D. FOSTER & W. LOCKWOOD.

Molds for Casting Ingots.

No. 158,696. Patented Jan. 12, 1875.

Fig: 1

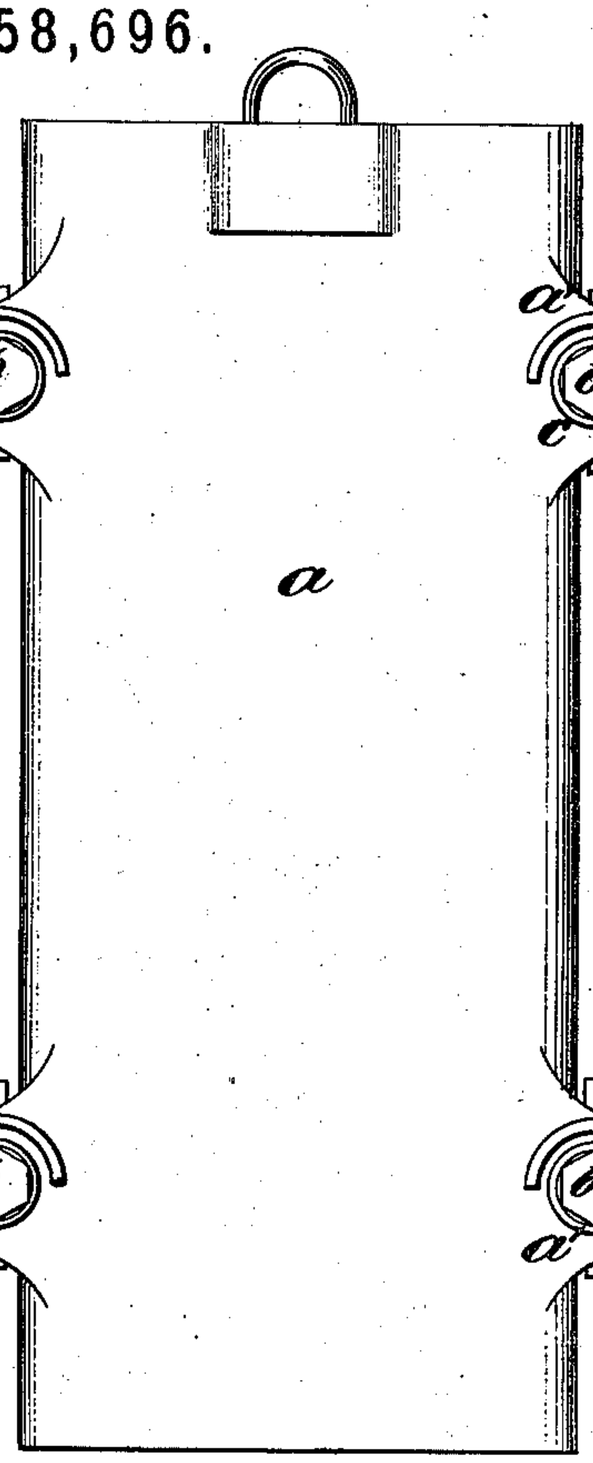


Fig: 2

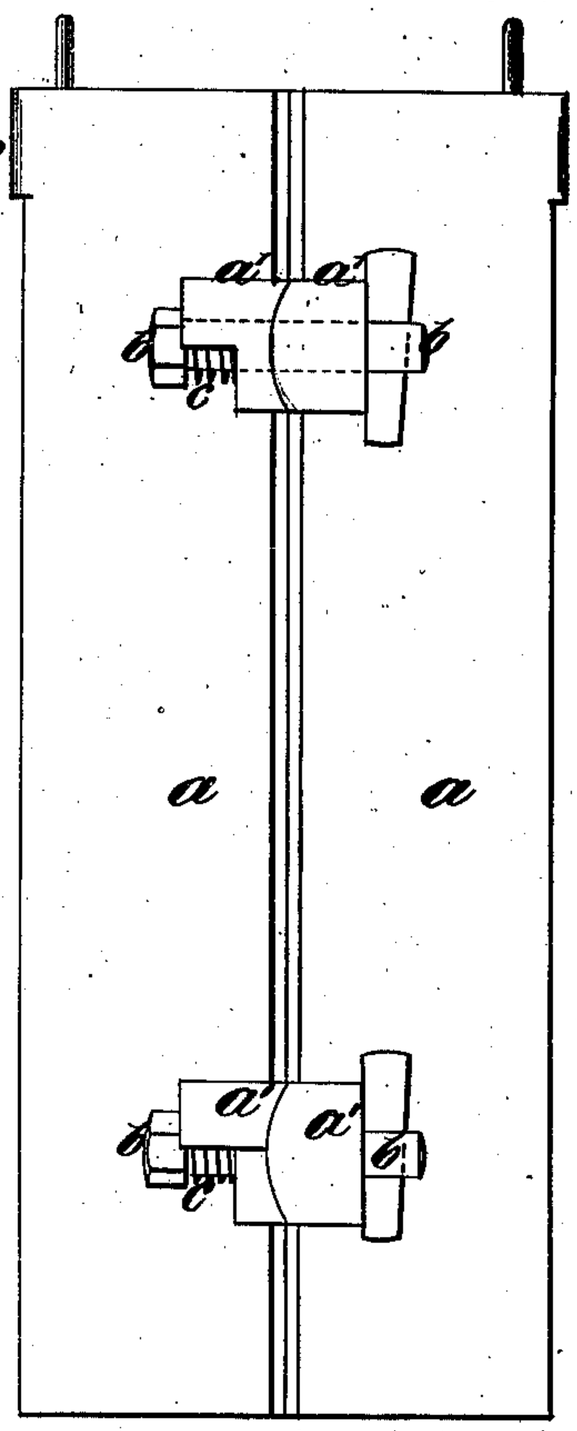
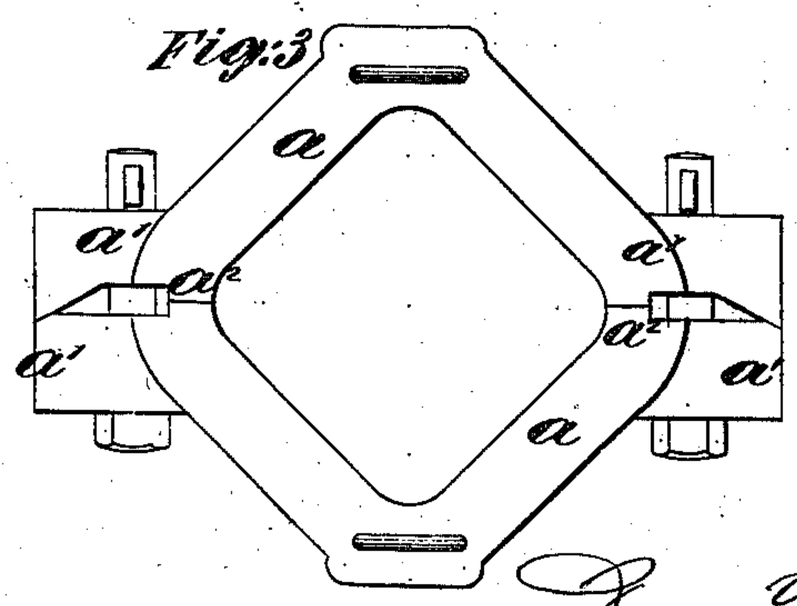


Fig: 3



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UNITED STATES PATENT OFFICE.

DAVID FOSTER AND WILLIAM LOCKWOOD, OF SHEFFIELD, ENGLAND.

IMPROVEMENT IN MOLDS FOR CASTING INGOTS.

Specification forming part of Letters Patent No. **158,696**, dated January 12, 1875; application filed May 29, 1874.

To all whom it may concern:

Be it known that we, DAVID FOSTER and WILLIAM LOCKWOOD, both of Sheffield, in the county of York, England, iron founders, have invented certain Improvements in Molds for Casting Crucible, Bessemer, and other Steel Ingots, of which the following is a specification:

Hitherto the molds employed for casting steel ingots have generally been made solid, or in one piece only; but attempts have been made to form them in two or more parts, having corresponding lugs cast on the different segments of the mold; and the various parts or segments have been securely held together by passing bolts through the lugs, and having either taper cotters passing through the ends of the bolts or nuts screwed on, so as to draw the joints of the segmental mold closely together.

When secured as described there is no possibility of the parts or segments of the mold yielding to the expansive force of the molten metal without submitting the casting to a severe strain, the result being that the castings crack or the lugs of the mold are broken off, rendering it wholly or partially useless.

To overcome this difficulty the ingot-molds have been made of soft gray iron; but these are liabled to be burnt into by the hot steel, and the latter to fasten itself in the molds. Either a solid mold or a longitudinally-split one, (that is, a mold formed in sections, arranged to provide for lateral expansion,) to which latter description of mold our invention relates, if made of white hard iron, soon breaks from the expansion of the fluid metal. Our invention, however, which consists in a combination, with the longitudinally-divided mold, of springs, arranged to provide for the lateral expansion of the mold-sections relatively with each other, allows us to use hard or chilled iron, which is much more durable than soft gray iron; or the bottom part, or the whole interior of the mold, may be cast upon a chill; and we prefer to use such a mixture of iron that the chill will not be white and deep, but simply insure closeness of grain and hardness to the interior of the mold.

According to our improvements the molds for casting steel ingots may be of parallel, taper, or other form, with a plain parallel joint, or otherwise, at the diagonal corners, as shown in the drawings hereunto annexed, and having lugs, with a small recess in the sides, facing each other, so that by our improved method of fastening the segments we are able to bring the parallel joints closely and firmly together. This we accomplish by having the lugs a^1 cast on the segments *a a* of the mold, with corresponding holes, through which bolts *b* are passed, and these bolts are secured by cotters, (elastic or otherwise,) as shown.

Now, in order to counteract the expansive force of the molten metal from injuring the mold *a* or the lugs a^1, we introduce a sufficiently-stong spring, *c*, under the head of each bolt *b*, the springs *c* causing the mold to adapt itself to the expansive force of the molten metal.

By thus removing the strain from the mold to the springs for keeping the parts of the mold in close contact, we are enabled to use a much stronger iron in casting the mold, and by so doing we run far less risk of the molten metal of the ingot eating into the mold and fastening itself therein.

The springs *c*, for holding together the mold segments or sections composing the longitudinally-divided molds, allow of the lateral expansion of the mold as far as may be required; and, as is well known, the molten metal, becoming chilled by contact with the inner surface of the mold, the metal will not run through the parallel, plane, or other joints a^2 a^2 of the mold, although they may be slightly opened by the expansive force of the molten steel or other like metal.

Another advantage obtained by the application of the springs *c* or other elastic fasten-

ing to the molds is, that the inside of the mold may be made parallel, and then cast-iron stoppers, filling the mold exactly, may be used, and the ingot stopped at any point, as may be desired.

We claim—

In an open-topped mold divided longitudinally for casting steel ingots, and having lugs a^1 a^1, the combination of the bolts *b* and the spring *c* arranged upon the bolts, for permitting the lateral expansion of the mold-sections, substantially as and for the purpose described.

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