G. R. MENEELY.

Casting Bronze.

No. 165,353. Patented July 6, 1875.

Fig. 1.

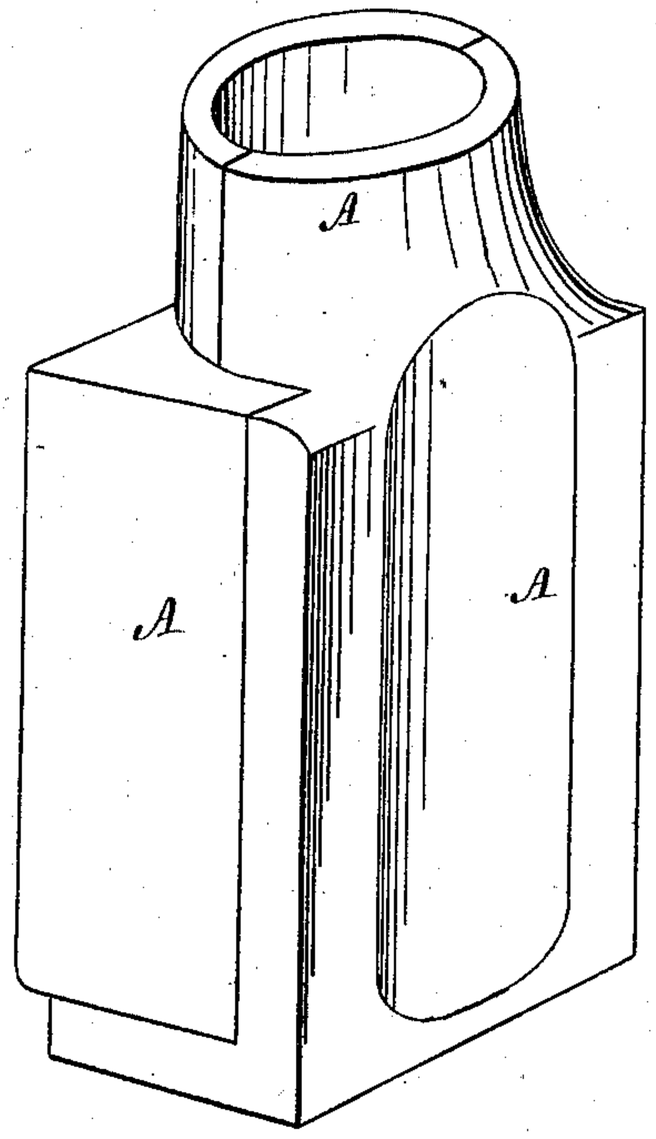


Fig. 2.

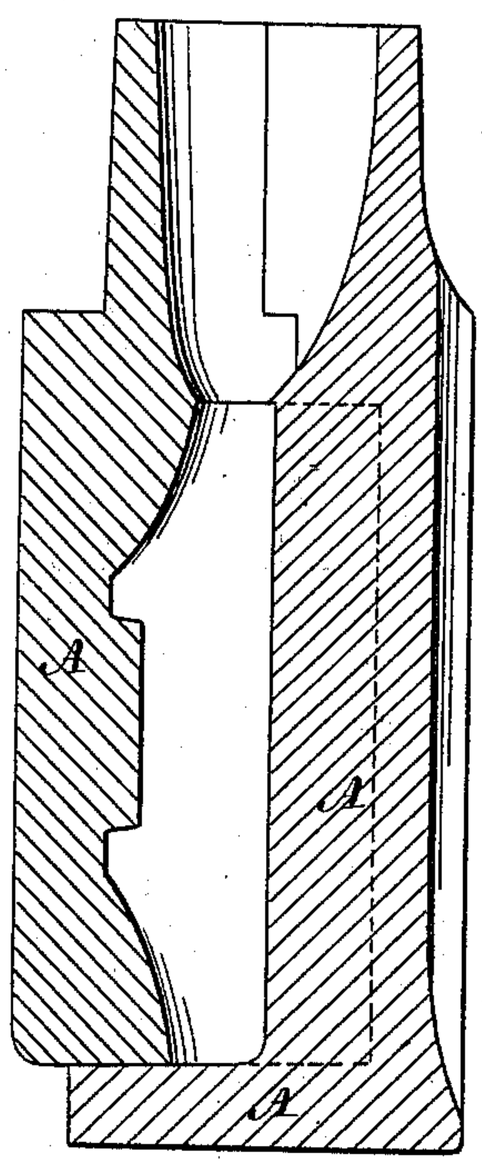
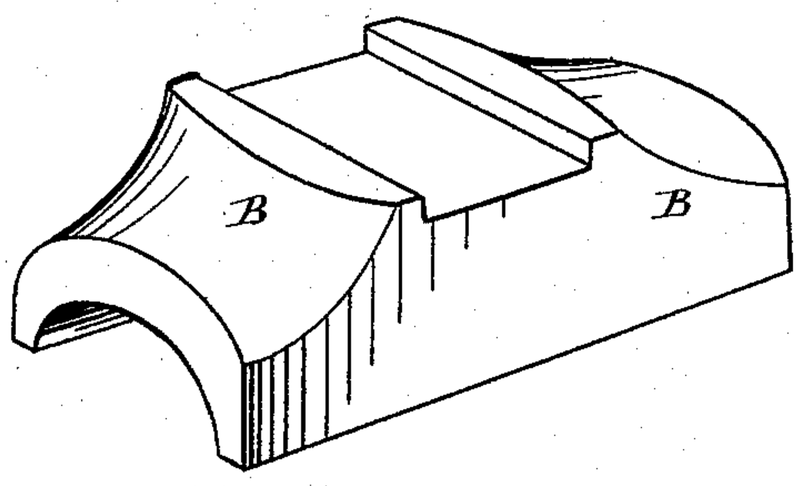


Fig. 3.



Witnesses.

D. R. Cook

Edmund Masson

Inventor.

George R. Meneely.

By atty A. B. Stoughton.

UNITED STATES PATENT OFFICE.

GEORGE R. MENEELY, OF WEST TROY, NEW YORK.

IMPROVEMENT IN CASTING BRONZE.

Specification forming part of Letters Patent No. **165,353**, dated July 6, 1875; application filed February 15, 1875.

To all whom it may concern:

Be it known that I, GEORGE R. MENEELY, of West Troy, in the county of Albany and State of New York, have invented certain new and useful Improvements in Casting Bronze Journal-Bearings, and other shapes in copper molds; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, illustrating the same, in which—

Figure 1 represents in perspective a cast copper mold, in position for receiving the molten bronze metal. Fig. 2 represents a section through the same. Fig. 3 represents in perspective a journal-box bearing of bronze, cast in said mold, sometimes called "chills," though the metal is not chilled.

My invention consists in casting bronze shapes in copper molds, whereby I obtain condensed or compressed bronze, capable, in journal boxes or bearings, of great endurance and resistance to frictional wear.

Journal boxes or bearings of bronze metal have heretofore been cast in sand molds. This, for such uniform shapes, is quite expensive, as skilled molders are required, sand has to be purchased and renewed, and much foundry-space is taken up. Iron or steel molds or chills will not answer the purpose, for two reasons, viz: first, the gas evolved by the contact or flowing over of the hot bronze upon iron or steel renders the bronze porous, and in that condition not suitable for journal-bearings; second, the liability of the hot bronze to weld to the iron or steel, and thus ruin both the molds and the casting, renders these metals impractical. And it may be further stated that, if these two objections of themselves were not fatal to the use of iron or steel molds, the fact that they are liable to be forced open under the internal pressure, or must be opened to relieve the expansion from within, render such iron or steel molds useless for the purpose of casting bronze shapes, such as I propose, as they would fail to be compact, condensed, or compressed, as they are in copper molds.

I have ascertained by practical tests that a bronze shape cast in a copper mold is of a specific gravity of more than six per cent. greater than one of similar size cast from the same crucible, and out of the same metal, in sand, and, being more dense, is of greater hardness and endurance.

In the use of copper molds for molten bronze metal, it is not necessary to open the molds to relieve the casting within, and thus, by keeping the copper mold tightly clamped until the bronze metal has set, it has a density and hardness like that of actually compressed bronze, for though it is not mechanically compressed, as is sometimes done, it is prevented from expanding, and so retains its greater density over bronze cast in sand.

I am aware that combined copper and sand molds have been essayed for making cast-steel shapes in. The liability of the steel to become attached to the gate or flask of the copper metal renders it necessary, as between these metals, to make provision for removing one or raising the other, to prevent this occurrence. Bronze and copper take more kindly to each other, and the difficulties that attach to iron and steel molds and molten bronze, or copper molds and molten steel, do not occur in pouring molten bronze into copper molds or chills.

In Figure 1, I have shown at A a two-part cast copper mold, in the position which it occupies—viz, a vertical one—when the molten bronze is to be poured into it. The clamps for binding and holding the two parts of the mold together are not represented, but may be of any of the usual well-known kinds. The interior of the mold is formed for producing a journal-box bearing, as seen at B, Fig. 3, and the entire surface of said bearing is cast in contact with the copper surfaces of the mold, and without sand, while to preserve the density of the bronze metal, and give it the character of condensed bronze, the molds are not opened, or the clamps slackened, until the bronze metal has set, and may be with safety removed.

By this process great expedition and economy are attained, and a more solid casting of bronze produced than can be produced in sand.

Having thus fully described my invention, what I claim is—

The process of casting bronze journal-box bearings in copper molds, for the purpose of producing greater density in the bronze metal than can be obtained by casting in sand, substantially as described.

GEO. R. MENEELY.

Witnesses:

GEORGE MORELAND,

ANDREW WILSON.