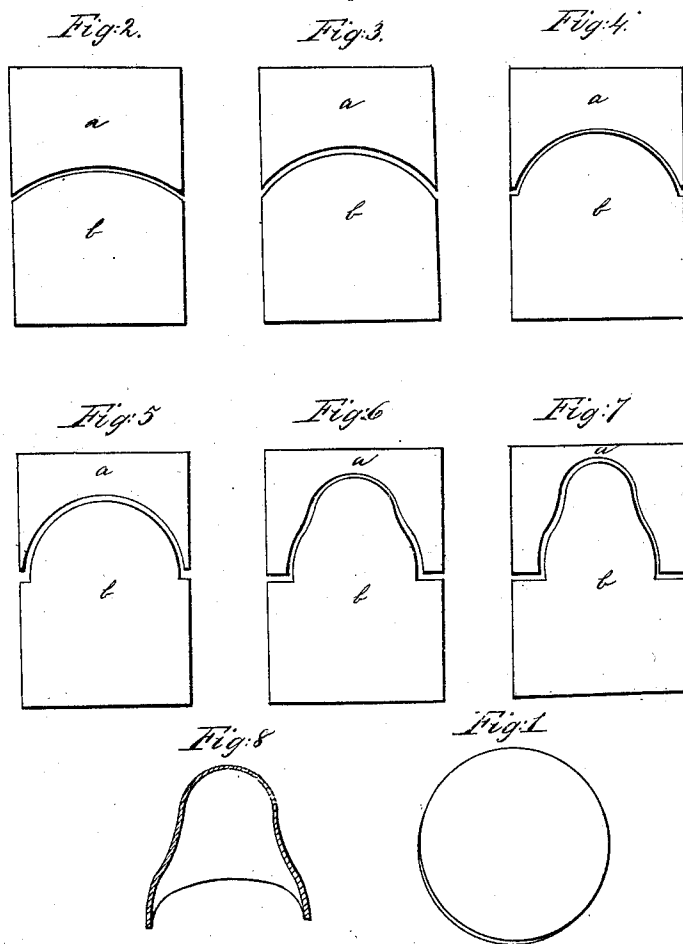


A. PATTERSON.
DIE FOR MAKING BELLS.

No. 62,678.

Patented Mar. 5, 1867.



Witnesses.
James Mould
A. B. Swann

Inventor.
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United States Patent Office.

ANDREW PATTERSON, OF BIRMINGHAM, PENNSYLVANIA.

Letters Patent No. 62,678, dated March 5, 1867.

IMPROVEMENT IN DIES FOR MAKING BELLS.

The Schedule referred to in these Letters Patent and making part of the same

Be it known that I, ANDREW PATTERSON, of Birmingham, Allegheny county, State of Pennsylvania, have invented certain new and useful Improvements in Manufacture of Bells; and I hereby declare that the following is a full, true, and exact description of the same, reference being had to the accompanying drawings, which form part of this specification, and to the letters of explanation marked thereon.

My invention consists in forming bells of the ordinary shape from circular plates of steel by subjecting them to pressure, while rendered pliable by heat, between suitably formed dies. The general principles which enter into the mechanical operation are old and well understood by workers in sheet metal, and need no especial explanation.

In making bells by my invention, I take a circular plate of steel about one-fourth larger in diameter than the intended bell, and having heated it to about a "cherry red," I apply the pressure of a drop-press to it placed between a pair of dies similar to those represented by the sectional drawing, fig. 2, *a b*; I then reheat and strike it between another pair of dies, which more nearly approximate the intended shape, and repeat this process of heating and pressing each time with another pair of dies until the proper shape of bell is obtained.

Figure 1, in the drawings, represents a sheet of steel before it has received the impress of any of the dies.

Figures 2, 3, 4, 5, 6, 7 are sectional views of a series of dies, such as I use in forming ordinary-shaped bells, *a* indicating the female and *b* the male die in all the drawings.

Figure 8 is a section of a bell formed from a sheet of metal by passing through this series of dies in the manner described.

It will be seen that each pair of dies into which the heated plate is put for stamping, has a different form and shape from the pair of dies in which it was last impressed, thus passing through the various series of dies until it has passed through the last pair, which give it the shape desired of a perfect bell. It will be further seen that the dies allow a thickening of the lower rim or edge of the bell at its mouth, which, strengthens the bell at this point, where the greatest danger and liability to crack exists, and which increases the tone of the bell greatly.

The advantages of my improvement are economy of production, with greater variety and depth of tone, and greater strength and durability, than can be obtained with the same weight of metal when the bells are formed by casting. Bells made by my process are especially adapted to be arranged in musical chimes, as the tone or note desired can be readily approximated by changing the temper or hardness of the steel. After being formed, these bells may be finished by plating with finer metals, as is done with cast bells when ornament is desired.

I am aware that it is not new to form vessels by dies from sheet metal. I do not, therefore, claim as new, stamping vessels from sheet metal by means of dies, but what I do claim as new, and desire to secure by Letters Patent, is—

The manner herein described of forming bells out of circular sheets of steel, by means of the action of a series of dies of different shapes, constructed and operating on the material substantially as described, so as to condense or thicken the outer portion of said sheets, thus forming the bells with a gradually increased thickness from their apex or centre to the base or mouth, as described and set forth.

A. PATTERSON.

Witnesses:

A. B. STEVENSON.

JAMES MOULD.