

H. W. Matter,

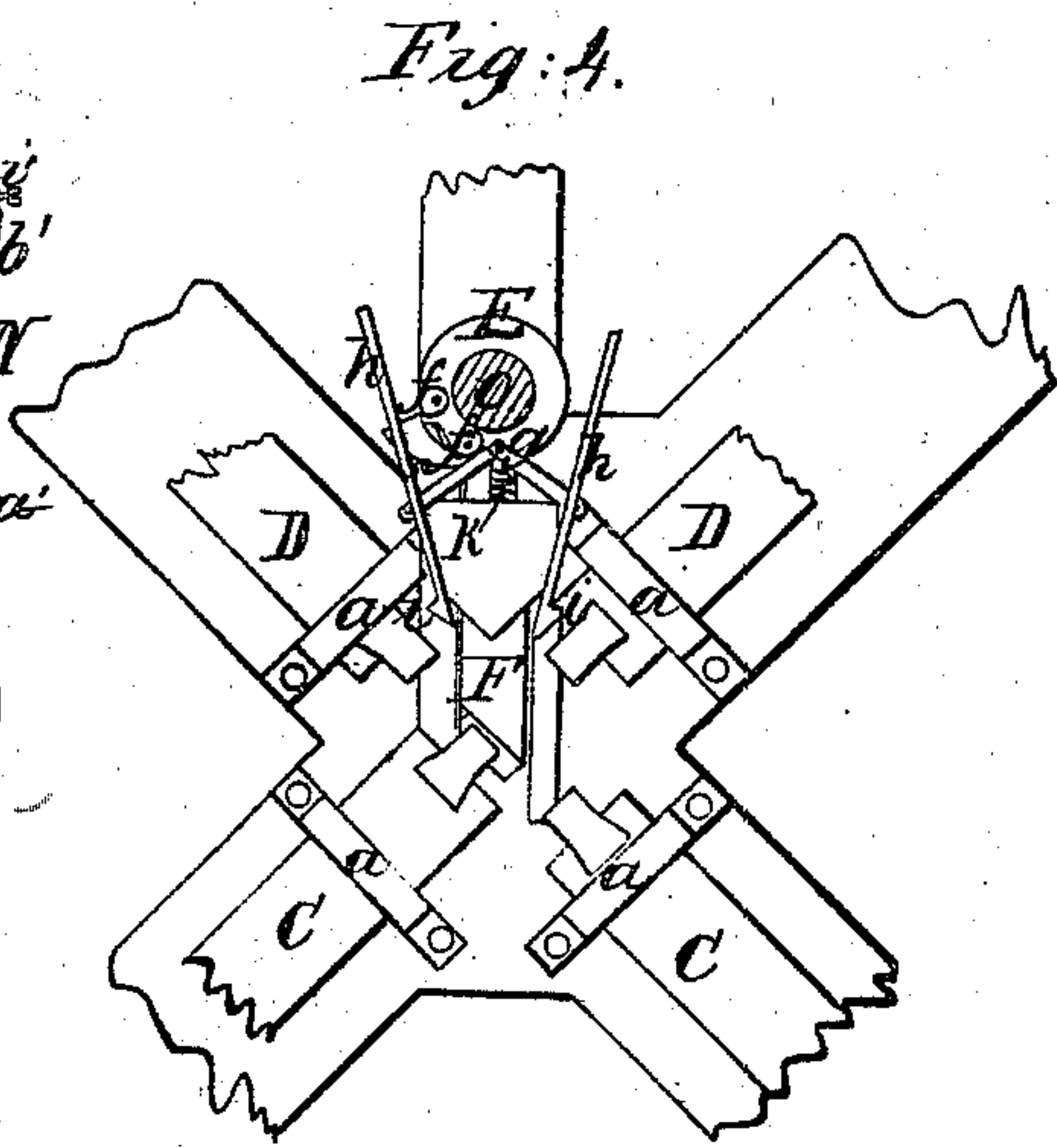
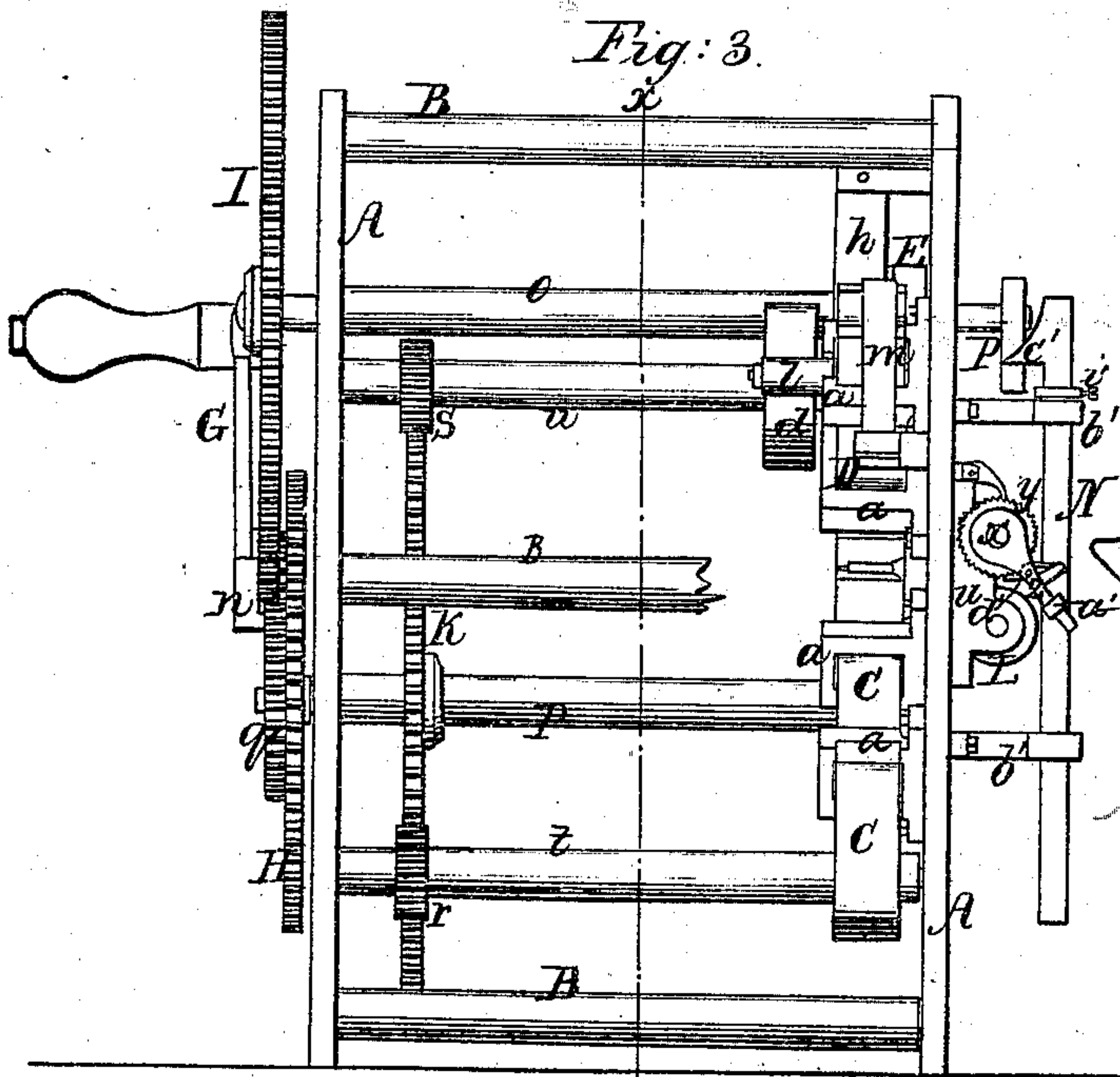
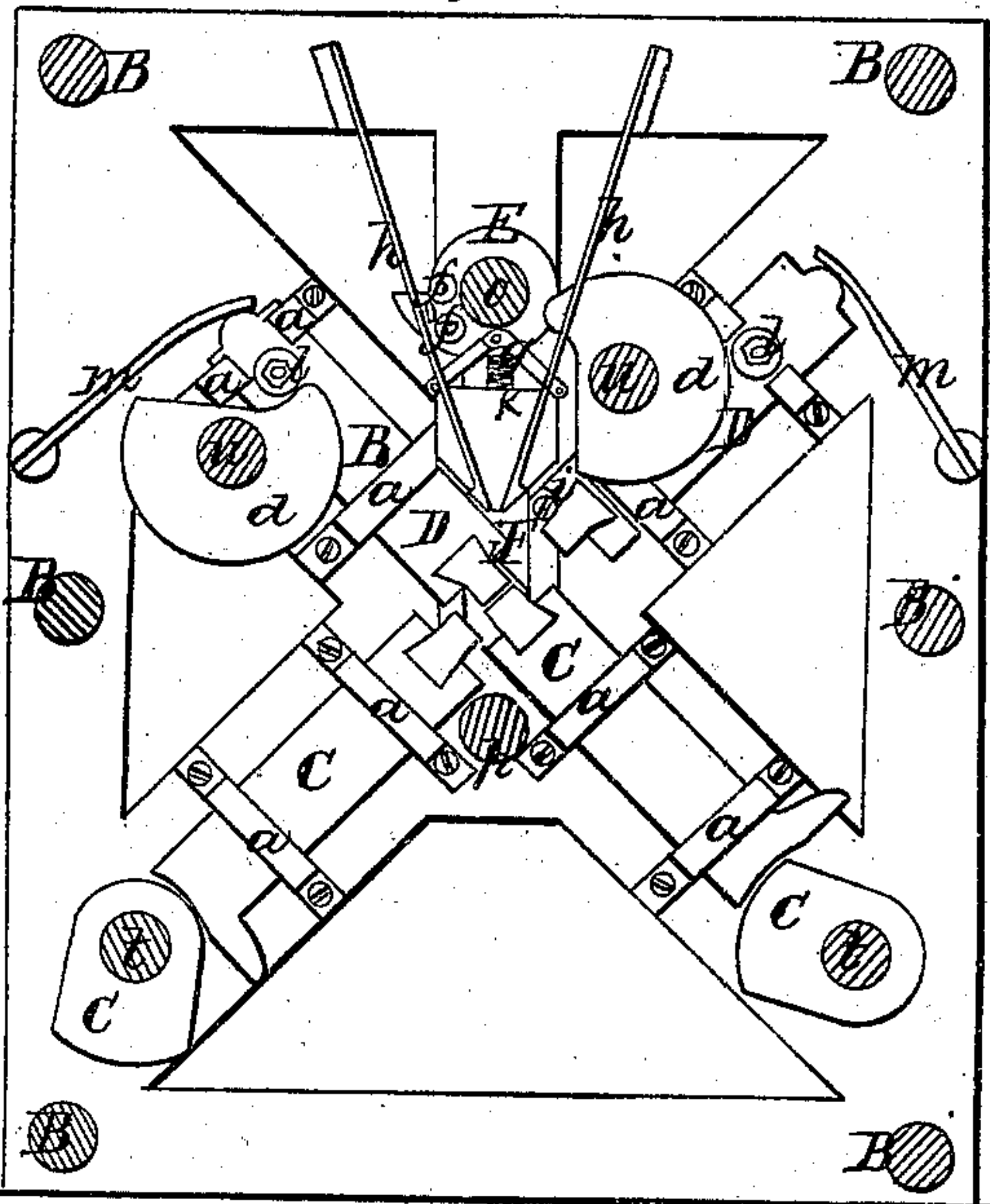
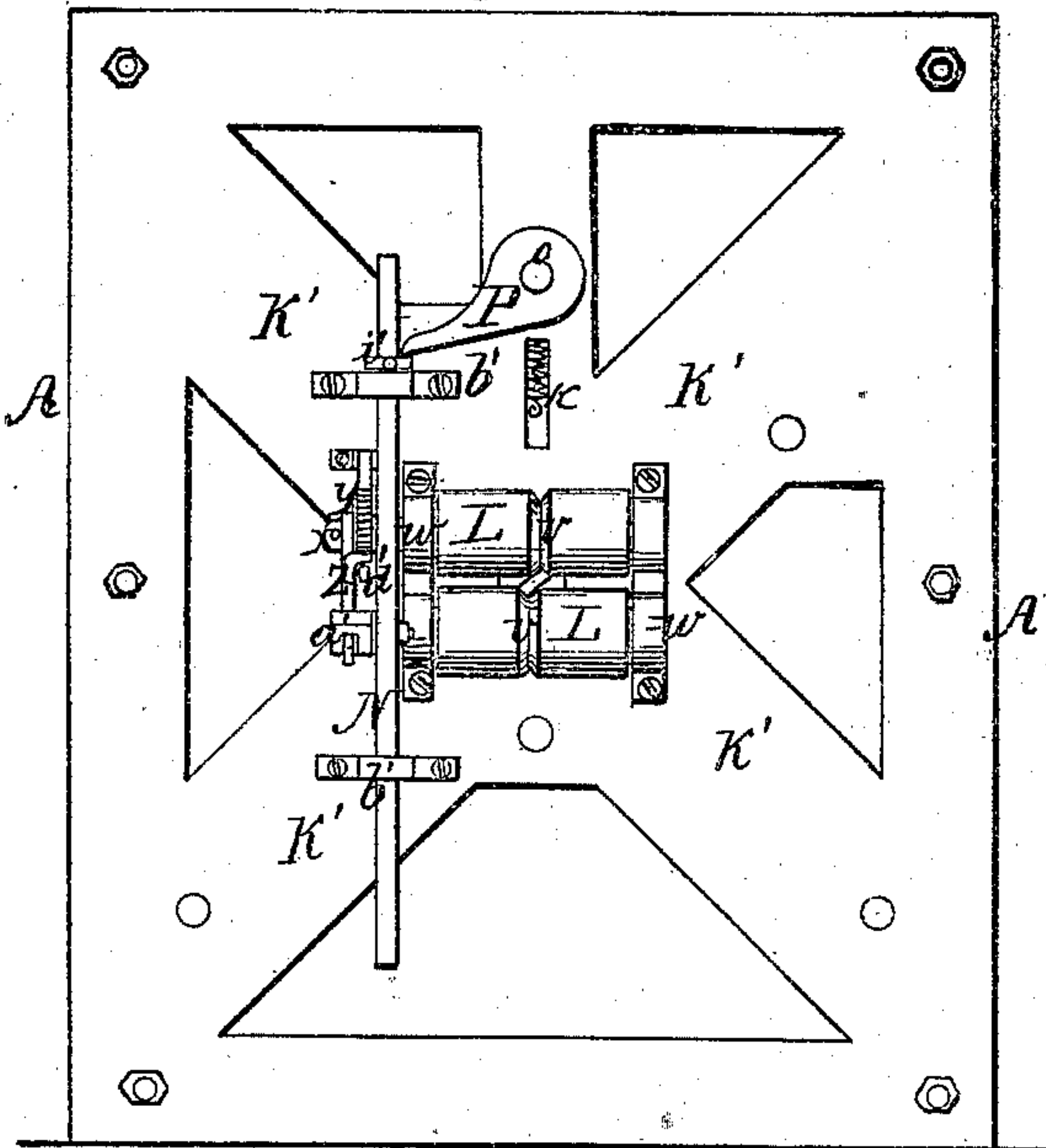
Horse Shoe Nail Match.

No. 88,652.

Fig:1.

Patented Apr. 6, 1869.

Fig: 2.



Witnesses;
Kate A. Jones
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Inventor.
H. W. Mather.
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United States Patent Office.

HENRY W. MATHER, OF DEEP RIVER, CONNECTICUT.

Letters Patent No. 88,652, dated April 6, 1869.

IMPROVED MACHINE FOR FORGING WROUGHT-NAILS.

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, HENRY W. MATHER, of Deep River, in the county of Middlesex, and State of Connecticut, have invented certain new and useful Improvements in Horse-Shoe-Nail Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation, showing the device for feeding the nail-rod into the machine.

Figure 2, a vertical section in the plane of line *x x*, fig. 3.

Figure 3, a side elevation, viewed at right angles to fig. 1.

Figure 4, a fragmentary view, representing parts of the anvils and hammers, and the chisel in position for severing the nail from the rod.

Like letters of reference indicate corresponding parts in all the figures.

My invention consists in the arrangement and operation of the adjustable anvils in relation to the hammers, the said anvils moving up and receding alternately, in right-angled directions, to receive the blows of the corresponding hammers, which operate in direct lines therewith, so as to strike the rod alternately, at different angles, to form the nail.

It also consists in the arrangement of the device for holding the hammers elevated, and depressing the chisel, in combination with the anvil, the two acting as shears to sever the nail from the rod; and, also, in the device for feeding the nail into the machine.

In the drawings—

A A represent the side-frames, connected by the bars, or braces B B.

These frames are composed of perpendicular bars at the sides, and horizontal ones at the top and bottom, which are intersected by intermediate bars *k k*, extending diagonally across the frame, and meeting at right angles in the centre.

The adjustable anvils C C and hammers D D rest in bearings *a a*, on these diagonal portions of the frame, and at right-angular positions, so that the direction of motion of the anvils will be on a direct line with the stroke of the corresponding hammer.

These parts receive motion by means of cams *c c* and *d d*, attached to shafts *t t* and *u u*, which are connected with suitable gearing, as hereinafter explained.

Thus arranged, the anvil moves up against the nail-rod simultaneously with the stroke of the opposing hammer, when both are withdrawn, and those acting in the transverse direction repeat the blow, thus each set alternating the other until a sufficient number of blows has been given to form the nail.

The cams *c d* are of such form as to retain one anvil and hammer in the retired position a sufficient length of time to allow those in the transverse position to act.

The hammers D D have friction-rollers *l l*, which rest on the peripheries of the cam-wheels *d d*, from which they receive motion, and springs *m m*, which give force and momentum to their stroke.

After the nail is formed, the cam E, which is provided with friction-rollers *f f*, compresses the toggle-joint *g*, thereby expanding the springs *h h*, which are provided with hooks, formed at their lower extremities, that catch in notches *i i* of the hammers, and hold them elevated, as shown in fig. 4.

While the hammers are thus held in the elevated positions, the adjustable knife or chisel F, which has a shank, or extension that rests up against the cam E, is forced down against the head of the nail, while, at the same time, one of the anvils C moves up, compressing the nail against the cutter to sever it from the rod.

The chisel is then withdrawn by means of a spiral spring, *k*, and the hammers are released to repeat the operation.

A pinion *n*, to which the crank G, or driving-power is attached, gears with a cog-wheel H, on shaft *p*, and to the side of this cog-wheel is secured a pinion, *q*, that gears with cog-wheel I, on shaft *o*, to which the cam E is secured.

To the shaft *p* is secured a main cog-wheel K, with which gear pinions *r* and *s*, on shafts *t* and *u*, to which the cams *c d*, operating the hammer, are also connected.

The rod from which the nails are formed is fed in between rollers L L, as shown in red lines, having angular grooves *v v*, by which the rod is held in such a position that its sides are on a plane with the face of the anvils.

These rollers have bearings *w w*.

The upper roller has a shaft, or journal-projection, *x*, on which is secured a ratchet, or otherise toothed wheel, *y*, and is provided with an adjustable arm, *z*, which turns loosely thereon, one end of which rests in a bearing, *a'*, of the perpendicular bar N.

This bar has bearings *b b*.

On the opposite end of shaft *o*, from that bearing the cog-wheel I, is attached a cam, P, which makes one revolution in the formation of each nail.

At the completion of each nail, the cam P catches under the shoulder *c'* of bar N, and elevates it sufficiently high that, when it falls back, the spring-pawl *d'* of arm *z*, catching the ratchet-wheel *y*, revolves the rollers L L, and draws the rod into the machine just far enough to form another nail.

The bar N is provided with an adjustable collar and set-screw, *i*, which may be gauged to adapt the fall of the bar to feed the rod a sufficient distance to produce the required length of nail.

The operation of the machine is as follows:

When the nail-rod is inserted into the machine, it is hammered into the proper shape by the uniform action of the corresponding anvils and hammers C D, which strike the nail alternately, in right-angular

directions, a sufficient number of blows to complete the nail. This being done, as the cam-wheel E revolves, the hooked springs *h h* are spread apart, by means of the toggle-joint *g*, so as to catch under the hammers D D, and hold them elevated, while the chisel F is depressed, as shown in fig. 4, and the anvil C moves up, forcing the head of the nail against the cutter, the anvil and chisel coming together in such a manner as to give the nail a shearing-cut, to sever it from the rod. At the same time, the bar N is elevated by cam P, and at the completion of each nail the cam has passed far enough to allow the bar to fall, and thus revolve the feed-rollers, and draw the rod into the machine, when the operation is repeated. The nail-rod is kept hot by a forge, of any suitable construction, placed as nearly as convenient to the feeding-device.

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

The arrangement of the reciprocating anvils C C

and hammers D D with a device for feeding and supporting the nail-rod, substantially as shown and described.

Also, the combination of the cam E, friction-rolls *f f*, toggle *g*, and springs *h h*, with the chisel F, and reciprocating anvil C, whereby the chisel is moved against the rod, and held while the nail is severed by the advancing movement of the anvil, substantially as described.

Also, the falling-bar N, actuated by the cam P, in combination with the pawl-arm *z*, ratchet-wheel *y*, or equivalent, and feed-rollers L L, arranged and operating substantially as and for the purpose set forth.

In witness whereof, I have hereunto signed my name, in the presence of two subscribing witnesses.

HENRY W. MATHER.

Witnesses:

I. A. DAVIS,

KATE N. JONES.