2 Sheets—Sheet 1.

J. STONE.

FORGING MACHINE.

No. 61,888. Patented Feb. 5. 1867.

Fig: 1

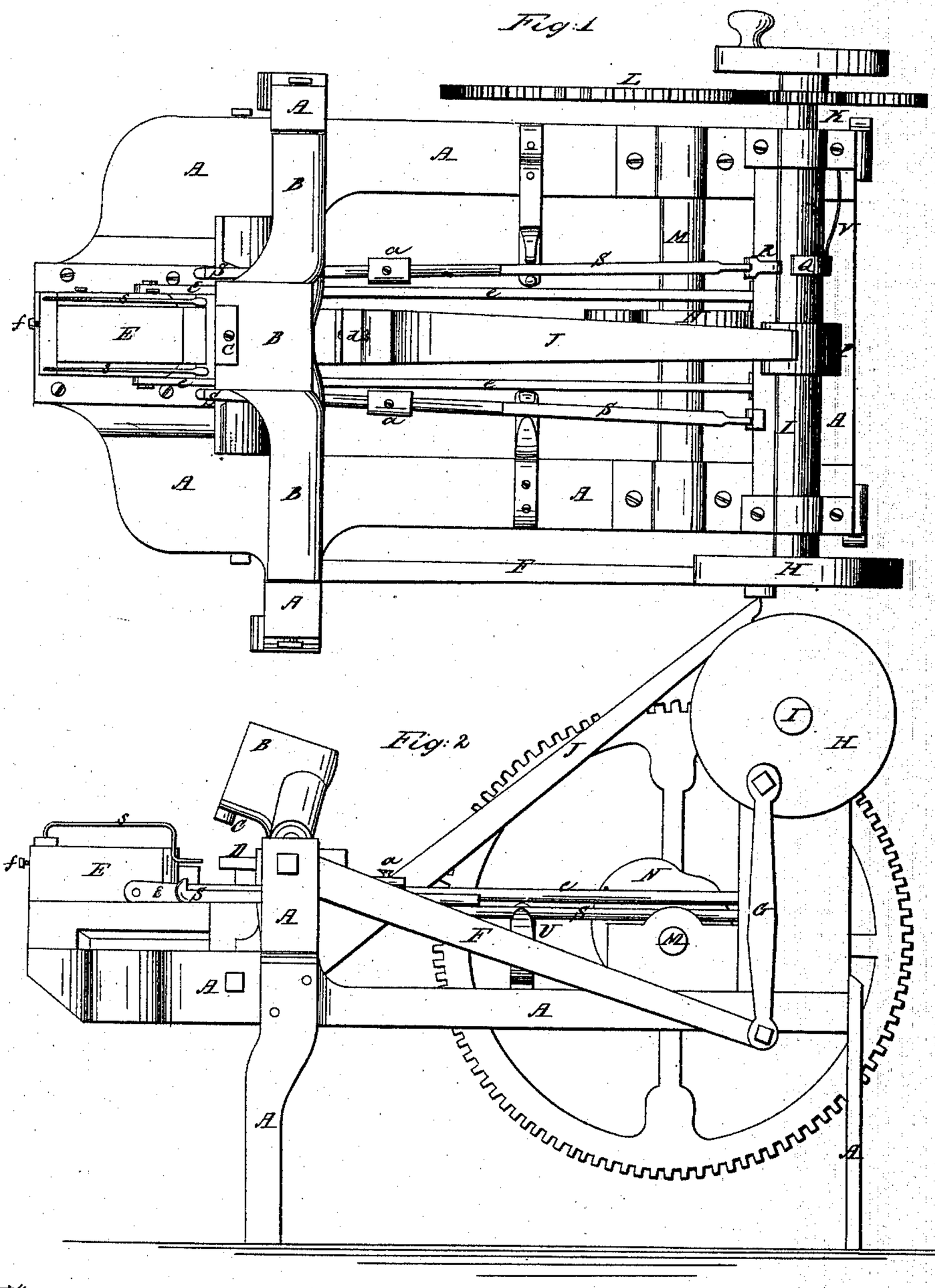

Fig: 2

Witnesses

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L. H. Kenthel

Inventor

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2 Sheets—Sheet 2.

J. STONE.

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Fig: 3

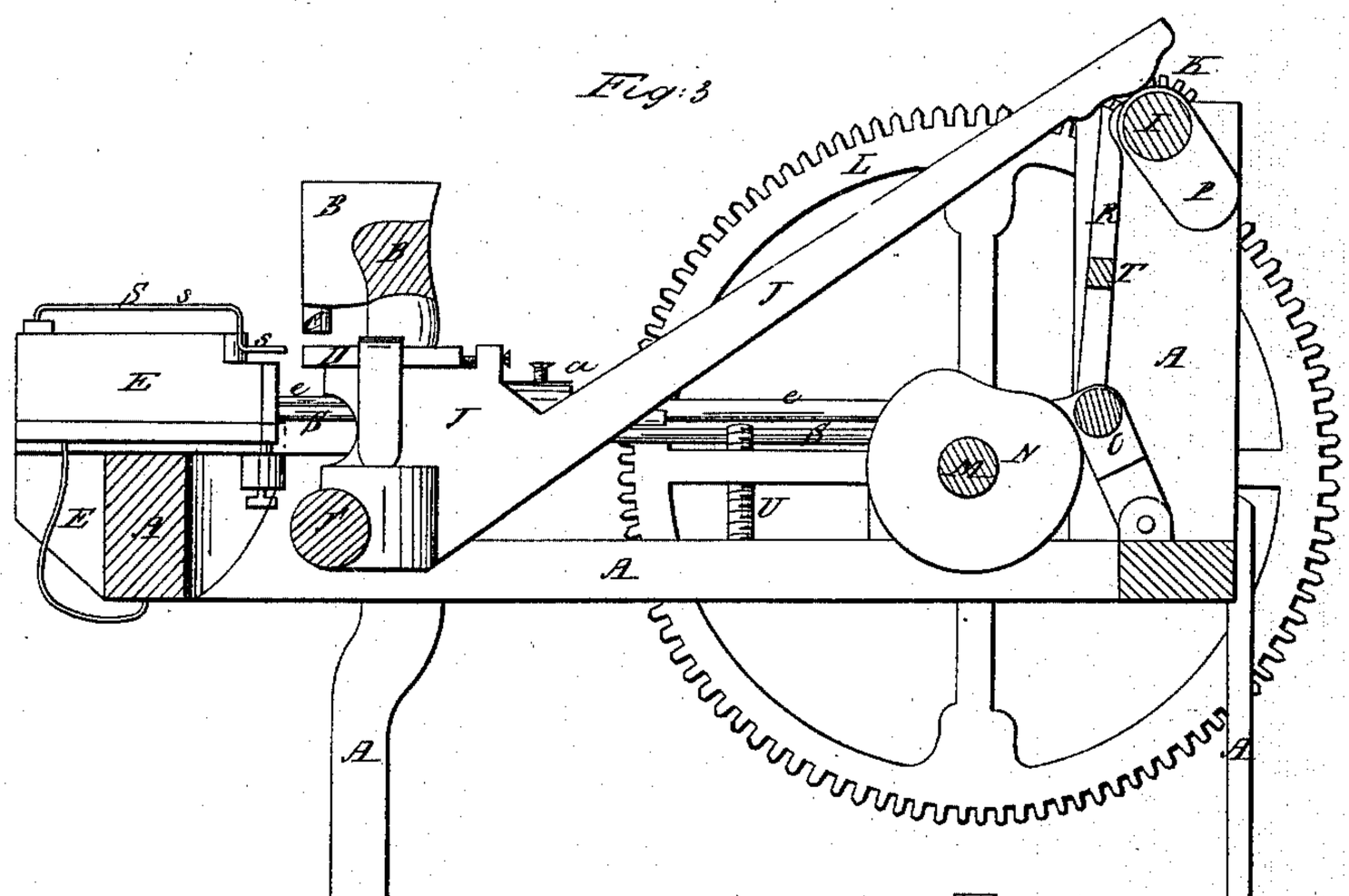
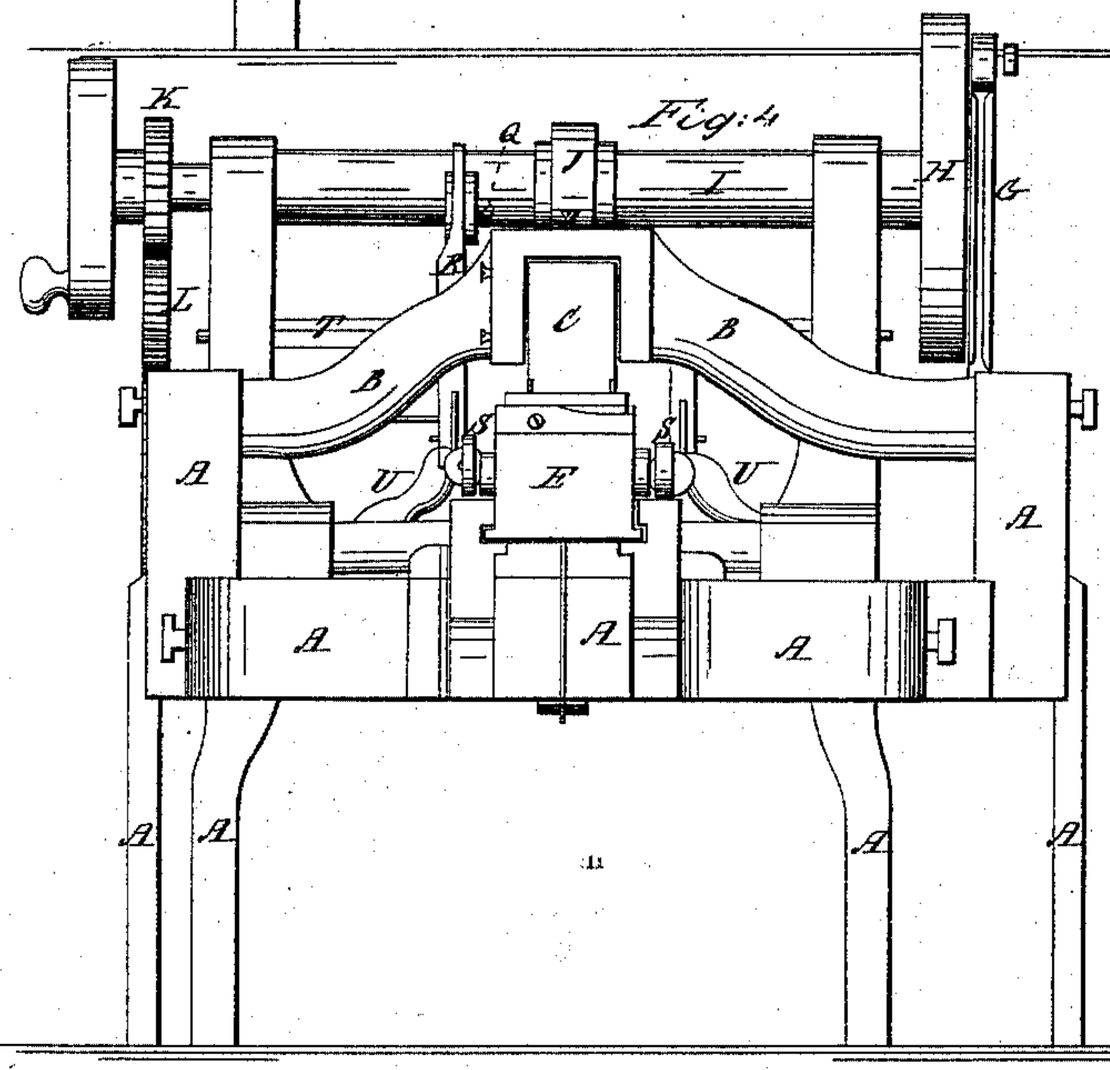


Fig: 4



Witnesses:
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Inventor
Joseph Stone

United States Patent Office.

JOSEPH STONE, OF CHICAGO, ILLINOIS.

Letters Patent No. 61,888, *dated February* 5, 1867

IMPROVED FORGING MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN.

Be it known that I, JOSEPH STONE, of Chicago, in the county of Cook, and State of Illinois, have invented a new and useful Improvement in Machines for Welding Iron; and I do hereby declare and make known that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and the letters and figures marked thereon, which form part of this specification.

The principle of my said invention consists in so constructing a machine for welding iron, that two welding hammers, one operating vertically and one operating horizontally, shall strike alternately upon an anvil suitably arranged and constructed with reference thereto; said anvil also having a sliding movement away from and towards said hammers, the former movement to permit the bars of iron to be properly arranged upon the said anvil without stopping the machine, and the latter movement to bring the same under the action of the said hammers, substantially as hereinafter described. My invention further consists in the employment, in connection with said hammers and anvil, of springs and draw-hooks, or their equivalents, for the purpose, respectively, of holding the bar to be welded alternately beneath and opposite said hammers, and away from the angle in the anvil to prevent the formation of a seam or flange upon the corner of the bar, substantially as hereinafter set forth.

To enable those skilled in the art to understand how to construct and use my said invention, I will now proceed to describe the same with particularity, making reference in so doing to the aforesaid drawings, in which—

Figure 1 is a plan or top view of my invention.

Figure 2 a side elevation of the same.

Figure 3 a vertical section thereof, at the line *x* in fig. 1; and

Figure 4 is an end view of the same.

Similar letters of reference in the different figures denote the same parts of my invention.

A represents a suitable frame, upon which the operating parts of the machine are supported; B a curved shaft which holds the vertical hammer C, as shown, so that by an oscillating movement of the said shaft, by means of the arms F G, and wheel H, which latter is fixed upon the shaft I, the proper vertical stroke is given upon the anvil as hereinafter mentioned. The whole machine is also operated by the revolution of the said shaft I, to which motion is imparted in any suitable manner. The horizontal hammer is suitably attached upon an oscillating shaft, J′, to which is attached the lever J, which is operated upon by means of the cam P, upon the said shaft I, as shown, so as to impart or give the desired horizontal stroke. These two hammers are so operated upon as to strike alternately, the forward movement being given to the hammer D, while the upward movement is given to the hammer C. These hammers are made adjustable in their holder by means of set-screws, as shown. The anvil E is constructed with an angle, so as to present resisting faces to the strokes of both hammers, as shown, and lies in the proper position with respect to the aforesaid hammers, while the bars are being welded, but recedes back to allow another bar to be adjusted properly thereupon, without stopping the motion of the hammers, which would be necessary were the anvil stationary, remaining in said last mentioned position long enough for the attendant to place the bar, when it returns to the proper position to subject said bar to the action of the hammers. This reciprocating movement is effected by means of the arms *e*, attached to the anvil as shown, acted upon by a suitable cam, as hereinafter described, being properly timed to accomplish the desired results. The said arms *e e* are connected by a cross-bar at their rear ends, upon which is arranged a roller marked O, which is operated upon to give said movements by the cam N, upon the shaft M, which is revolved by the shaft I by means of the gear-wheels K L, as shown in fig. 3, the receding movement being effected by the spring E′, and the forward movement by the pressure of said cam. S S represent hooks which operate to draw the bars to be welded beneath the vertical hammer to receive the vertical blow, but release the same to allow it to rest upon the vertical face of the anvil to receive the horizontal stroke, the springs *s s* operating in like manner to hold the bar up free from the anvil to receive said horizontal stroke, while they readily yield so as to allow the bar to rest upon the horizontal face of the anvil to receive the vertical blow, as aforesaid. These hooks S S are so constructed that their lengths may be adjusted by means of the set-screws *a*, as shown, and the anvil E has an adjustment, effected by means of the set-screw *f*. T represents a shaft or rod, having its supports in the sides of the machine, upon which is fixed a lever, R, whose lower end is suitably attached to the ends of said springs *s s*, while its upper end is operated upon by a cam, Q, upon the shaft I. This cam Q operates to

draw the said hooks up against the iron bars to be welded, and the spring V operates upon the rear ends of said hooks, to release them as desired.

The aforesaid machine is constructed, and proportioned, and arranged in its various parts so as to operate in the following described manner.: When motion is communicated to the driving-shaft I, assuming the anvil to be out from beneath the hammers, ready to receive the bars for welding, the vertical and horizontal hammers commence their alternate strokes as aforesaid. The bars of iron which are to be welded together, having been properly arranged upon the anvil, it advances beneath the said hammers. Just as the vertical hammer is to descend upon the bar, the hooks S S seize the bars and draw them fairly and wholly beneath the face of the descending hammer, and as soon as the blow is given the said hooks recede, and the springs *s* raise the bars up to receive the blow from the horizontal hammer. When a suitable number of blows are given, sufficient to weld the bar, the anvil recedes, the bar removed, the next bar placed, and the operation is repeated. By varying the proportions or size of the machine, and using hammers with various faces, bars of any size or shape may be welded by this machine.

Having described the nature, construction, and operation of my invention, I will now proceed to specify what I claim, and desire to secure by Letters Patent:

1. In combination with the alternating hammers C D, the sliding anvil E, when arranged and operating substantially as and for the purpose set forth.

2. In combination with the vertical hammer C, and the anvil E, constructed substantially as described, I claim the arrangement of the hooks S S, or their equivalents, substantially as set forth, operating as and for the purposes specified and shown.

3. I claim, in combination with the anvil E, constructed as described, and the horizontol hammer D, the employment of the springs *s s*, or their equivalent, arranged and operating as and for the purposes set forth.

JOSEPH STONE.

Witnesses:

W. E. MARRS,

J. W. HERTHEL.