(No Model.)

L. F. DOUGLASS.

METHOD OF AND MEANS FOR DUPLICATING OR TRANSFERRING PHONOGRAPHIC RECORDS.

No. 475,490. Patented May 24, 1892.

Fig. 1.

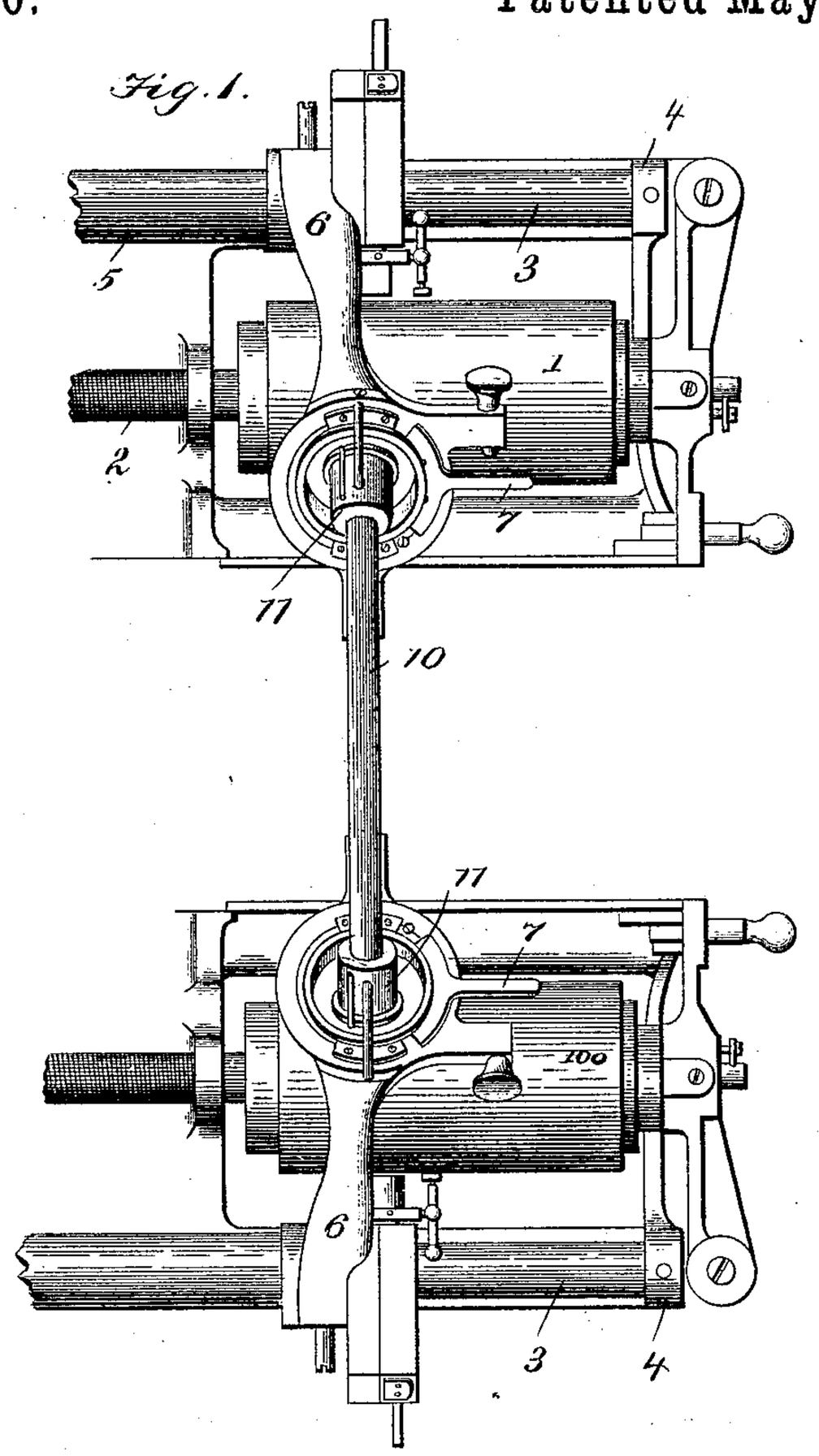
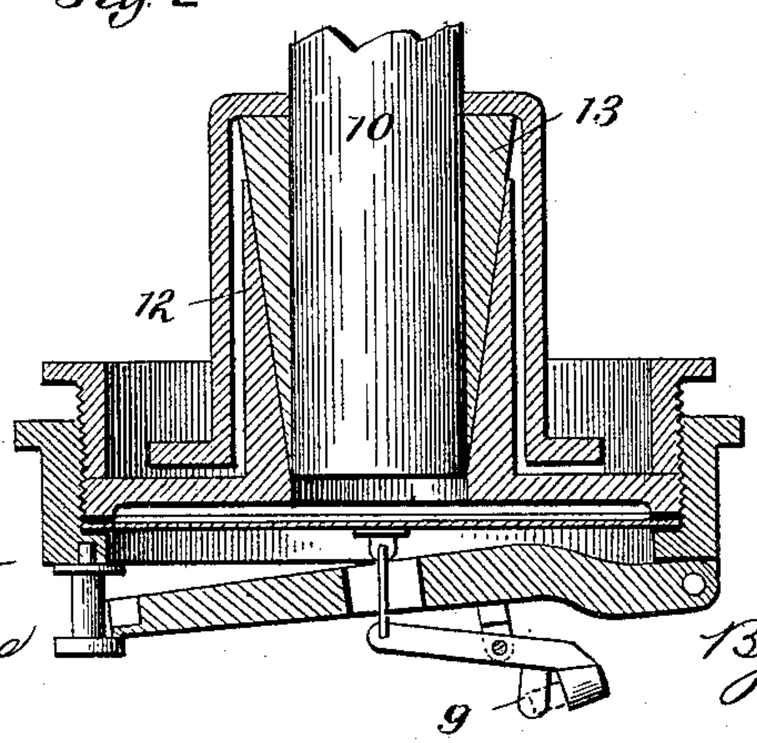


Fig. 2



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UNITED STATES PATENT OFFICE.

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METHOD OF AND MEANS FOR DUPLICATING OR TRANSFERRING PHONOGRAPHIC RECORDS.

SPECIFICATION forming part of Letters Patent No. 475,490, dated May 24, 1892.

Application filed March 17, 1892. Serial No. 425,259. (No model.)

To all whom it may concern:

Be it known that I, LEON F. DOUGLASS, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Methods of and Means for Duplicating or Transferring Phonographic Records; and I hereby declare the following to be a full, clear, and exact description of the same, such as will enable others skilled int he art to which it appertains to make and use the same.

My invention relates to a new and useful method of duplicating or transferring phonographic records; and it consists, generally stated, in delivering the sound-waves emitted by the reproducing-diaphragm to a receiving-diaphragm carrying the cutting-stylus, which causes said diaphragm to move successively or in the order of the force of the sound-waves and cut like forms of sound-waves upon the receiving phonogram-blank, thus making a duplicate of the record.

A second feature of the invention resides in providing means for confining and directing the sound-waves from one diaphragm to the other.

A third feature resides in delivering the sound-waves through a channel or conduit of rarefied air or air at a reduced pressure, and, finally, in the construction and arrangement of the several parts, whereby these features are obtained, all as will hereinafter be described, and afterward pointed out in the claims.

In the accompanying drawings, forming a part of this specification, like symbols of reference refer to like parts wherever they occur, in which—

Figure 1 is a plan view showing the diaphragms in position on the respective cylinders and the flexible conduit for conducting the sound-waves from one diaphragm to the other. Fig. 2 is a cross-section through one of the diaphragms, showing the air-tight connection of the conduit therewith.

In the drawings, 1 indicates the phonogram-record, mounted upon a mandrel of any ordinary or approved construction, which is turned by the screw-shaft 2 in the usual manner.

3 is the guide-rod, mounted in supports 4, upon which is mounted the sleeve 5, carrying the arm 6, which supports and carries the diaphragm or reproducer, said arm and its contained diaphragm or reproducer being moved along by a feed-arm (not shown) and which co-operates with the screw-shaft 3. The receiving-phonogram blank 100 is similarly mounted and operated by mechanism which may be connected with or be operated independently of the mechanism which operates the record-phonogram; but this I deem unimportant, as it forms no particular feature in this present invention.

The record diaphragm or reproducer is provided with an arm or extension 7, the function of which being to throw the reproducing-stylus 9 into or out of engagement with the phonogram-record cylinder. This arm or extension I also prefer to mount upon the receiving-diaphragm, in order that either or both diaphragms may be put into or out of engagement with their respective phonograms. I connect the reproducing and receiving diaphragms by a conduit or flexible pipe connection 10, said pipe extending through a thimble 11 and into a nose or extension 12 on the respective diaphragms.

13 indicates a conical-shaped flexible thimble or ferrule fitting tightly around the ends of the connecting-conduit 10 and into the noses 12 of the diaphragms, thus making an air-tight connection between the same and confining the sound-waves therein. I preferably rarefy or reduce the atmosphere in the conduit 10, in order to more readily transmit the sound-waves and make the diaphragms more susceptible to vibration on account of pressure of the outside air.

To reduce the air in the conduit, it is only necessary to compress the same before insertion, which will exclude a portion of the air therefrom, and the conduit will of its own assertion of elasticity resume its normal position.

I have illustrated in Fig. 1 the ordinary means of operation of the several phonograms; but I do not wish to be understood as confining myself to such construction, as it is obvious that any suitable mechanism may be substituted and employed to accomplish the same results without in the least departing from the nature and principle of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The method herein described of duplicating or transferring phonographic records, which consists in delivering the sound-waves emitted by the reproducing-diaphragm in contact with the record-phonogram to a receiving-diaphragm, which actuates the cutting-stylus in contact with the receiving-phonogram blank, thereby making a copy of said sound-waves upon the receiving phonogram-blank, substantially as and for the purposes described.

2. The combination, with the record-phonogram, of a receiving-blank phonogram, a diaphragm for receiving vibrations from the record-phonogram, and a diaphragm for transmitting vibrations or sound-wave forms on the receiving-blank phonogram, substantially as and for the purposes described.

3. The combination, with the record-phonogram, of a diaphragm adapted to be vibrated thereby, a diaphragm adapted to be vibrated by the sound-waves emitted by the first diaphragm, and a receiving-blank phonogram for receiving the vibrations from the latter diaphragm, substantially as and for the purposes described.

4. The combination, with the record and receiving-blank phonograms, of diaphragms in juxtaposition thereto, provided with reproducing and cutting styli, and a conduit of rarefied air connecting the two diaphragms, substantially as and for the purposes described.

In testimony whereof I affix my signature, in presence of two witnesses, this 16th day of March, 1892.

LEON F. DOUGLASS.

Witnesses:
WM. A. EASTERDAY,
F. R. CORNWALL.