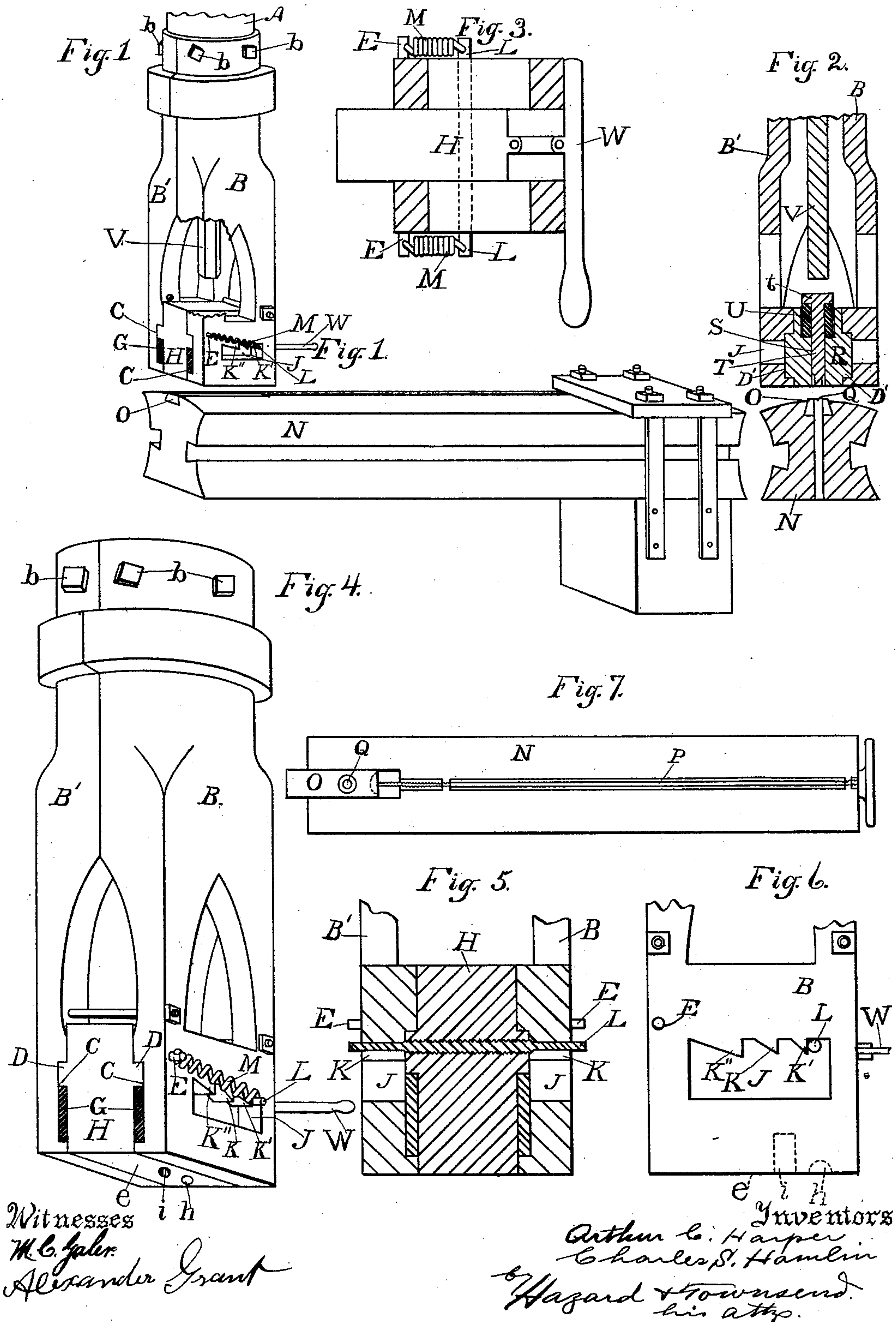


(No Model.)

A. C. HARPER & C. S. HAMLIN.
MACHINE FOR PUNCHING AND RIVETING.

No. 432,528.

Patented July 22, 1890.



UNITED STATES PATENT OFFICE.

ARTHUR C. HARPER AND CHARLES S. HAMLIN, OF LOS ANGELES,
CALIFORNIA.

MACHINE FOR PUNCHING AND RIVETING.

SPECIFICATION forming part of Letters Patent No. 432,528, dated July 22, 1890.

Application filed April 23, 1890. Serial No. 349,140. (No model.)

To all whom it may concern:

Be it known that we, ARTHUR C. HARPER and CHARLES S. HAMLIN, citizens of the United States, residing at Los Angeles, in the
5 county of Los Angeles and State of California, have invented a new and useful Improvement in Steam Punches and Riveters, of which the following is a specification.

The object of our invention is to provide
10 convenient and efficient means for applying steam-power for the punching and riveting of metal plates for manufacturing pipe and for analogous uses.

Our invention consists, essentially, of the
15 combination, with a steam-hammer, of a hanger attached to the cylinder of the steam-hammer and provided with vertical guideways, springs supported by such hanger, and a vertically-reciprocating flanged die mount-
20 ed in such guideways upon such springs in the path of the hammer.

It also comprises various details of construction hereinafter more fully set forth, whereby we facilitate the operation and whereby we
25 adapt the same hammer for use interchangeably as a punch and as a riveter.

The accompanying drawings illustrate our invention.

Figure 1 is a perspective view showing a
30 riveting-stake and the lower end of a steam-hammer provided with our invention adjusted for riveting. Fig. 2 is a vertical mid-section of the hammer and a cross-section of the stake when arranged for punching. Fig. 3 is
35 a horizontal section of the lower portion of the hanger, showing the rivet-set die and mechanism for operating the die. Fig. 4 is a perspective view of the hanger, showing the under side of the rivet-set die in position to
40 "plug" a rivet. Fig. 5 is a vertical section through the hanger and across the rivet-set die along the axis of the die-adjusting bolt. Fig. 6 is a plain side elevation with the rivet-set die adjusting-spring removed. Fig. 7 is
45 a top view of the stake.

A represents the lower portion of the cylinder of a steam-hammer, which is of the ordinary construction of such hammers, and is therefore not shown in detail. To this cylinder
50 is attached the hanger formed of two

members B B', fitted upon and depending from the lower end of the cylinder and secured thereto by lag-screws *b b*. The lower ends of the two members are each provided upon
55 their inner faces with a horizontal groove C to receive interchangeably the flanges D of the rivet-set die H and flanges D' of punch-block R. The flanges D of the rivet-set die are narrower than the grooves C, and elastic rubber blocks or springs G are mounted in their re-
60 spective grooves between the bottom of such groove and the under side of the flange fitted in such groove. The rubber blocks or springs hold the rivet-set die H in its normal elevated position. The springs and flanges are so ar-
65 ranged with relation to each other and to the hammer and rivet-set die that when the hammer makes its full downward stroke the rivet-set die may be forced down to strike the rivet, thus giving a quick true stroke upon
70 the rivet, and will then be returned by the springs G into its normal elevated position. It will be observed the rivet-set die is reciprocable horizontally back and forward as well as vertically.
75

The means for successively adjusting the rivet-set die in position for plugging, drawing, and cupping the rivet are illustrated in Figs. 4, 5, and 6. The hanger is horizontally
80 slotted at the sides, each slot J being provided upon its roof or upper wall with teeth K K' K'', with which the ends of bolt L engage to stop the rivet-set die at different positions, as hereinafter more fully set forth. The spring
85 M is attached at one end to the hanger by pin E or other suitable means, and at the other end to the die-adjusting bolt L, and the tension of the spring forces the rivet-set die H forward. The under face of the rivet-set
90 die is provided with a drawing-hole *h* and a cup *i* for drawing and finishing the rivet. The front portion or plugging-face *e*, however, is left plain for plugging the rivet—that is, for stoving up the rivet.

In practice the punch-die shown in Fig. 2
95 is first used. For this purpose the stake N is provided with a sliding plate O, operated by a screw P or other suitable means, and provided with a hole Q for the burrs or punch-
100 ings to pass through. The punch is mounted

on the hanger by means of block R, having a countersunk perforation S to receive the punch T, which has a flange or head *t*, resting upon a perforated rubber block or other suitable spring U, seated in the countersink of the perforation S. The ribs or flanges D' fit the grooves C of the hanger, and the perforation S is so arranged that when the punch-block is in position in the hanger the punch-die will center with the hole Q of plate O when the plate is in its forward position, as will be understood from Figs. 2 and 7. When thus arranged, the plates are placed in position upon the stake and the hammer V is operated. The downstroke of the hammer drives the punch-die through the metal, and when the hammer rises the spring U retracts such die to allow the sheet to be moved into position ready for another hole to be punched. When the necessary rivet-holes have been punched, the punch-block is removed from the hanger, the plate O is drawn back, so that the hole Q will not be under the hammer, and the rubber springs G and the rivet-set die II are placed in position in the hanger, the ribs or flanges D resting upon the rubber springs G. The metal to be riveted is then placed in position on the stake with the rivet inserted in the hole beneath the hammer. The rivet-set die is drawn back into the position shown in the drawings, thus bringing the plain portion of the face of such die immediately beneath the hammer, which is then operated with a light stroke to plug the rivet. The blow upon the rivet-set die drives the die down until the bolt L has passed the rear tooth K', and when the hammer rises and releases the die the spring M draws the die forward along the front face of tooth K' until the bolt engages the rear face of tooth K, where it is stopped and holds the set in posi-

tion with the drawing-hole *i* above and axial with the rivet. The hammer is then given another stroke to "draw" the rivet, the hole *i* receiving the rivet, while the die forces the sheet together, and as the hammer rises the spring M again draws the die forward, so that the bolt rests against the front tooth K'', thus bringing the cupping or finishing hole *h* over the rivet. The hammer is then operated to strike a forcible blow to finish the rivet. The operator then draws the rivet-set die back by means of the handle W or by any other suitable means which may be arranged for that purpose, another rivet is set, and the operation described is repeated.

Now, having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination of the steam-hammer, the vertical guideways, the springs, and the vertically-reciprocating flanged die mounted in such guideways upon such springs in the path of the hammer.

2. The combination of the steam-hammer, the hanger attached to the cylinder of the hammer and provided with the guideways, the springs, and the flanged die mounted upon the springs in the path of the hammer.

3. The combination of the steam-hammer, the spring-supported horizontally and vertically reciprocable rivet-set die provided with the plugging-face, the drawing-hole and cup, the die-adjusting spring, and means for successively adjusting the die in position for plugging, drawing, and cupping.

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Witnesses:

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