L. Chapman.

Making Cast Metal Dies.

No. 97,046. Patented Nov. 23, 1869.

Fig. 1

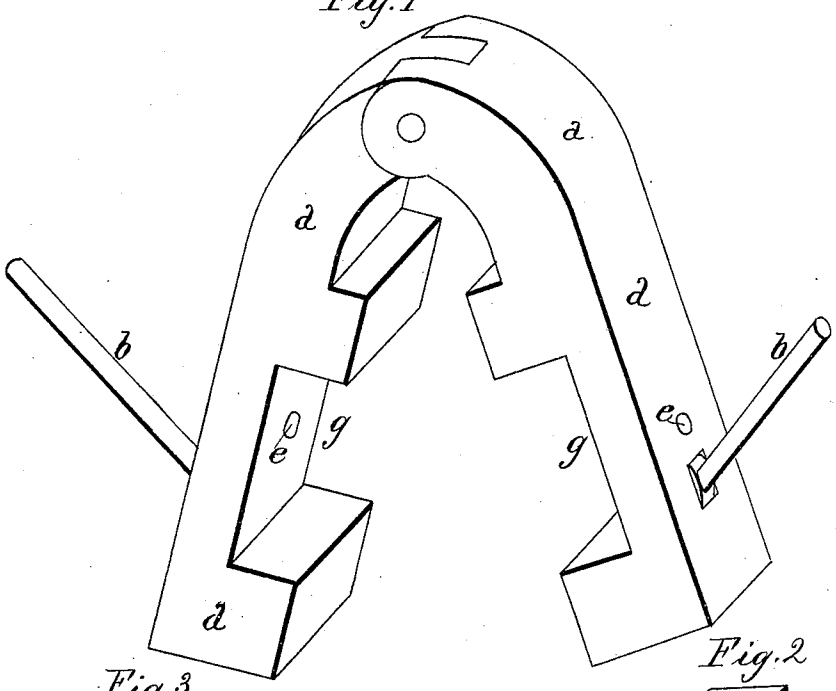


Fig. 2

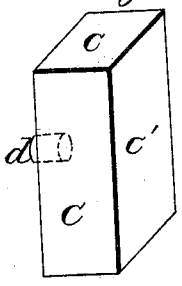


Fig. 3

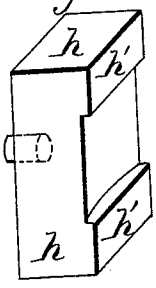


Fig. 4

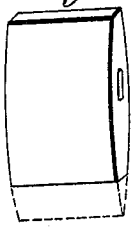


Fig. 5



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United States Patent Office.

LUKE CHAPMAN, OF COLLINSVILLE, CONNECTICUT, ASSIGNOR TO COLLINS COMPANY, OF SAME PLACE.

Letters Patent No. 97,046, *dated November* 23, 1869.

IMPROVEMENT IN MANUFACTURE OF CAST-METAL DIES.

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

To all whom it may concern:

Be it known that I, LUKE CHAPMAN, of Collinsville, in the county of Hartford, and State of Connecticut, have invented a new and useful Improvement in the Manufacture of Cast-Metal Dies to be used in the manufacture of axes and for other purposes; and I declare the following to be a full and exact description thereof, which will enable any artisan skilled in the art to which this improvement appertains, to make and construct the same.

The Collins Company, of said Collinsville, have been for many years large manufacturers of axes and similar edge-tools.

In making axes and the like, the iron constituting the body of the axe is first made into what are technically termed "heads," and sometimes, in similar manufactories, "blanks." These "heads" are produced by heating bars of iron of the proper dimensions to a bright-red heat, cutting them into proper lengths, and then, by means of dies and punches, working under great pressure, punching the eye for the helve, and making the general shape of the "head" something like the general shape of a finished axe. These "heads" are afterward subjected to various manipulations under trip and hand-hammers, to describe which would be foreign to the purpose of this specification.

In making these heads, the Collins Company have for many years used the machine patented by Elisha K. Root, which patent, I think, has expired. Latterly, they have also used the machine patented by Levi Dodge, on the 12th day of March, 1861, the dies in which are of cast-iron.

The improvement made by me is applicable to both these machines, and to other purposes, as described hereafter herein.

It is necessary to manufacture a large number of different varieties of axes, and each variety of axe requires its own set of dies. The method of making these cast-iron dies heretofore has been to cast a blank, and then to work out, by hand, tools, and the like, the face of the blank, to fit the surface of the sides of the axe; this, of course, with a great expenditure of time and skill.

I have invented a much simpler process of producing these cast-iron dies, in the following manner:

Fasten into the press, in the place of the dies, blanks of soft lead, which shall be made on all sides, but the face, the same as the dies, and shall fasten into the press in the same manner as the dies. The face of the blanks will be smooth, and the thickness of the blank will be regulated as hereinafter described. Now, introduce between these blanks an axe of the desired pattern, apply the power to the press, and the faces of the lead blanks will be forced into perfect moulds of the surfaces of the sides of the axe. The lead blanks are now taken out of the press, the sides trimmed and squared up, and the blanks otherwise fitted for models for casting, and from these models can be cast as many dies as are desired. I thus produce better blanks, at a cheaper rate.

There is one point in this process which it needs judgment to determine upon, that is, the depth or thickness of the lead blanks from the face to the back before submitting to pressure. The lead blanks should be thick enough to fill the whole surface designed, and as little thicker as possible. A trifle of thickness more or less will not affect the result, so long as there is metal enough. Upon this point no absolute and definite rule can be given, but any person moderately skilled in die-making can easily make a sufficient estimate.

This process is applicable to the production of cast-metal dies, in all cases where the press used is strong enough to sustain the somewhat heavy pressure necessary, and when the article to be manufactured is capable of being submitted to such pressure.

Although my process is applicable to a variety of manufactures, I will now describe one method of its application, by referring to drawings filed herewith, and to letters of reference marked thereon, forming a part of this specification.

In the drawings—

Figure 1, let *a* and *a* represent the jaws of a press, working together under strong pressure, impelled by the arms *b* and *b*, which are attached to proper motive-power.

In Figure 2, let *c* represent a blank of soft lead, of which *c'* is the face, and at the back is the iron pin *d*, which fits into either of the holes *e*.

The whole blank *c* just fits into either of the beds *g* in the jaws of the press. There are two of these blanks, one for each of beds *g g*.

Now, put the blanks *c* and *c* into the beds *g g*, and insert the axe (Figures 4 and 5) flatwise between the blanks, so that both sides shall be covered except the part shown in dotted lines. Then apply the motive-power to the press, and force the jaws together, and the result will be that the axe will sink into the faces of the blanks, and that said faces will be a perfect mould of the sides of the axe.

It will readily be inferred, that in undergoing this pressure, the blanks will be pressed somewhat out of shape on the sides. They are now taken out of the press and "trued up," when they are ready to be used as patterns for casting real dies of hard metal, which, in the case just described, can be used in the press just described for the manufacture of axe-heads.

I am aware that soft gutta-percha has been employed to receive impressions of fern-leaves and other

delicate objects, with a view to using such impressions for patterns from which to cast "plates for printing" copies of such ferns and other articles; and I am also aware that plaster of Paris is in common use for taking impressions for the purposes of casting; and, therefore, I do not claim, broadly, the method of making patterns for dies for casting by the use of a soft material; but

What I claim as my invention, and desire to secure by Letters Patent, is—

The improved method herein described of making patterns from which to mould, in sand, in the ordinary way, metal dies to be used for swaging axes; that is to say, obtaining the pattern by compressing two or more pieces of lead around and upon a finished axe, so as to obtain thereof the exact impression of the axe.

LUKE CHAPMAN.

Witnesses:
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