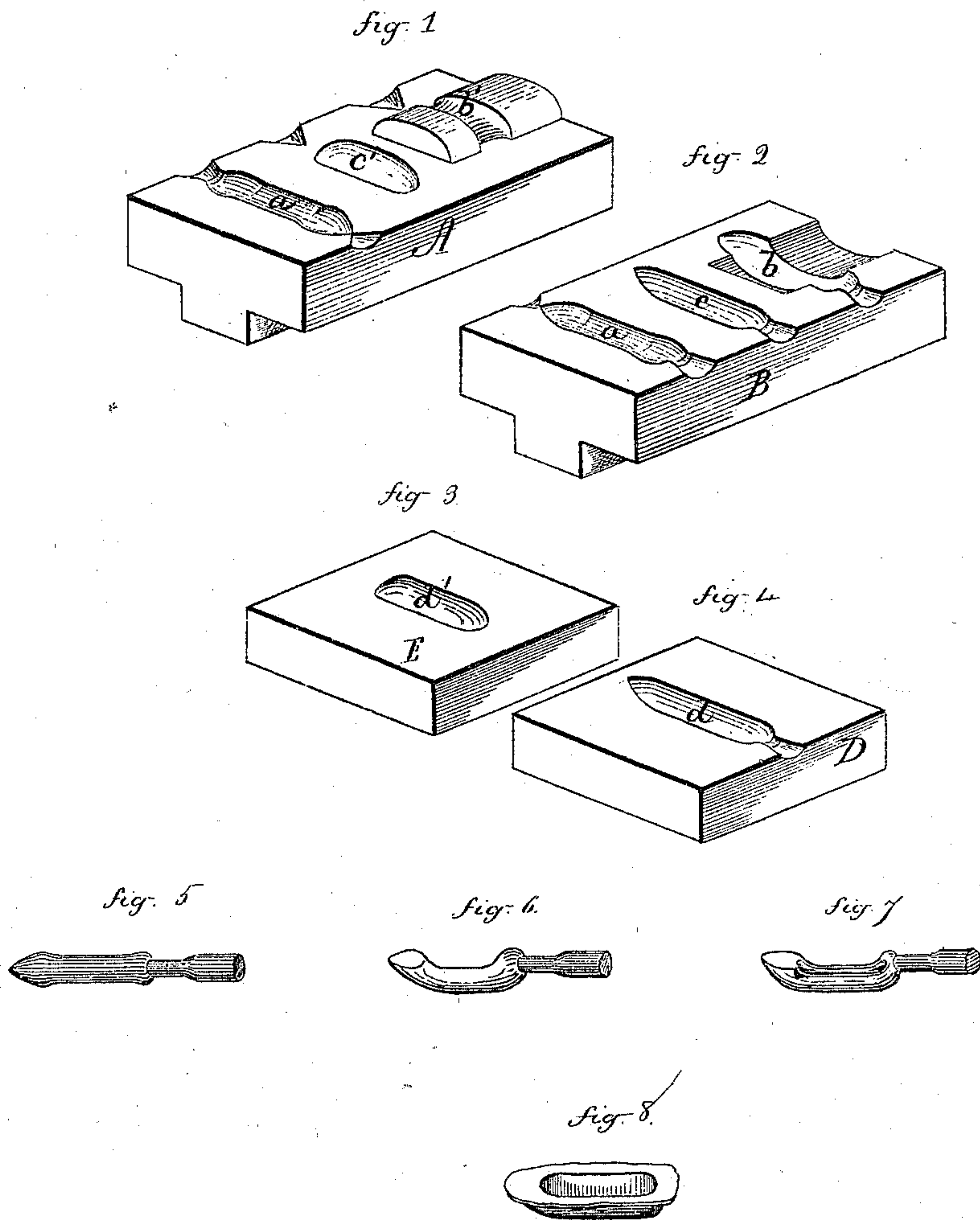


D. W. HALE.

Dies for Forming Sewing-Machine Shuttles.

No. 134,541.

Patented Jan. 7, 1873.



Witnesses.

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UNITED STATES PATENT OFFICE.

DANIEL W. HALE, OF MIDDLETOWN, CONNECTICUT.

IMPROVEMENT IN DIES FOR FORMING SEWING-MACHINE SHUTTLES.

Specification forming part of Letters Patent No. 134,541, dated January 7, 1873.

To all whom it may concern:

Be it known that I, DANIEL W. HALE, of Middletown, in the county of Middlesex and State of Connecticut, have invented a new Improvement in Dies for Forging Shuttles for Sewing-Machines; and I do hereby declare the following, when taken in connection with the accompanying drawing and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawing constitutes part of this specification, and represents, in—

Figure 1, a perspective view of the upper portion, and Fig. 2 a perspective view of the lower portion, of the first three dies in the series; Fig. 3, a perspective view of the upper, and Fig. 4 a perspective view of the lower, portion of the fourth or last die of the series; and in Figs. 5, 6, 7, and 8 illustrating, respectively, the operation of the four successive dies.

This invention relates to the construction of dies for forging sewing-machine shuttles; the object being to facilitate the operation; and it consists in a series of dies for this purpose, as more fully hereinafter described.

In both the lower portion B and upper portion A of the die a cavity, *a*, substantially alike in each, is formed to produce the first operation. These dies are used in drops, presses, or hammers in the usual manner. The rod or blank of metal heated is placed in the die *a*,

and the two struck together will forge the blank into the shape denoted in Fig. 5. From this it is placed in the second die or cavity *b*. A projection, *b'*, in the upper die, corresponding, bends the blank into the form seen in Fig. 6; then placed in the third die or cavity *c* in the lower die. A projection, *c'*, on the upper part strikes upon the blank, and further shapes it toward completion, as seen in Fig. 7.

I am enabled to produce these three operations by a single heat; and I find it advisable before the last or completing operation to re-heat the metal. This done, and placed in the cavity *d* in the fourth lower die D, this cavity corresponding to the exterior of the shuttle to be produced, and on the upper portion E a projection, *d'*, is formed corresponding to the interior of the shuttle to be produced, and this struck upon the blank in the lower die, completes the shaping of the shuttle, throwing the surplus metal out in the form of a fin, as seen in Fig. 8. This fin is trimmed or cut off, and the shuttle is ready for the operation of finishing, the forging or shaping being complete.

I claim as my invention—

A series of dies, substantially as shown and herein described, for forging shuttles.

DANIEL W. HALE.

Witnesses:

E. H. PARSHLEY,
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