

T. H. MACDONALD.
 GRAPHOPHONE.
 APPLICATION FILED APR. 27, 1907.

936,646.

Patented Oct. 12, 1909.
 3 SHEETS—SHEET 1.

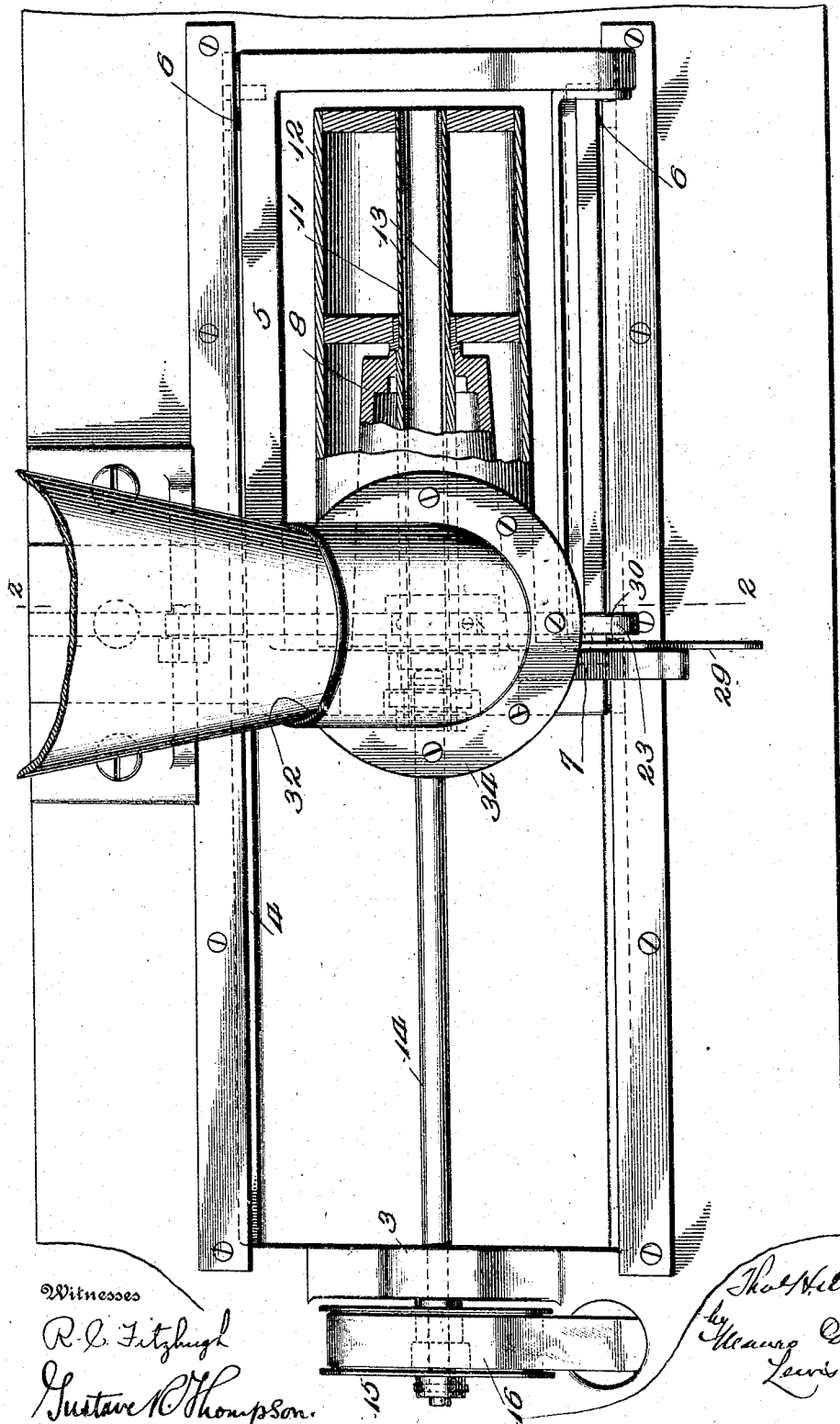


Fig. 1.

Inventor

Witnesses

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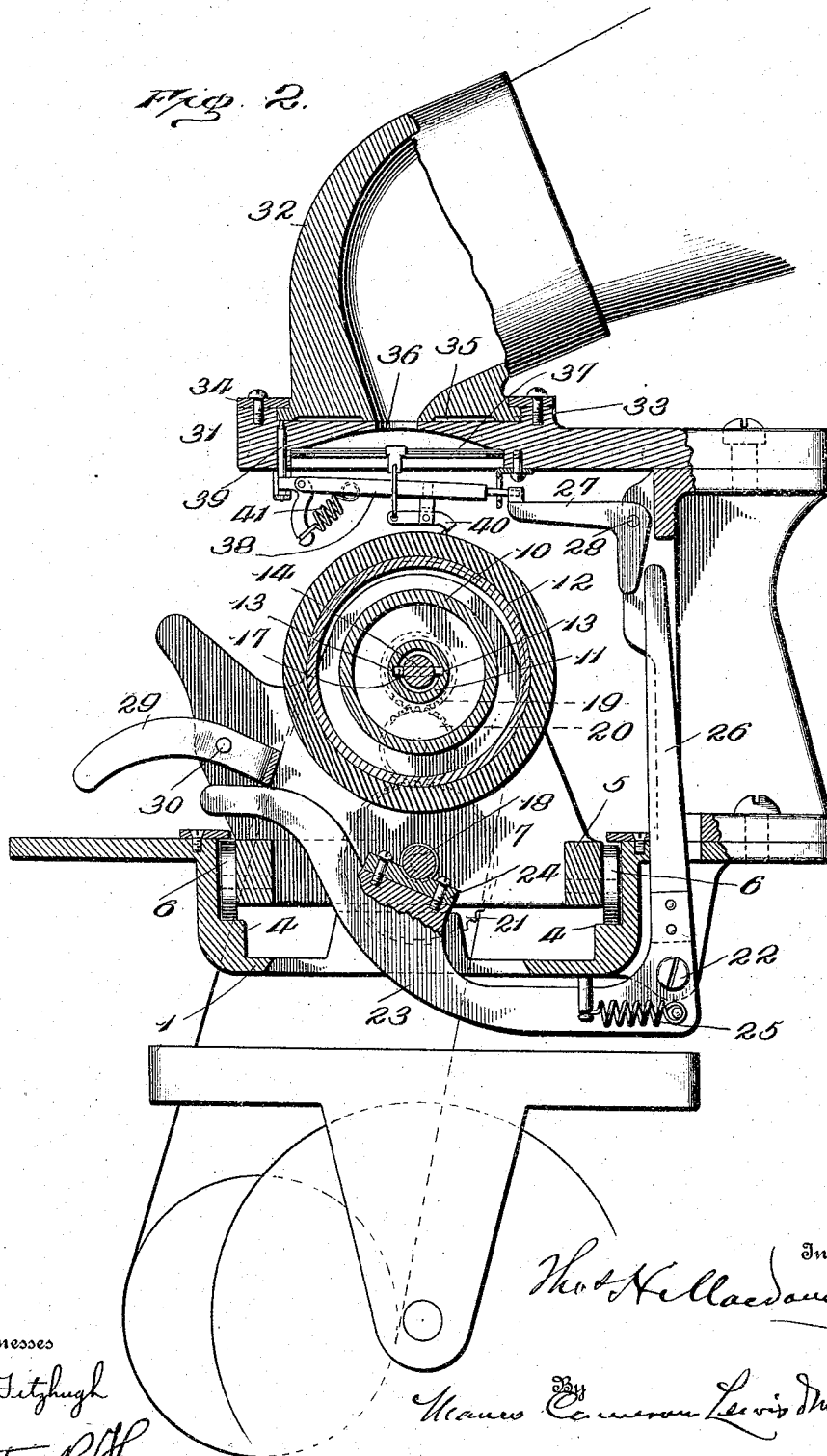
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 3 SHEETS—SHEET 3.

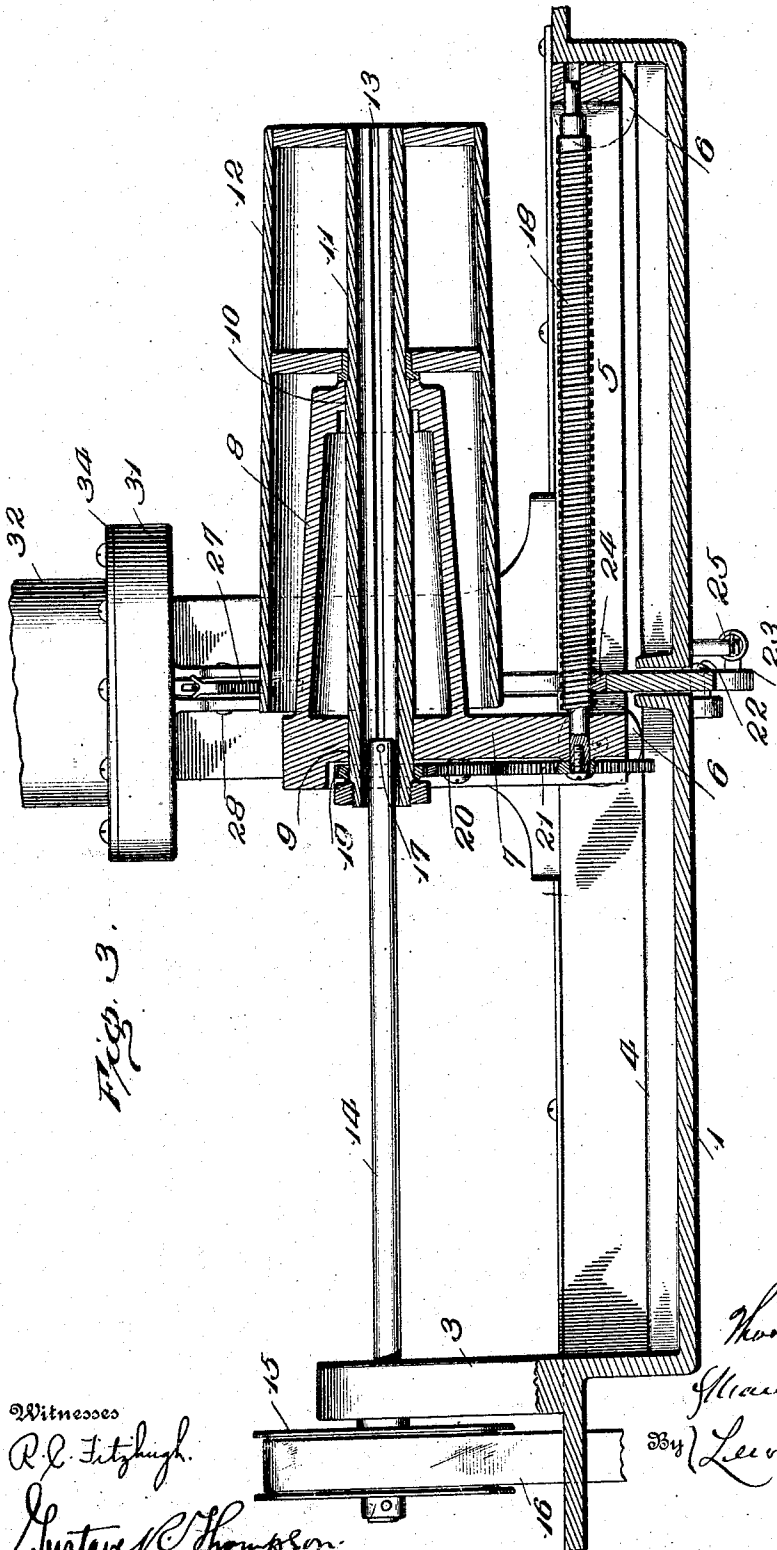


Fig. 3.

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UNITED STATES PATENT OFFICE.

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GRAPHOPHONE.

936,646.

Specification of Letters Patent.

Patented Oct. 12, 1909.

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To all whom it may concern:

Be it known that I, THOMAS H. MACDONALD, of Bridgeport, Connecticut, have invented a new and useful Improvement in 5 Graphophones, which improvement is fully set forth in the following specification.

This invention relates to graphophones, and has for its object to provide a machine of this character which shall be simple in 10 construction, with a direct connection from the sound-box into the amplifying horn used in such machines, without any loose joints between the sound-box and the horn; to provide a rigid horn support, and generally a 15 more compact construction in that form of machine which employs a cylindrical record.

With these objects in view, the invention consists of the arrangement and combination of elements hereinafter described and 20 then pointed out in the claims.

One mechanical expression of the inventive idea is, for the purpose of illustration, shown in the accompanying drawings, in which—

25 Figure 1 is a top plan view with parts broken away; Fig. 2 is a cross-section on the line 2—2, Fig. 1; and Fig. 3 is a central longitudinal section.

Referring to the drawings, 1 is a suitable 30 frame provided with a vertical upright 3, and provided with a suitable track or raceway such as the ledges 4, 4. A carriage 5, preferably provided with wheels 6, 6, rests upon this track or raceway, said carriage 35 having at one end a vertical upright 7 with an outwardly projecting and preferably hollow bracket piece 8. The upright 7 and the bracket piece 8 are provided with bearings 9 and 10 respectively, within which is mounted 40 to turn a hollow mandrel shaft 11, supporting a mandrel 12. This mandrel shaft has, on diametrically opposite sides of its interior, spline-grooves 13, 13.

Turning in bearings in the upright 3 is a 45 shaft 14 having on its exterior end pulley 15 driven by belt 16 extending from the motor. On the opposite end of the shaft 14 is a pin 17 whose outwardly projecting ends extend into the spline-grooves 13 on the interior of the mandrel shaft 11 with which the propelling 50 shaft 14 is arranged to telescope. Beneath the mandrel, propelling screw 18 is mounted in the carriage 5, with one end projecting through the bearing in the carriage, and a

train of gears 19, 20 and 21 connect the mandrel shaft 11 with the propelling screw 18.

Pivoted to the frame 1 at 22 is a lever 23 bearing a nut 24, which nut is normally held in engagement with the propelling screw 18 by the spring 25 secured at one end to the 60 lever 23 and at the other end to the frame of the machine, as shown. Rigidly secured to and preferably integral with the lever 23 is an upwardly projecting arm 26, whose upper end is in position to wipe against one arm 65 of bell-crank-lever 27, pivoted to the frame of the machine at 28, the other arm of the lever 27 being in position to lift the reproducer, so as to throw the style out of engagement with the record when the lever 23 is 70 operated against the tension of the spring 25, by which operation the nut 24 is disengaged from the propelling screw. As a convenient means for thus actuating the lever 23, a lever 29 is pivoted to the frame at 30 75 with one arm in position to engage the lever 23 when the outwardly projecting end of the lever 29 is lifted, as will be readily understood.

Rigidly secured to the frame 1 is the 80 sound-box 31 with the amplifying horn 32 secured directly upon the back thereof, preferably so as to swing around, to the end that the horn may be directed to any point 85 of the compass. This connection in the present instance is shown as secured by forming a suitable recess in the back of the sound-box 31, within which the flanged end 33 of the horn snugly fits, but without binding, and an annulus 34 is secured to the sound- 90 box, with its inner edge projecting over the flange 33 of the horn, as clearly shown in Fig. 2. For the purpose of avoiding unnecessary friction, the end of the horn, or more properly speaking, the elbow thereof, 95 has an annular recess 35 formed therein. The interior of the horn adjacent to the part where it joins the sound-box is tapered or conical, with its smallest point provided with an opening registering with a suitable hole 100 or opening 36 in the top or back of the sound-box. The sound-box is provided with the usual or any suitable diaphragm 37, and with a stylus bar or lever 38 pivoted at 39 to the frame and carrying a stylus lever 40 105 which is connected to the diaphragm, as by a suitable thread or other connection. The stylus bar or lever 38 is normally held de-

pressed by the action of a spring 41, the outer end of said lever being in the path of the upward movement of the bell-crank-lever 27, to the end that when said latter lever is actuated this stylus will be elevated from the record. This general construction of reproducer is one shown, described and claimed in a previous application of mine, and need not, therefore, be further herein described in detail.

Operation: As shown in the drawings, the parts are in the position which they occupy at the time when the reproduction of a record has begun, the nut 24 being in engagement with the propelling screw 18, and the reproducing stylus being in engagement with the record. When power is applied to the shaft 14 it revolves the mandrel 12 by reason of the engagement of the pin 17 and the splines 13 of the hollow mandrel shaft 11; and by reason of the chain of gearings 19, 20 and 21 the propelling screw 18 is revolved; and by reason of the engagement of this screw with the nut 24 the carriage 5 is propelled along the ways 4, 4, the shaft 14 telescoping with the mandrel shaft 11 during this movement. When it is desired to stop the machine, the lever 29 is raised, thereby disengaging the nut from the propelling screw and causing the lever 27 to elevate the stylus to disengage it from the record.

It will be observed that there is thus provided a very compact construction, with a rigid horn support, which horn has direct connection with the sound-box, without any movable or loose joints between the horn and the sound-box which would interfere to a greater or less extent with the correct transmission of the sound waves from the sound-box to the amplifying horn.

What I claim is:

1. In a graphophone, the combination of a carriage, a mandrel shaft and operating screw mounted to revolve therein, a record-carrying mandrel on said shaft, a nut fixed on the machine and engaging said screw, a

power shaft operatively connected to said mandrel shaft and operating screw, a sound-box fixedly mounted with relation to the mandrel, and an amplifying horn directly mounted on the sound-box.

2. In a graphophone, a frame, a track or way on said frame, a carriage movable on said way, a revoluble mandrel and an operating screw mounted to turn on said carriage, a power shaft having bearing on said frame and operatively connected to said mandrel, a train of gearing between said mandrel and screw, a nut on the frame engaging said screw, a sound-box fixed to the frame, and an amplifying horn mounted directly on said sound-box.

3. In a graphophone, the combination of a fixedly mounted sound-box, a hollow mandrel, a hollow mandrel shaft supporting the same, a bearing for said shaft projecting into said mandrel, a power shaft telescoping with and splined to said mandrel shaft, an operating screw and nut one of which is fixed and the other of which moves longitudinally with the mandrel, and operative connections between the power shaft and the one of these elements which moves longitudinally with the mandrel.

4. In a graphophone, the combination of a fixedly mounted sound-box, a carriage, a revoluble mandrel and an operating screw on said carriage, a lever pivoted to the machine frame and bearing a nut engaging said screw, a record on the mandrel, a stylus on the sound-box engaging the record, and means operated by said lever when it is moved to disengage the nut from the screw, which means lifts the stylus from the record.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

THOMAS H. MACDONALD.

Witnesses:

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