Diston & Marsden,

Ingot Mold.

No. 93,863. Patented Aug. 17. 1869.

Fig: 1.

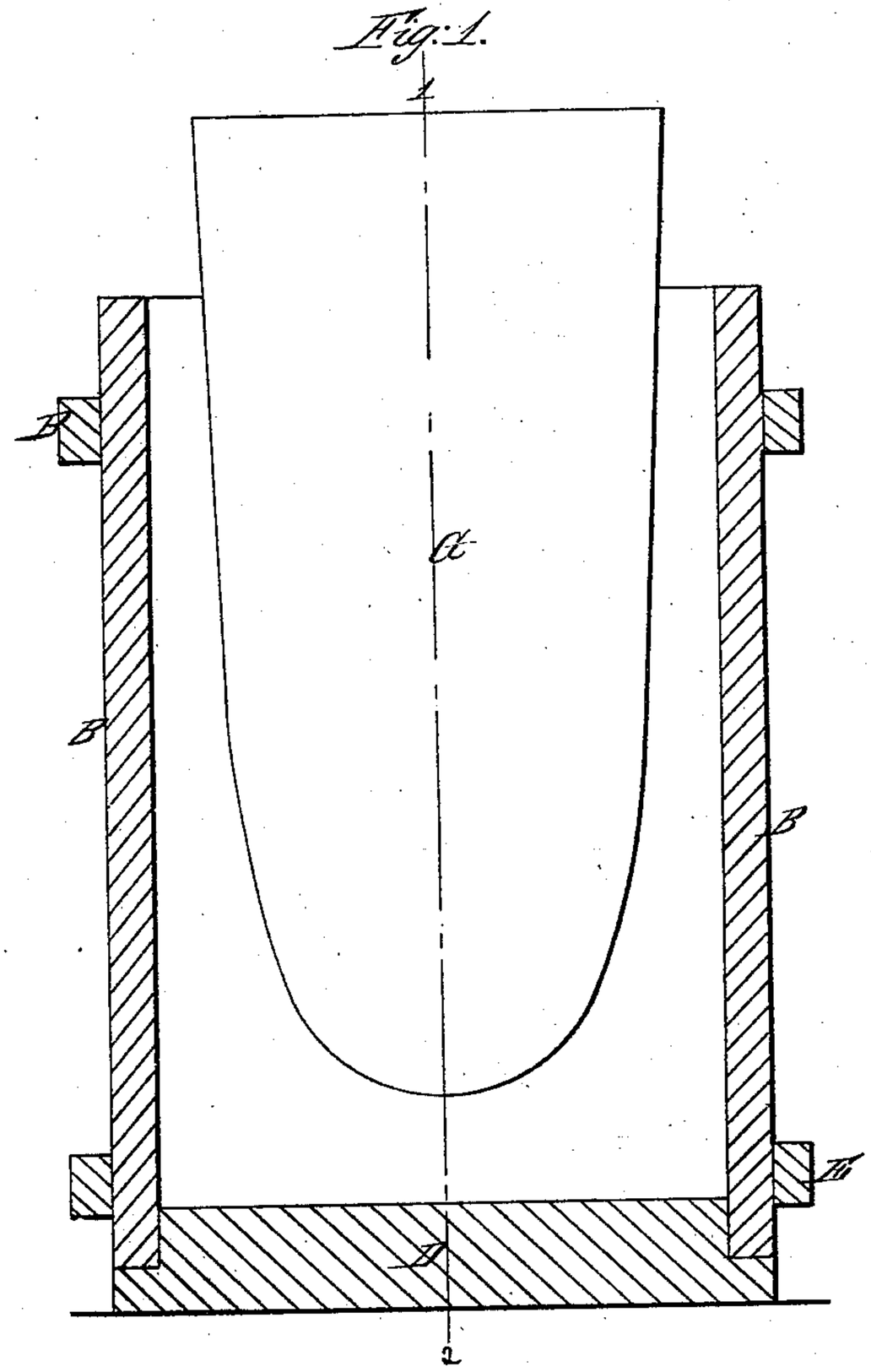


Fig: 2.

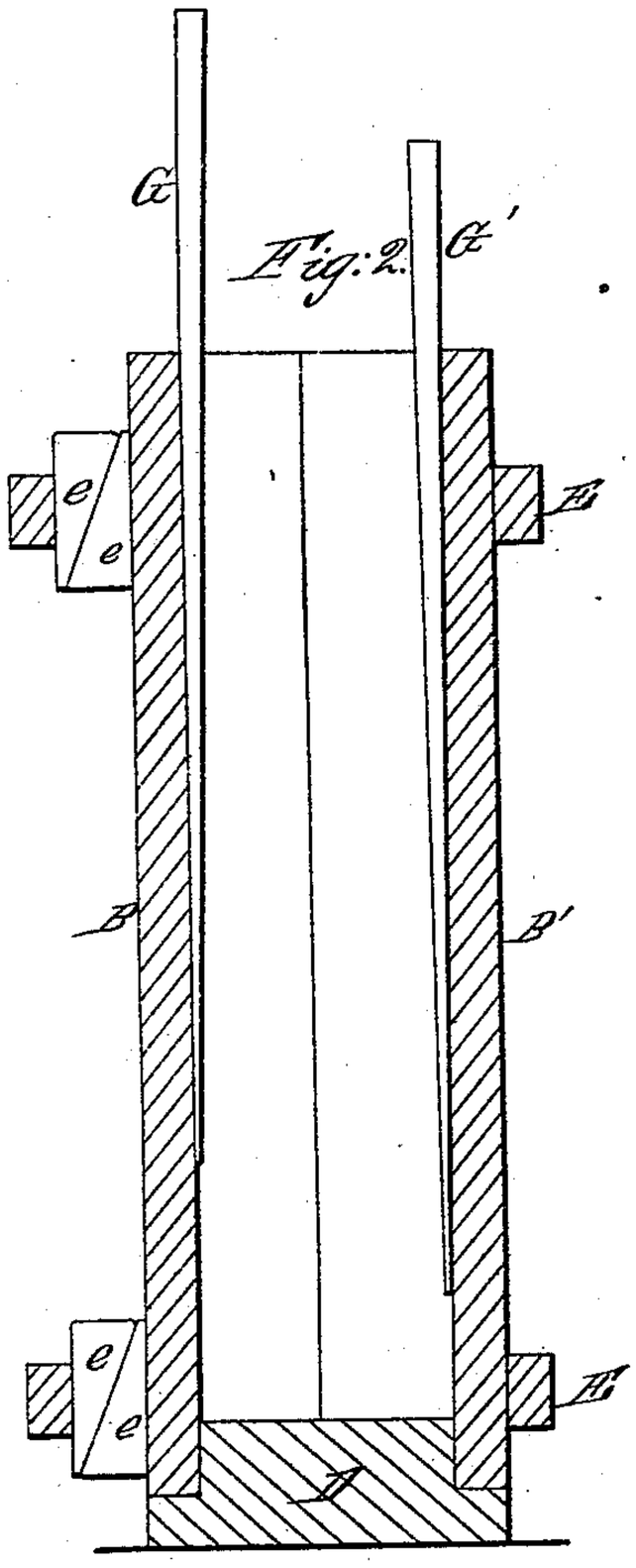
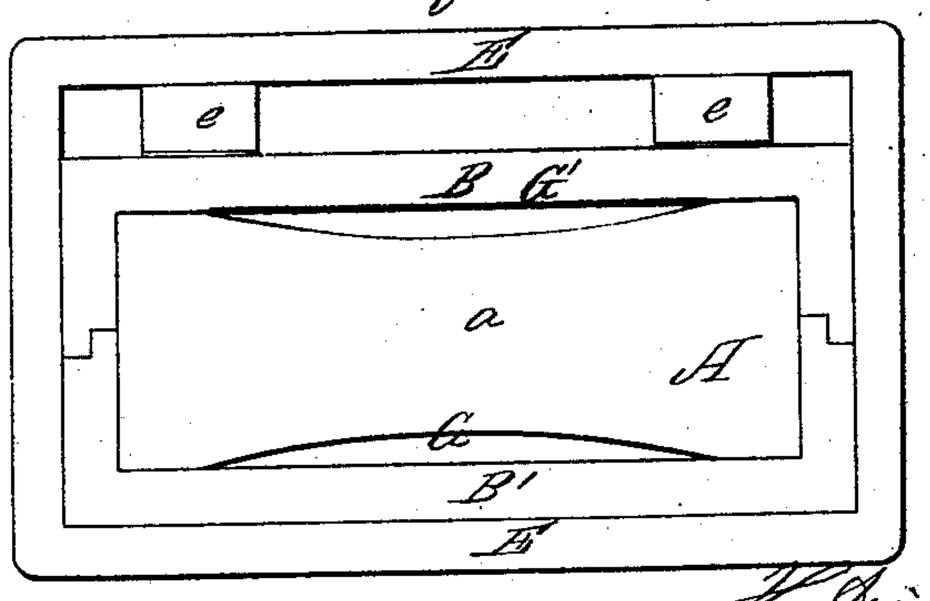


Fig: 3.



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United States Patent Office.

HENRY DISSTON AND JONATHAN MARSDEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO HENRY DISSTON.

Letters Patent No. 93,863, *dated August* 17, 1869.

IMPROVEMENT IN CASTING STEEL INGOTS.

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

To all whom it may concern:

Be it known that we, HENRY DISSTON and JONATHAN MARSDEN, both of Philadelphia, Pennsylvania, have invented an Improvement in the Casting of Steel Ingots; and we do hereby declare the following to be a full, clear, and exact description of the same.

Our invention consists in the contracting of steel ingots while the metal is setting, by driving between the steel and the moulds, a wedge or wedges, substantially in the manner described hereafter, thereby counteracting the effect which shrinkage has to form cavities in the ingot.

Our invention further consists in making the wedges of the peculiar form described hereafter, so as to contract the ingot to an extent proportionate to the extent and capacity of the cavity which would be formed in the absence of the said contracting wedges.

In order to enable others to practise our invention, we will now proceed to describe the mode of carrying it into effect, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a vertical section of a mould in which to cast steel ingots, and which illustrates our invention;

Figure 2, a transverse vertical section on the line 1–2, fig. 1; and

Figure 3, a plan view.

In casting ingots of steel, much loss occurs, owing to the formation, during the cooling and shrinking of the metal, of an irregular cavity or recess, which extends downward into the ingot to a greater or less extent. Thus, in the ingot A, fig. 3, a cavity *a*, of about the shape shown, would, under ordinary circumstances, be formed, the cavity decreasing in size from the top, but penetrating, in many cases, to the extent of one-third of the depth of the ingot, which, if rolled in this condition, would result in a plate, a great portion of which would be laminated and useless. It becomes necessary, therefore, to sever from the ingot as much of the same as the cavity penetrates, and this portion has to be remelted, the solid portion only being rolled into plates, or otherwise utilized.

In order to prevent this waste, we have adopted the plan which we will now proceed to describe.

The mould consists, in the present instance, of the two cast-iron vertical pieces, B and B′, fitted together, as shown in fig. 3, and to a base, D, as illustrated in figs. 1 and 2, the several parts enclosing a space (open at the top) into which the steel is poured, and the whole being held together by strong wrought-iron bands E, and wedges *e e*.

We prepare two wedge-shaped pieces, G and G′, of wrought-iron or steel, each of which is flat on one side, but rounding on the opposite side, the edges being comparatively sharp, as illustrated in the drawing. Each wedge should also decrease in thickness and width from the top downward.

After the molten steel has been poured into the mould, and begun to set, the wedges are at once inserted, one on each side of the ingot, as seen in fig. 3, and between the ingot and the inside of the mould, the flat side of the wedge bearing against the mould, and the rounded side projecting into the ingot.

As the steel cools, the wedges are driven down, so as to contract the ingot and prevent the formation of the usual cavity *a*, so that when the steel has become comparatively cool and set, it will be solid throughout, and the usual waste will be prevented.

The wedges should be proportioned to the size of the probable cavity; thus, in fig. 3, where the ingot is of an oblong section, and the cavity is elongated, the wedges are wider than the cavity, while the thickness of the two wedges combined is greater than that of the cavity, so that on driving the wedges, they may contract the ingot over an extent of surface greater than that which the cavity would occupy in length and breadth, while the amount of contraction is greater than the capacity of the probable cavity. Again, the cavity is always wider at or about the middle than toward the ends; hence, the wedges are made thick in the middle, and are reduced to comparatively sharp edges at the sides, for if the edges of the wedges were abrupt or blunt, the recesses formed by them in the ingot would be of a character to interfere with the proper rolling of the same.

One wedge only, driven between the steel and inside of the mould, would serve the desired purpose, but we prefer the use of two wedges, as we have found them most serviceable in practice.

We claim as our invention, and desire to secure by Letters Patent—

1. The method of contracting steel ingots by means of a wedge or wedges, applied during the cooling of the ingot, between the latter and the mould, all substantially as set forth.

2. The within-described wedges made flat on one side, and rounding to comparatively sharp edges on the opposite side, and tapering in width and thickness, when the said wedges are applied to a mould for casting steel ingots, all substantially as specified.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

HENRY DISSTON.
JONATHAN MARSDEN.

Witnesses:
A. H. SHOEMAKER,
A. H. DISSTON.