

No. 689,536.

Patented Dec. 24, 1901.

F. L. CAPPS.

PROCESS OF MANUFACTURING CELLULOID RECORDS.

(Application filed Apr. 3, 1900.)

(No Model.)

Fig. 1

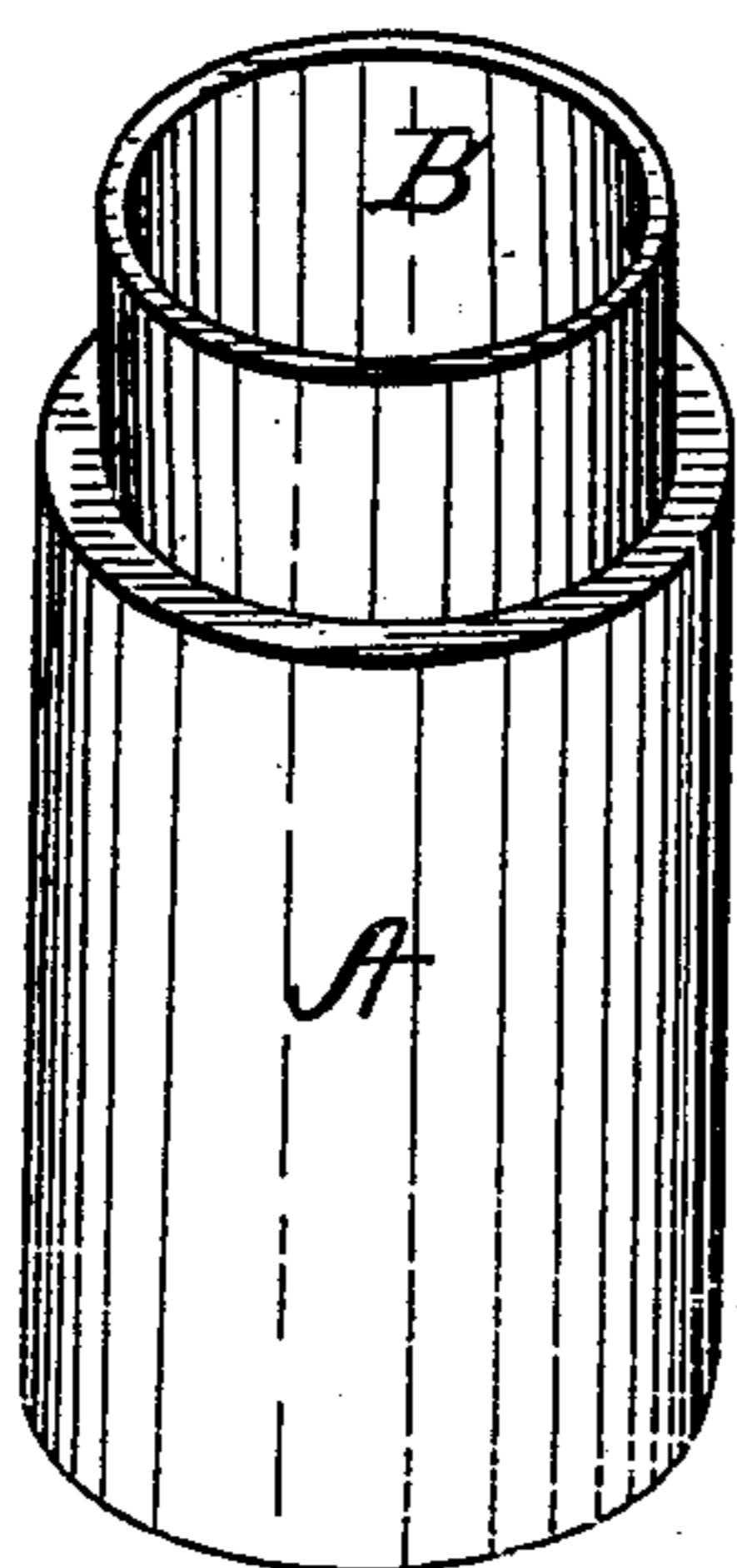


Fig. 2.

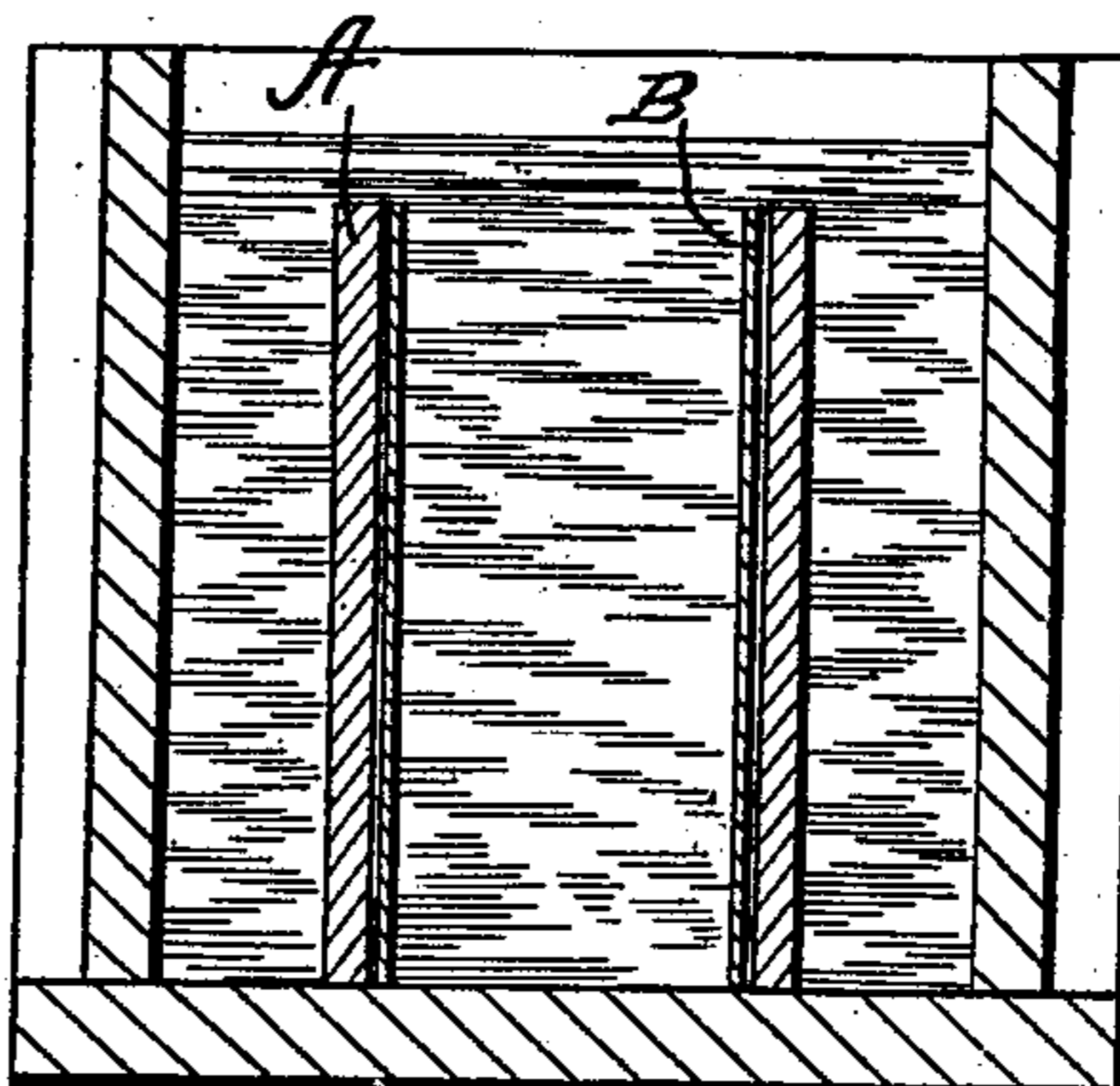
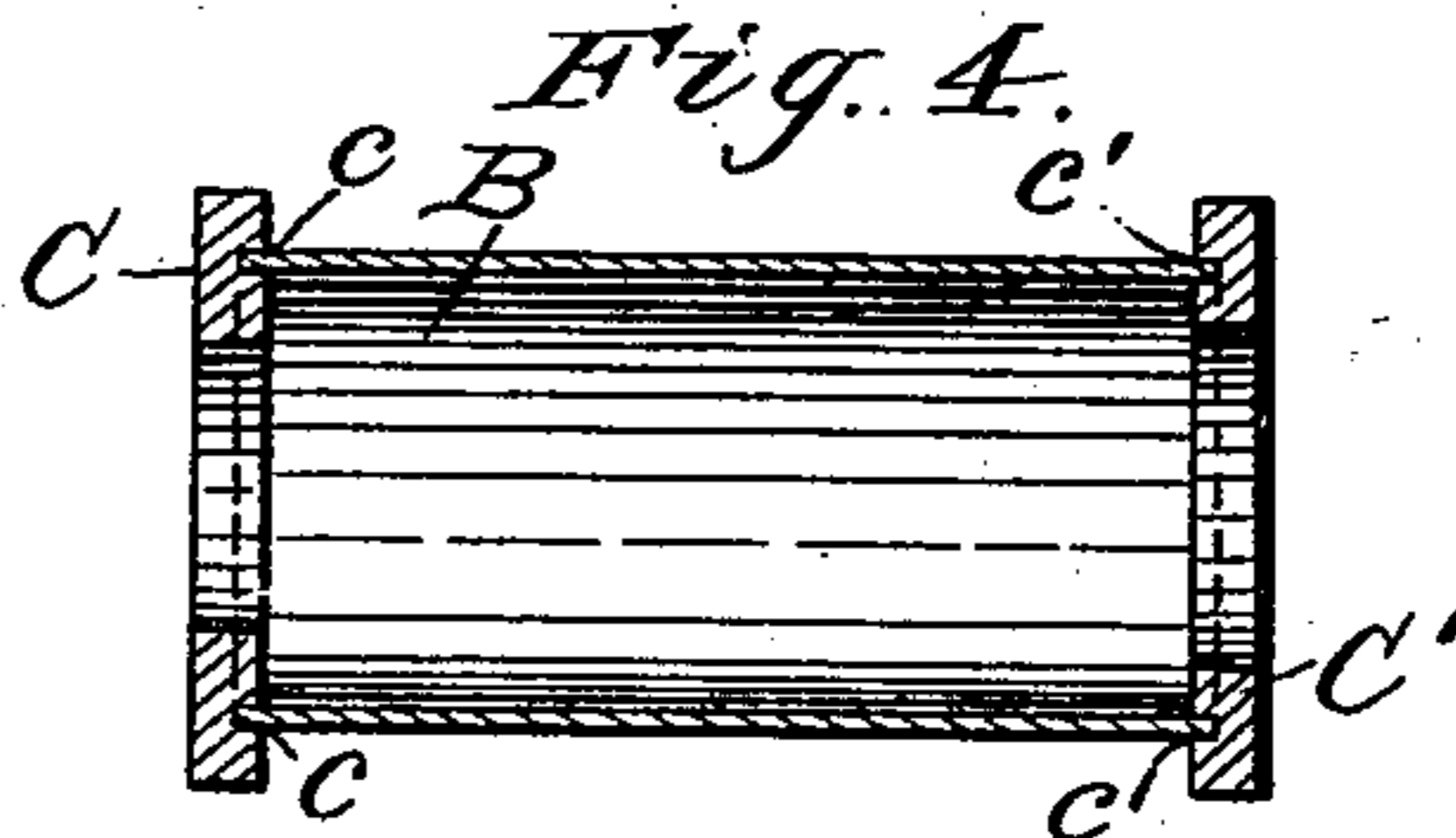
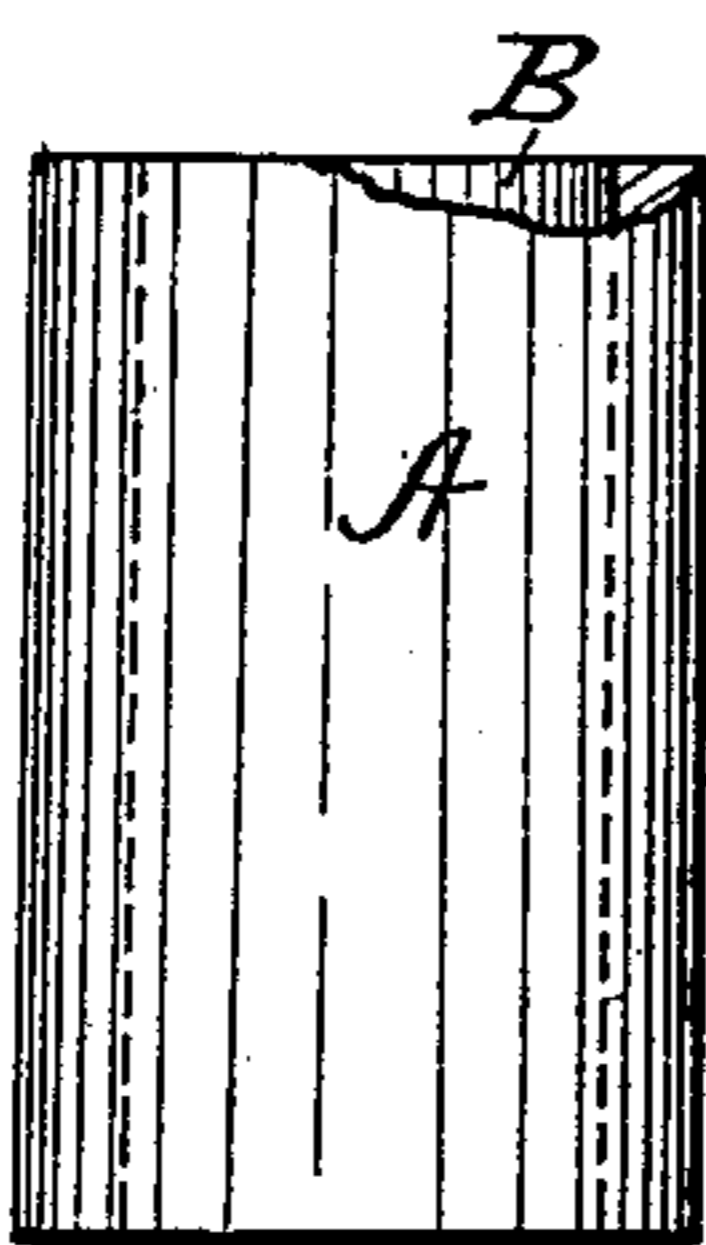


Fig. 3.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

FRANK L. CAPPS, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE AMERICAN GRAPHOPHONE COMPANY, A CORPORATION OF WEST VIRGINIA.

## PROCESS OF MANUFACTURING CELLULOID RECORDS.

SPECIFICATION forming part of Letters Patent No. 689,536, dated December 24, 1901.

Application filed April 3, 1900. Serial No. 11,357. (No specimens.)

*To all whom it may concern:*

Be it known that I, FRANK L. CAPPS, of Newark, New Jersey, have invented a new and useful Improvement in Processes of Manufacturing Celluloid Records, which invention is fully set forth in the following specification.

This invention relates to sound-records, and particularly to an improvement in the production of copies of sound-records (or duplicates) in celluloid by the pressing or molding process.

The invention is based upon the fact that celluloid expands considerably when softened by the admixture or the application of a solvent. It is not limited to any particular shape of record, as the latter may be a cylinder or a disk, nor is it limited to the kind of record, which may consist of vertical irregularities characteristic of graphophone-records or of lateral undulations characteristic of the type known as "gramophone-records." For the sake of clearness I will describe my invention as applied to cylindrical graphophone-records.

I avail myself of the property of celluloid above referred to, as follows: First I take a cylindrical matrix that contains upon its inner face a cast or copy in reverse of the original sound-record. This matrix may be formed in any approved manner, as by casting or by depositing upon the surface of the original record a film or coating of chromitized gelatin. This step forms no part of my present invention, being fully set forth in certain pending applications of my own. Next I take a celluloid cylinder and insert it into the matrix. Then I dip the two cylinders into a solvent of celluloid, such as alcohol or the commercial "celluloid-thinner," but preferably amyl acetate, and hold them there for a short while until the surface of the celluloid has become softened. Then I remove them from the bath and set them to dry, taking care all the while that there is no slip between the two cylinders. When the celluloid cylinder is softened by the solvent, it expands, as stated, and resumes its normal condition only by the evaporation of the solvent; but the solvent can evaporate only from the interior surface of the celluloid cylinder and not from its outer surface, which is now tightly clamped against

the surrounding matrix-surface. In consequence the whole interior surface (where the evaporation takes place) shrinks back radially from the center toward the matrix, drawing back and contracting the whole (radial) thickness of the cylinder-wall. Moreover, as each particle of the solvent from the outer surface of the celluloid cylinder (which is held closely against the matrix-surface, as noted) and each particle throughout the mass of the same passes out its place has to be taken by an equivalent particle of celluloid. The result of all this is to pack the celluloid material closely against the matrix-surface, so that when the celluloid has resumed its normal condition the cylinder is of slightly-larger diameter both external and internal than originally. This means that after hardening and becoming set the celluloid cylinder is still pressing firmly against the matrix, its temporarily-softened surface having been pressed into the minute irregularities of the matrix-surface. When the celluloid is thoroughly dried, it is separated from the matrix, as by breaking off the latter or by in any manner shrinking the former or by collapsing and then withdrawing the former. This celluloid cylinder will be found to contain upon its outer surface a faithful copy of the original sound-record. It may be backed up by any suitable mounting. A simple and inexpensive mounting consists of two rings of suitable material—metal, wood, celluloid, &c.—each having an annular groove into which the adjacent end of the celluloid shell or cylinder is fitted and cemented or otherwise secured. The inner diameters of the respective rings are proportioned to fit upon the tapering mandrel of an ordinary reproducing-machine. In case the original record be a flat one (disk) of course the matrix will be of the same shape and a flat sheet of celluloid will be employed; but the process and the results will be the same. The temporarily-softened celluloid will shrink back against the matrix-surface, being held there by atmospheric pressure, as before, and when removed will be found to contain a faithful copy of the original record.

In the drawings illustrating my invention, Figure 1 shows a celluloid cylinder B being

inserted into a matrix A. Fig. 2 is a sectional view representing the two cylinders in a solvent-bath. Fig. 3 shows the two set to dry; and Fig. 4 is a sectional view showing the record B mounted in supporting-rings C C', the ends of the shell B being cemented in the annular grooves c c'.

Having thus described my invention, I claim—

10 1. The herein-described process of molding sound-records in celluloid, which consists of softening a celluloid tablet by the application of a solvent and then forcing the same against a suitable matrix by its own expansive force, substantially as described.

15 2. The process of molding a record of sound into or upon a celluloid cylinder, which consists in first inserting the celluloid cylinder into a suitable matrix, next applying a sol-

vent to the celluloid, then allowing the celluloid to dry, and finally separating the celluloid cylinder from the matrix, substantially as described.

3. The process of molding a record of sound into or upon a celluloid cylinder, which consists in first inserting the celluloid cylinder into a suitable matrix, next dipping the two into a solvent-bath, then removing them and allowing the celluloid to dry, and finally separating the celluloid cylinder from the matrix, substantially as described.

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

FRANK L. CAPPS.

Witnesses:

V. H. EMERSON,

C. A. L. MASSIE.