3 Sheets—Sheet 1.

D. MAYDOLE.

MANUFACTURE OF HAMMERS.

No. 186,588. Patented Jan. 23, 1877.

Fig. 1

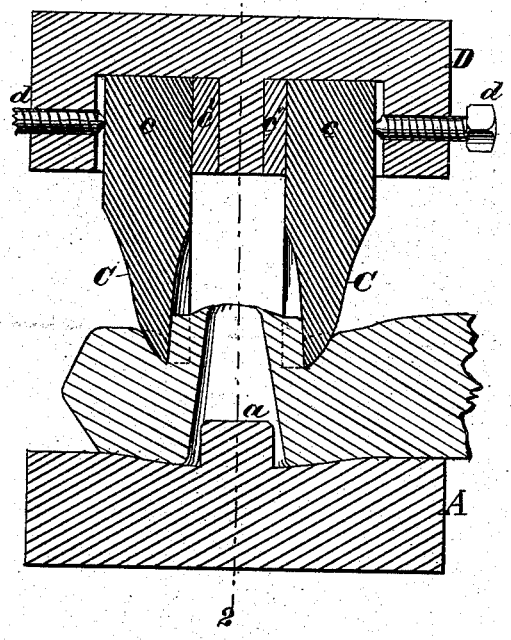


Fig. 2.

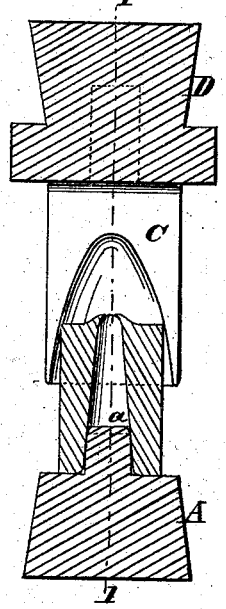


Fig. 3.

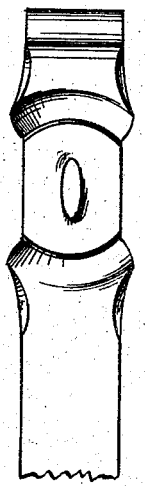


Fig. 6.

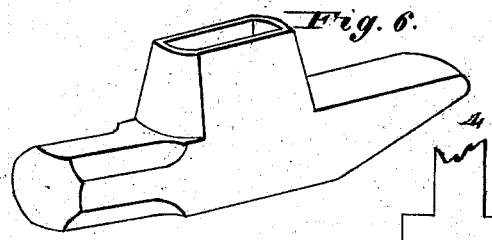


Fig. 4.

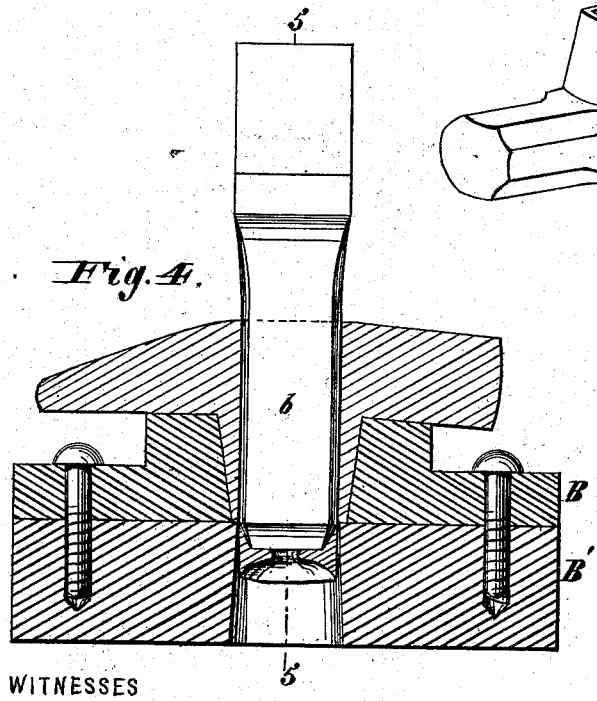
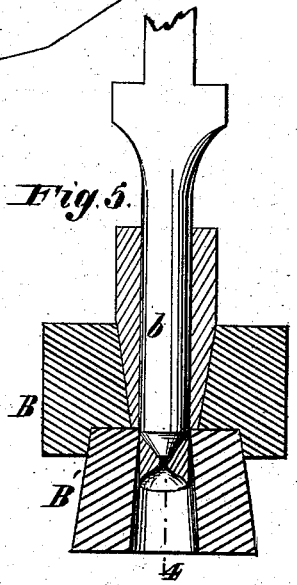


Fig. 5.



WITNESSES

Le Blond Burdett

A. H. Hall

INVENTOR

David Maydole

By Knight Bros. Attorneys

3 Sheets—Sheet 2.

D. MAYDOLE.

MANUFACTURE OF HAMMERS.

No. 186,588. Patented Jan. 23, 1877.

Fig. 10.

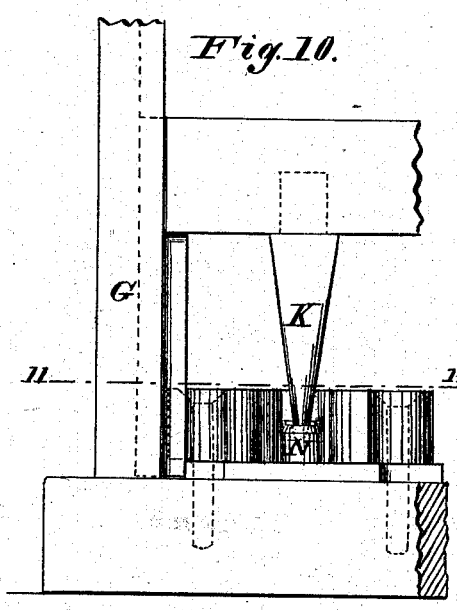


Fig. 12.

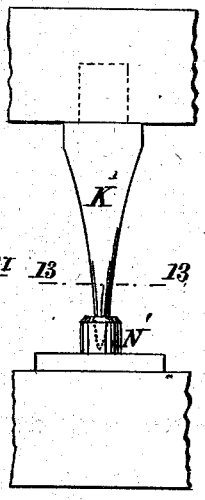


Fig. 7.

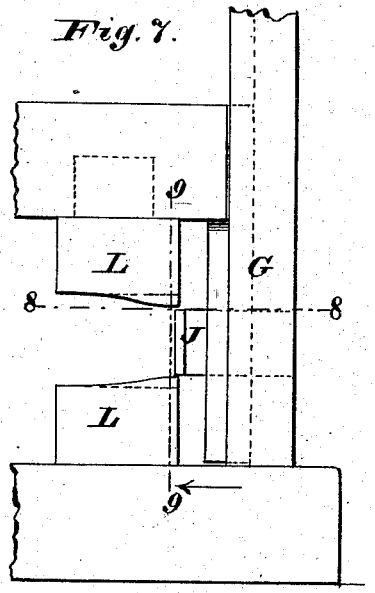


Fig. 11.

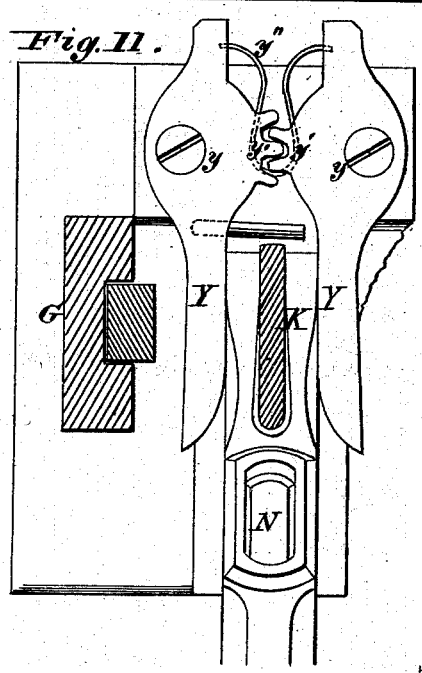


Fig. 13.

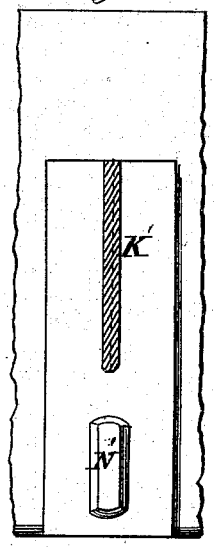


Fig. 8.

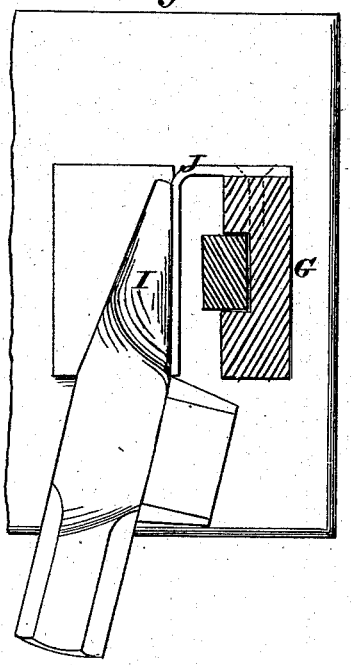
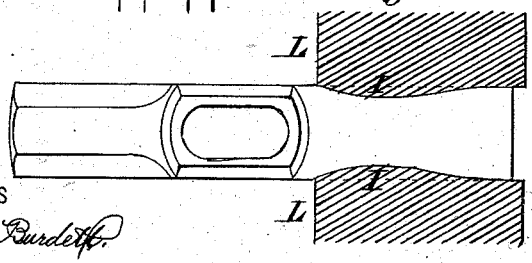


Fig. 9.



WITNESSES

E. Blond Burdett.

A. E. Galt

INVENTOR

David Maydole.

By Knight Bros Attorneys.

3 Sheets—Sheet 3.

D. MAYDOLE.

MANUFACTURE OF HAMMERS.

No. 186,588. Patented Jan. 23, 1877.

Fig. 14.

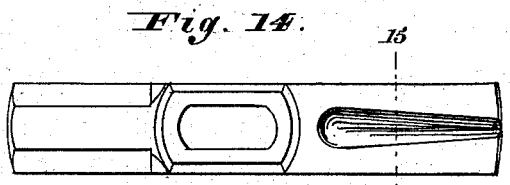


Fig 15.

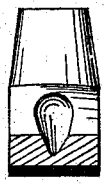


Fig. 16.

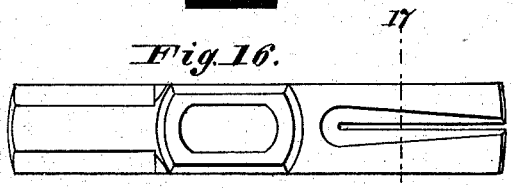


Fig. 17.

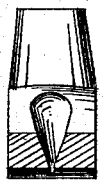
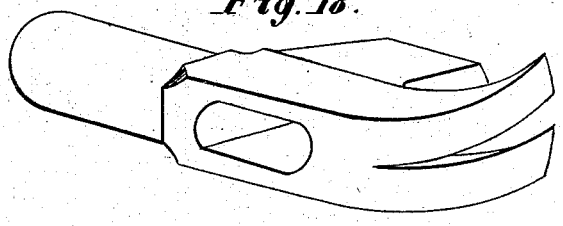


Fig. 18.



WITNESSES

LeBlond Burdett.

A. H. Galt.

INVENTOR

David Maydole

By Knight Bros. Attorneys.

UNITED STATES PATENT OFFICE.

DAVID MAYDOLE, OF NORWICH, NEW YORK, ASSIGNOR OF ONE-FOURTH OF HIS RIGHT TO CHARLES HENRY MERRITT, OF SAME PLACE.

IMPROVEMENT IN MANUFACTURE OF HAMMERS.

Specification forming part of Letters Patent No. **186,588**, dated January 23, 1877; application filed November 23, 1876.

To all whom it may concern:

Be it known it that I, DAVID MAYDOLE, of Norwich, in the county of Chenango and State of New York, have invented certain new and useful Improvements in the Art of Forging Hammers, of which the following is a specification:

My process relates to the forging of what are known as adz-eye claw-hammers. The process consists in first forming a tapering hole in a heated bar of suitable section, gouging down on either side of the smaller extremity of the said hole, and setting down the metal thus separated to form the respective ends of the hammer, then drawing and completing the eye, and subsequently finishing the hammer, as hereinafter described.

The improvements further relate to the mode of constructing and mounting gouges for cutting the metal from either side of the adz-eye; also, to the construction of a die in two parts, for the drawing of the adz-eye, and cutting off the surplus metal by the action of a punch; also, to dies for shaping the back and pene; also, to the combination of jaws pressed together by a spring, and connected by teeth, to confine them to a uniform motion for centering the pene beneath the cutter, in order to insure the equal separation of the claws.

In the accompanying drawing, Figure 1 is a vertical section on the line 1 1, Fig. 2, of the gouging-dies. Fig. 2 is a vertical section of the same on the line 2 2, Fig. 1. Fig. 3 is a plan of the bar after the action of the gouges. Fig. 4 is a vertical section on the line 4 4, Fig. 5, of the two-part die employed for drawing the adz-eye, and cutting off the surplus metal therefrom, the hammer being shown in section and the punch in elevation. Fig. 5 is a vertical section on the line 5 5, Fig. 4. Fig. 6 is a perspective view of the partially-formed hammer, as it leaves the die shown in Figs. 4 and 5. Fig. 7 is a front elevation of the dies employed for thinning the back and indenting the pene, as hereinafter described. Fig. 8 is a horizontal section of the same on the line 8 8, Fig. 7. Fig. 9 is a vertical section thereof on the line 9, Fig. 7. Fig. 10 is a front view of the claw-splitting and centering device. Fig. 11 is a horizontal section on the line 11, Fig. 10. Fig. 12 is a front elevation of the cutter for completing the splitting of the claws. Fig. 13 is a horizontal section on the line 13, Fig. 12. Fig. 14 is a plan of the blank, with the pene stamped preparatory to the splitting of the claw. Fig. 15 is a transverse section on the line 15, Fig. 14. Fig. 16 is a plan of the blank, showing the claws split preparatory to spreading and bending. Fig. 17 is a transverse section at 17, Fig. 16. Fig. 18 is a perspective view of a finished hammer.

In carrying out my invention I provide gages, stops, or steady-pins to guide or control at each step of the manipulation the location of the bar with relation to the tool which is to operate upon it, and during the operation of forging frequent recourse is had to flat or sizing dies, which restore the sides of the bar to normal dimensions when any bulging has resulted from the use of a tool. The hammers are forged, preferably, at three heats, or it can be done at two heats. In practice, the dies, punches, gouges, and shears used during the first heat are all mounted in one press. The second heat is worked upon a second press and a power-hammer. A third press, with a little hand-work, finishes the hammer at the third heat.

First heat: One end of a bar of steel of any convenient length and of proper section being brought to a working heat, is placed flatwise between flat dies, which insure its thickness to be exactly normal. It is then placed edgewise under a punch of any construction, which passes nearly through the bar without removing any material. A second punch is then inserted in the hole so made, and driven far enough down to make a hole completely through the bar, (a hole in the bed-die being provided to permit this,) but still without removing any metal. A third punch enlarges the hole still further. The hole so made is of tapering form, being largest at the top or back, and a mere slit at the outcome, and no material has been punched out. The bar is then turned over and placed with the

hole just made upon a steady-pin, *a*, on the bed-die A, while the gouges C C descend and cut down each side of the smaller end of the proposed eye. The gouges C C are mounted adjustably in a die, D, through shanks *c*, fitting in slots in the die D and against blocks *c'* of any required thickness, so as to set the gouges at the proper distance asunder. They are held firmly by set-screws *d* forcing their shanks *c* against the blocks *c'*.

It will be noticed that the bed-die A beneath the gouges C C is hollow, so as to bring out the central part of the back of the proposed hammer, thus counteracting the tendency of the punch to make the hammer hollow-backed. Fig. 3 shows the appearance of the bar or blank at this stage. Plain-faced dies are then employed to set down the face of the hammer to a square. Ordinary shears cut the blank from the bar, and other dies set down the pene. The face is then eight-squared.

Second heat: By the use of a female die, B B', made in two parts for convenience of repairs and facility in keeping the cutting-edge of the lower member B' sharp, and a punch, *b*, of suitable shape, the eye of the hammer is drawn down to the required length and shape, and the surplus metal discharged, as illustrated in Figs. 4 and 5. Then a loose punch being inserted in the eye for support, flat dies bring the sides to the right thickness, a little thinner at the back or top of the hammer, so that the hammer will be thickest at the part where the neck of the adz-eye joins the body of the hammer. The face is then swaged to its final shape, usually round, under a power-hammer.

Fig. 6 shows the form of the blank after the completion of the eye by the punch *b* and die B.

Third heat: The blank from the second heat has the pene swaged down under the hammer, and is then put between dies L L of the press G, and indented, as shown at I, J being a gage to insure the proper insertion and location of the blank. The blank then goes under the chisel K, for the partial splitting of the pene to form claws.

To insure the proper centering of the pene beneath the chisel K, jaws Y Y are employed, turning on pivots at *y*, and connected by cogs or teeth *y'*, compelling them to move in unison.

The forward ends are pressed together by a spring, *y''*, between their heels, so as to cause the jaws to press with sufficient force against the edges of the hammer-pene. The blank then goes under the chisel K', which enters the notch or indentation made by the chisel K, and goes nearly or quite through the pene. Steady-pins N N', entering the eye of the blank, keep it in place, and gage its insertion beneath the chisels K K', respectively.

Usually the claws are finally divided by a thin chisel held by a workman, and cutting through to a plate of copper.

The claws are turned by hammering and by means of a swage, producing a superior effect in accuracy of form and smoothness of surface. The end of the face is fined by hammering, which is kept up until the metal is sufficiently cool. The inside end of the eye is slightly opened by a punch at the same heat. This finishes the forging.

The form of the blank as it leaves the chisel K is shown in plan in Fig. 14, and in transverse section in Fig. 15. Its form after the action of the chisel K' is shown in plan in Fig. 15, and in transverse section in Fig. 17. Fig. 18 shows the completed hammer as made by my process.

It will be noticed that in order to forge the eye by my process, a steel bar of the proper shape and size must have a taper hole punched in it without removing any material, and without perceptably changing the shape of the bar; that the steel must be cut down from each side of the smaller end of the proposed eye with curved chisels, and the face and pene set down, so as to leave the eye protruding, and that then the eye must be drawn down, and the surplus cut off, and that afterward the inside end of the eye is to be slightly opened.

I am aware that it has before been proposed in forging adz-eye hammers and other tools to provide metal out of which the projecting eye may be drawn down by producing a protuberance on the blank before punching, and also by setting down the metal on either side of the hole in a completely-punched blank. This, therefore, I do not claim; but I have effected a highly beneficial result in economy of material and rapidity of operation by my mode of first producing a preliminary eye or hole by means of a tapering punch without the discharge of metal, leaving within the eye thus formed material which is subsequently drawn down into the projecting neck.

Having thus described my invention, the following is what I claim as new and desire to secure by Letters Patent—

1. The method of forging the adz-eye, consisting in the preliminary punching of a taper hole in a bar of proper size, followed by the cutting down and setting down of the metal from each side of the smaller end of such hole, followed by the final drawing down and completing of the eye with punch and female die, substantially as described.

2. The gouges C C, secured adjustably in the die D, and employed to separate the metal on either side of the eye, as described.

3. The die B B', consisting of a cutting-base, B', and a forming upper part, B, secured thereon, and employed in combination with a punch, *b*, substantially as and for the purposes set forth.

4. The dies L L, for thinning the back and

indenting the pene of the hammer at I I, in the manner described.

5. The centering-jaws Y Y, connected by teeth y', and pressed together by a spring, y'', as and for the purposes set forth.

6. The concave bed-die A, for bringing out the back of the hammer, thereby counteracting the tendency of the punch to make the hammer hollow-backed.

DAVID MAYDOLE.

Witnesses:
C. L. FERRY,
W. B. GUERNSEY.