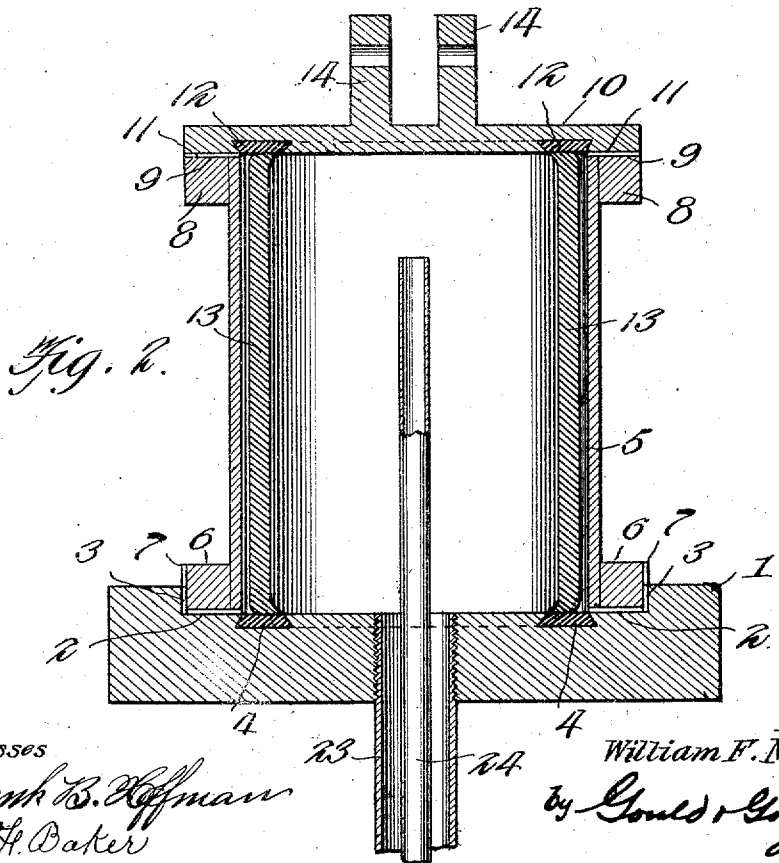
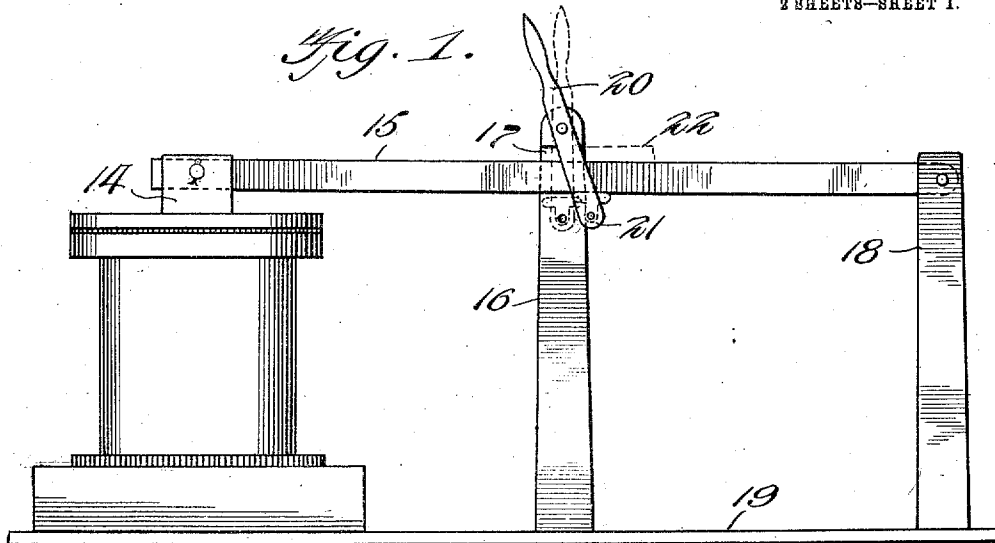


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 PHONOGRAM REPRODUCING APPARATUS.
 APPLICATION FILED AUG. 13, 1909.

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Patented June 21, 1910.

2 SHEETS—SHEET 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

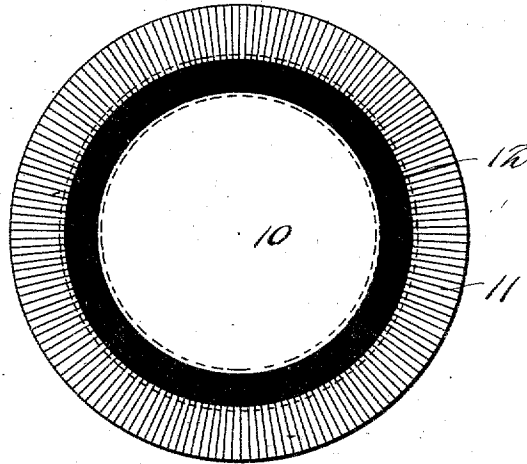
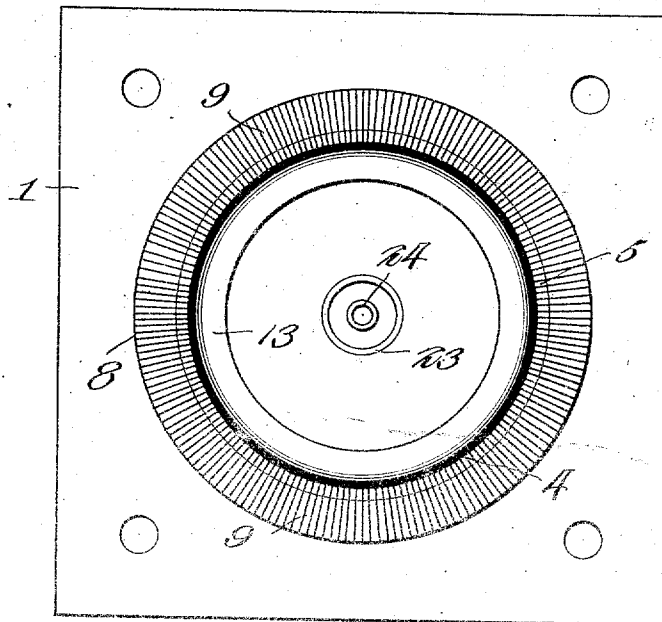


Fig. 4.



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PHONOGRAM-REPRODUCING APPARATUS.

961,980.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM F. MESSER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Phonogram-Reproducing Apparatus, of which the following is a specification.

This invention relates broadly to an improvement in apparatus for the production of phonograms being directed more particularly to such an apparatus designed to produce that form of record known as a cylinder record in the process of manufacture of which the plastic record material is molded under the influence of the expansive force of a fluid molding agent, such as steam under pressure, or the like.

The salient features of the invention reside in a resilient, removable seal disposed in such manner as to hermetically close the molding chamber into which the expanding mold fluid is introduced and in corrugated contacting portions of the base block, head plate, and matrix whereby air escapes communicating with the space between the matrix and the blank phonogram are provided.

It is well known in the art to which the invention relates that a large proportion of cylinder phonograms as at present produced are not true reproductions of the master record due in large part to two commonly-experienced causes, namely, the escape during the process of forcing the phonogram blank in contact with the matrix from some part of the molding chamber of a portion of the fluid molding agent which results in an unequal application of expansive force of said agent at different points on the plastic blank and incidentally producing too deep or too shallow an impression of the indentations of the matrix on the blank which, as obvious, causes a false tone value at that particular point when the record is being used, or the imperfect or distorted phonogram is the result of a partial retention at some point of a portion of the air between the matrix and the phonogram blank during the molding operation and preventing a proper contact between them.

One object of the present invention is the

provision of an apparatus such as above indicated in which the liability of accidental escape of the expanding molding agent from the molding chamber except at a desired time and through the proper channel is eliminated.

Another object is to provide a means whereby the air confined between the matrix and phonogram blank may be, during the process of contacting said blank and matrix, permitted to easily and completely escape from between said parts at an approximately uniform rate of flow, thus insuring, in conjunction with a perfectly-sealed molding chamber, a desired contact of the blank and matrix and overcoming the above-mentioned disadvantage of an impeded escape or partial retention of said air.

Another object is to provide a phonogram apparatus in which a movable headpiece while being automatically seated to operative position will simultaneously seal the ends of the molding chamber and be adapted to be locked in said position while the phonogram is being molded.

With these to be considered as the main objects the improvement will be described in the following specification taken in connection with the drawings accompanying the same and forming part of this application, and then more specifically pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation of my invention, the head plate being illustrated as partially seated in operative position on the matrix. Fig. 2 is a central, vertical section of the base block, head plate, matrix, phonogram blank, and fluid inlet pipes, all shown in operative situation. Fig. 3 is a bottom plan of the head plate, showing one member of the sealing means, and Fig. 4 is a top plan of the apparatus with the head plate removed.

Referring now to the drawings, wherein is illustrated the preferred details of my invention and wherein like reference characters indicate like parts throughout the several figures, 1 denotes a base block of the molding apparatus formed of any desired conformation as to plan outline and of suitable rigidity and stableness to withstand the

usual pressure incident to the operation of apparatus of this class. The base block 1 is formed with an approximately circular, centrally-disposed depression 2 in which the matrix and cooperating parts of the apparatus are designed to seat and be effectually held against lateral movement thereof, the circumferential wall of said depression being provided with a corrugated or knurled surface 3, the ribs forming said corrugated surface being of slight lateral dimension and closely spaced one from another.

4 denotes a resilient, annular sealing member, such as rubber or the like, formed, as illustrated, with beveled edges to eliminate possibility of accidental displacement and disposed within a suitably-formed groove provided in the depression 2 and spaced from the edges thereof an appropriate distance to contact said sealing member with the lower end of the phonogram blank during the molding process, as later explained. As obvious the member 4 can be easily removed from its retaining depression if occasion arises such as when substitution is desired on account of wear or the like.

5 denotes a matrix, of usual cylindrical form employed in molding phonograms of this class and having of course impressed upon its inner face a negative of the indentations recorded upon the master record. An annular reinforcing member 6, formed of any suitable material, such as brass or the like, is shrunk upon the lower end of the matrix 5, the lower face of said ring lying approximately in a plane coincident with that of the lower edge of the matrix, as shown. The circumferential face and the bottom face of ring 6 are formed with a corrugated surface 7 the ribs of the former extending practically in a vertical direction; said ring being of such lateral extent as to provide for said ribs contacting with the corrugated surface 3 of depression 2, the ribs on the corrugated bottom face of said ring being disposed radially thereon throughout its entire length, and contacting with that portion of said depression underlying said face, the above-described arrangement providing a plurality of air channels of very small caliber communicating with the space which exists between the matrix and the phonogram blank previous to the forcing of the latter into contact with the former.

8 indicates an upper annular reinforcing member attached to the upper end of the matrix 5 in similar manner and relative position as ring 6 to the lower end of said matrix, and provided with a corrugated face 9, the ribs thereof being arranged in radial form. A removable head plate 10, co-exten-

sive in circular dimension with ring 8 is provided on that portion of its lower face which normally overlies the ring 8 and upper edge of the matrix 5 with a corrugated or knurled face 11 formed of ribs disposed in radial form similar to those of face 9 with which face 11 is designed to so contact when the head plate is seated in operative position on the matrix as to provide a series of air channels communicating with the space between the matrix and blank in similar manner and with like function as the channels formed between the base block and the ring 6, the construction just described in conjunction with that of said base block and corrugated contacting ring 6 providing unobstructed passage for the escape of air from said space at practically all points at the top and bottom of the matrix, the air being of course, as obvious, forced from said space into these channels at a practically uniform rate of flow as the phonogram blank approaches and is forced into contact with the inner record face of the matrix under the influence of the expansive force of the molding agent, all of said air being thus forced from said space into the channels and thence into the surrounding atmosphere immediately prior to the contact of the expanding blank and the matrix. An upper sealing member 12 by preference similar in form and material to the lower member 4 is removably disposed in the head plate 10 in a suitable annular groove in approximately vertical alignment with said lower sealing member, against the proximate faces of which sealing members the inwardly-turned flanges of the ends of the phonogram blank 13 are designed to contact when said blank is in operative position in the molding chamber, as illustrated clearly in Fig. 2 of the drawings, it being understood that these sealing members are of such consistency and the cooperating parts are so proportioned that when the head plate is seated in operative position and locked therein and under pressure of the molding agent that said flanges will be forced into the sealing members and effectually seal the molding chamber.

14 denotes a pair of upwardly-extending lug plates formed if desired integral with head plate 10 and to which is pivotally and removably attached one end of a seating bar 15 disposed in loose contact with standard 16 formed with offset 17, and pivotally connected at its opposite end with standard 18, both of said standards and also the base block 1 being suitably attached as desired to a supporting platform 19. Connected to offset 17 and adapted for pivotal movement in relation thereto is a lifting lever 20 between which and the standard 16 the seating bar 15

passes, to the lower end of which lever a dog 21 is pivotally swung, the lever, dog, and the cooperating parts of the seating-bar being of such relative dimensions and position 5 that in the forward movement of the lever as shown in full lines in the drawings, the dog 21 will contact with the lower edge of the seating-bar 15 and raise it and the connected head plate out of contact with the 10 matrix and phonogram blank. A reverse movement of the lever, as shown in dotted lines in Fig. 1 will force the dog out of contact with said lower edge and permit the head plate to drop into operative position 15 and contact the upper sealing member with the phonogram blank, said blank having been previously seated of course in contact with the lower sealing member. A key 22 is adapted to be forced manually between the 20 offset 17 and the upper edge of the seating-bar and rigidly hold said bar and attached head plate in locked operation position.

An inlet pipe is denoted by 23, said pipe being connected to any desired source of 25 molding fluid under pressure, such as steam, said pipe being of course provided with appropriate inlet and outlet valves.

24 indicates an inlet pipe designed to convey a volume of cooling medium under pressure, said cooling agent, such as chilled air or the like being introduced, as well understood in the art, subsequent to the contacting of the phonogram blank and the matrix for the purpose of setting the former to a sufficiently rigid consistency appropriate to its 35 safe removal from the molding chamber.

The blank, formed of any usually desired material, such as celluloid, having been placed in the molding chamber with its 40 lower flange in contact with the lower sealing member, the head plate is swung into position and seated by operation of the lever 20, when key 22 is employed to lock the same in place, the upper sealing member contacting 45 when said head plate is seated with the upper flange of the blank, as obvious, said blank lying at this period of the process in slightly spaced relation to the positioned matrix. Steam or other molding fluid is 50 then introduced through pipe 23 and the blank, initially introduced into the molding chamber in an appropriate state of plasticity, forced against the matrix under pressure of the molding fluid, the upper and 55 lower seals rendering the molding chamber perfectly steam tight, as desired, while the air confined between the blank and the matrix previous to the introduction of the steam or other molding fluid is forced out 60 from between said parts into the channels formed by the contacting corrugated faces of the matrix rings and the base block and

head plate and thence into the atmosphere, as before described. At the proper moment 65 the steam is cut off and the cooling medium under pressure admitted which sets the phonogram to a proper degree of hardness to enable it to be removed from the molding chamber.

I claim—

1. A phonogram reproducing apparatus, 70 including sealing strips disposed directly above and below the upper and lower edges respectively of the phonogram cylinder.

2. A phonogram reproducing apparatus, 75 including a matrix, means for supporting the matrix, and a sealing strip underlying and bearing directly on the lower edge of the cylinder.

3. A phonogram reproducing apparatus 80 including a base block, a head plate, and a sealing strip inclosed by each of said parts to engage and bear directly on the ends of the record cylinder.

4. A phonogram reproducing apparatus 85 including a base block, a head plate, a matrix supported in the block and engaged by the head plate, the contacting surfaces of the matrix and head plate being formed to provide a series of divergent air escapes 90 disposed in the same horizontal plane.

5. A phonogram reproducing apparatus including a matrix, a record cylinder, a base block, a head plate, said base block and head plate being formed with a plurality of 95 radially-disposed channels to permit escape of air from between the matrix and cylinder.

6. A phonogram reproducing apparatus including a base block, a head plate, and a removable sealing member embedded in each 100 of said parts to engage and surround the uppermost and lowermost parts of the record cylinder.

7. A phonogram reproducing apparatus including a base block, a head plate, a matrix 105 supported in the block and engaged by the head plate, the contacting surfaces of the matrix and head plate being corrugated to provide air escapes.

8. A phonogram reproducing apparatus 110 including a base block, a head plate, a matrix supported in the block and engaged by the head plate, the contacting surfaces of the matrix and the head plate being formed with radially-disposed corrugations to provide 115 air escapes.

9. A phonogram reproducing apparatus including a matrix, a base plate for supporting the matrix, a head plate contacting with the matrix, the surfaces of the matrix 120 contacting with the head plate and with the base block being corrugated to form air escapes.

10. A phonogram reproducing apparatus

including a matrix, a phonogram blank, and a series of radially-disposed channels to permit escape of air from between said matrix and blank.

5 11. A phonogram reproducing apparatus including a phonogram blank, a base plate, a head plate, and sealing members removably embedded in said plates beyond the terminals of said blank and bearing directly on
10 said terminals.

12. A phonogram reproducing apparatus including a base block, a head plate, a rec-

ord cylinder, sealing members removably embedded in said block and plate, and means for exerting pressure directly on and be- 15 yond the head plate to cause sealing co-operation between said members and the extreme ends of the cylinder.

In testimony whereof, I affix my signature in presence of two witnesses.

WILLIAM F. MESSEF

Witnesses:

O. L. NEFF,

CHAS. E. FERRELL.