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T. A. & J. B. CONNOLLY.

SOUND REPRODUCING RECORD AND METHOD OF MAKING SAME.

APPLICATION FILED SEPT. 12, 1903.

NO MODEL.

Fig. 1

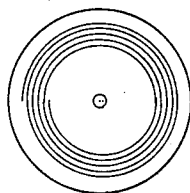
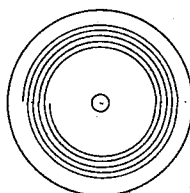


Fig. 2



Fig. 3



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WITNESSES

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SOUND-REPRODUCING RECORD AND METHOD OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 749,030, dated January 5, 1904.

Application filed September 12, 1903. Serial No. 172,972. (No model.)

To all whom it may concern:

Be it known that we, THOMAS A. CONNOLLY and JOSEPH B. CONNOLLY, citizens of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Sound-Reproducing Records; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has relation to records for sound-reproducing machines and to methods of making said records, and has for its object the reproduction of a tablet-record having the sound-reproducing groove impressed, indented, or milled in its surface by means of a roller or mill having formed on its surface a sound-record in cameo or relief. In producing said milled record we proceed as follows: A master plate or die of hard metal is first formed by suitably etching a volute record traced through an etching-ground by means of the stylus of a sound-recording instrument. From said master plate or die a roller or mill is then produced by rolling a cylinder or segment of softer metal upon the master-plate under such pressure as will produce upon said roller or mill a counterpart in cameo or relief of the original record. This roller or mill is then hardened or tempered and rolled upon the surface of a plate of softer metal, so as to indent or mill the surface of the latter and produce a milled facsimile of the record of the master plate or die.

In the accompanying drawings, Figure 1 is a plan view of the etched master plate or die. Fig. 2 is a side view of the roller or mill, and Fig. 3 is plan view of a milled sound-reproducing record.

In carrying our invention into effect we use as the preferable material for the master plate or die hardened steel, and the steel may be hardened or tempered either before or after the record has been etched thereon. The master-plate is prepared for etching by having its surface smoothly finished and, if desirable, polished or burnished and then thinly coated with a suitable etching-ground in which a volute record is traced by the stylus

of a sound-recording machine. The etching is then effected by means of a suitable etching fluid and the plate cleaned off. The etched record line or groove so produced will be of substantially even depth throughout, but laterally undulating. A cylinder or roller of soft steel is then rolled on the etched plate under sufficiently heavy pressure in a suitable press to cause the surface of the roller to take up in relief or cameo a transfer of the record from the master-plate, and thus become a "mill." The roller or mill is then hardened or tempered and rolled over a metal plate under sufficient pressure in a suitable press to indent, impress, or mill on or into the surface of said plate an intaglio facsimile of the original etched record-groove. The plate so milled by the action of the cylindrical roller or mill as above described constitutes the sound-reproducing record for sound-reproducing machines and may be hardened or tempered to increase its durability and impart to it other desirable characteristics, and it may be plated or otherwise treated to prevent corrosion.

Instead of using steel for the master plate or die, the roller or mill, and the sound-reproducing plate or record the master-plate may be made of steel or other hard metal, the roller or mill of a softer metal than the master plate or die, such as copper or nickel, and the sound-reproducing record-tablet of a still softer material than the roller or mill, such as tin or aluminium or a suitable non-metallic material. If necessary or desirable, the surface of the roller or mill may be buffed or polished after receiving the record in cameo or relief without impairing its accuracy.

A large number of sound-reproducing records may be produced from a single roller or mill, and many rollers or mills may be produced from a single master plate or die.

Records according to our invention can be produced with great facility and at comparatively low cost. When made of hardened steel, they cause less wearing-friction on the stylus and walls of the grooves than occurs with records made of other materials. The record-grooves are more even and accurate than those formed in soft plastic material, and

owing to the unyielding character of the material the tone-qualities are more pronounced and true.

Having described our invention, we claim
5 and desire to secure by Letters Patent—

1. A sound-record consisting of a disk having a volute record-groove milled in its surface.
2. A duplicate or copy of a sound-record,
10 consisting of a disk of metal having a volute sound-record groove impressed in its surface at normal temperature.
3. A flat metallic record-tablet for sound-reproducing machines having a continuous

volute rolled or milled sound-reproducing 15 groove.

4. A record-tablet for sound-reproducing machines consisting of a plate of metal formed with a volute milled or rolled sound-reproducing groove and hardened or tempered. 20

In testimony whereof we affix our signatures in presence of two witnesses.

THOMAS A. CONNOLLY.
JOSEPH B. CONNOLLY.

Witnesses:

THOMAS V. SULLIVAN,
W. E. WRIGHT.