(No Model.)

S. DUFFIELD.

MANUFACTURE OF HOES.

No. 261,321. Patented July 18, 1882.

FIG 1

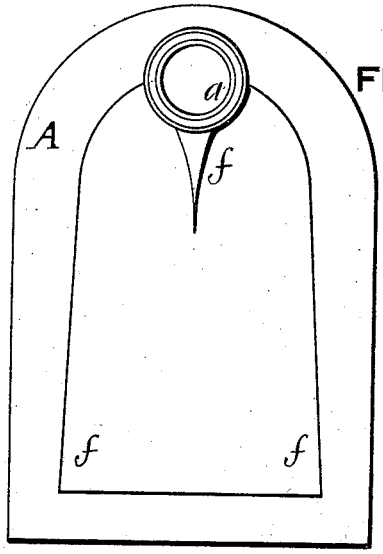


FIG 2

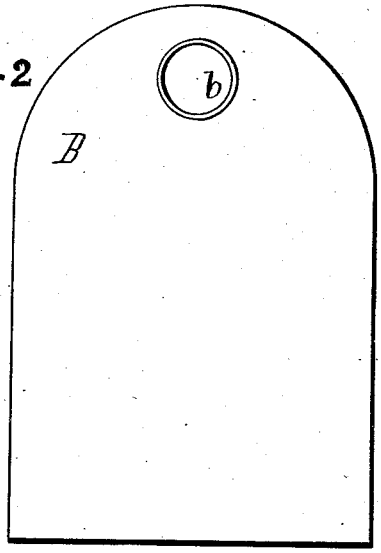


FIG 3

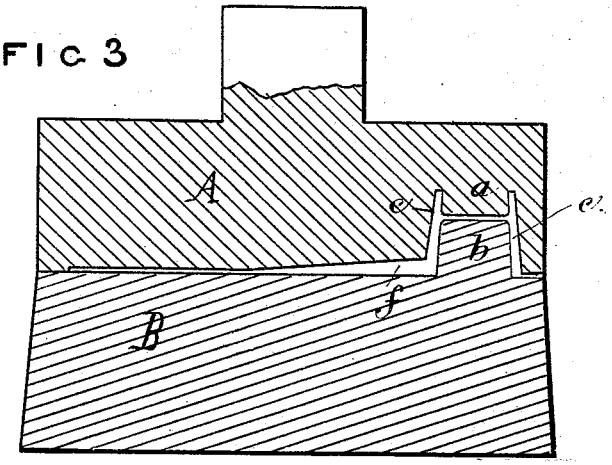


FIG 5

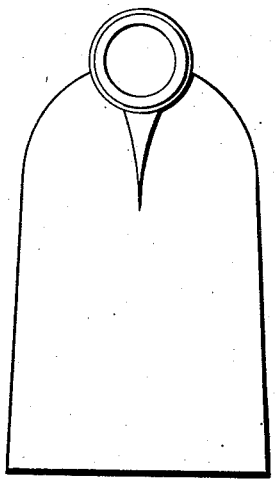
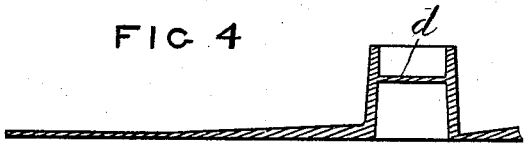


FIG 4



Witnesses,
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UNITED STATES PATENT OFFICE.

SILAS DUFFIELD, OF WILLENHALL, COUNTY OF STAFFORD, ENGLAND.

MANUFACTURE OF HOES.

SPECIFICATION forming part of Letters Patent No. 261,321, dated July 18, 1882.

Application filed May 22, 1882. (No model.) Patented in England December 5, 1878, No. 4,974; in France May 28, 1879, No. 130,932, and in Belgium May 29, 1879, No. 48,347.

To all whom it may concern:

Be it known that I, SILAS DUFFIELD, a subject of the Queen of Great Britain, residing at Willenhall, in the county of Stafford, England, have invented certain new and useful Improvements in the Manufacture of Hoes, Adzes, and such like Articles, (for which I have received Letters Patent in Great Britain, No. 4,974, dated December 5, 1878; in France, No. 130,932, May 28, 1879; and in Belgium, No. 48,347, May 29, 1879,) of which the following is a specification.

The present invention relates to the manufacture of hoes, adzes, and the like implements; and it consists mainly in the method of forming such implements by means of suitable dies at a single operation, ready for trimming off the edges and removing waste metal.

A single bar of metal, steel, or iron, or a bar of steel and iron is employed as the stock from which the implements are formed, the thickness of the bar being such as to give it a square or round section of about one inch in diameter. The bar being sufficiently heated at the end for the purposes of welding, and laid upon the bed or bottom die of a pair of dies of a shape to form the implement to be made, the top die is operated on by a steam stamp or hammer or other device giving blows of sufficient force to spread the metal throughout the interior or hollow portion of the dies. The hoe being formed is then cut off and dressed or clipped by a press, and hardened at the same heat. The bar having been returned to the fire, the process is repeated.

The manufacture refers more particularly to hand-hoes with eyes, but may be used for other kinds; also, the section or form of the bar is not material.

I next proceed to describe my invention with reference to the drawings, and to the figures and letters marked thereon.

Figure 1 is a plan view of an inverted top die, A, to form a hoe, showing a short core, *a*, to form a part of the eye of a hoe, and a recess, *f*, to receive the metal and form one side of the hoe. Fig. 2 is a plan of the bottom die, B, being a plane with a core, *b*, to form the remainder of the eye and the other side of the hoe. Fig. 3 is a section through the center of the dies. Fig. 4 shows the hoe in section through the center of the eye, and Fig. 5 is a plan view.

The tools for clipping are of the form of the hoe, and consist of top and bottom tools, which are acted upon by a screw, lever, eccentric, or other appliance.

In further explanation of my process of manufacture I make the hoes, adzes, or other like articles in the manner following: I heat the end of a bar of iron to a suitable heat and lay it upon the bottom die, B, shown in Fig. 2. If I require the hoe or other like article made with steel edges or points, I now take the heated end of a bar of steel and lay it upon the extreme end of the heated part of the bar of iron and strike blows with the die shown in Fig. 1 (which is secured to a steam-stamp or press, by preference; but I do not confine myself to any particular appliance for administering the blows) sufficiently numerous and powerful to compress the iron and steel, and thus fill up the spaces *c c* left in the dies shown in section, Fig. 3, and making the hoe as shown in section, Fig. 4, and in plan, Fig. 5, which I now detach from the remainder of the bar of iron or steel, and remove from it the diaphragm *d* and the "frazing" of waste iron which has escaped from the dies during the above process with clipping and punching tools. The iron or steel hoe, or iron hoe with steel edge, being still sufficiently heated, is, if required, immediately hardened.

In the event of my requiring the two edges or points of the article under manipulation to be of steel, as in the case of an adze or pick-ax, I detach from an iron bar a sufficiently large portion of iron to make that part of the tool which is intended to be made of iron, which I weld to the end of a bar of steel. The portion of iron, together with the end of the bar of steel to which it is attached, being heated, I now proceed as before described.

My invention refers more particularly to the manufacture of implements with eyes—such as hoes, adzes, pickaxes, and such like—but also applies to the manufacture of the same implements without eyes.

Having now described the nature of my said invention and in what manner the same

may be carried into effect, I wish it to be understood that I do not confine myself to the exact form of dies shown or the number of cores on the dies, as one core in the bottom die will, if required, form the eye; but

What I claim is—

The method of forming hoes, adzes, and similar implements at a single operation by heating a bar of metal to a welding state, placing it between a pair of dies of the form described and shown, and spreading the metal in the dies by blows from a steam stamp or hammer or other suitable device, substantially as set forth.

SILAS DUFFIELD. [L. S.]

Witnesses:
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