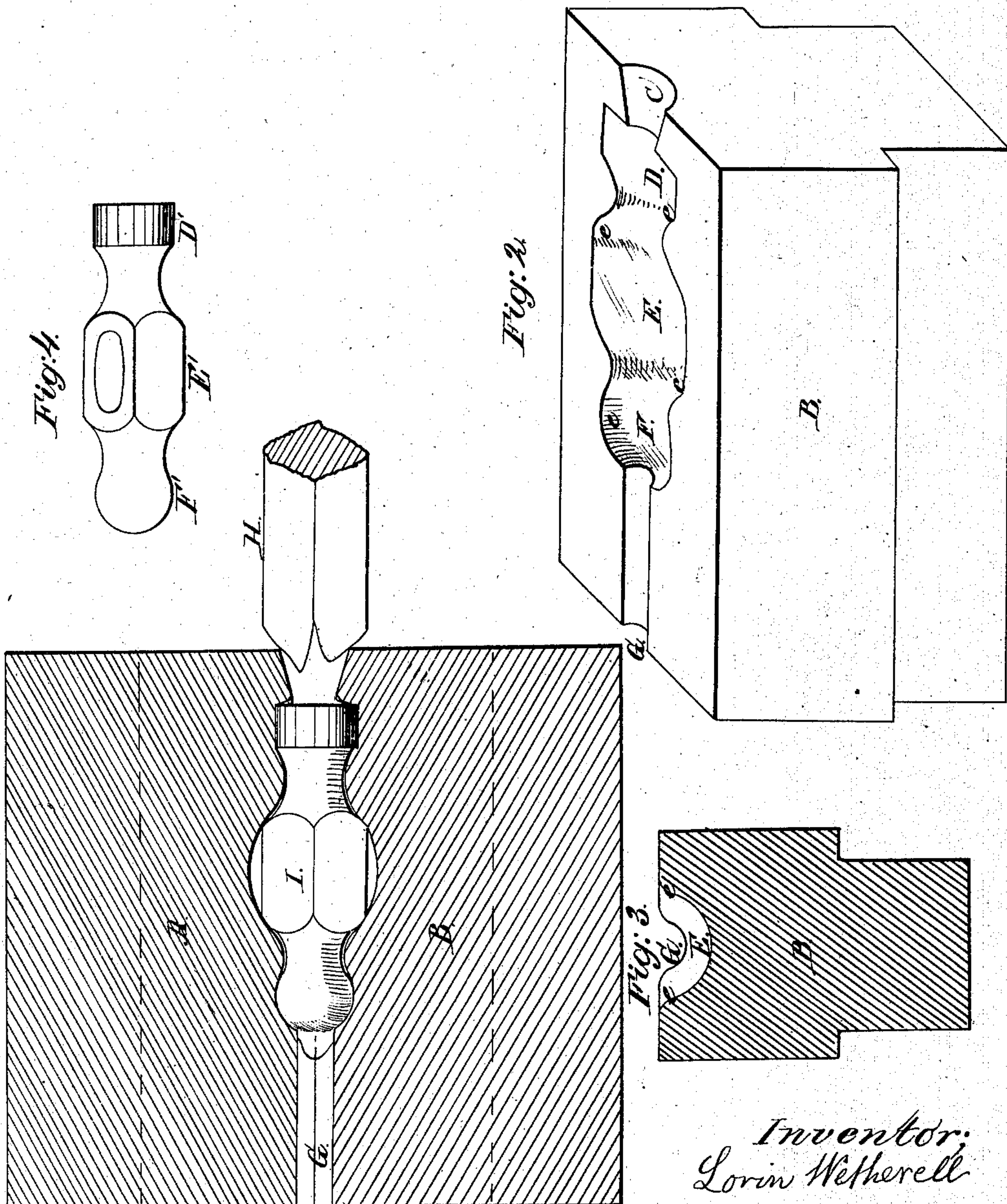


L. Wetherell.

Making Metal Tools.

N^o 62, 174.

Patented Feb. 19, 1867.



*Witnesses;
J. W. V. 12 also
H. Farnham Smith*

Fig. 1.

*Inventor:
Lorin Wetherell
By his attorney,
Chas. F. Farnsbury.*

United States Patent Office.

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

Letters Patent No. 62,174, dated February 19, 1867.

IMPROVEMENT IN 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, LORIN WETHERELL, of the city of Boston, in the State of Massachusetts, have invented a certain new and useful Improvement in Forging; 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 longitudinal section of a pair of dies in the act of forging a riveting hammer, one of the class of articles to the production of which my improvement is applicable.

Figure 2 is a perspective view of one of these dies.

Figure 3 is a transverse vertical section of the same; and

Figure 4 is a perspective view of the finished hammer produced by this process.

The same part is marked by the same letter of reference wherever it occurs.

The nature of this invention consists in the use of a trip-hammer of peculiar dies, suitable to produce articles which have heretofore been produced by the turning-lathe, viz, articles having such irregularity of longitudinal contour that the rod or bar of metal from which they are formed could not be moved longitudinally in the dies, but could only be rotated on its axis while under the operation of the hammer.

The trip-hammer is for the most part employed in drawing metal to a regular thickness or taper, or in forming articles regularly cylindrical, and, where dies are used in connection with it, they are such as admit of the free movement longitudinally of the rod or bar of metal subjected to their action. The manufacture of gun-barrels illustrates this use of the hammer, the barrel being both rotated on its axis and drawn longitudinally along the anvil. The drop-hammer is used to form articles of irregular form in dies, but its action differs in its effect upon the metal from that of the trip-hammer by reason of its substituting one or two heavy blows, given at considerable intervals, for a rapid succession of lighter blows. The dies used in the drop-hammer are quite different from those which would be applicable in the trip-hammer. In the use of dies in the drop-hammer most of the superfluous stock escapes at the sides, forming what is called a "flash" or thin sheet of metal, which adheres to the article formed, and has to be removed by trimming, leaving a distinct mark to be effaced by grinding and polishing. In dies applicable to the trip-hammer, where articles are subjected to numerous and rapid blows, another provision for the removal of superfluous stock must be made. It will not be practicable to allow it to escape in a flash, as that would prevent the article from being turned in the dies, or the flash, having become cool, could not be incorporated into the metal under the action of the hammer. It is therefore necessary that the surplus stock, instead of escaping in the form of a flash or thin sheet at the sides of the die, should assume there the form of an enlargement or bulge, which, as the metal is consolidated by hammering, gradually disappears from that position, and, when the dies have finally been brought together, shows itself at the end of the finished article, whence it is removed by the chisel, shears, file, or grindstone. It will be perceived, therefore, that the conditions are quite different in the trip hammer from those which exist in the drop-hammer—a distinction of vital importance in its relation to the present invention. The dies used in the drop-hammer would not be capable of use where the metal acted upon has to be constantly turned as it receives a rapid series of blows. The dies heretofore used in the trip-hammer (if they can properly be called dies) would not answer to produce the class of articles which I aim to make. They are more properly mere "formers," which co-operate with the skill of the workman in producing a result, but do not absolutely and independently control it as the drop-hammer dies do. The class of articles to which I apply the trip-hammer by means of the dies which are the subject of the present application, has heretofore been made by hand labor, assisted by the turning-lathe. The production of these articles by these dies results in an enormous economy in labor as well as a great improvement in the quality of the article manufactured.

In the drawings I illustrate the invention in its application to the manufacture of a riveting hammer. A make the upper, and B the lower die; C the groove, in which a rod of steel is introduced; D that portion of the die in which the face of the hammer is produced; E an enlarged space in the middle of the die, in which the rod can turn without being subjected to the blow of the die; F the semi-spherical portion of the die, in which the rounded pane of the hammer is produced; and G the groove, into which the surplus stock is forced during the process of the hammering, and where it all appears at the close of the operation. The edges *eeee* of the

"impression" in the die are cut away and rounded off in the manner shown, for the purpose of allowing the surplus stock to show itself in a bulge instead of in a "flash," on the principle before alluded to. H marks the square steel rod from the end of which a hammer has just been forged; and I the hammer as it appears when the dies are brought together. Fig. 4 shows the finished article after it has been detached from the rod H and had the surplus metal removed from the end on the grindstone.

Having thus fully described my invention, what I claim therein as an improvement in the art of forging, and desire to secure by Letters Patent, is—

The use in the trip-hammer of dies, constructed as described, for the purpose of forging articles of the description specified.

The above specification of my said invention signed and witnessed at Boston this 13th day of August, A. D. 1866.

LORIN WETHERELL.

Witnesses:

CHAUNCEY SMITH,

CHAS. F. STANSBURY.