

H. T. OLIVER.

PHONOGRAPH.

APPLICATION FILED SEPT. 15, 1908.

955,424.

Patented Apr. 19, 1910.

2 SHEETS—SHEET 2.

Fig. 7

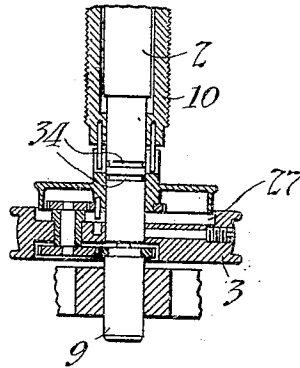


Fig. 4

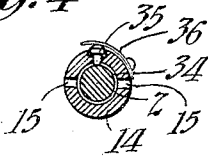
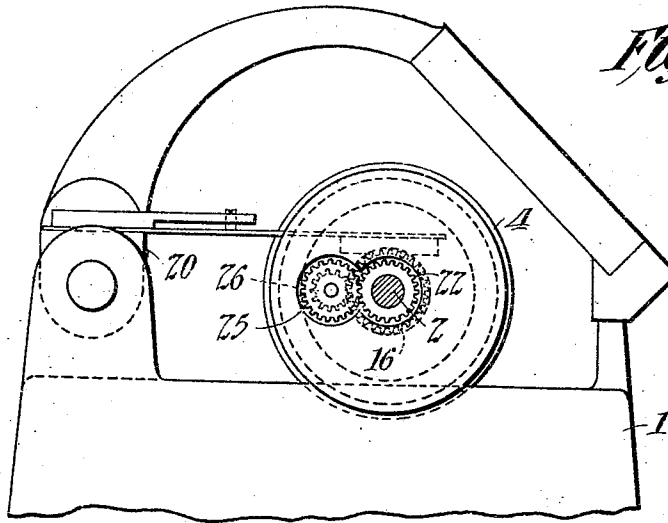


Fig. 3



Witnesses:

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UNITED STATES PATENT OFFICE.

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PHONOGRAPH.

955,424.

Specification of Letters Patent. Patented Apr. 19, 1910.

Application filed September 15, 1908. Serial No. 453,119.

To all whom it may concern:

Be it known that I, HENRY T. OLIVER, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Phonographs, of which the following is a description.

My invention relates to phonographs and has for its object the provision of interchangeable means for feeding the traveling carriage upon which the sound box is mounted at either of two rates of speed, one of which may be suitable for operating upon a record having one hundred threads per inch and the other for operating upon a record having two hundred threads per inch. The particular means employed by me in a general way embodies the invention disclosed in the application of Peter Weber, Serial No. 425,844, filed April 8th, 1908, in that there is a hollow rotary feed screw mounted concentrically with respect to an inner shaft and capable of being locked to said shaft so as to rotate therewith, or of being unlocked therefrom and driven thereby through interposed gearing so as to rotate at a different rate of speed.

My invention relates more particularly to improvements in the mounting of the hollow shaft, the means for locking the same to the inner shaft and for gearing the two shafts together, with a view to obtaining a structure in which the movable parts are protected to a great extent, are few in number, and capable of operating at the desired high rate of speed without undue wear or noise, such as would be objectionable in a phonograph, and in which the arrangement of the parts is compact and capable of being applied to phonographs of ordinary construction without any changes in the frame or stationary parts of such machines, and without the provision of any supplementary or auxiliary frame for attachment to the phonograph body.

With these ends in view, my invention consists in the features hereinafter described and claimed.

In order that my invention may be more fully understood, reference is hereby made to the accompanying drawing, forming part of this specification, and in which—

Figure 1 is a plan view, partly in section, of a phonograph constructed in accordance with my invention, the parts being arranged

for feeding the sound box carriage at a suitable speed for operating upon records having one hundred threads per inch; Fig. 2 is a view of a portion of Fig. 1 except that the parts occupy the positions which are assumed when the carriage is to be fed at a speed suitable for operating upon records having two hundred threads per inch; Fig. 3 is a section on line 3—3 of Fig. 1, and Fig. 4 is a section on line 4—4 of Fig. 1. In all the views corresponding parts are designated by the same numerals of reference.

The phonograph shown is of a well known type and comprises a base or body 1 upon which is rotatably mounted the main shaft 2, which carries at one end a driving pulley 3, and at the opposite end the mandrel 4, for supporting the sound record. This shaft may be supported in any suitable manner. As shown, the end upon which the pulley is mounted is cupped at 6, to receive a spherical roller or ball 7, and a stud or center 8 is formed on the pin 9 which is secured to the body.1. Upon the shaft 2 is rotatably mounted a hollow shaft 10 formed with a feed screw 11 of fine pitch, preferably one hundred threads to the inch, said screw shaft being journaled at its ends upon the shaft 2 as shown. The outer end of the screw shaft 10 is provided with a pair of oppositely disposed pins 13 and upon the shaft 2 is slidably mounted a sleeve 14 formed with a cup 12 integral therewith. One end of said sleeve is formed with a pair of notches 15 which receive the pins 13 of the shaft 10, thereby causing said members to rotate together. On the other end of said sleeve is fixed a spur gear 16 and one or more pins 17 projecting from its face and adapted to engage holes or sockets 18 formed in the web of the pulley 3 which is fixed to the shaft 2 by means of a set screw 5. When in this position, as illustrated in Fig. 1, the sleeve 14 and shaft 2 are locked together and the screw shaft 10 is therefore locked to the shaft 2 and rotates at the same speed, and by reason of the engagement of the feed nut 21 with the screw 11, feeds the sound box carriage 20 at a rate suitable for operating upon records having one hundred threads per inch.

There is a spur gear 22 which is fixed upon a shouldered portion of the pin 9, and there is a bearing 23 carried by the pulley

3, in which is journaled a shaft 24, upon the ends of which are secured the spur gears 25 and 26. The gear 25 meshes with the gear 22 and the gear 26 is so placed that when the parts occupy the position shown in Fig. 1, it is out of engagement with the gear 16, and the shaft 24 rotates idly. When the parts are in the position shown in Fig. 2, the gears 16 and 26 are in driving engagement and the pin 17 entirely withdrawn from the socket 18, so that the shaft 10 is unlocked from the shaft 2, and is driven from the pulley 3 by reason of the engagement of the gear 25 with the fixed gear 22 and the gear 26 with the gear 16, which gears are so proportioned as to drive the shaft 10 at half the speed of the shaft 2 and thereby feed the carriage 20 at a rate suitable for operating upon records having two hundred threads per inch. In order, therefore, to render the instrument capable of operating upon records having one hundred threads per inch, it is necessary only to move the sleeve 14 into such position as to lock the same to the pulley 3 by the engagement of the pin 17 with the socket 18, as shown in Fig. 1, and in order to adapt the instrument to operate upon records having two hundred threads per inch, it is necessary only to move the sleeve 14 from the position of Fig. 1 into that of Fig. 2.

It will be observed that the cup 12 which is formed upon the sleeve 14 fits closely within the circular opening 27 in the face of the pulley 3 and incloses and protects the gears 26 and 16, and that the opposite face of the said pulley is provided with a recess 28 in which are situated the gears 22 and 25. Thus the entire interchangeable gear system occupies about the same space as the drive pulley of the main shaft of the ordinary phonograph, and the driving parts or gears are largely protected from dust and dirt, while at the same time the practical operation of my invention has shown me that there is very little noise produced by the driving mechanism when operating in either of its positions, so that it does not detract at all from the operation of the instrument. Furthermore, my improvements may be readily applied to an ordinary phonograph, as it is necessary only to remove from the phonograph the shaft which carries the mandrel, feed screw and driving pulley, and substitute therefor the concentric shafts 2 and 10, pulley 3 and parts associated therewith.

In order to prevent longitudinal movement of the shaft 10 a groove 29 is formed in the end thereof, and there is a collar 30 secured by a set screw 31 to the shaft 2. A bent plate 32 is secured to said collar by a screw 33, in such a way that its end engages said groove 29, as shown in Fig. 1.

In order to lock the sleeve 14 in either of its operative positions, a pair of grooves 34

are formed in the shaft 2, and there is a small pin 35 (see Fig. 4) mounted in an opening in the sleeve 14, in such position as to enter one of the grooves 34 when the sleeve is in the position of Fig. 1, and the other of said grooves when said sleeve is in the position of Fig. 2. The inner end of the pin 35 is rounded, and there is a flat spring 36 secured at one end to the sleeve 14 by a screw 37, the free end of said spring pressing upon the head of the pin 35, whereby said pin operates as a detent releasable by the longitudinal movement of the sleeve 14, which will ordinarily be operated by the hand, although special means may be provided for this purpose, if desired.

Having now described my invention, what I claim is:

1. In a phonograph, the combination of the main shaft, a rotary hollow feed screw shaft surrounding said main shaft, a gear concentric and rotatable with said hollow shaft, a fixed gear concentric therewith, and a planet wheel for driving said rotary gear from said fixed gear, substantially as set forth.

2. In a phonograph, the combination with the rotating hollow feed screw shaft, of a rotary shaft within said screw shaft, means for locking said shafts together so as to rotate at the same speed, and means interchangeable therewith for gearing said shafts together so as to rotate at different speeds and comprising a fixed and a rotary gear concentric with said shafts, and a planet wheel, substantially as set forth.

3. In a phonograph, the combination of the main shaft, a rotary hollow feed screw shaft surrounding said main shaft, a drive pulley fixed to said main shaft and planetary gearing applied to said pulley and adapted to drive the hollow shaft in the same direction as the main shaft but at a different speed, substantially as set forth.

4. In a phonograph, the combination of the main shaft, a rotary hollow feed screw shaft surrounding said main shaft, a drive pulley fixed to said main shaft, and planetary gearing adapted to drive the hollow shaft in the same direction as the main shaft but at a different speed, said pulley being recessed to receive said gearing, substantially as set forth.

5. In a phonograph, the combination of the main shaft and hollow feed screw shaft concentric therewith, a longitudinally movable sleeve 14 rotatable with the hollow shaft 10, said sleeve being formed with a cup, and a planet wheel adapted to connect said shafts in driving relation and so situated as to be protected by said cup, substantially as set forth.

6. In a phonograph, the combination of a hollow feed screw shaft and main shaft concentric therewith, a drive pulley secured

to the main shaft and formed with a recess,
a sleeve rotatable with said hollow shaft
and movable longitudinally thereof, said
sleeve being so situated as to close said re-
cess formed in said pulley, substantially as
set forth.

7. In a phonograph, the combination of
the hollow feed screw shaft and main shaft
concentric therewith, a drive pulley secured
to the main shaft and formed with a recess,
a fixed gear concentric with said pulley and
situated within said recess, and a planet
wheel carried by said pulley in driving re-
lation to said fixed gear, substantially as set
forth.

8. In a phonograph, the combination of
the hollow feed screw shaft and main shaft

concentric therewith, a sleeve rotatable with
said screw shaft but slidable into different
positions axially with respect thereto, gear
means, means for coupling said shafts to-
gether directly through said sleeve in one
position thereof and through said gear
means in another position thereof, and
means for locking said sleeve in each of its
operative positions, substantially as set
forth.

This specification signed and witnessed
this 31st day of August 1908.

HENRY T. OLIVER.

Witnesses:

DELOS HOLDEN,
H. H. DYKE.