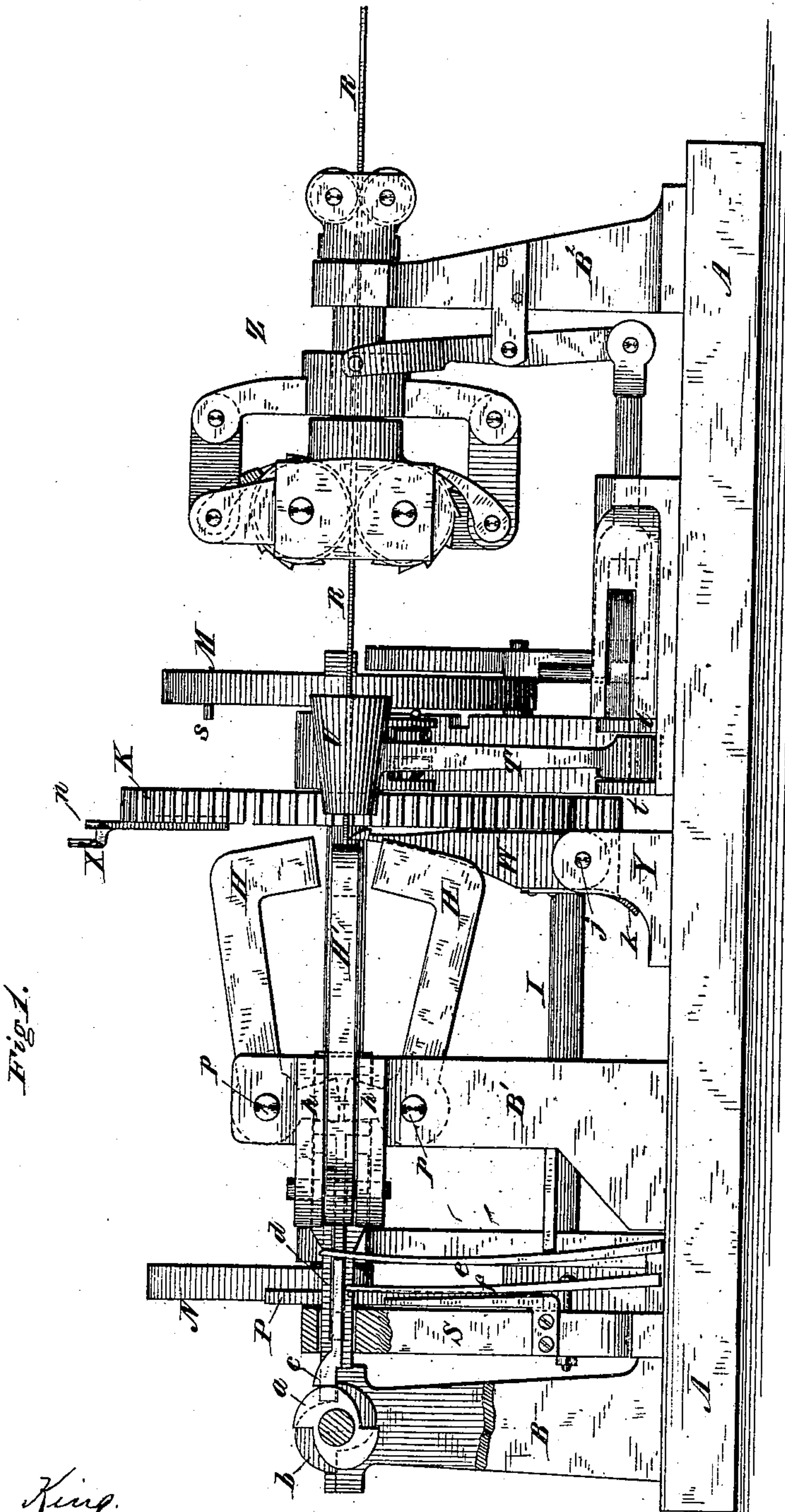


J. ROY.
Horseshoe Nail Machine.

No. 228,220.

Patented June 1, 1880.



Witnesses.

Harry King.
D. P. Cowl

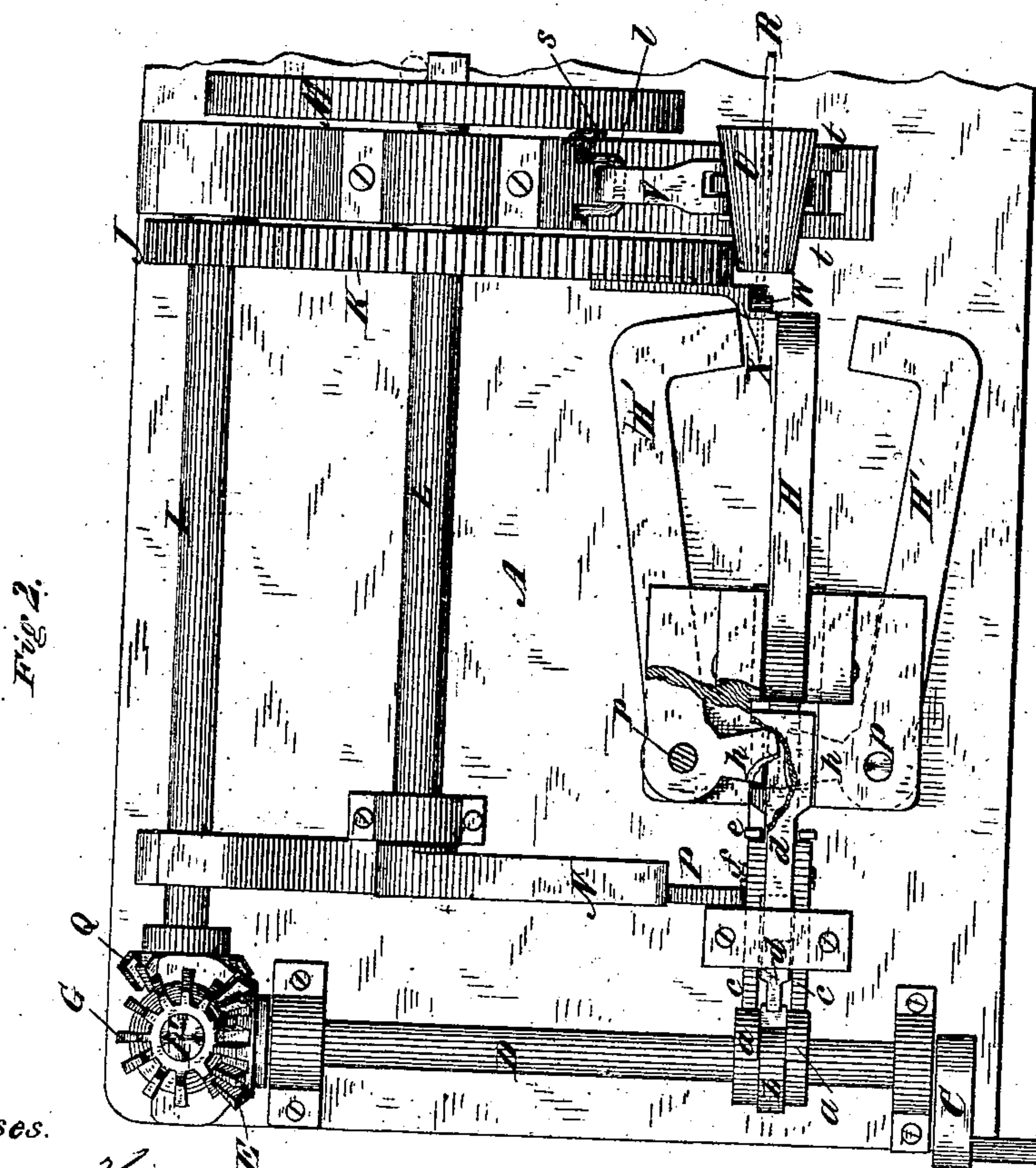
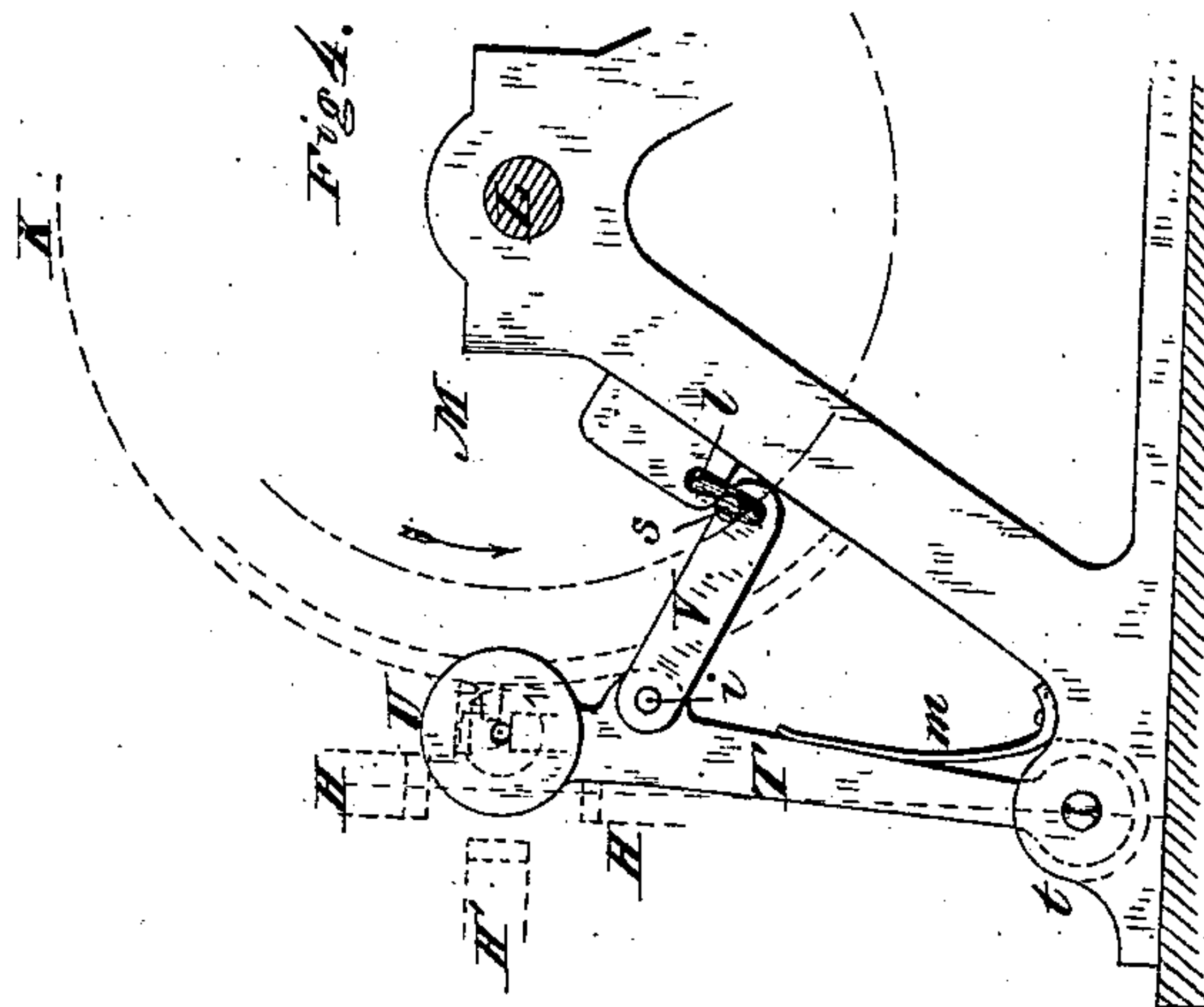
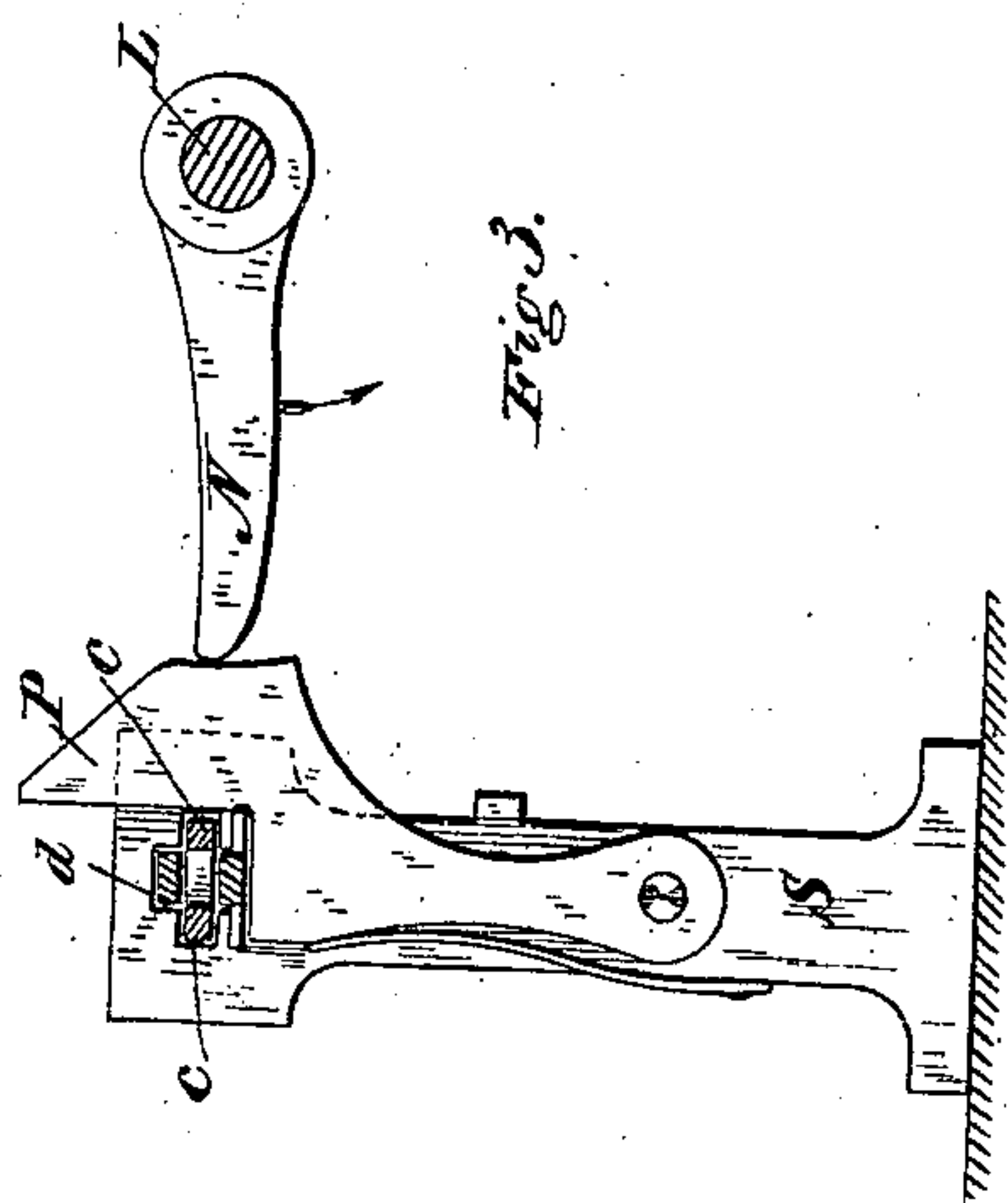
Inventor.

Joseph Roy,
By his Attorneys,
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UNITED STATES PATENT OFFICE.

JOSEPH ROY, OF WILMINGTON, DELAWARE.

HORSESHOE-NAIL MACHINE.

SPECIFICATION forming part of Letters Patent No. 228,220, dated June 1, 1880.

Application filed March 25, 1879.

To all whom it may concern:

Be it known that I, JOSEPH ROY, of Wilmington, in the county of New Castle and State of Delaware, have invented certain new and useful Improvements in Horseshoe-Nail Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation of the machine, partly in section. Fig. 2 is a top view or plan. Fig. 3 is an end view of the device for arresting the movement of the lateral hammers. Fig. 4 is an end view of the device for giving a lateral movement to the fire-box.

The same part is indicated by the same letters of reference in the figures in which it occurs.

These improvements relate to the series of inventions for making horseshoe-nails described in my Patents No. 169,044, dated October 19, 1875, Reissue No. 6,776, November 30, 1875, and No. 195,653, dated September 25, 1877.

The improvement consists in novel devices for operating the hammers, for arresting the movement of the side hammers, and for severing the finished nail from the rod at a point within the plane of the ends of the hammer-heads, all as hereinafter more particularly set forth.

These devices hold the lateral hammers apart while the lower cutter is drawn in between them and inside of the plane formed by the ends of the hammer-heads, draw the fire-box aside to the position to bring the nail-rod over the lower cutter at the proper moment to be severed, and bring the lower cutter at the same moment into position to co-operate with the revolving cutter in the severance of the rod.

The mode of feeding the nail-rod to the fire-box and the forging-hammers and of shaping it by the action of said hammers does not differ in any material respect from that described and shown in Patent No. 195,653. The fire-

box is also of the same description as that therein shown.

In the drawings, A marks the bed-plate of the machine, and B B' B² uprights, which support the principal operative parts. The crank C indicates the point of application of the driving power at the end of the main shaft D. On the opposite end of shaft D is a bevel-gear, E, which meshes into a similar gear, G, on the upper end of vertical shaft F. On the lower end of this shaft is a bevel-gear meshing into a similar gear, Q, on the end of horizontal shaft I. The forward end of shaft I carries a pinion, J, meshing into a reversing-pinion, which engages with the teeth of large gear K on shaft L. The gear K carries the revolving cutter X, which co-operates with the lower cutter in severing the finished nail from the rod.

On the forward end of shaft L is wheel M, which is provided with a stud, s, which operates the device for moving the fire-box, as hereinafter described.

The forging of the nail is done by four hammers, two of which, H H, are vertical, and two, H' H', horizontal. These hammers are pivoted at p p p p to the upright B', and are formed with heels h, which enter slots in the spring-slides c and d, by which the vertical and horizontal pairs of hammers are respectively operated. The slides are thrown backward to produce the blow by means of the springs e f, and are driven forward to cause the divergence of the hammers by means of the cams a a b on shaft D. The outer cams, a a, operate slide c, which controls the pair of vertical hammers. The middle cam, b, operates slide d, controlling the horizontal hammers. They operate to produce the vertical and horizontal blows alternately.

R marks the nail-rod, which is fed to the fire-box U in proper lengths by the mechanism shown at Z, Fig. 1, the construction and operation of which are the same as those of the mechanism for the same purpose shown and described in my Patent No. 195,653, September 25, 1877. This mechanism is not claimed in this application, forms no part of the present improvement, and need not be particularly described.

The fire-box U is the same in construction and operation as the gas-furnace described in the last-cited patent. It is mounted on a vibrating arm, T, pivoted at its lower end to the lugs *t t* of a bracket attached to the bed-plate of the machine.

To the arm T is pivoted a link, V, attached at the other end to the frame by a metallic loop, *l*, having an arm projecting laterally, (see Fig. 2,) so as to be tripped by the stud *s* projecting from the side of wheel M. When stud *s* engages the arm of loop *l* the link V is drawn down and to one side, and the center of fire-box U is drawn out of the plane of movement of the vertical hammers H H'. (See Fig. 4.) When in that position the nail-rod R is directly over the upright cutter W. This cutter (see Fig. 1) is attached by a pivot, *j*, to a bracket, Y, so as to have motion toward the hammers. It is held upright by the spring *k*. Its upper end has the form of a curved lip, which at each revolution of wheel K is encountered by the projection *n* on the inside of revolving cutter X and moved toward the hammers and within the plane of their ends. At the moment when this movement of the cutter W takes place the fire-box U is moved laterally, so as to bring the nail-rod over the upright cutter, and the severing of the finished nail from the rod takes place. During this operation the lateral hammers are held apart by the operation of arm N on the rear end of shaft L, which forces the vibrating stop P (see Fig. 3) into position to engage and hold the slide *d*, so that the spring *f* cannot cause the lateral hammers to fly together and give a blow until the cutter W, having severed the rod, is released and thrown back to its original position out of the path of the hammers by the operation of spring *k*. When the cutter is released the arm N releases the stop P and the hammers operate as before.

The operation of the machine is as follows: The nail-rod is fed forward by the feed mechanism Z through the fire-box U till a sufficient length to form a nail is subjected to the ac-

tion of the hammers. When the forging is completed the lateral hammers are arrested, the rod is thrown to one side of the plane of operation of the vertical hammers, the lower cutter is brought within the plane of the hammer-heads, and the finished nail is severed from the rod by the joint action of cutters W and X. The further revolution of cutter X releases cutter W, which returns to its original position. The fire box is at the same time released, and resumes the proper position to bring the nail-rod under the action of the hammers. The lateral hammers are also released at the same instant, and resume their proper function of co-operating with the vertical hammers in forging the nail.

What I claim is—

1. The cutter W, pivoted as described, in combination with the cutter X, attached to gear K, and provided with the projection *n*, all constructed and arranged relatively to the hammers and fire-box in the manner and for the purpose specified.
2. The vibrating arm T, carrying the fire-box U on its upper end, in combination with the link V, loop *l*, and stud *s* on wheel M, all constructed, arranged, and operating as and for the purpose set forth.
3. The combination, with the hammers H H', having the heels *h*, of the slotted slides *c d*, springs *e f*, and cams *a b* on shaft D, all constructed, arranged, and operating as and for the purpose described.
4. In combination with the slide *d*, operating the lateral hammers H', the vibrating stop P and revolving arm N on shaft L, all constructed, arranged, and operating as and for the purpose stated.

In testimony that I claim the foregoing as my own invention I affix hereto my signature in presence of two witnesses.

JOSEPH ROY.

Witnesses:

EGIDE ROY,
DAVID T. BUNKER.