

(No Model.)

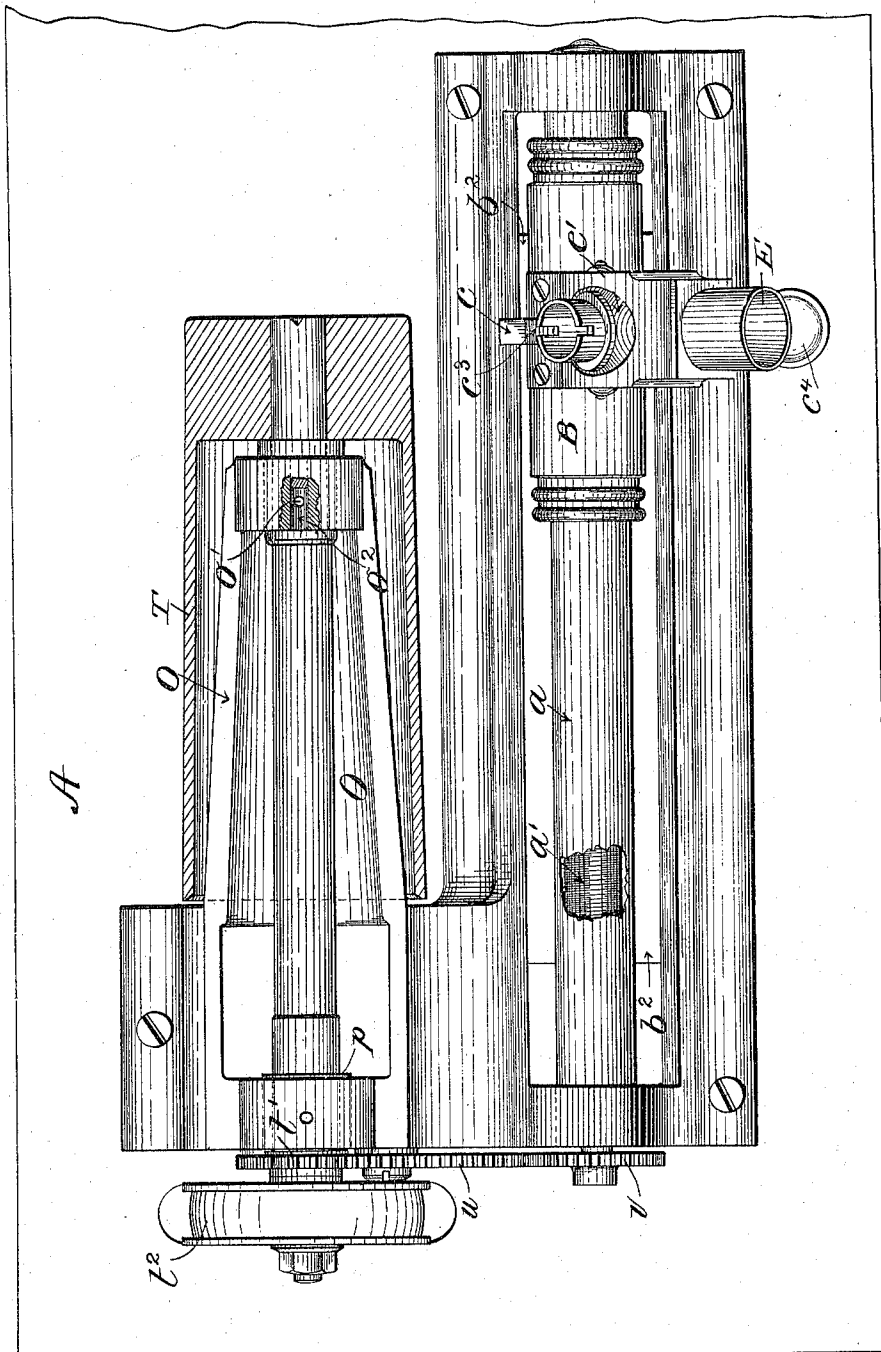
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T. H. MACDONALD.
GRAPHOPHONE.

No. 579,595.

Patented Mar. 30, 1897.

Fig. 1.



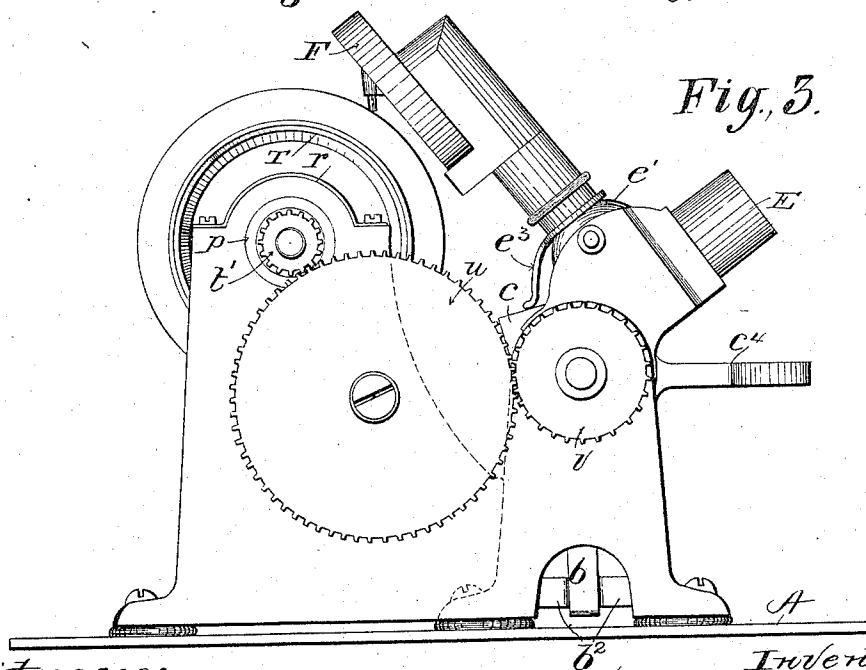
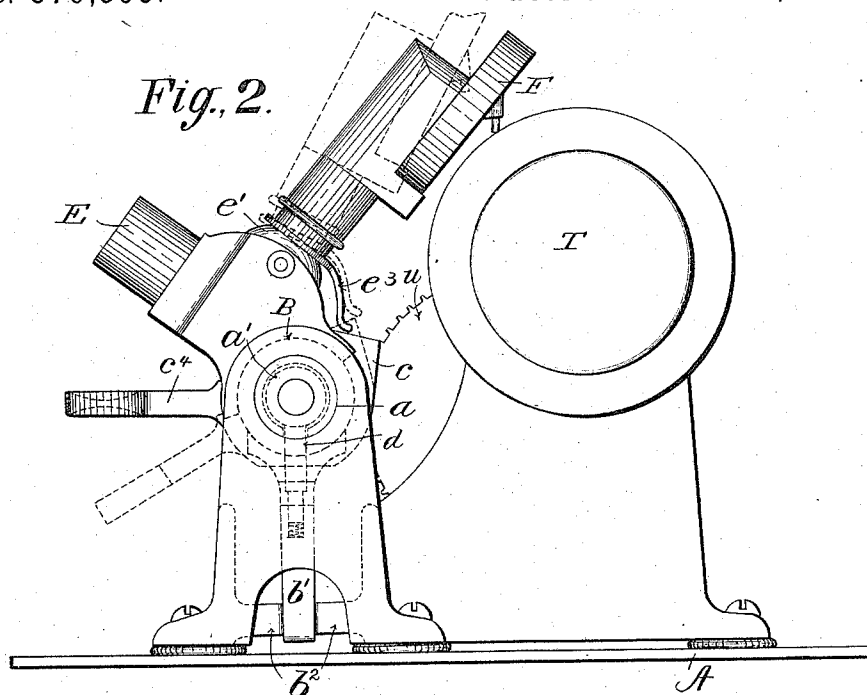
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3 Sheets—Sheet 2.

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Fig. 4.

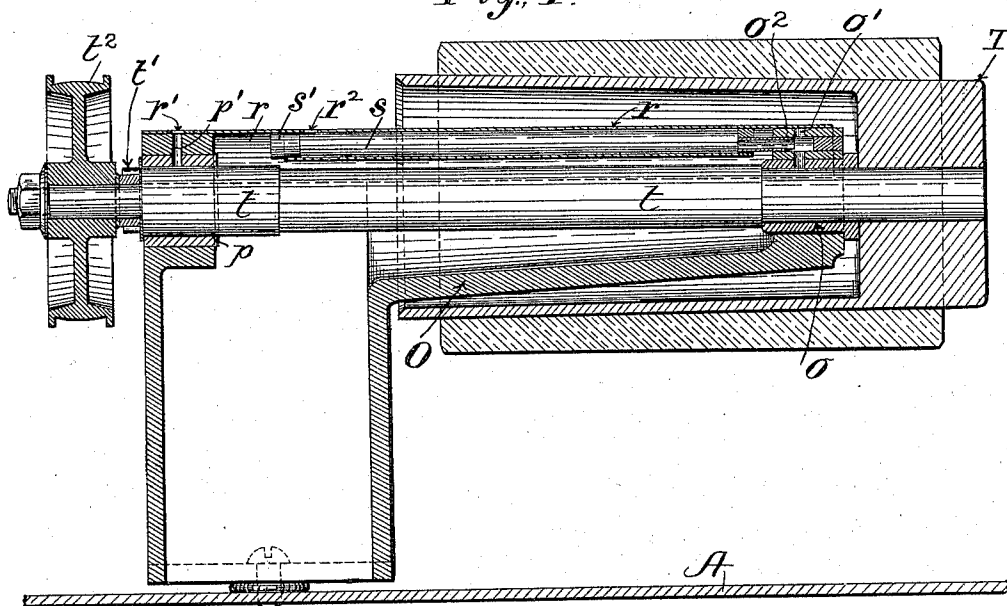


Fig. 5.

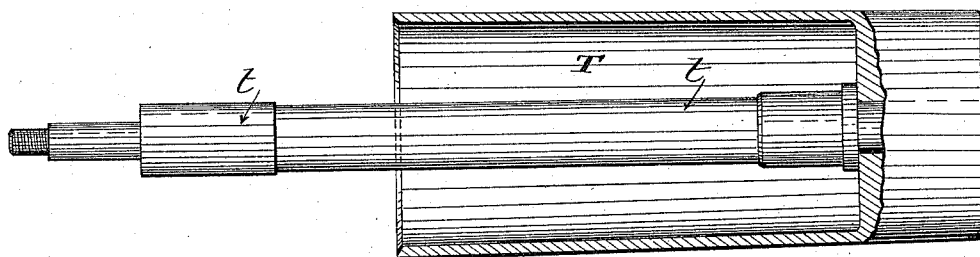


Fig. 6.

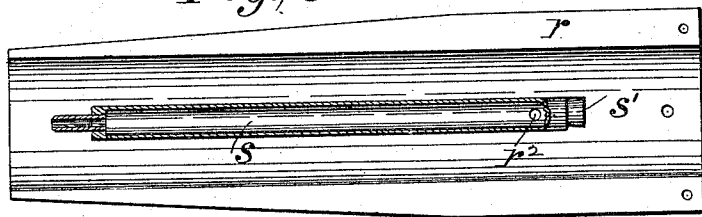


Fig. 7.



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UNITED STATES PATENT OFFICE.

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

GRAPHOPHONE.

SPECIFICATION forming part of Letters Patent No. 579,595, dated March 30, 1897.

Application filed November 27, 1896. Serial No. 613,616. (No model.)

To all whom it may concern:

Be it known that I, THOMAS H. MACDONALD, of Bridgeport, Connecticut, have invented new and useful Improvements in Graphophones, which improvements are fully set forth in the following specification.

The principal object of my present invention is to dispense with the end gate which carries the bearing for one end of the mandrel-shaft in graphophones and phonographs as heretofore generally constructed. In accomplishing this object I support the mandrel entirely from one end thereof, thus leaving its other extremity entirely free and unobstructed, so that a record tablet or cylinder can be slipped onto and off of the mandrel with the greatest facility and without the necessity of swinging open an end gate or in any other way disturbing the normal arrangement of the parts of the machine. The elimination of the end gate obviously removes from the machine a very troublesome part, the absence of which permits a much more compact and greatly-simplified structure which can be produced at a great reduction in cost. In thus dispensing with the end gate and supporting the mandrel entirely from one end the greatest difficulty encountered is to provide bearings which will so maintain the mandrel in a horizontal position as to prevent sagging at its free end, which would result in imperfections in the operation of the machine both in recording and reproducing. This would be the result if it were attempted to remove the end gates from the machines as heretofore constructed. One way of overcoming the difficulty is to project the shaft of the mandrel a sufficient distance from the end thereof to accommodate a long bearing, but such arrangement would detract greatly from the compactness of the machine, which at the present stage of the development of this art is of much importance. As a much preferable construction I make the mandrel hollow, with its shaft extending centrally therethrough, the bearing for one end of the shaft being located on an overhanging arm of the machine, projecting into the hollow mandrel from one end of the latter. With one bearing for the shaft thus located within the mandrel and the other bearing located

exterior to the same and at one end thereof a rigid support for the mandrel is afforded, while all of the desirabilities as to compactness and simplicity of structure are realized. 55

Other features of the invention, as well as those above referred to, will be better understood by reference to the accompanying drawings, illustrating what has been practically demonstrated to be a very successful embodiment of my invention in an operative machine, and wherein— 60

Figure 1 is a plan view partly in section and with parts removed. Fig. 2 is an end elevation looking from the right of Fig. 1. Fig. 3 is an end elevation from the opposite side of the machine. Fig. 4 is a vertical section through the mandrel. Fig. 5 is a detail in section of the mandrel, and Figs. 6 and 7 are details of the cover which fits over the overhanging arm. 70

Referring to the drawings, A represents the base-plate of the machine, beneath which is located a suitable motor. (Not shown.)

a is the usual guide-tube, slotted on its under side and inclosing feed-screw *a'*. 75

B is the carriage sliding on the tube *a* and having a depending leg *b'*, sliding between two flanges *b² b³*, Fig. 2.

d is a segmental nut adapted to engage the feed-screw for imparting movement to the carriage. 80

c is a ring on the carriage concentric to the feed-screw and guide-tube and having cam-surfaces on its periphery for disengaging the nut from the feed-screw and for lifting the reproducer or recorder from the record-cylinder, as hereinafter described. 85

c¹ is a handle on the ring *c* for manipulating said ring and for sliding the carriage along the guide-tube when nut *d* is disengaged from the feed-screw. 90

e' is a pivoted joint at the end of sound-conducting passage E, to which recorder or reproducer F is attached. 95

e³ is a depending arm on joint *e'*, bearing against a cam-surface on ring *c*, and whereby the recorder or reproducer is lowered upon and lifted from the record. 100

The parts of the machine as thus far described are substantially similar to corresponding parts in Patent No. 569,290, dated

October 13, 1896, granted to the American Graphophone Company upon an application filed by myself.

From the left-hand end of the framework of the machine projects an arm or horn O, located to the rear of and somewhat above the guide-tube and parts sliding thereon, and extending practically parallel thereto. The arm O is semicircular in cross-section with its concave side upward and has at its extremity or overhanging end an annular bearing o, which has a vertical oil-opening o' through its upper side, intersected by a horizontal oil-passage o², through which oil is fed from a suitable receptacle, as hereinafter described.

At the end of the machine and in line with bearing o is a second annular bearing p, to which a vertical oil-passage p' leads. Over the arm O fits an arched cover r, having openings r' r² through its top, the former leading to passage p' and the latter to a tubular oil-receptacle s, secured against the under side of cover r and having a contracted portion at one end projecting into the horizontal oil-passage o². The other end of the oil-receptacle is closed by a suitable plug s'.

T is a hollow mandrel open at one end and having a solid portion at its other end, from which a shaft or axle t projects centrally through the chamber of the mandrel and for some distance beyond the open end thereof, as shown in Fig. 5.

When the mandrel is in place on the machine, the arm O projects into the space between shaft t and the inner end of the mandrel, said shaft passing through and resting in bearings o and p and carrying at its extremity a small gear-wheel t' and a pulley t², which latter is driven from a motor (not shown) by a suitable belt. Gear t' meshes with an idler u, which in turn engages a gear v on the end of feed-screw a'.

Modifications in the construction herein shown and described may be made without departing from the nature and principle of the invention.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. In a graphophone, the combination with the mandrel and its shaft rigidly secured thereto, of a bearing in which the latter rotates located within the mandrel, and means for driving the shaft to rotate the mandrel, substantially as described.

2. In a graphophone, the combination with a hollow mandrel and its shaft rigidly secured thereto and extending centrally therethrough, of a bearing for one end of said shaft located within the mandrel, a bearing for the other end of the shaft exterior to the mandrel, and means for rotating the mandrel, substantially as described.

3. In a graphophone, the combination with a hollow mandrel closed at one end and open at the other, of a shaft rigidly secured to and extending centrally through the interior of the mandrel, a projecting or overhanging arm on the machine extending into the hollow mandrel and on which the mandrel-shaft has its bearing, and means for rotating the mandrel, substantially as described.

4. In a graphophone, the combination with a hollow mandrel open at one end and closed at the other, of a shaft rigidly secured in the closed end of the mandrel and extending centrally through the interior of the latter, a hollow projecting or overhanging arm on the machine extending into the open end of the mandrel about the shaft, a bearing for the shaft located on the end of the arm within the mandrel, a cover for the arm having an oil-passage leading to said bearing, said passage having a feed-opening outside of the mandrel, another bearing for the shaft, exterior to the mandrel, and means for rotating the mandrel, substantially as described.

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

THOMAS H. MACDONALD.

Witnesses:

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E. M. SCRIBNER.