

No. 874,973.

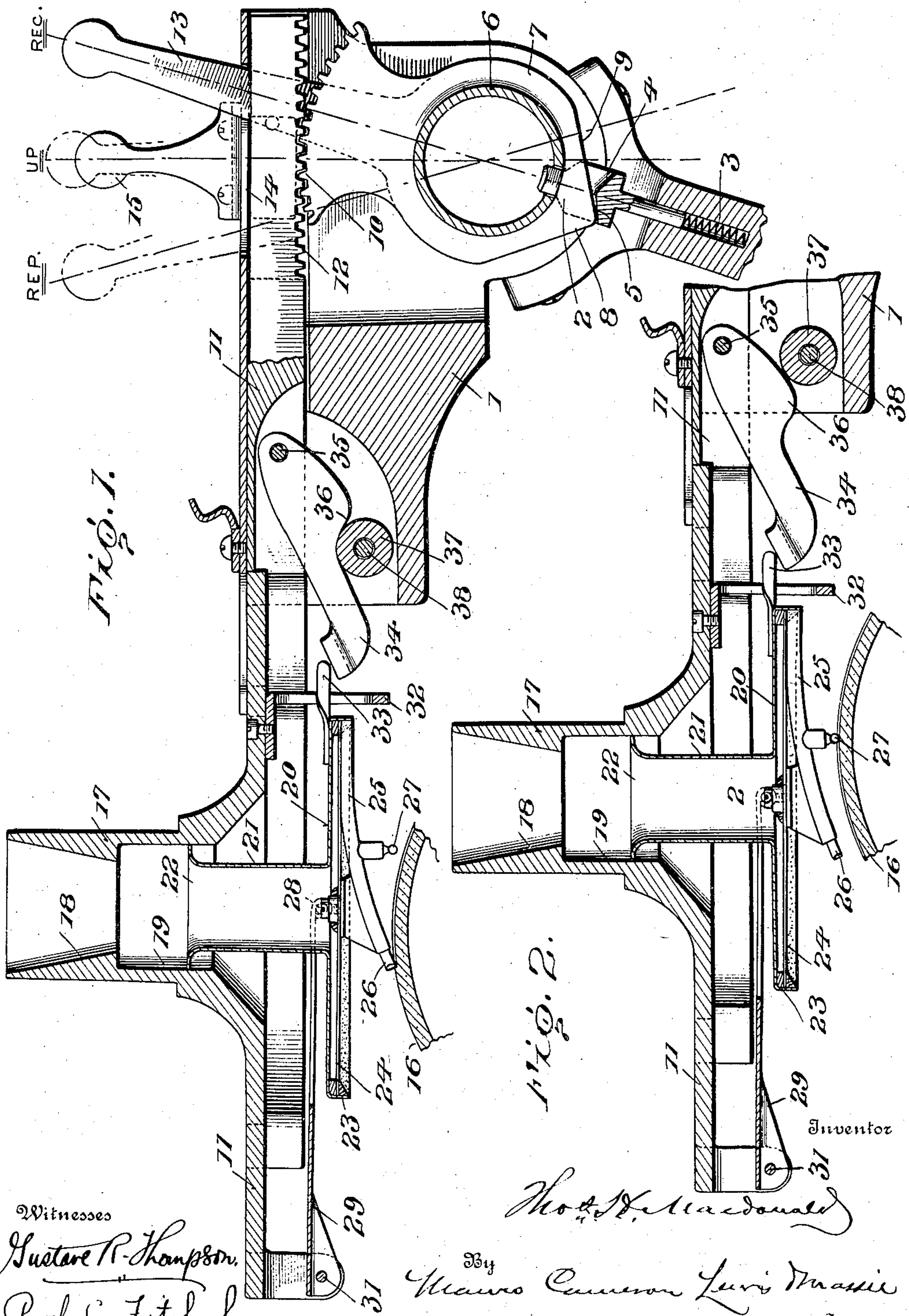
PATENTED DEC. 31, 1907.

T. H. MACDONALD.

COMBINED RECORDER AND REPRODUCER FOR TALKING MACHINES.

APPLICATION FILED MAR. 27, 1907.

2 SHEETS—SHEET 1.



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Fig. 3.

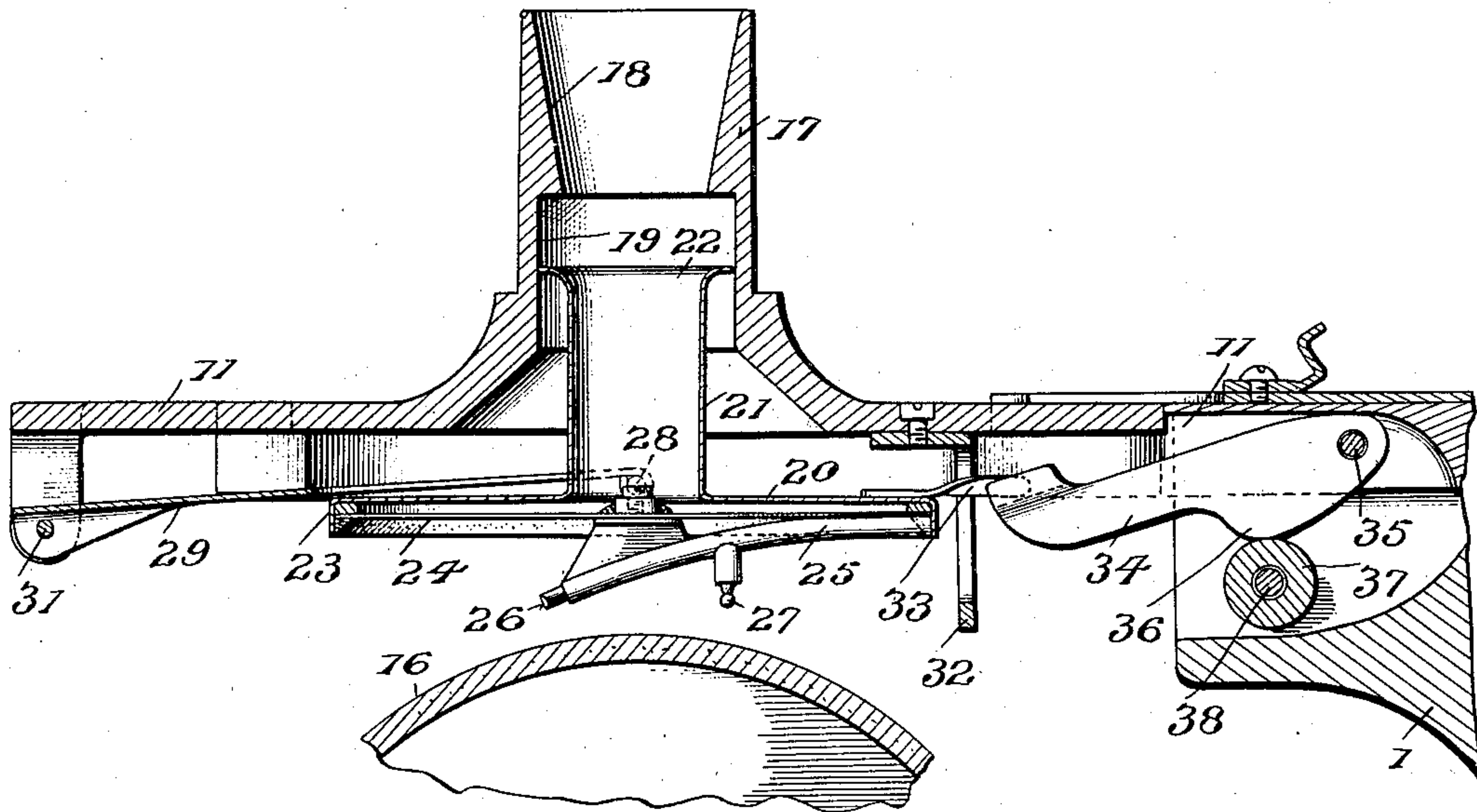
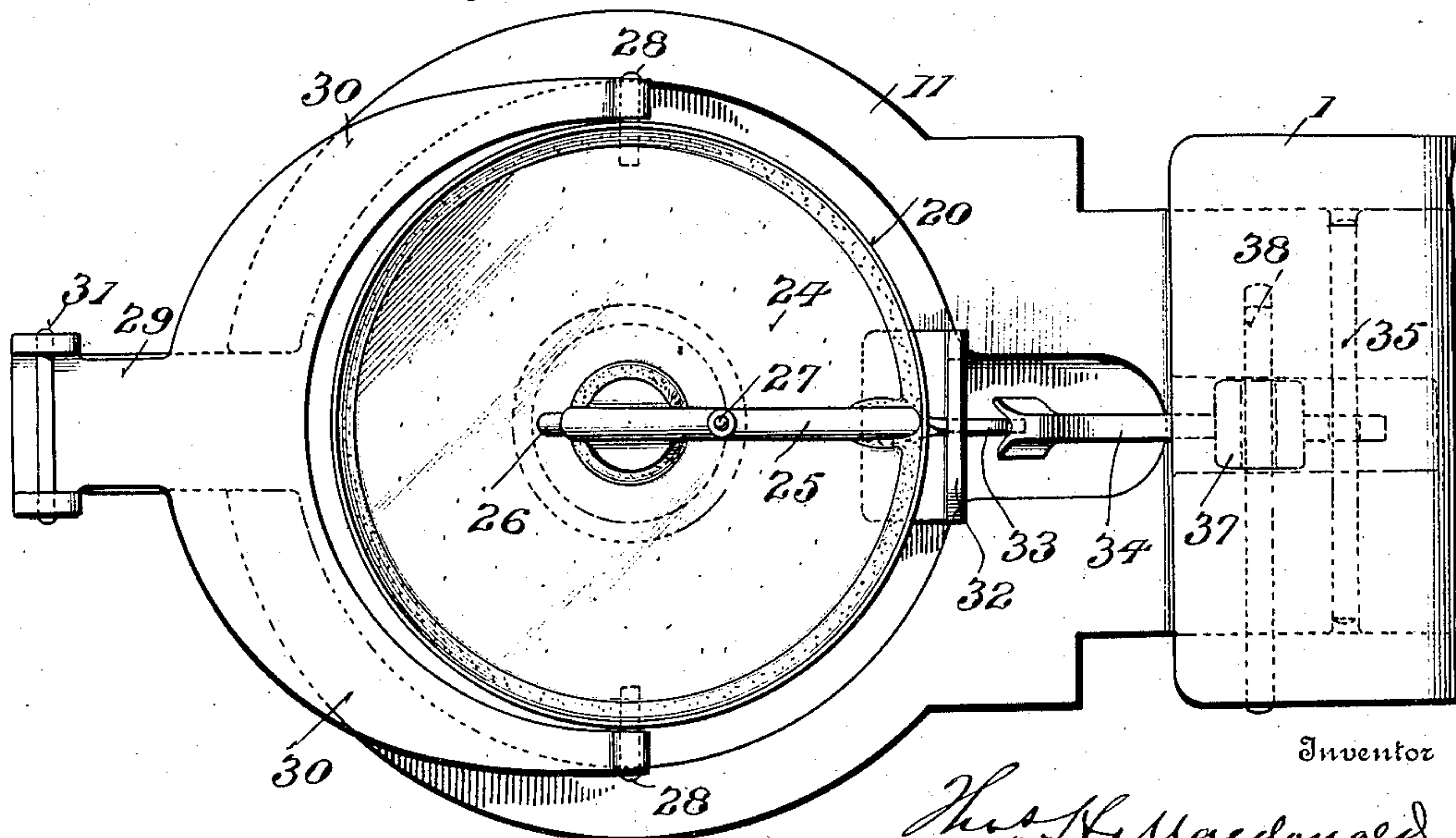


Fig. 4.



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# UNITED STATES PATENT OFFICE.

THOMAS H. MACDONALD, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO AMERICAN GRAPHOPHONE COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF WEST VIRGINIA.

## COMBINED RECORDER AND REPRODUCER FOR TALKING-MACHINES.

No. 874,973.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed March 27, 1907. Serial No. 364,849.

*To all whom it may concern:*

Be it known that I, THOMAS H. MACDONALD, of Bridgeport, Connecticut, have invented a new and useful Combined Recorder and Reproducer for Talking-Machines, which invention is fully set forth in the following specification.

This invention relates to a combined recorder and reproducer for talking machines, and has for its object to provide such a device which will be readily shifted from the recording to the reproducing action, or from either the recording or the reproducing action to a position of inactivity, while at the same time providing a device which will be simple and cheap to manufacture and efficient in operation.

With these objects in view, the invention consists in a slide and means for operating the same, upon which slide is supported a diaphragm carrying a recording stylus and a reproducing stylus, which diaphragm is supported on the slide by means which, as the slide is reciprocated, will move the diaphragm toward or from the record, as the case may be, while always maintaining the diaphragm in a plane practically parallel with the movement of the slide.

Moreover, the invention further consists in the construction of the recorder and reproducer head whereby the sound-tube or neck leading to the space to the rear of the diaphragm is formed integrally with the head itself, instead of being jointed thereto, as heretofore.

One mechanical expression of the inventive idea is embodied in the accompanying drawings, in which—

Figure 1 is a central transverse vertical section, showing the parts in the position which they occupy when the recording stylus is in contact with the record; Fig. 2 is a like view with the reproducing stylus in contact with the record; and Fig. 3 is a similar view with both the recording and reproducing styli lifted from or out of contact with the record. Fig. 4 is a bottom plan view.

Referring to the drawings, 1 is a part of the carriage of the machine, and 2 is the usual sectional nut by which the carriage is caused to engage the usual or any suitable advancing screw, said nut being normally pressed inward towards the screw by the

spring 3. This nut has two reversely inclined cam surfaces 4 and 5 which meet in a centrally located apex, as shown. Surrounding guide-tube 6 which protects the propelling screw (not shown) is disk 7 having on its lower portion two cam faces 8 and 9, and on its upper portion a segment 10 provided with rack-teeth, as clearly shown in Fig. 1.

Mounted upon the carriage portion 1 is a slide 11 provided on its under side with a rack 12 engaged by the segmental rack-teeth 10, and secured to disk 7 is a handle 13 projecting upward through a slot 14 in the top of the slide, while 15 is an upwardly projecting lug permanently secured to the carriage. The slide projects outward over the record 16 and is provided on its upper side with a horn or sound-tube-receiving neck 17, the interior of the neck tapering as at 18 along its upper portion, but being substantially cylindrical, as at 19, in the lower portion of the neck.

20 is the recorder or reproducer head which has formed integral therewith the upwardly projecting neck 21, which is of less diameter than the cylindrical portion 19, and is provided with a flaring mouth 22 which fits loosely within the cylindrical portion 19. The recorder or reproducer head and the neck or tube 21 are preferably struck up from a single piece of metal, a depending flange 23 being provided within which is seated the diaphragm 24 held in place by the usual rubber gaskets or any other suitable means. Carried on the diaphragm 24 is the support 25 for the recording stylus 26 and the reproducing stylus 27, which are arranged one behind the other in a plane transverse to the axis of the record 16 and substantially in the line of movement of the slide. The position of the recording stylus 26 and the reproducing stylus 27 is such that when the slide is in the position shown in Fig. 1 the recording stylus is in operative relation with the record 16, the curve of the record, however, being such that the reproducing stylus 27 is out of contact therewith. On the other hand, when the slide is at its extreme left-hand position, as shown in Fig. 2, the recording stylus 26 is out of contact with the record and the reproducing stylus is in contact therewith. It will thus be seen that when



one stylus is in operation the other is substantially on the tangent to the record at the point occupied by the other stylus.

In order to remove the respective styli 5 from contact with the record during the time when the shifting occurs, so as to bring one or the other of the styli into operative position, and also in order to throw both styli out of operation when desired, means are provided 10 whereby the styli are both lifted from the record at a point intermediate of the extreme throw of the slide. In order to accomplish this end and at the same time hold the diaphragm at all times parallel with 15 the face of the slide, the reproducer head 20 is provided with two trunnions 28, 28, Fig. 4, and piece 29 provided with forked arms 30, 30, is pivoted at 31 to slide 11, the outer ends of forks 30 having bearings within which the 20 trunnions 28, 28 rest. Secured to slide 11 is a downwardly projecting slotted lug 32, and projecting through said slot is an arm 33 whose outer end rests on the inclined end of a lever 34 pivoted at 35 to slide 11. This 25 lever 34 has on its under side a cam 36 which rests upon an abutment 37 forming a part of the carriage 1. As here shown, this abutment is in the form of a roller turning upon a pin 38. The construction of the cam portion 30 of the lever 34 is such that when the slide is in its medial position, as shown in Fig. 3, the cam rests upon the roller and thereby raises the lever 34, and, by reason of contact of the lever with the end of arm 33, the diaphragm is also raised, the free sliding movement of flange 22 of tube 21 readily permitting this action. When the slide lever 13 is 35 thrown from the up or medial position (see Fig. 1) to the recording position shown in full lines in Fig. 1, the slide is thrown to the right, and the lever 34 is also thrown to the right so as to withdraw the cam 34 from off the abutment roller 37, thereby permitting the lever to fall and the reproducer head descends by 40 gravity until the recording stylus rests upon the record. When the slide lever 13 is thrown from the up position at the left, however, and into the position shown in dotted lines in Fig. 1, the cam 36 is pushed off of the 45 abutting roller 37 and the lever permitted to descend with the recording stylus 27 in contact with the record, as shown in Fig. 2. During these movements the reproducer head and with it the diaphragm, rises and 50 falls in a horizontal plane, thereby avoiding any rocking of the diaphragm and tendency of the recording stylus to gouge into the record or the reproducing stylus to unnecessarily press thereon, the first and initial part of the movement being to promptly elevate the 55 stylus away from the record in a substantially vertical direction.

When the arm 13 is thrown into the medial or up position (Fig. 1) the apex lying 60 between the cam faces 8 and 9 of disk 7 prac-

tically rests upon the apex of the nut that lies between the cam faces 4 and 5, thereby pressing the nut against the tension of spring 3 and throwing the nut out of engagement 70 with the screw, and hence stopping the machine. It will be apparent from an inspection of Fig. 1 that when the lever 13 is shifted either from the right or left for throwing the recorder or reproducer into action the pressure on the nut will be removed and the 75 same will be again thrown upward so as to engage the propelling screw.

The stationary upwardly-projecting lug 15 affords a ready means by which the operator can exactly adjust the throw of the lever 13 80 and by placing the thumb and forefinger upon the lever 13 and upon the head of the lug 15 and throwing the lever it can be readily stopped opposite the lug 15, and, as the lever 13 is the longer, its projecting end 85 may be readily operated when it is desired to throw the slide in either direction away from the up or central position.

What is claimed is:

1. The combination of a diaphragm, a recording stylus and a reproducing stylus attached thereto, a slide supporting said diaphragm, and means elevating the diaphragm relative to the slide at a point intermediate the extremes of movement of the slide. 90 95
2. The combination of a diaphragm, a recording stylus and a reproducing stylus connected thereto, a slide, means supporting said diaphragm on said slide and parallel therewith, means elevating the diaphragm 100 upon the movement of the slide, and means maintaining the diaphragm parallel with the slide during the elevating movement.
3. The combination of a diaphragm, a recording stylus and a reproducing stylus connected thereto, a slide supporting said diaphragm, and means moving the diaphragm from and permitting it to move by gravity towards the record, and means maintaining the diaphragm substantially parallel with the 105 110 slide during said movements.
4. The combination of a slide, a diaphragm supported by said slide, a style carried by the diaphragm and in contact with the record tablet, and means carried by the slide 115 and lifting the diaphragm upon the movement of the slide.
5. The combination of a slide and means for reciprocating the same, a diaphragm, a stylus carried thereby and resting by gravity 120 on the record, means lifting the diaphragm from and permitting it to return by gravity towards the record while maintaining the diaphragm at all times substantially parallel with the slide. 125
6. In a combined recorder and reproducer the combination of a diaphragm carrying a recording stylus and a reproducing stylus, a slide, flexible connections between said slide and diaphragm, means carried by the slide 130



and acting to raise said diaphragm and permit it to fall on each forward or backward movement of the slide, and means for reciprocating said slide.

5 7. In a combined recorder and reproducer, the combination of a reciprocatable slide and means for actuating it, with a diaphragm, a head or support therefor, a hinge-piece piv-  
10 oted to said slide and said diaphragm-head, means carried by the slide and engaging a part of said diaphragm-head, and a device for raising said last-named means and per-  
mitting the same to descend by gravity on each full reciprocation of the slide.

15 8. In a combined recorder and reproducer, the combination of a slide having a sound-conveying neck projecting therefrom, a re-  
20 corder or reproducer-head having an integrally formed neck fitting loosely in the neck on the slide, a diaphragm carried by said  
slide, a style connected to said diaphragm and normally resting by gravity on the rec-  
ord tablet, and means carried by the slide and acting on the reciprocation of the slide  
25 to raise the diaphragm and permit it to again descend by gravity.

9. The combination of a carriage, a slide mounted thereon, means on the carriage whereby said slide may be reciprocated by  
30 hand, a diaphragm supporting a recording stylus and a reproducing stylus, a hinge-piece pivoted to the slide and also to the dia-  
phragm at opposite sides thereof, a lever pivoted to the slide and engaging the diaphragm-  
35 head, and means on the carriage engaging and elevating said lever at the medial point of each reciprocation of the slide but permit-

ting said lever to fall when said medial point is passed.

10. The combination of a carriage, a slide 40 mounted thereon, means on the carriage whereby said slide may be reciprocated by hand, a diaphragm supporting a recording stylus and a reproducing stylus, a hinge-  
45 piece pivoted to the slide and also to the diaphragm at opposite sides thereof, a cam-lever fulcrumed on the slide, an abutment on the carriage and engaged by the cam on the said lever, the construction of the cam being such  
50 that the lever is elevated at the medial point of the slide's movement and permitted to fall as the slide is moved to either side of said medial point.

11. The combination of a slide, a dia- 55 phragm carrying a recording stylus and a reproducing stylus and supported on said slide, a carriage for said slide having a spring-pressed feed-screw nut thereon, and means  
60 simultaneously depressing said nut against its spring and actuating said slide.

12. The combination of a slide having a tube or neck, a diaphragm-head having a tubular neck integral therewith and entering the neck on the slide, a diaphragm carried by  
65 said head, and a recording stylus and a reproducing stylus carried by said diaphragm.

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

THOS. H. MACDONALD.

Witnesses:

A. B. KEOUGH,  
C. A. GIBNER.