Sheet 1, 2 Sheets.

L. Wetherell.

Making Metal Tools.

No. 62,793. Patented Mar. 12, 1867.

Fig: 8.

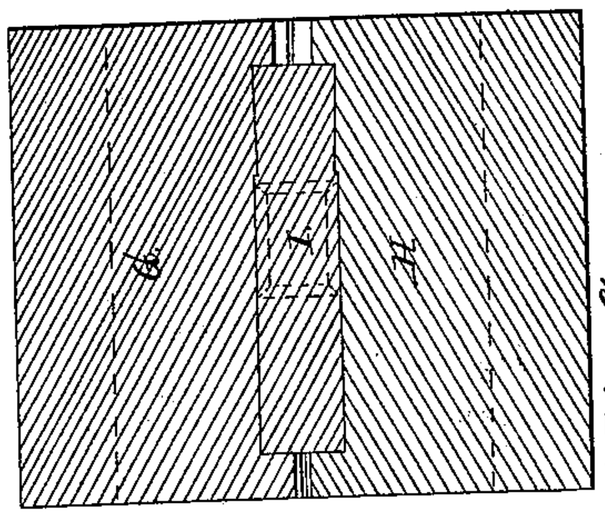


Fig: 9.

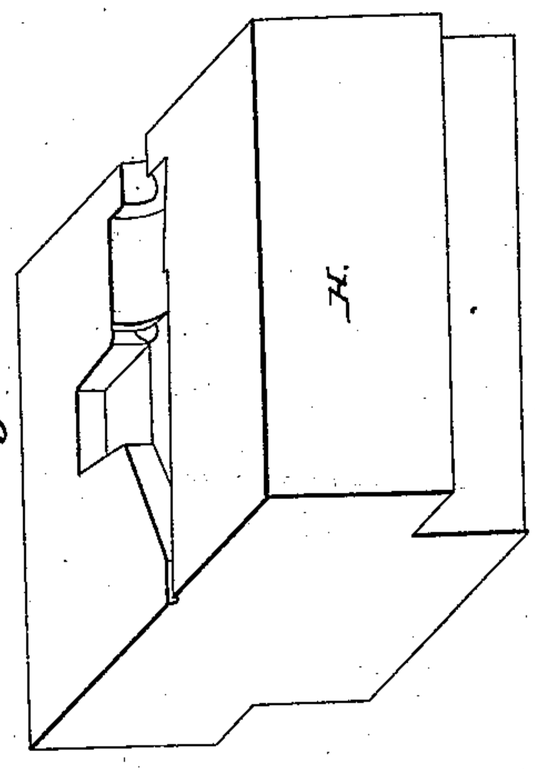


Fig: 10.

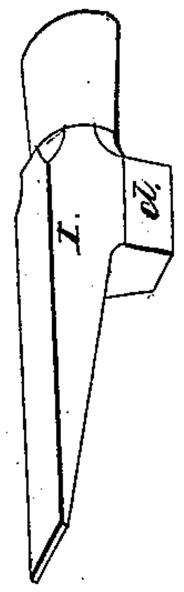
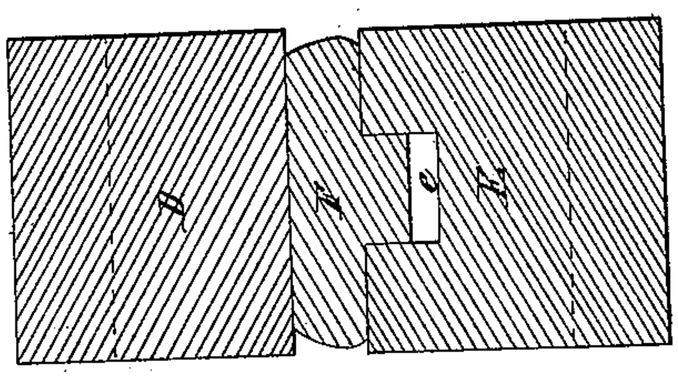


Fig: 4.



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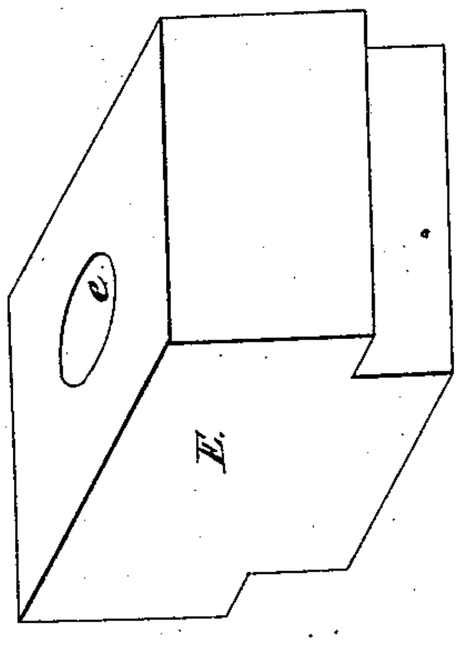


Fig: 6.

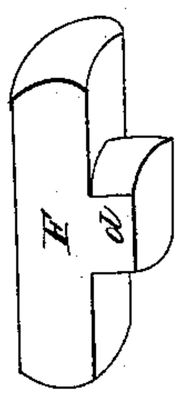


Fig: 7.

Fig: 2.

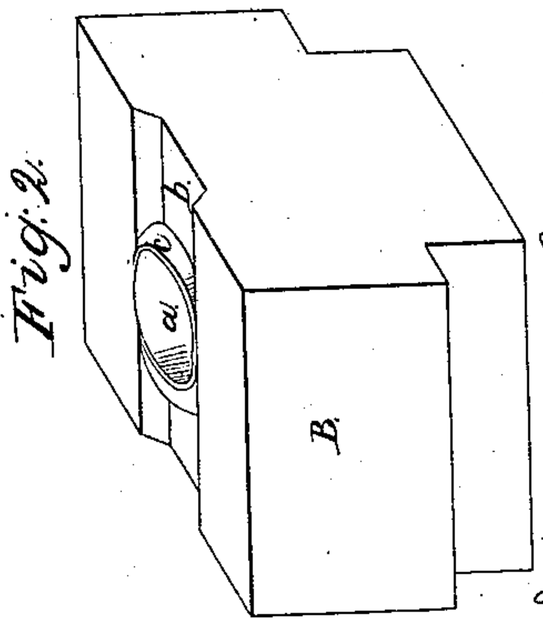


Fig: 3.

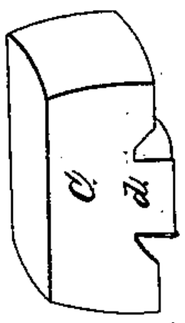
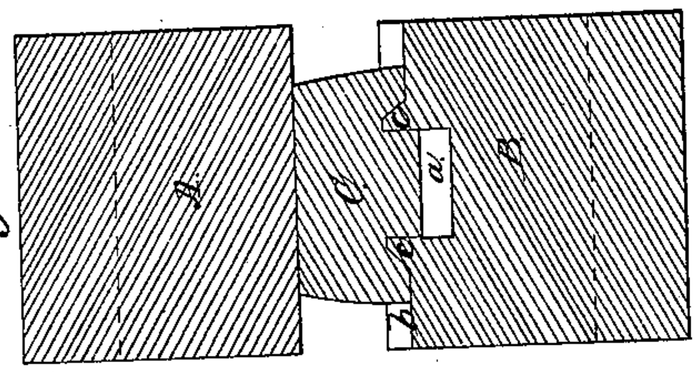


Fig: 1



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By his Attorney
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Sheet 2, 2 Sheets.

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Making Metal Tools.

No. 62,703. Patented Mar. 12, 1867.

Fig: 15.

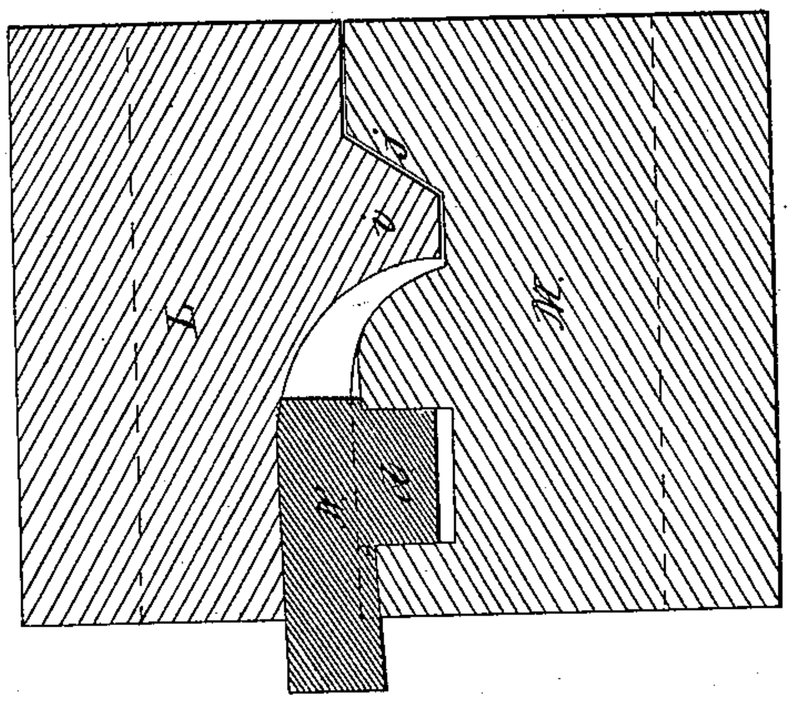


Fig: 16.

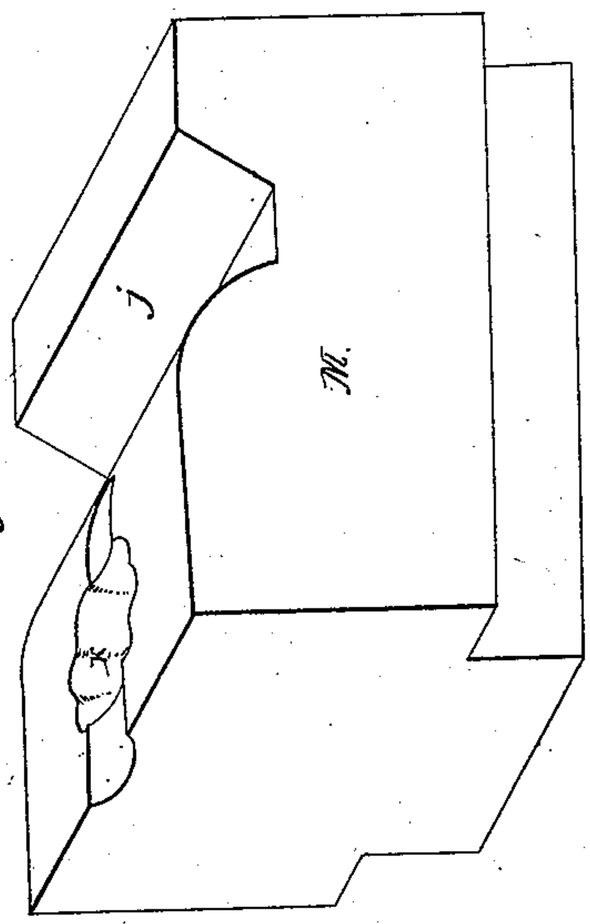
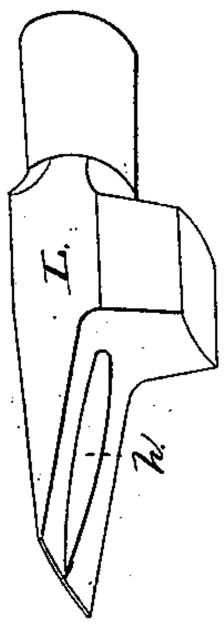


Fig: 14.



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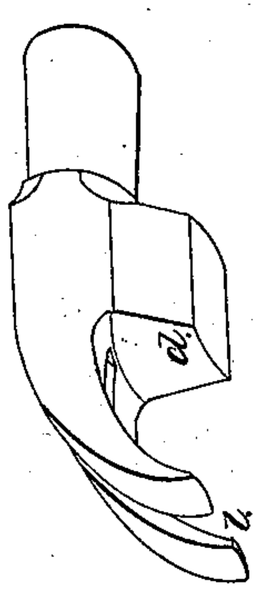


Fig: 13.

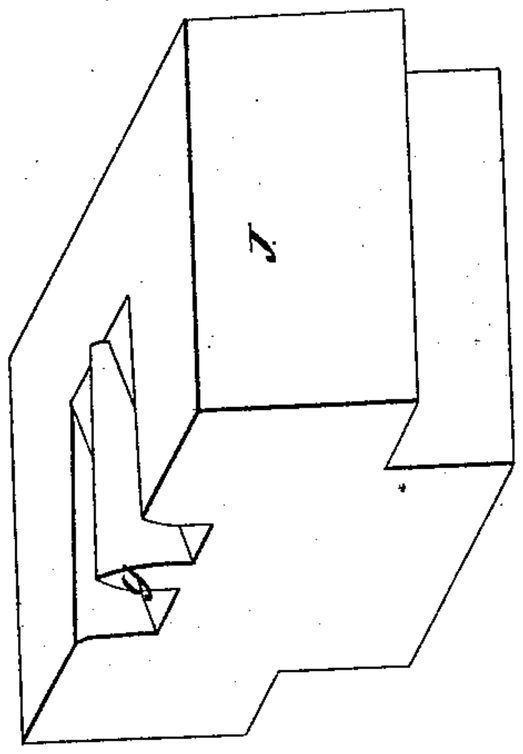


Fig: 11.

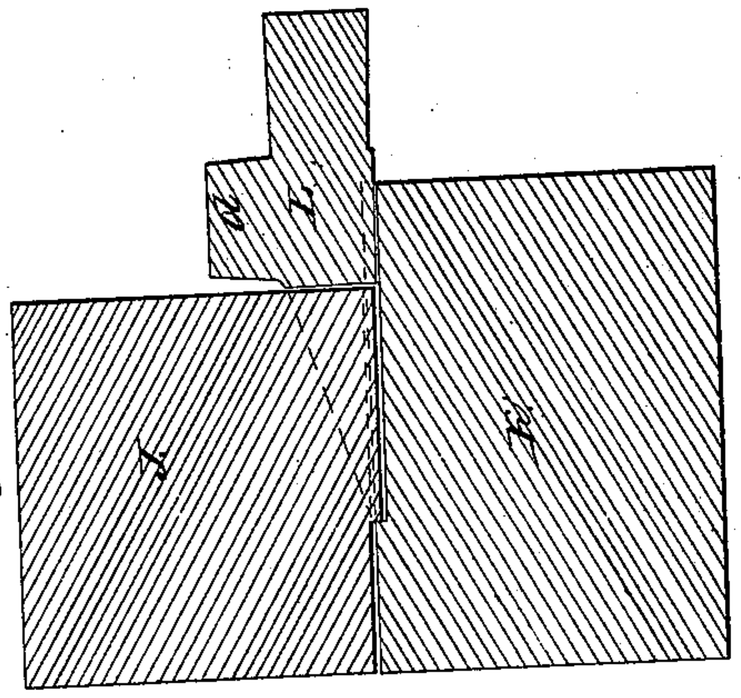
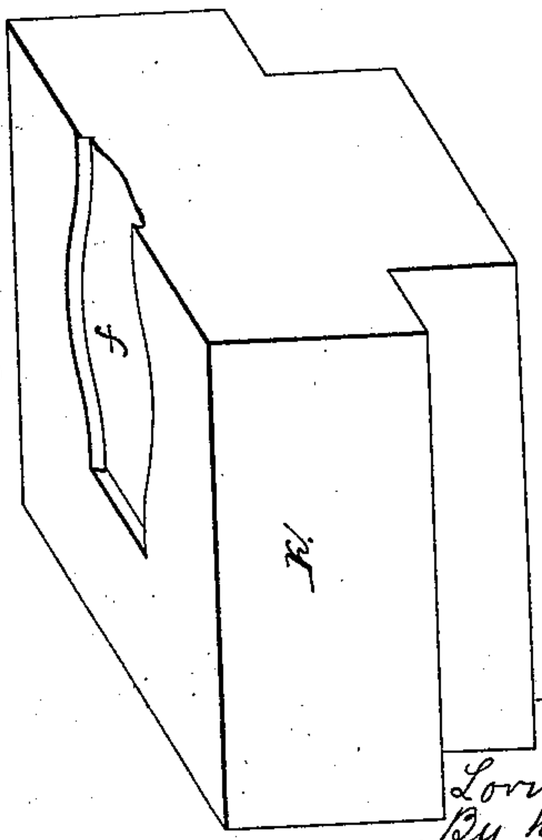


Fig: 12.



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By his Attorney

Chas. F. Van Sourly.

United States Patent Office.

LORIN WETHERELL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND JOHN H. WELLS.

Letters Patent No. 62,793, *dated March* 12, 1867.

IMPROVEMENT IN FORGING HAMMERS.

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, LORIN WETHERELL, of the city of Boston, in the State of Massachusetts, have invented a new and useful Process for Forging Hammers; and I do hereby declare the following to be a full and correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical central section of the first pair of dies, with a piece of steel subjected to their action.

Figure 2, a perspective view of the lower die of the pair represented in fig. 1.

Figure 3, a similar view of the steel blank as it comes from the first pair of dies.

Figure 4 is a vertical central section of the second pair of dies, with the piece represented in fig. 3 subjected to their action.

Figure 5 is a perspective view of the lower die of the second pair.

Figure 6, the steel blank as it comes from the second pair of dies.

Figure 7, the hammer as it goes into the third pair of dies.

Figure 8, the third pair of dies.

Figure 9, the lower die of the third pair.

Figure 10, the hammer as it comes from the third pair of dies.

Figure 11, the fourth pair of dies with the hammer between them.

Figure 12, the bottom die of the fourth pair.

Figure 13, the top die of the fourth pair.

Figure 14, the hammer as it comes from the fourth pair of dies.

Figure 15, the fifth pair of dies with the hammer between them.

Figure 16, the bottom die of the fifth pair; and

Figure 17, the finished claw-hammer.

The nature of this invention consists in a new process for the forging of claw and other hammers by means of a series of dies of novel construction, operated and operating in the manner hereinafter more particularly set forth.

Hammers have heretofore been made almost entirely by hand machinery being used only to a very limited extent to co-operate with the hand-workman in their manufacture. The trip-hammer and turning-lathe are sometimes employed for their production in that manner. As articles of universal use, the reduction of the cost of their manufacture and improvement of their quality become matters of great importance. After many and costly experiments I have devised the dies and the process which are the subject of the present application, and by which the entire manufacture of hammers is done by machinery, to the very great improvement of the quality of the article and an essential diminution of its cost.

The process is as follows: From a bar of steel of the proper size I cut a piece, which I call a blank, of about the weight of the hammer I wish to make. Experience soon enables a workman to judge with great accuracy how much stock will be needed for a hammer of any given size. After heating, I subject this in a drop-hammer to the action of the first pair of dies, represented in figs. 1 and 2. The upper one, A, of these is plain, but the lower one, B, has an "impression" in it, which prepares the blank for the formation of the socket of the hammer. A round hole, *a*, in the centre of the die is surrounded with a sharp projecting cutting edge, *c*, which is seen both in section and in view in the figures. A groove, *b*, is cut away to allow the ends of the blank to descend when the blow is struck. The blank, as it comes from the first pair of dies, after receiving two blows, presents the appearance represented in fig. 3. It is next taken to the second pair of dies, the upper one of which is plain, while the lower one has a round cavity of the size and depth to receive the hammer socket. The socket piece *d* is inserted in the cavity *c*, and two more blows are given, which flatten the ends of the blank and leave the socket *d* in relief, as shown in fig. 6, which represents the blank as it appears after coming from the second pair of dies. The blank is next taken to the trip-hammer, where one end is drawn down to a taper for a pane or claw, and the other is prepared for the action of the third pair of dies, both of which are alike, and have an impression of one-half the shape to be produced. These dies give an improved shape to the hammer and impart a taper to the socket, leaving the blank in the form shown in fig. 10. At

this point of the process the hammer might be finished and polished for an ordinary pane-hammer; but if a claw-hammer is to be produced the process is continued by again heating the blank, and subjecting it to the action of the fourth pair of dies, represented in figs. 11, 12, and 13. The lower die of this pair (see fig. 12) has an "impression," *f*, in it wider than the pane of the hammer to be struck to allow of lateral expansion under the blow. The upper die is furnished with a chisel, *g*, (see fig. 13,) for cutting the slit for the claw. With this pair of dies I use a light hammer, and repeat the blow three or four times in order to avoid breaking the chisel, an accident which is apt to occur if a heavy hammer is employed. I also use a yoke, or some similar device, to hold the blank down to the anvil to prevent its adhering to the chisel *g* and rising with it after the blow has been struck, and thus drawing its temper by excessive heating. The slit is not entirely cut through by this pair of dies, but the cutting is readily finished by a common chisel on the anvil, where also a slight turn is given to the pane to prepare it for the fifth and last pair of dies, represented in figs. 15 and 16. These dies give the curve to the claw. The upper die L has a projection, *i*, which works against an inclined abutment, *j*, to resist the backward thrust occasioned by the resistance of the jaws of the claw to the process of bending. The hammer as it comes from this pair of dies only requires polishing to be ready for the market.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The first pair of dies, represented in figs. 1 and 2, constructed and operating as described.
2. The fourth pair of dies, represented in figs. 11, 12, and 13, constructed and operating as described
3. The fifth pair of dies, represented in figs. 15 and 16, constructed and operating as described.
4. The process of forging hammers by the use of a series of dies constructed and operating substantially in the manner specified.

The above specification of my invention signed and witnessed at Boston this 20th day of August, A. D. 1866.

LORIN WETHERELL.

Witnesses:

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CHAUNCEY SMITH.