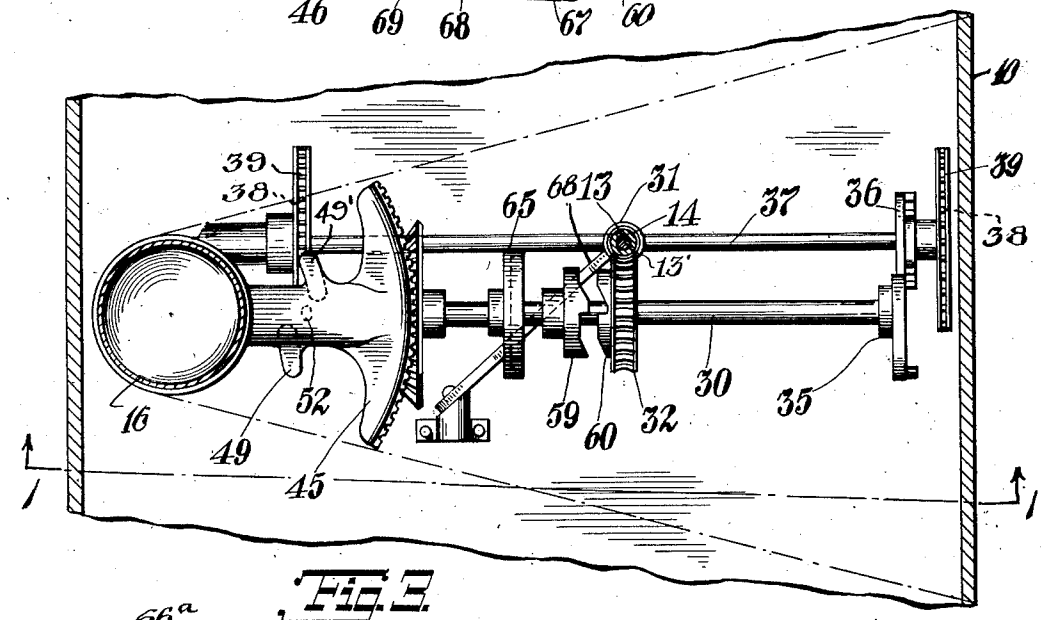


Fig. 3.

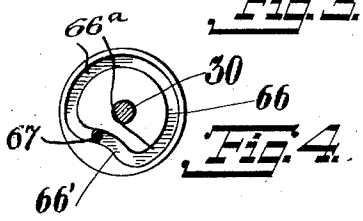


Fig. 4.

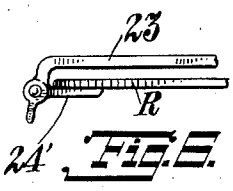


Fig. 5.

INVENTOR
Constantino Moccia
BY
ATTORNEY

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C. MOCCIA

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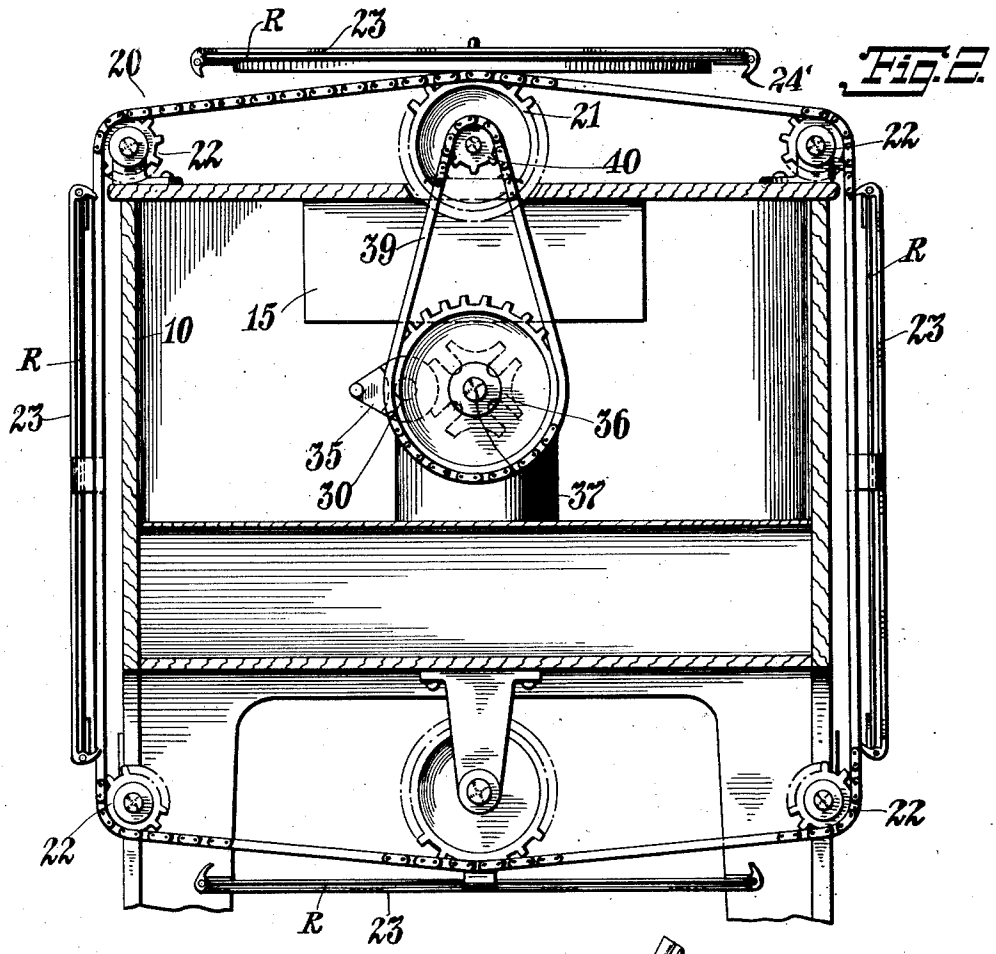


Fig. 2.

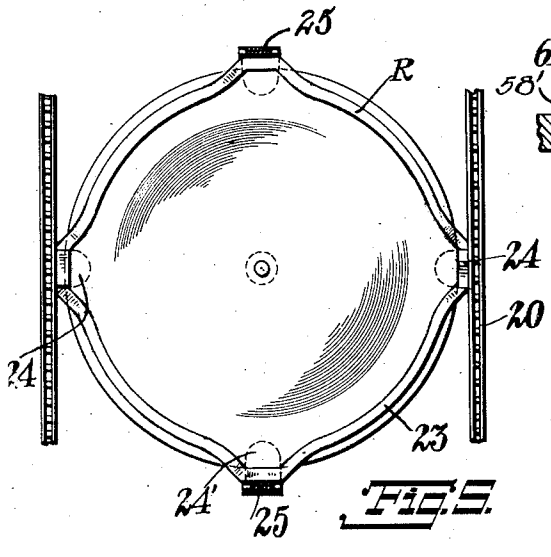


Fig. 5.

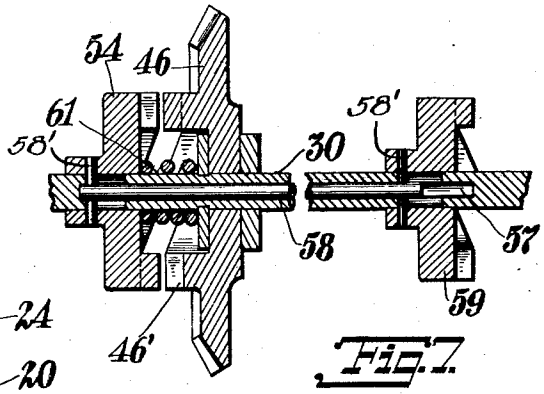


Fig. 7.

INVENTOR
Constantino Moccia
BY Colton & Hoffman
ATTORNEY

Patented Mar. 13, 1928. 1,662,584

UNITED STATES PATENT OFFICE.

COSTANTINO MOCCIA, OF LYNCH MINES, KENTUCKY.

TALKING MACHINE.

Application filed January 2, 1924, Serial No. 683,865. Renewed August 13, 1927.

This invention relates to talking machines of the disk type, which, are commonly known as gramophones, the invention having for an object the provision of a novel means whereby a number of records may be played in succession, and be automatically placed in position on the turntable of the machine and removed therefrom.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

Fig. 1 of the drawings is a vertical sectional view showing my improved gramophone, this view being taken on the line 1—1 of Fig. 3.

Fig. 2 is a vertical sectional view at right angles to Fig. 1 and taken along the line 2—2 of the latter figure.

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is a detail vertical sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is a detail plan view showing the record carrier, and a record thereon.

Fig. 6 is a fragmentary side view of the record carrier.

Fig. 7 is a fragmentary axial sectional view showing the clutch operating device.

As here embodied the improved gramophone comprises a box or casing having vertical walls 10 and a top 11, a turntable 12 being positioned above this top. The turntable is fixed on a shaft 13, which extends downward into the box, and has a feather connection 13′, with a hollow drive shaft 14, through which the shaft 13 extends, this drive shaft being driven by ordinary mechanism contained in a housing secured underneath the top 11. The shaft 13, extends at its lower end below the housing 15, and the drive shaft 14, and is engaged by a part to be presently described, which raises and lowers the turntable at certain times. The usual tone arm 16 is provided and has a rotary connection with the small end of a horn 17.

The records to be played in succession are placed on an endless carrier comprising a pair of sprocket chains 20, which are looped over the center or drive sprocket wheels 21, and the idler sprocket wheels 22, the latter being positioned at the sides of the box. Attached to these sprocket chains are a number of record holders in the form of the polygonal frame members 23 which carry at their corners the underturned claws 24, which serve to support the records R, one of these claws, indicated specifically at 24, being hinged to the frame so that it may be swung out to permit of insertion and removal of the record, a spring 25, normally holding the claw in engagement with the record.

The chains 20 are advanced step by step, to bring the records successively above the turntable, by means of a shaft 30, which is driven intermittently from the shaft 14, by means of a worm pinion 31 on said shaft 13 meshing with a worm gear 32 loose on the shaft 30. Upon this shaft 30, is the pinwheel 35 of a Geneva movement which engages with a starwheel 36 on a shaft 37 parallel to shaft 30. Fixed to opposite ends of this latter shaft 37 are sprocket wheels such as 38, over which are looped chains 39 which engage also over smaller sprocket wheels such as 40 on the stub shafts to which the sprocket wheels 21 are fixed. The worm gear 32 is given an intermittent drive connection with the shaft 30 by means operated from the tone arm 16 as the latter reaches the end of the record.

Fixed coaxially to the tone arm 16 is a bevel gear segment 45 which meshes with a bevel gear 46 loose on the shaft 30 and adapted to be driven in one direction from said shaft by means to be presently described. The gear segment 45 has a pair of arcuately shaped cam elements 49 and 49′ formed on its lower face. A bell crank lever 52 fulcrumed as at 53 is formed with a vertical arm 52^a and a horizontal arm 52^b, and the said cam elements being engageable with the upper end of the vertical arm. The said horizontal arm 52^b is formed with a cam surface 52^c on its end adapted to engage a collar 54, slidable on the shaft 30, and adapted to clutch in the worm gear 32. To this end the shaft 30 is formed with an axial central boring 57 in which is a slidable rod 58 which is fixed at opposite ends to the collar 54 and a clutch element 59 by means

of pins 58'. The clutch element 59 is adapted to engage a clutch face 60, formed on the gear 32, a spring 61 normally holding this clutch element 59 free. When the lever 52 is operated by the lug 49' to set the clutch, its horizontal arm remains in position forming an abutment for the collar 54 until the other lug 49 on the gear segment 45 moves the lever to free said collar. The collar 54, also acts to establish a one way connection between the shaft 30, and gear 46, and to this end it is formed with a clutch face adapted to engage a complementary clutch face 46' on said gear.

To raise and lower the turntable a cam disk 65 is fixed on the shaft 30 and has formed therein a cam groove 66 in which engages a finger 67 on a lever 68 fulcrumed at one end as at 69 and having its other end projecting under the turntable shaft 13 to hold the latter raised.

The manner of operation is as follows: Assume that a record is in position on the turntable 12, and the tone arm 16 is in proper position to travel over said record. As the turntable rotates the tone arm moves across the record. When the tone arm has swung through an arc sufficient for the needle to traverse the record, the cam lug 49 on the gear segment 45 engages the lever 52, causing the clutch element 59 to engage the clutch face 60 on the gear 32 and the shaft 30 to be rotated. As shaft 30 rotates the finger 67 on the lever 68 immediately comes into contact with the portion 66[a] in the cam groove 66 and the lever 68, and with it the turntable 12, is lowered. The teeth on the clutch members 54 and 46' engage and the gear 46 is caused to rotate with the shaft 30, swinging the tone arm 16 to starting position. It will be noted that by the depression of the turntable the needle on the sound box will have left the record R, a stop such as 75 being provided on the vertically adjustable end of the tone arm to engage a like stop such as 76 on the main body of the tone arm to limit downward movement of the needle. When the shaft 30 starts rotating, the pinwheel 35 thereon starts moving and engages the starwheel 36 after the turntable has dropped. The shaft 37, being thus rotated the carrier 20 is caused to advance, bringing the next record in position above the turntable, the movement of the carrier being completed before the return movement of the tone arm is finished. As the tone arm completes its return movement, the lug 49' thereon engages the lever 52 and swings the latter to a position free from the collar 54, the spring 61 then moving the clutch 59 free of the gear 32, and the collar 54 free of the gear 46. The parts are so arranged that one complete revolution of shaft 30 causes the tone arm to move to starting position. As the rotation of the shaft approaches completion, the finger 67 on lever 68 engages the rise portion 66' in the cam groove 66 and causes the turntable to be lifted. As the tone arm travels over the new record, the gear 46 moves with it, while shaft 30 remains stationary since the gear is loose on the shaft.

Having thus described my invention what I claim as new and desire to protect by Letters Patent of the United States is as follows:

1. In a talking machine of the class described, a tone arm having a bevel gear segment projecting therefrom, a shaft rotatably mounted in said talking machine, a bevel gear loosely engaged on said shaft, and meshing with said bevel gear segment, said bevel gear being formed on one side with a clutch face, a collar slidable on said shaft, and formed with a complementary clutch face, means for normally urging said clutch faces into disengagement, said shaft being formed with a central bore, and provided with elongated slots communicating with said central bore, a rod slidable in said central bore, a cross pin fixed to one end of said rod, and projecting through said elongated slots, engaging said collar, a clutch element slidable on said shaft, another cross pin fixed to the other end of said rod, and projecting through said elongated slots, engaging said clutch element, a driven gear loosely mounted on said shaft, and provided with a complementary integral clutch element, and means for pressing forward said collar to cause engagement of said clutches, when the tone arm is in record playing finished position, and releasing said collar to cause disengagement of said clutches, when the tone arm is in record playing starting position.

2. In a talking machine of the class described, a tone arm having a bevel gear segment projecting therefrom, a shaft rotatably mounted in said talking machine, a bevel gear loosely engaged on said shaft, and meshing with said bevel gear segment, said bevel gear being formed on one side with a clutch face, a collar slidable on said shaft, and formed with a complementary clutch face, means for normally urging said clutch faces into disengagement, said shaft being formed with a central bore, and provided with elongated slots communicating with said central bore, a rod slidable in said central bore, a cross pin fixed to one end of said rod, and projecting through said elongated slots, engaging said collar, a clutch element slidable on said shaft, another cross pin fixed to the other end of said rod, and projecting through said elongated slots, engaging said clutch element, a driven gear loosely mounted on said shaft, and provided with a complementary integral clutch element, and means for pressing forward said collar to

cause engagement of said clutches, when the tone arm is in record playing finished position, and releasing said collar to cause disengagement of said clutches, when the tone arm is in record playing starting position, said last mentioned means comprising a pair of arcuately spaced cam lugs on the lower face of said gear segment, and a bell crank lever formed with a vertical arm engageable with said lugs, and a horizontal arm with a cam surface engageable with said collar and a stationary member, the bell crank lever being fulcrumed thereto.

In testimony whereof I have affixed my signature.

COSTANTINO MOCCIA.