

G. E. MITTINGER, JR.
 METHOD OF SHAPING SHEET METAL INTO BILGED BARREL SHELLS.
 APPLICATION FILED MAR. 9, 1912.

1,042,945.

Patented Oct. 29, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

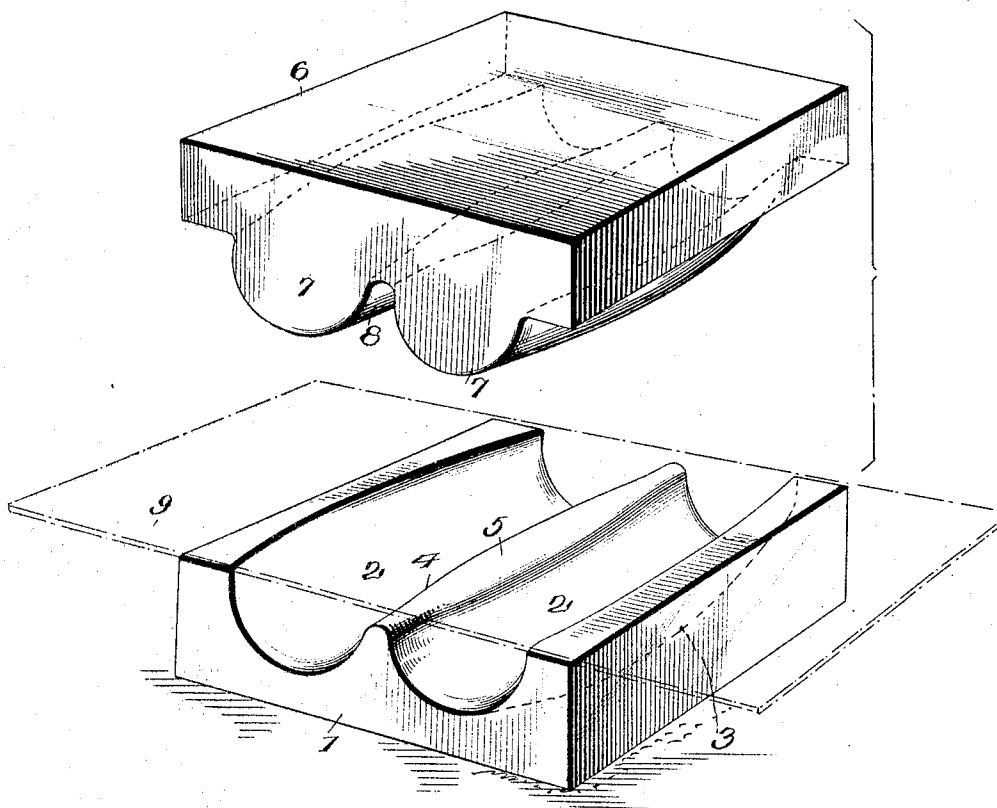
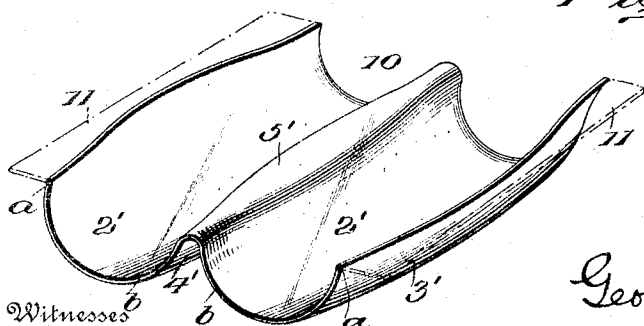


Fig. 2.



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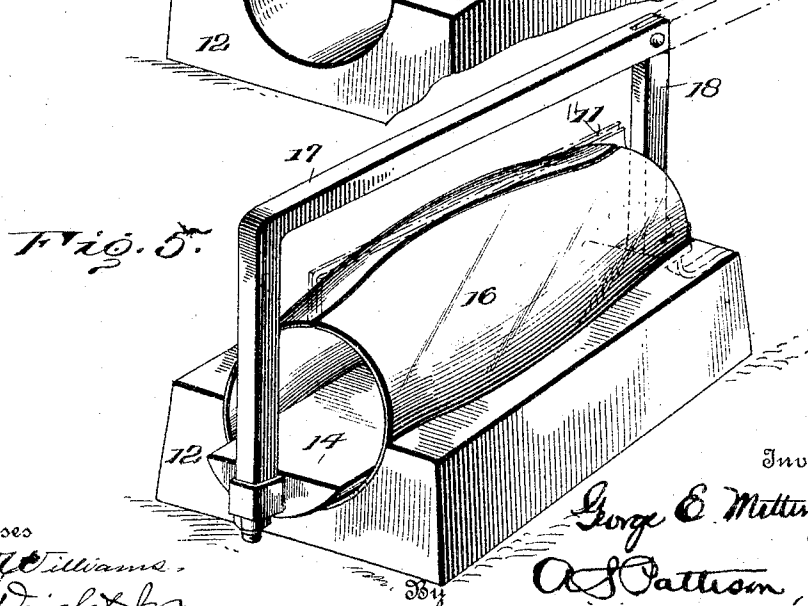
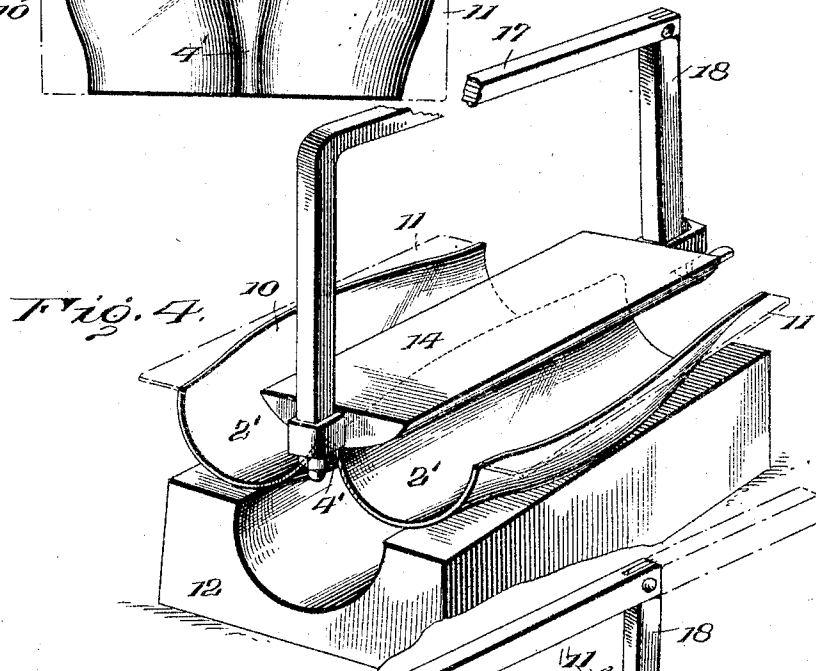
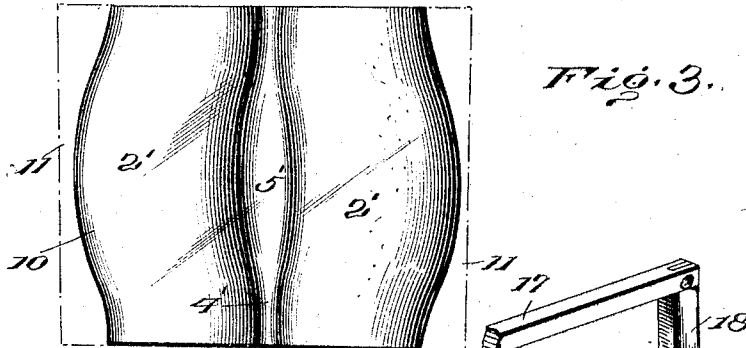
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 Attorney

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

GEORGE EUGENE MITTINGER, JR., OF NEW CASTLE, PENNSYLVANIA.

METHOD OF SHAPING SHEET METAL INTO BILGED BARREL-SHELLS.

1,042,945.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed March 9, 1912. Serial No. 682,831.

To all whom it may concern:

Be it known that I, GEORGE E. MITTINGER, Jr., a citizen of the United States, residing at New Castle, in the county of Lawrence and State of Pennsylvania, have invented certain new and useful Improvements in the Method of Shaping Sheet Metal into Bilged Barrel-Shells, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in the method of shaping sheet metal into bilged barrel shells, and the primary object thereof is the production of a bilged metal barrel shell from a single sheet of metal, without any material stretching thereof or any material disturbance of the molecules of the metal, with the result that a metal bilged barrel without any weak places in the metal is produced.

A primary feature of my present invention comprises a method by which a bilged barrel shell is produced from a sheet of cold metal by two operations, the shell needing only the suitable seaming of its edges and the securing of suitable heads therein to make a completed metal barrel.

A further feature of my present invention is the production of an initial blank so shaped that a bilged barrel shell can be produced therefrom by a single succeeding operation.

A further feature of my present invention is the production of the aforesaid initial blank by a single operation so shaped that a bilged barrel shell can be made therefrom by a single succeeding operation, thus producing a bilged barrel shell by two operations.

My improved method consists in taking a sheet of metal and forming therein two parallel curved and bilged bends and a longitudinally extending reverse bend therebetween, and then forcing this intermediate reverse bend into a curved and bilged form corresponding with the curve and bilge of the said parallel bilge bends, which action forms the completed bilged barrel shell.

Reference will hereinafter be made to such portions of the dies or apparatus used to form the initial blank, and to the carrying out of the complete method, as will enable the invention to be readily understood.

Referring to the accompanying drawings, in which like reference characters indicate the same parts: Figure 1 is a perspective

view showing the shape and contour of the male and female dies used in the apparatus to form the initial blank, together with the sheet of metal in position from which the initial blank is formed. Fig. 2 is a perspective view of the initial blank after it has been formed. Fig. 3 is a top plan view of the initial blank. Fig. 4 is a perspective view showing the shape and contour of the male and female dies for acting on the initial blank to convert it into the completed bilged barrel shell, the initial blank being shown in its position in respect to said dies. Fig. 5 is a perspective view showing the position of the dies after they have acted upon the initial blank, and showing also the completed bilged barrel shell.

In carrying out my invention for producing the initial blank, I provide a female die 1, which is provided with two parallel curved recesses 2, and these recesses have what I term expanded or bilged portions 3, and a central projection 4. This central projection 4 is centrally located between the curved cavities 2 and is gradually widened from its ends to its center, forming an enlarged central portion 5.

The male die 6 is provided with parallel projections 7, shaped to correspond with the curved cavities 2 of the female die 1, and with a central longitudinally extending recess 8, corresponding in form and shape to the projection 4 of the female die.

The sheet of metal 9 to be acted upon is placed on the female die as shown in dotted lines Fig. 1, and the male die is forced downward carrying the metal sheet into the recesses 2 and forming what I term an initial blank 10, which corresponds in shape to the shape of the dies; that is to say, it has a reverse bend 4', the curved bends or recesses 2' and the bilged portions 3' and also the widened central portion 5' of the reverse bend 4'. This blank 10 also preferably has laterally extending flanges 11 at the longitudinal edges of the blank.

The aforesaid dies are preferably so shaped that the blank from approximately the points *a, b*, is of a shape or contour which corresponds with the shape and contour of the completed bilged barrel shell, and also of the completed bilged barrel, and the distance between the points *a, b*, of each of the curved recesses or cavities 2 is preferably approximately three-fourths of the diameter of the barrel, while the distance between

the points *b* is approximately two-eighths or one-fourth of the diameter of the barrel, but not, of course, of a shape corresponding to the shape of the barrel.

5 From the foregoing it will be observed, that in a single operation, I form from a cold sheet of metal an initial blank which has a bilged barrel shape of approximately three-fourths of the completed barrel shell
10 or barrel, and thus it may be aptly referred to as the major portion of the barrel. It will also be noted that the reverse bent or projection of the initial blank is of an area constituting approximately one-fourth of
15 the area of the completed barrel shell, or barrel, and may thus be aptly referred to as the minor portion of the barrel. I do not limit myself in respect to these dimensions of the several operations, and have referred
20 to them as the preferred manner of carrying my method into effect, but these dimensions may be varied without departing from the spirit and scope of the broad inventive idea herein disclosed. I also wish to mention that
25 the flanges 11, shown in dotted lines, may be omitted or retained. These flanges are merely for the purpose of enabling a lock seam to be formed, but I desire it to be understood that the flanges may be omitted
30 and the abutting edges of the shell joined in any well-known suitable manner, though at this time I prefer to form the blank with the flanges so that a lock seam may be formed. Attention is also directed to the fact that
35 preferably the top of the reverse bend 4' of the initial blank is not as high as the outer edges of the curved bilged recesses 2, and may be aptly described as being a plane below the plane of the outer edges of said
40 recesses.

The initial blank having been formed, it is placed in the position shown in Fig. 4, on a female die 12, and in such position that its projection 4' is centrally located over the
45 curved and bilged recess 13 of the female die 12. A male die 14 having its under side 15 curved and bilged to correspond with the recess 13 of the die 12, is forced downward on the reverse bend 4' of the initial
50 blank, and the reverse bend of the blank is upset and carried down into the position shown in Fig. 5, thus causing the reverse bend to take the shape of the dies and thus
55 complete the bilged barrel shell 16. The male die 14 is of a size to be approximately one-fourth of the diameter of the completed barrel shell which is the length of the metal contained in the reverse bend 4', of the initial blank.

60 Of course, it will be understood that any suitable press or other mechanism will centrally engage the pressure beam 17 of the die 14 to force it down and to enable the finished barrel shell to be removed, the leg
65 18 of the pressure beam is hinged so that it

can be swung out, as shown in dotted lines Fig. 5, and thus permit the completed shell to be removed from the dies.

I do not limit myself to the exact disclosure herein made, for it may be varied
70 without departing from the spirit and scope of my invention so long as it embodies the feature of producing a bilged metal barrel shell by forming an initial blank from a single sheet of metal with parallel curved
75 bilged bends or recesses and an intermediate reverse bend, and then upsetting or forcing the reverse bend into a bilged curve corresponding with the curve or bilge of said parallel bends.

80 Having thus described my invention what I claim and desire to secure by Letters Patent is:

1. The method of shaping sheet metal into a bilged barrel shell, which consists in forming
85 an initial blank from a metal sheet with two parallel bilged bends and an intermediate parallel reverse bend with gradually increasing amount of metal at its center, and then upsetting and shaping the reverse
90 bend into a curve and bilge corresponding with the curve and bilge of said parallel bends.

2. The method of shaping sheet metal into a bilged barrel shell, which consists in forming
95 an initial blank from the sheet with two parallel bilged bends and an intermediate parallel reverse bend gradually widening from its ends to its center, and then upsetting and shaping said reverse bend into a
100 curve and bilge corresponding with the curve and bilge of said parallel bends.

3. The method of shaping sheet metal into a bilged barrel shell, which consists in forming
105 an initial blank from the sheet, with two parallel curved and bilged bends, and shaping the combined curve and bilge of the bends with an area equal to the major portion of the barrel shell, and forming a reverse intermediate bend of minor area of the
110 completed shell, and then upsetting and shaping this reverse bend into a curve and bilge corresponding with the curve and bilge of the completed barrel shell.

4. The method of shaping sheet metal into
115 a bilged barrel shell, which consists in forming an initial blank from a sheet, with parallel curved and bilged bends, forming the bottom and outer sides of the bends with a curve and bilge corresponding with the
120 curve and bilge of the completed barrel shell, and forming a reverse bend between said parallel bends and of such shape as to throw the inner sides of said recesses out of said barrel curve and bilge, and then upsetting
125 and shaping said reverse bend and the inner sides of said parallel recesses into a curve and bilge corresponding to the curve and bilge of the outer sides of said parallel
130 bends.

5. The method of shaping a sheet of metal into a bilged barrel shell, which consists in forming an initial blank with two parallel bends having their bottoms and outer sides of a curve and bilge corresponding with the curve and bilge of the completed barrel shell, and an intermediate reverse bend having its top in a plane below the plane of the outer edges of said parallel bends, and then forcing said reverse bend into a mold recess having a curve and bilge corresponding with the curve and bilge of the outer sides of said

parallel bends to bring the outer edges of the parallel bends together and upset and shape the reverse bend into a curve and bilge corresponding to the curve and bilge of the outer sides of said parallel bends.

In testimony whereof I hereunto affix my signature in the presence of two witnesses:

GEORGE EUGENE MITTINGER, JR.

Witnesses:

J. M. MARTIN,
HOMER C. DRAKE.