(No Model.)

F. H. SMITH.

DIE FOR UPSETTING BRIDGE BARS.

No. 389,115. Patented Sept. 4, 1888.

Fig. 1.

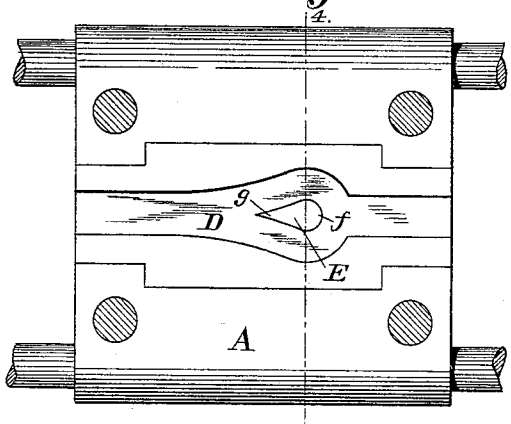


Fig. 2.

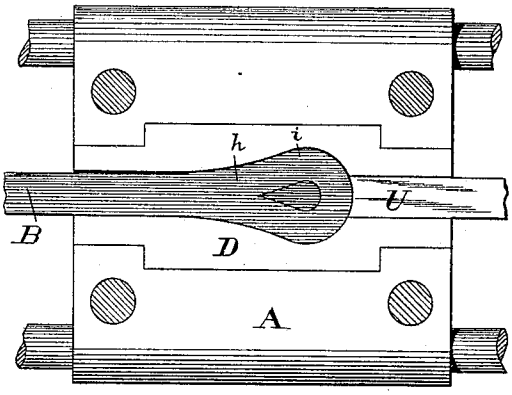


Fig. 3.

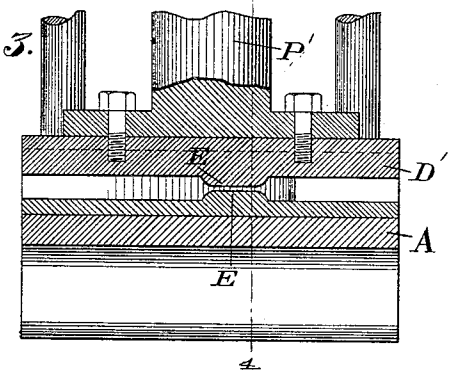


Fig. 4.

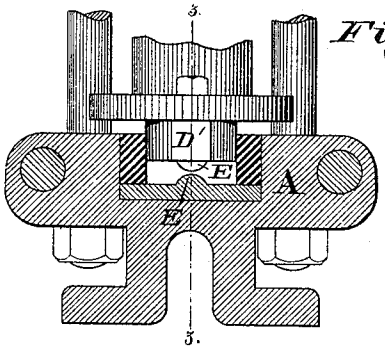


Fig. 5.

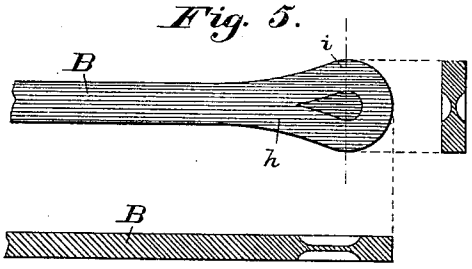


Fig. 6.

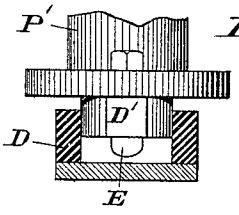


Fig. 7.

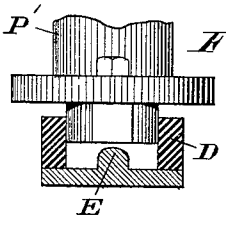
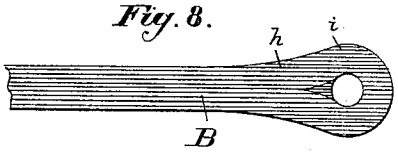


Fig. 8.



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UNITED STATES PATENT OFFICE.

FREDERICK H. SMITH, OF BALTIMORE, MARYLAND.

DIE FOR UPSETTING BRIDGE-BARS.

SPECIFICATION forming part of Letters Patent No. 389,115, dated September 4, 1888.

Application filed July 16, 1888. Serial No. 280,103. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK H. SMITH, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Upsetting-Dies for Forging Enlarged Ends on Metal Bars, of which the following is a specification.

This invention relates to an improvement in dies for upsetting and forging enlarged ends on metal bars.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a top view of the anvil and female die with the improved bulb. Fig. 2 is also a top view of the same parts, and shows the bar with finished enlarged end having the impression of the improved bulb. Fig. 3 is a longitudinal vertical section of the upper and lower parts of the die, and shows the improved bulb attached to both parts. Fig. 4 is a cross-section of both parts on the line 4 4. Fig. 5 shows three views of the bar as it comes from the die. Fig. 6 illustrates the improved bulb attached to the upper part or shoe of the die alone. Fig. 7 illustrates the bulb attached to the lower part or female die alone. Fig. 8 is a view of the finished bar.

A bulb or protuberance attached to the bottom of the shoe and protruding downward, also attached to the bottom of the die and protruding upward, is shown, described, and claimed in my two applications for Letters Patent filed December 2, 1887, Serial Nos. 256,803 and 256,804, and is also shown in my application filed April 28, 1888, Serial No. 272,102.

Referring to the drawings, the letter A designates the anvil; D, the female die; U, the ram which upsets the heat-softened end of the bar B back on itself. The male die D′ above is movable up and down and is actuated by the piston P′, and when down this die fits within the female die and compresses the bar. All these parts are fully described in my said applications, and it is therefore unnecessary to describe the same here. The bulb or protuberance E is first pressed or driven into the hot metal bar by closing the male die down into the female die. Thereby the bulb is made to penetrate more or less into the surface of the bar. This penetration displaces the metal and expands it laterally toward both edges of the bar, and firmly holds the bar stationary while the adjacent parts of the metal are forced to take the shape of the die.

Now my present improvement consists in a particular shape given to the bulb or protuberance E. This bulb, as shown in Fig. 1, is rounded at one end, *f*, and tapered or wedge-point shaped at the opposite end, *g*. This particular shape serves to give a greater lateral expansion to the metal, and to produce a longer taper at that portion, *h*, of the bar-neck which is between the broadest part of the enlarged head *i* and the ordinary width of the bar B. The metal is thus arranged into a shape which gives strength where it is most needed. This bulb or protuberance may project from the top or bottom, or both, into the shaping-chamber of the die, as illustrated in Figs. 6, 7, and 4, respectively,

Having described my invention, I claim—

A die for upsetting and forging enlarged ends on metal bars, having a bulb or protuberance, E, one end of which is rounded and the opposite end tapered or wedge-point shaped, said bulb projecting from the top or bottom, or both, into the shaping-chamber of the die.

In testimony whereof I affix my signature in the presence of two witnesses.

FREDERICK H. SMITH.

Witnesses:

JOHN E. MORRIS,

JNO. T. MADDOX.