No. 697,256. Patented Apr. 8, 1902.

B. KAPLAN.

MATRIX FOR MAKING GRAMOPHONE, ZONOPHONE, OR SIMILAR RECORDS.

(Application filed Nov. 1, 1901.)

(No Model.)

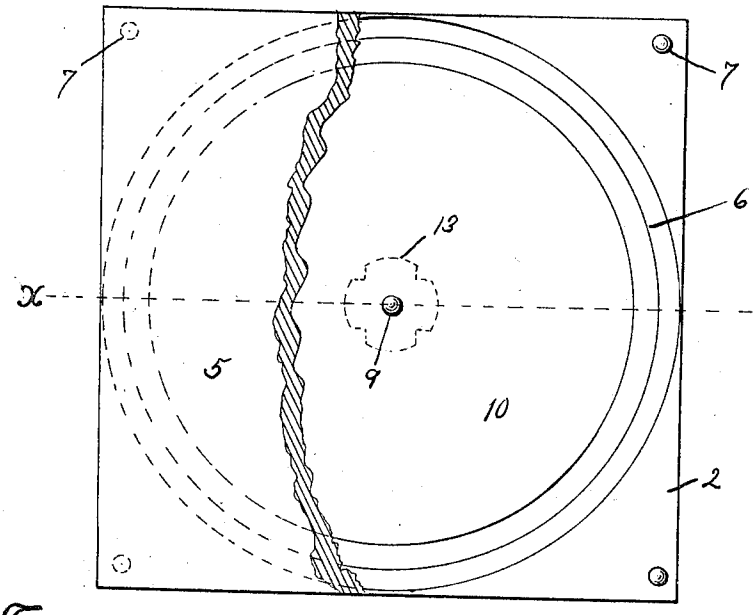


Fig. 1

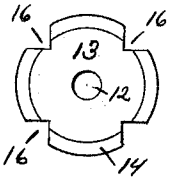


Fig. 3.

Fig. 2.

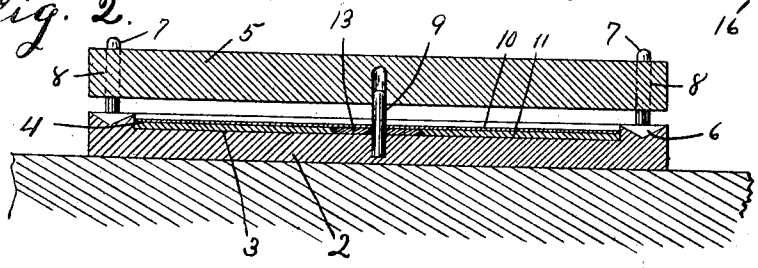


Fig. 4.

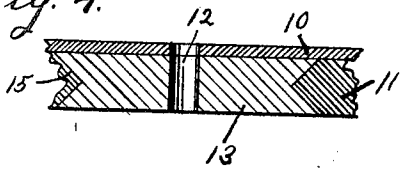
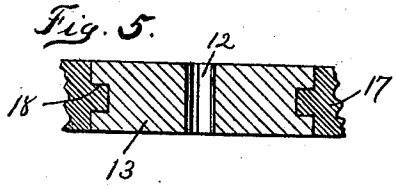


Fig. 5.



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MATRIX FOR MAKING GRAMOPHONE, ZONOPHONE, OR SIMILAR RECORDS.

SPECIFICATION forming part of Letters Patent No. 697,256, dated April 8, 1902.

Application filed November 1, 1901. Serial No. 80,761. (No model.)

To all whom it may concern:

Be it known that I, BERNARD KAPLAN, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Matrices for Making Gramophone, Zonophone, or Similar Records; and I 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to matrices used in the molding or manufacture of talking-machine records, which have the general form of a disk; and the objects of the invention are to strengthen the middle of the matrix around the hole or opening for the center-pin of the dies, to thus increase the durability of the matrix, to obtain more perfect records, and to secure other advantages and results, some of which may be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved matrix for making records for gramophones, zonophones, &c., and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth, and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several figures, Figure 1 is a plan of a pair of dies with a matrix of my improved construction in position therein, the upper die-plate being broken away to show the construction more clearly. Fig. 2 is a central cross-section as on line *x*, Fig. 1, the die-plates being slightly separated. Fig. 3 is a plan of a certain washer in which my invention particularly inheres; and Figs. 4 and 5 are central detail sections of the middle portions of matrices on an enlarged scale, the latter showing the application of my invention to a solid-copper matrix.

In said drawings, 2 indicates the lower of a pair of die-plates such as are commonly used, said die-plate having a central recess or depression 3, in the bottom of which the matrix 4 is laid. A suitable quantity of the composition or substance from which the record is to be made is then laid upon the matrix and the upper die-plate 5, which is plane at its lower face, is forced down upon the lower die-plate 2 with a pressure of several thousand pounds, more or less, said die-plate being preferably hot. This spreads out the composition or stock, forcing it into the grooves and markings of the face of the matrix and filling the recessed chamber 3 of the lower die-plate. Any overflow escapes into a gutter or groove 6 around the die-chamber 3.

The lower die-plate 2 is provided with the usual dowel-pins 7, adapted to enter sockets 8 in the upper plate 5, and at the center of said lower die-plate is an upright pin 9, which forms the central opening commonly found in records of the class to which this invention relates.

The matrix 4 most commonly employed comprises a thin sheet or facing 10, of copper, formed by the process of electrotyping and provided with a backing 11, of lead or the like. This after being planed at the back is put in a lathe and turned down at the edges, as well as bored at the center to form the hole 12 for the center-pin 9. In practice, however, it has been found that with a matrix of this construction the composition or stock under the tremendous pressure of the dies will "flow" in between the walls of the central aperture 12 and the pin 9 to a greater or less extent and force the edges of the matrix around said central aperture 12 upward and outward. This produces a sort of bur or hub on the matrix and a corresponding depression in the record, as well as forming a kind of flange around the center hole of the record. The matrix has to be hammered flat again, and this is apt to batter and disfigure it.

The purpose of my invention is to so strengthen the central part of the matrix that it will withstand the tendency of the tremendous pressure of the dies to force it out of shape. To this end I provide the matrix with a central bushing 13, preferably of steel or iron, which will be unaffected by the pressure. This bushing is preferably applied as

a disk to the central part of the back of the copper face 10 in making the matrix and the lead backing 11 flowed around said disk. Then after planing and turning the matrix, as usual, it is bored through the disk to form the central opening 12. The periphery of said bushing 13 may be oppositely beveled, as at 14, Figs. 2 and 3, or grooved or undercut in any suitable manner, as indicated at 15 in Fig. 4 or 18 in Fig. 5, so as to engage with the lead backing when said lead is poured around. The edges of the bushing may also be radially notched, as at 16, in order to hold it more firmly against any possible rotation, or other equivalent means may be employed for this purpose.

Obviously my invention can be applied to a solid-copper matrix 17, if desired, as shown in Fig. 5, the bushing in this case being preferably applied to the mold in electrotyping and the copper deposited directly thereabout.

Having thus described the invention, what I claim as new is—

1. A matrix for making records for gramophones, zonophones, &c., having at its center a bushing of more resisting material than the body of the matrix.

2. A matrix of the character described, having at its center a disk of material harder than the body of the matrix, said matrix having a central perforation through said disk.

3. A matrix of the character described, comprising a discous body portion with a central bushing in the plane of said body and being of harder material.

4. A matrix for making records for gramophones, zonophones, &c., comprising a facing 10, of copper or the like, a backing 11, of lead or similar material, a bushing 13, of iron or steel at the center of the matrix and in the plane of the backing 11, said matrix being perforated through said bushing.

5. A matrix for making records for gramophones, zonophones, &c., comprising a facing 10, of copper or the like, a backing 11, of lead or similar material, and a bushing of material harder than the backing inserted into said backing, the matrix being apertured through said bushing.

6. A matrix for making records for gramophones, zonophones, &c., comprising a copper face 10, a disk 13, applied to the back thereof, and a backing of lead or the like around said disk, said disk being more resistive material than the backing, and the matrix being perforated through said disk.

7. The herein-described matrix, having a facing 10, a bushing 13, centrally disposed at the back of said facing, and a backing 11, around said bushing, said bushing being of more resistive material than the backing and held in place thereby.

8. The herein-described matrix, having a facing 10, a center bushing 13, and a backing 12, around said bushing, said bushing being of harder material than the backing and being adapted at its peripheral edges to be overlapped by said backing and held in place.

9. The herein-described matrix having a facing 10, a center bushing 13, and a backing 11, around said bushing, said bushing being of harder material than said backing and being shaped in plan to be held against rotation by said backing.

10. A matrix for making records for gramophones, zonophones, &c., having a central bushing of material harder than the body of the matrix, said bushing being embedded in said body of the matrix and held thereby.

11. A matrix for making records for gramophones, zonophones, &c., having a central bushing of material harder than the body of the matrix, said bushing engaging at its edges with the said body of the matrix to prevent displacement.

In testimony that I claim the foregoing I have hereunto set my hand this 22d day of October, 1901.

BERNARD KAPLAN.

Witnesses:
CHARLES H. PELL,
C. B. PITNEY.