

Aug. 13, 1929.

E. J. GULICK

1,724,280

METHOD FOR THE MANUFACTURE OF MUSICAL INSTRUMENT BELLS

Filed Feb. 17, 1928

2 Sheets-Sheet 1

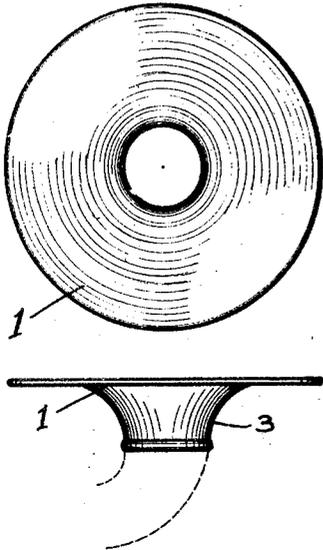


FIG. 1.

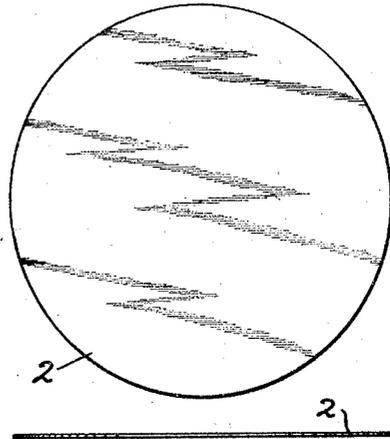


FIG. 2

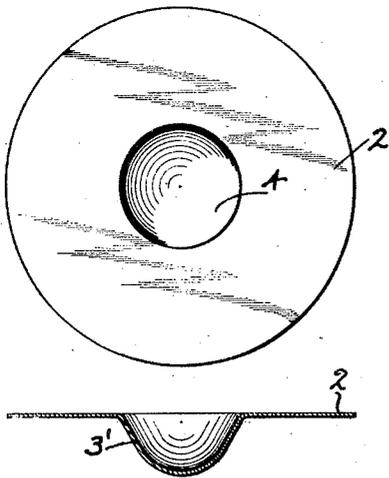


FIG. 3.

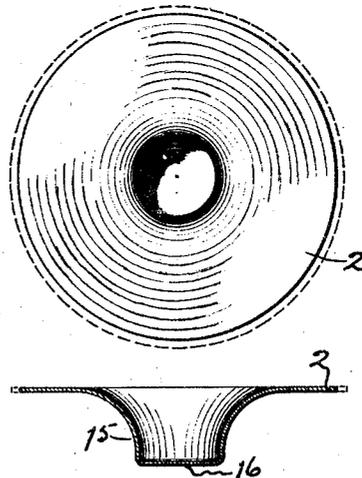


FIG. 4.

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2 Sheets-Sheet 2

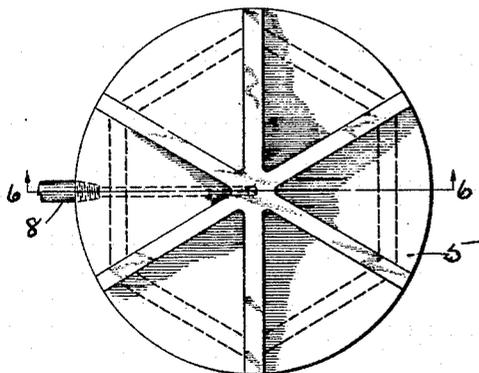


FIG. 5.

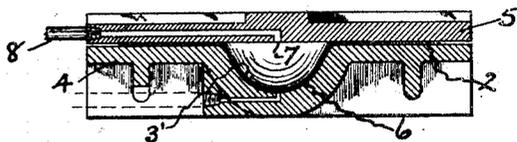


FIG. 6.

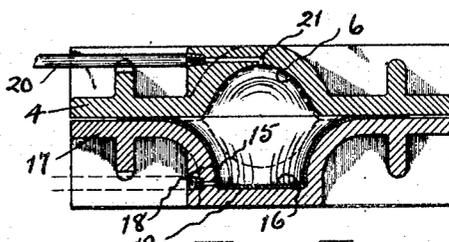


FIG. 7.

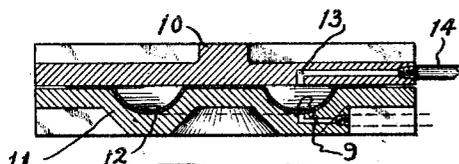


FIG. 8.

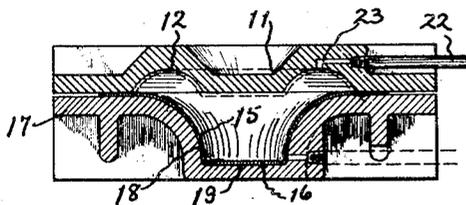
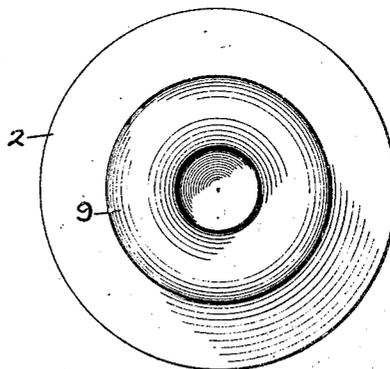


FIG. 9.



FIG. 10.

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METHOD FOR THE MANUFACTURE OF MUSICAL INSTRUMENT BELLS.

Application filed February 17, 1928. Serial No. 255,076.

This invention relates to musical instruments, and especially to the bell section of horns, cornets, and the like.

The principal object of my invention is to provide a method for forming the bell section of wind musical instruments from a flat sheet of ductile metal by fluid pressure.

Another object of the invention is to provide a method for forming the bell section of a horn, or like musical instrument, from a single piece, or disk, of sheet metal by hydraulics.

A third object of the invention is to provide a one piece jointless horn bell section which is made from a flat sheet or disk of sheet metal and which is belled by hydraulic pressure in a mould.

Still another object of the invention is to provide the moulds for hydraulically forming a bell section of a musical instrument from a single piece of flat sheet metal.

Other objects of the invention are mentioned and described herein.

The preferred embodiment of my invention is illustrated in the accompanying drawings, wherein,

Figure 1 illustrates two views of a finished horn bell made according to my improved method;

Fig. 2 illustrates two views of the rudimentary sheet metal blank from which the bell is made; Fig. 3 illustrates two views of the condition of the metal blank after the first step of the method;

Fig. 4 illustrates two views of the condition of the blank after the second step of the method;

Fig. 5 illustrates a top plan view of the mould for dishing the blank as illustrated in Fig. 3;

Fig. 6 is a section taken on line 6—6 of Fig. 5;

Fig. 7 is a section taken through a two part mould for shaping the blank as illustrated in Fig. 4;

Fig. 8 is a section taken through a two part mould to effect a modification of the first step of the method for treating the blank;

Fig. 9 is a similar section through a two part mould for effecting the second step of the modified method; and

Fig. 10 illustrates two views of the metal blank after the first step of the modified

method as formed in the mould illustrated in Fig. 8.

Similar numerals of reference indicate like parts throughout the several views on the drawing.

Referring to the details of the drawings the numeral 1 indicates a horn bell made from a flat circular rudimentary blank 2 of ductile sheet metal, preferably brass. The flaring branch portion 3 of the bell is formed by centrally dishing the blank 2 by fluid under pressure after placing the blank in a mould, as hereinafter described.

For certain sizes and weights of metal the first step of the method consists of centrally embossing the blank 2 in dome-like form at 3' (Fig. 3), and to effect such a condition the blank is placed between the top and bottom sections 4 and 5, respectively, of the two part mould illustrated in Figures 5 and 6, of which the lower section 4 is provided with the central hemi-spherical recess 6. The mould top section 5 is provided with a fluid inlet 7 which is in communication with the recess 6, and a conduit pipe 8 is placed in communication with the inlet 7, said pipe being connected with any suitable source of fluid under pressure, preferably hydraulic.

The mould is then placed in a press to lock the two sections thereof together and the fluid under pressure is introduced into contact with the upper surface of the blank 2, whereby the metal of the blank is pressed downward into the recess 6 and section 3' thereof centrally formed therein. When the fluid under pressure is thus applied to the blank 2 in the mould the metal of the blank is drawn slidably inward thereby and a uniform thickness of the metal is thereby maintained.

For certain other sizes and weights of metal for musical instrument bells the first step of the method consists of forming the annular channel or ring-like recess 9 in the blank 2, and to effect such a recess or condition in the blank the two part mould shown in Fig. 8 is used, said mould comprising the top and bottom sections 10 and 11, respectively, the latter being provided with the annular channel-like recess 12 and the former is provided with a fluid inlet 13 and a conduit pipe 14 to supply fluid under pressure, preferably water, to the upper surface of the

blank 2 after the latter has been secured in said mould and the mould locked together in a press, or by other suitable means.

5 The second step of the method consists of the formation of the blank section 15 which is an operation on the domed portion 3', or the channeled portion 9 of the disk 2, this condition being illustrated in Fig. 4 and represents the last step of the hydraulic treat-
10 ment of the blank. Thereafter, the end wall 16 is severed or removed in any suitable manner, and the article is then ready for the plating process and any other treatment to enhance its artistic appearance.

15 When the second step of the method is applied to the disk or blank, after being dished at 3', as described, the mould illustrated in Fig. 7 is used, and said mould may include the part 4 of the mould shown in Fig. 6 together with a new lower half mould section
20 17, the latter being provided with recess 18 which has an annular flat bottom 19 and side walls which are convexed, or flaring curves, in cross-section. The blank 2 is then placed
25 in this mould with the domed portion 3' projecting into the mould recess 18, and the application of fluid under pressure through inlet 21 and pipe 20 forces the blank snugly into the recess 18 and thereby effecting the
30 belled formation illustrated in Fig. 4.

The second step of the method on the disk 2 provided with the annular recess 9 is effected in the mould shown in Fig. 9, and this mould may include mould section 11

(Fig. 8) and mould section 17 (Fig. 7), the former having conduit pipe 22 connected with the inlet 23 for introducing fluid under pressure to the channel 12 and into contact with the dished portion 9 of the blank or disk.

I claim:

1. In the method of hydraulically making a belled article, the steps consisting of forming a rudimentary blank of flat ductile sheet metal, then centrally deforming the blank, then dishing the deformed blank in the opposite direction to form a bell-like element, and then severing the end wall of the dished portion.

2. In the method of hydraulically making a belled article, the steps consisting of forming a rudimentary blank of flat ductile sheet metal, then centrally deforming the blank to a dome-like formation, then dishing the deformed blank in the opposite direction to form a bell-like element, and then severing the flat end wall of the dished portion.

3. In the method of hydraulically forming a musical instrument bell, the steps consisting of forming a rudimentary blank of flat ductile sheet metal, then forming a ring-like deformation in the blank, then dishing the deformed blank in the opposite direction to form a bell-like element having a flat end wall, and then severing the flat end wall of the dished portion.

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