

J. W. AYLSWORTH & E. L. AIKEN.  
PRODUCTION OF SOUND RECORDS.  
APPLICATION FILED JUNE 19, 1912.

1,282,011.

Patented Oct. 15, 1918.

FIG. 1

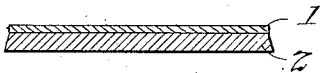


FIG. 2



FIG. 3

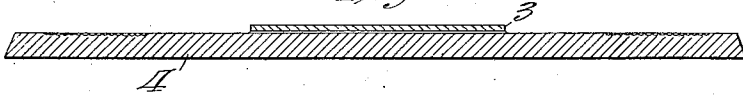


FIG. 4

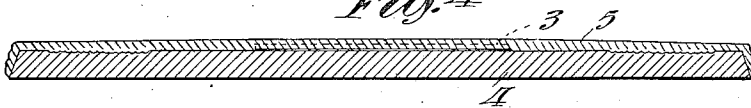
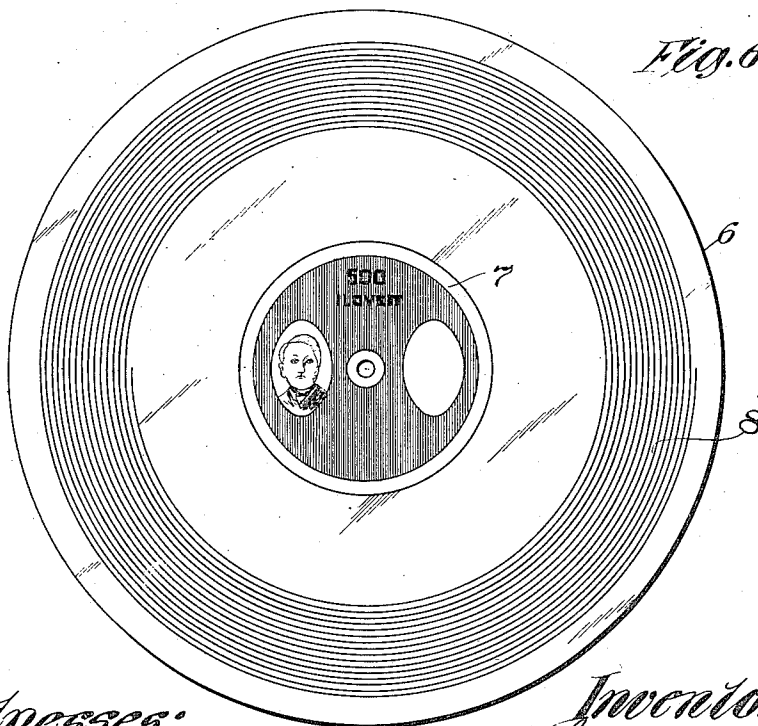


FIG. 5



FIG. 6



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Edward L. Aiken.

# UNITED STATES PATENT OFFICE.

JONAS W. AYLSWORTH, OF EAST ORANGE, AND EDWARD L. AIKEN, OF ORANGE, NEW JERSEY, ASSIGNORS, BY MESNE ASSIGNMENTS, TO NEW JERSEY PATENT COMPANY, OF WEST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## PRODUCTION OF SOUND-RECORDS.

1,282,011.

Specification of Letters Patent.

Patented Oct. 15, 1918.

Application filed June 19, 1912. Serial No. 704,517.

*To all whom it may concern:*

Be it known that we, JONAS W. AYLSWORTH, a citizen of the United States, residing at East Orange, State of New Jersey, and county of Essex, and EDWARD L. AIKEN, a citizen of the United States, residing at Orange, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in the Production of Sound-Records, of which the following is a description.

Our invention relates to the production of sound records; and our principal object is to provide a sound record having an improved label or other means of identification. Our invention also contemplates the production of an improved matrix for forming the said record and also improved processes for making the record and the matrix. The production of an improved matrix for forming said record, referred to above, is described and claimed in copending application Serial No. 253,653 filed September 11, 1918, entitled Matrices for producing sound records, and the improved process for making sound records is described in copending application Serial No. 253,652 filed September 11, 1918, entitled Methods of producing sound records, both of which copending applications are divisions of the present case. Other objects of our invention will appear in the following specification and appended claims:

In accordance with our invention, we form a matrix containing a reversed facsimile of the design to be reproduced on the record, this design being in half tone. When the matrix has been obtained, the same is pressed into or against the record composition, which is maintained in a plastic state during the pressing operation. The matrix preferably contains a reversed facsimile of the sound record impressions as well as of the label; so that the record and the label can be impressed into the record tablet by a single operation. By means of a matrix formed according to our invention, a label embodying the finest design may be satisfactorily impressed into the record tablet.

In order that the invention may be more clearly understood, reference is hereby made to the accompanying drawings in which Figures 1 to 4 inclusive are cross-sectional views

illustrating diagrammatically various steps performed in carrying out the invention. 55

Fig. 5 is a central vertical sectional view of a sound record embodying the invention; and

Fig. 6 is a face view of the same.

In all of the views, like parts are designated by the same reference numerals. 60

In practicing the invention, an engraved copper cut 1 containing a reversed facsimile of the label impression is first made. This cut may be made by any of the well known engraving processes, but is preferably formed in half-tone by the process of photo-engraving, a very fine screen, having preferably about 400 lines per inch, being employed for producing the half-tone effect. This cut will have the parts which correspond with the places where no light has passed through the half-tone screen, such as the letters in the label shown in the accompanying drawing, solid and smooth, while the other portions, such as the background of the label shown, will be covered with minute depressions corresponding to the light openings of the screen. The cut 1 should be left handed. 75 80

When the cut 1 has been obtained, the same is pressed into or against a member 2 formed of plastic composition. The composition of which the member 2 is formed is of such a nature as to be plastic at the temperature at which the impression is to be made thereon and to admit of the same being subsequently hardened. The product which we prefer to employ for this purpose is fully described in an application of Jonas W. Aylsworth, Serial No. 543,238, filed February 11, 1910, and entitled "Phenolic condensation product and method of preparing the same", upon which United States Patent No. 1,020,593 has been granted. It may consist of a mixture of fusible ingredients which are transformed by chemical action upon the application of sufficient heat to form an infusible product, or it may consist of a final infusible product containing a solid solvent or plasticity agent which imparts to the product the property of becoming sufficiently plastic when heated to take the desired impression and to harden again when it becomes cold. When the mixture of fusible ingredients above referred to is em- 85 90 95 100 105

ployed, the material, preferably in a powdered form, is placed in a mold, after which the mold with the cut 1 on top of the powdered composition is placed in a press where the composition is rendered plastic by heat, molded under pressure against the cut 1, and finally transformed by application of heat to its final hard, infusible, insoluble state. After this, the plate 2 and cut 1 may be cooled and separated from each other. When the composition of the plate 2 is one which becomes sufficiently plastic to take an impression when heated, a plate or slab of the same may be heated and pressed against the copper cut to take the impression and then cooled while in contact with the cut.

The plate 2 having been formed, the same is rendered electro-conductive as by coating the same with graphite or other suitable conductive material, and is then submerged in an electroplating bath and coated to a sufficient thickness with copper or other suitable metal to form the electrotype 3. The latter is then separated from the plate 2 and the flanges or edges 3' removed therefrom. The electrotype 3 is made rather thin, preferably about .01 of an inch thick. The face of the electrotype 3 containing the label design is next coated with a thin film of adhesive material which may be softened by heat, such as a mixture of beeswax and rosin, and is then placed with the coated face in engagement with that portion of the face of a master or sub-master record 4 at which it is desired that the label impression appear. The electrotype 3 and through it the adhesive material are then warmed to a slight extent and subsequently allowed to cool whereby the electrotype and the record become firmly secured to each other. When a mixture of beeswax and rosin is used as the adhesive material, the electrotype should be heated to a temperature between 100 and 150° Fahr. to produce the necessary adhesion. The next steps in our process consist in rendering the record electro-conductive, as by covering the same with graphite or other suitable electro-conductive material, and in then immersing the same in an electroplating bath and coating the same in said bath with a layer of copper or other suitable metal to form the matrix 5. By the above process the electrotype 3 will become integrally secured to the center of the record matrix; so that by pressing the matrix into a plastic record tablet, both the record and the label impressions will be simultaneously pressed into the said tablet. A record produced in this way is shown in Figs. 5 and 6, the label impression being shown at 7 and the impressed sound waves at 8 in both of these figures. In this impression, the characters, lines, and other parts corresponding to the solid portions of the cut 1 and electrotype 3 will appear smooth and depressed

below the remaining parts, which latter will be covered with a large number of minute and contiguous elevations corresponding to the light openings in the screen used in making the cut 1. These elevations so reflect the light from the record as to cause the portions of the record covered with the same to appear of a different shade from the remainder of the record, giving a black record composition a steelish gray appearance. Furthermore there are in the label different shades varying in depth in accordance with the variations in depth of the shadows on the original drawing or print. The solid portions of the label, of course, have the true color of the composition; so that the label is clearly legible and the design including all of the shadows on the original drawing or print is clearly discernible on the label.

With certain designs it may be desirable to rub suitable coloring matter over the molded label surface to fill in the depressed portions of the impression. In this case, however, the process as described above would not be entirely suitable; as the elevations referred to have rounded tops and would, therefore, not be clearly visible through the coloring matter. To obviate this objection, the member 2 may be omitted, and the electrotype 3 formed on the cut 1, a thin non-adhesive film of a suitable material being first coated on the cut to permit ready separation of the electrotype from the same. The copper cut 1 instead of being left handed, as in the form of the invention first described would, of course, be right handed. The record impressed from the matrix 5 containing the electrotype 3 produced in this way would contain a number of depressions in place of the elevations described above, there being sharp lines of division between the depressions and the adjacent surface of the label; so that the colored portions may be made to stand out clearly from the other portions. The depressions having been filled in with the coloring matter, the surface of the record is preferably ground slightly to remove the coloring matter from the high parts and then varnished with any desired protecting varnish such as collodion, cellulose acetate, or copal, or a solution of phenol resin in alcohol. Obviously, the matrix 5 may be employed for the production of other working matrices to be used in pressing the records.

We prefer to employ a record tablet 6 having a surface layer or veneer of a hardened infusible insoluble phenolic condensation product containing plasticity ingredients such that the veneer becomes plastic being reheated to take an impression, (see application hereinbefore mentioned of Jonas W. Aylsworth, Ser. No. 543,238, filed February 11, 1910); but this tablet may obvi-

ously be formed of any material capable of being rendered plastic so as to take a clear impression from the matrix.

5 While we have described the preferred form of the invention, numerous changes may be made in the specific disclosure herein made without departing from the spirit of the invention.

10 What we claim as new and desire to protect by Letters Patent is as follows:

1. A sound record formed of moldable record material and having a design molded in its surface, said design being in half tone with at least one hundred and fifty lines per 15 inch, substantially as described.

2. A sound record formed of moldable record material and having a design molded in its surface, said design being in half tone with approximately four hundred lines per 20 inch, substantially as described.

3. A sound record having a surface portion comprising a hardened infusible phenolic condensation product containing a plasticity ingredient, whereby said surface 25 portion becomes sufficiently plastic when heated to take a clear impression from a die, said surface portion having a design in half tone molded therein, substantially as described.

30 4. A sound record having a surface portion formed of a hardened phenolic condensation product having a design molded therein, said design being in half tone with at least one hundred and fifty lines per inch, 35 substantially as described.

5. A sound record having a surface portion formed of a hardened infusible phenolic condensation product containing a plasticity ingredient whereby the said surface portion becomes sufficiently plastic upon 40 heating to take a clear impression from a die, the said surface portion having molded therein a design in half tone with at least one hundred and fifty lines per inch, substantially as described.

6. A sound record having a surface portion comprising a hardened infusible phenolic condensation product containing a plasticity ingredient, whereby the said surface portion becomes sufficiently plastic upon 50 heating to take a clear impression from a die, the said surface portion having molded therein a design in half tone with approximately four hundred lines per inch, substantially as described.

7. A sound record having a surface portion formed of moldable record material and having a design molded in its surface, said design being in half tone with at least one hundred and fifty lines per inch and having 60 coloring matter in its depressed portions, substantially as described.

This specification signed and witnessed this 17th day of June, 1912.

JONAS W. AYLSWORTH.  
EDWARD L. AIKEN.

Witnesses:

FREDERICK BACHMANN,  
ANNA R. KLEHM.