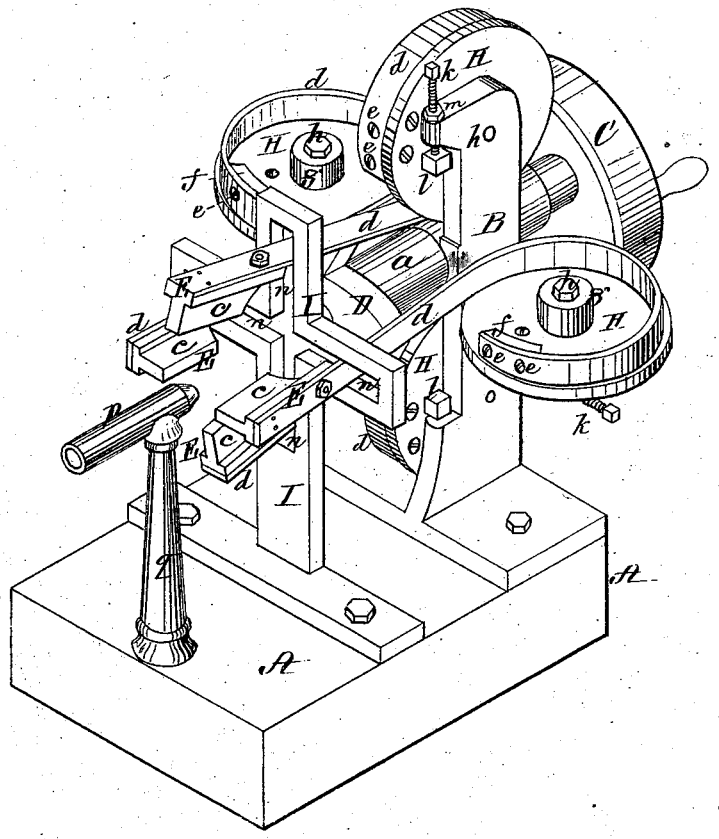
2 Sheets--Sheet 1.

S. S. PUTNAM.

Machine for Forging Nails.

No. 161,154. Patented March 23, 1875.

Fig. 1.



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2 Sheets--Sheet 2.

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Fig. 2.

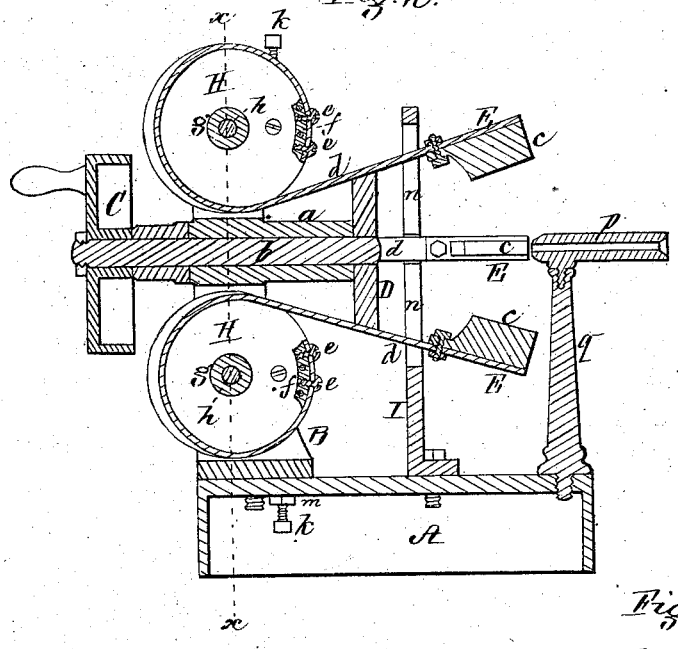


Fig. 4.

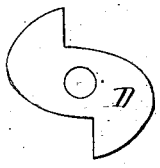
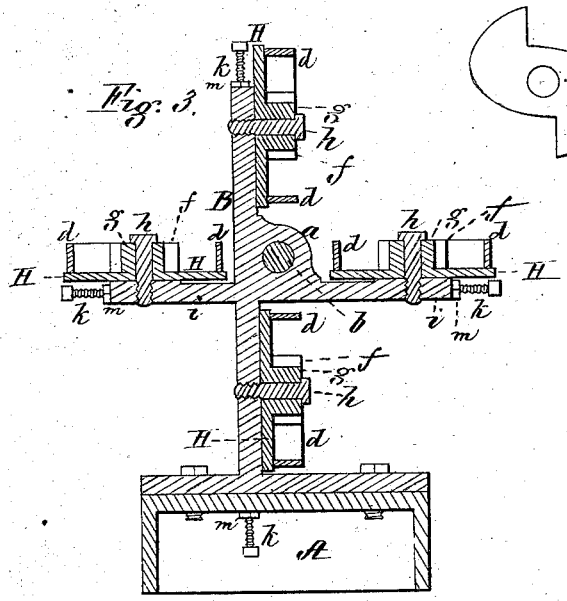


Fig. 3.



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UNITED STATES PATENT OFFICE.

SILAS S. PUTNAM, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR FORGING NAILS.

Specification forming part of Letters Patent No. **161,154**, dated March 23, 1875; application filed May 16, 1874.

To all whom it may concern:

Be it known that I, SILAS S. PUTNAM, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Forging-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of my improved forging-machine. Fig. 2 is a longitudinal vertical section through the center of the same. Fig. 3 is a transverse vertical section on the line *x x* of Fig. 2; Fig. 4, detail.

This invention relates to certain improvements in machines designed particularly for forging light articles, such as nails, brad-awls, &c.; and consists in two pairs of hammers provided with spring-helves, in combination with adjusting devices to control the tension of the spring and force of the blows.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A represents the bed of the machine, from one end of which rises a standard, B, near the center of which is an elongated bearing, *a*, in which runs the driving-shaft *b*, to one end of which is secured a fly-wheel, C, and to the opposite end a cam, D, which actuates the hammers E. This cam is constructed with two branches, placed symmetrically upon opposite sides of the center, and is so arranged as to release the two opposite hammers at the same instant, and to operate each pair of hammers alternately in succession, the cam being so shaped that one pair of hammers will be drawn back out of the way before the other pair are released. Each of the hammers is composed of a head, *c*, and a helve, *d*, the latter consisting of a long elastic spring, the rear portion of which is bent around on a curve on the face of a circular disk or set-plate, H, the end of the spring-helve *d* being secured by screws *e* to a projection, *f*, attached to the plate H. The helves *d*, when thus bent and secured, form of themselves powerful springs, which, when released after being drawn back by the cam D, serve to throw the heads *c* of a pair of hammers toward each other, so as to give an elastic and effective blow. Each of the plates H is provided at its center with a hub, *g*, through which passes a screw-bolt, *h*, by which it is held in place. The plates H, to which the vertical hammers are attached, are secured to the standard B, while the plates H of the side or horizontal hammers are attached to arms *i*, projecting out from opposite sides of the standard B, and at right angles thereto. The tension or strain upon each of the spring-helves *d* is increased or diminished, so as to vary the force of the blow of the hammer, by turning its plate H around the bolt *h* as a center, which is effected by an adjusting-screw, *k*, which passes through the stationary support and bears against a projection, *l*, attached to the plate H, a check-nut, *m*, being provided for holding the screw in position when properly adjusted.

The pressure exerted by the spring-helves can thus be adjusted with the greatest degree of nicety, so as to insure the hammer-heads striking the article being forged at the same instant, and with equal force, there being no friction to overcome after they are released by the cam, as is the case with pivoted hammers, where a slight difference in the friction on the journals or bearings (which is liable to occur from the oil on one getting dryer than that on the other) will cause one hammer to strike before the other, and thus produce imperfect work.

Where articles being forged are to have shoulders on opposite sides, (for example, horseshoe-nails,) it is absolutely necessary that the two hammers of a pair should strike simultaneously and with equal force, as otherwise the shoulders would not be made opposite to each other, and the article would be spoiled.

The hammer-heads are attached to the spring-helves by rivets and bolts; but they may be welded to the helves, if preferred, or secured thereto in any other suitable manner; and the faces of the hammers may be flat, or provided with dies of any form to correspond to that of the article to be forged.

I is a guide-frame, made in the form of a cross, and rising from the bed A, to which it is secured. In the opposite sides of this frame

are formed four slots, *n*—two horizontal ones, and two vertical ones—and through each of these slots passes one of the spring-helves *d*.

The width of the slots *n* slightly exceeds that of the helves *d*, in order that the latter may move freely therein, and these slots serve as guides to prevent the hammer-helves from being carried by the friction of the cam D out of the direct line in which they should move.

On account of the lightness of the spring-helves, I am enabled to elongate them so as to remove the faces of the hammers away from the immediate vicinity of the central cam D, and thus reduce the liability of hot cinders being thrown between the cam and the spring-helves, which would greatly increase the wear upon the bearing-surfaces.

In practice, I intend to provide each of the spring-helves with a friction-plate for the cam D to bear against, thus preventing the helves from being worn away, as would otherwise occur.

The rod or bar of metal to be operated upon by the hammers is passed through and supported by a hollow guide, *p*, secured to the top of a post, *q*, rising from the bed A.

A machine constructed as above described may be built at a much less cost, and run for a much longer time without repairs, and with less power, than one provided with pivoted hammers operated by springs, which is objectionable on account of the rapidity with which the pivots and springs become worn, and the consequent cost of keeping it in repair. Furthermore, pivoted hammers will sag when the pivots or their bearings become worn, whereas the spring-helves above described will, at all times, support the hammer-heads in their proper position.

What I claim as my invention, and desire to secure by Letters Patent, is—

The two pairs of hammers E E, in combination with the spring-helves *d*, disks H, screws *k*, and stops *l*, substantially as and for the purpose described.

Witness my hand this 12th day of May, A. D. 1874.

SILAS S. PUTNAM.

In presence of—
P. E. TESCHEMACHER,
W. J. CAMBRIDGE.