

J. H. Swett. Spike Machine.

2. Sheets.
Sheet. 1.

No 1209-
32213

Patented April 30. 1861.

Fig. 1.

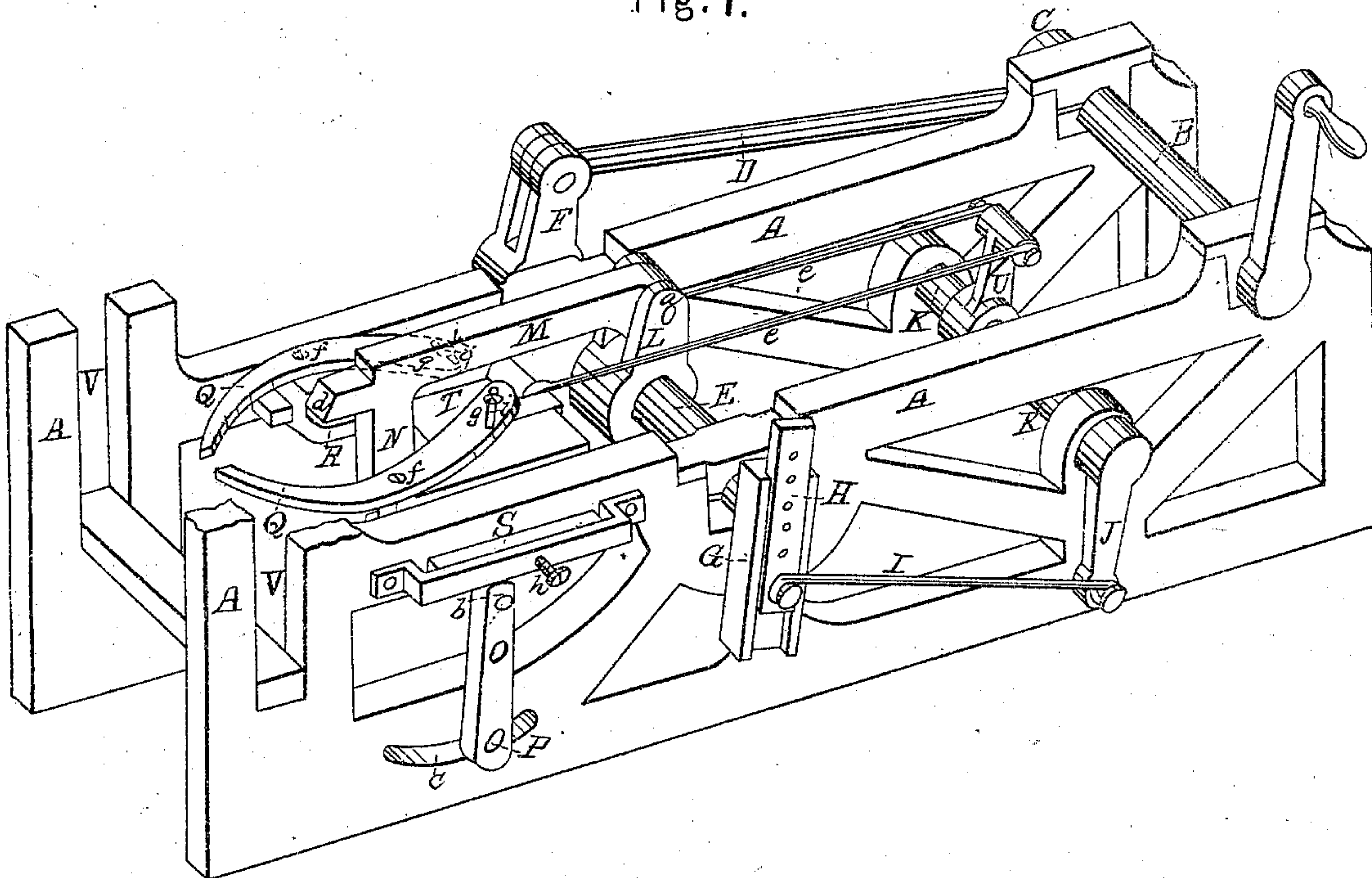
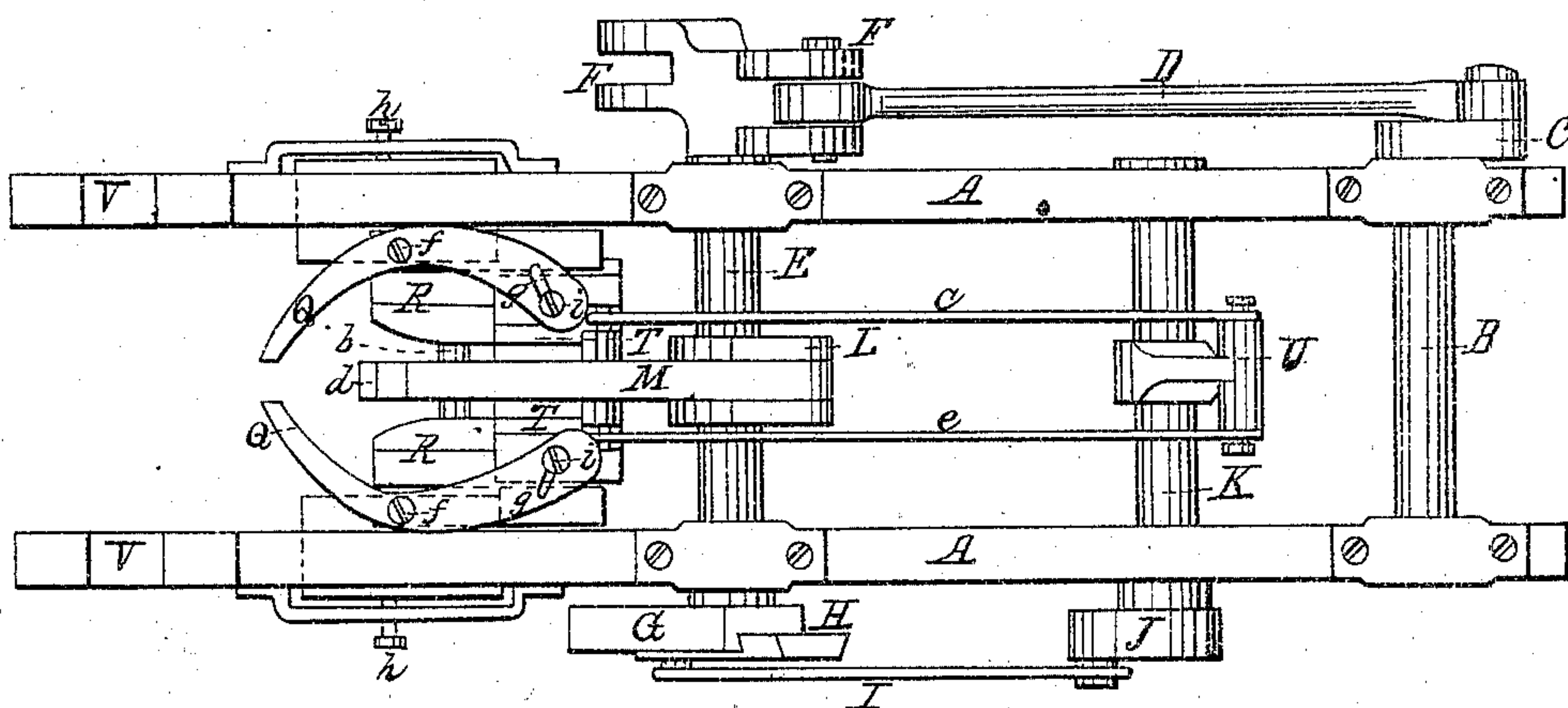


Fig. 2.



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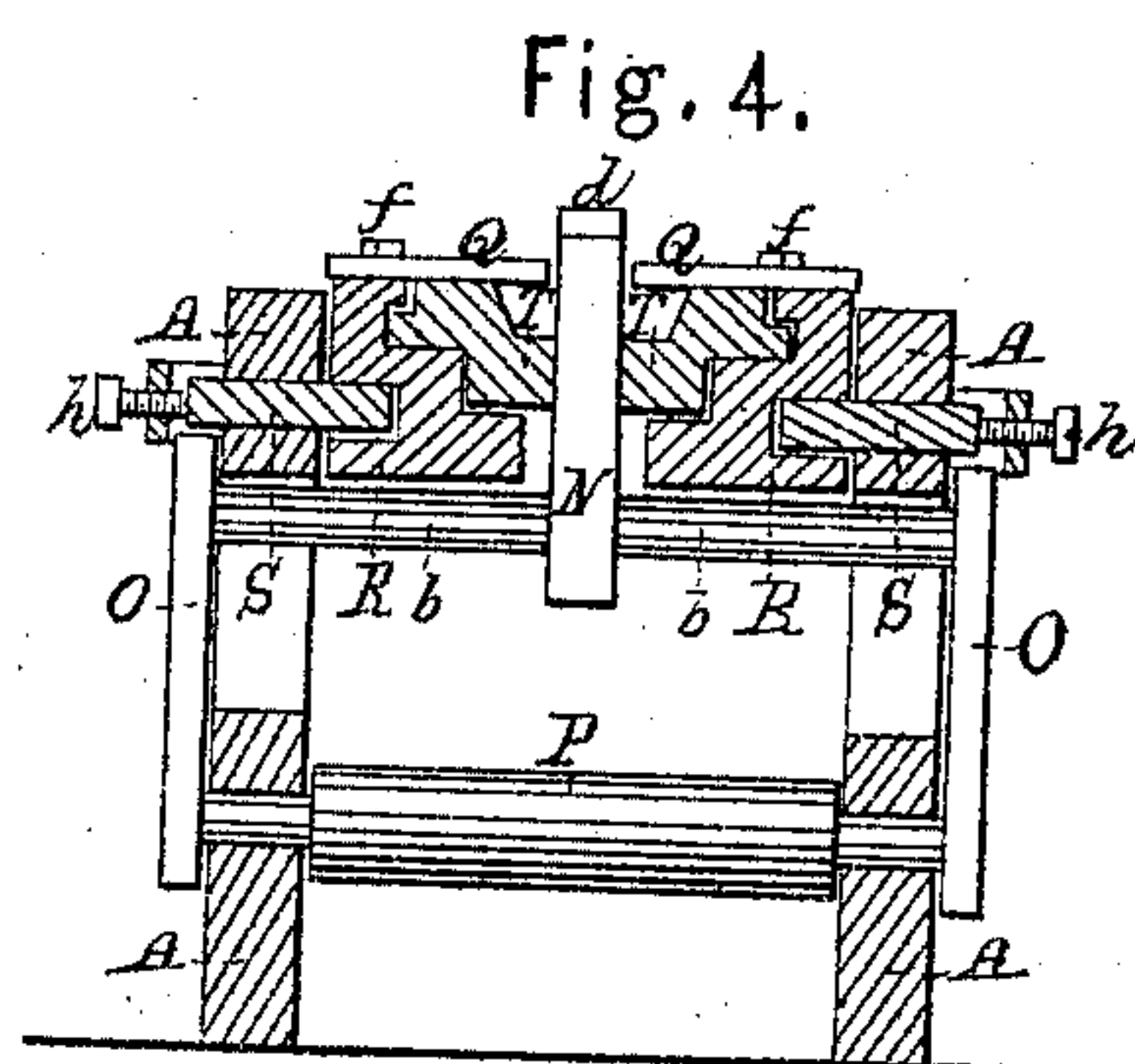
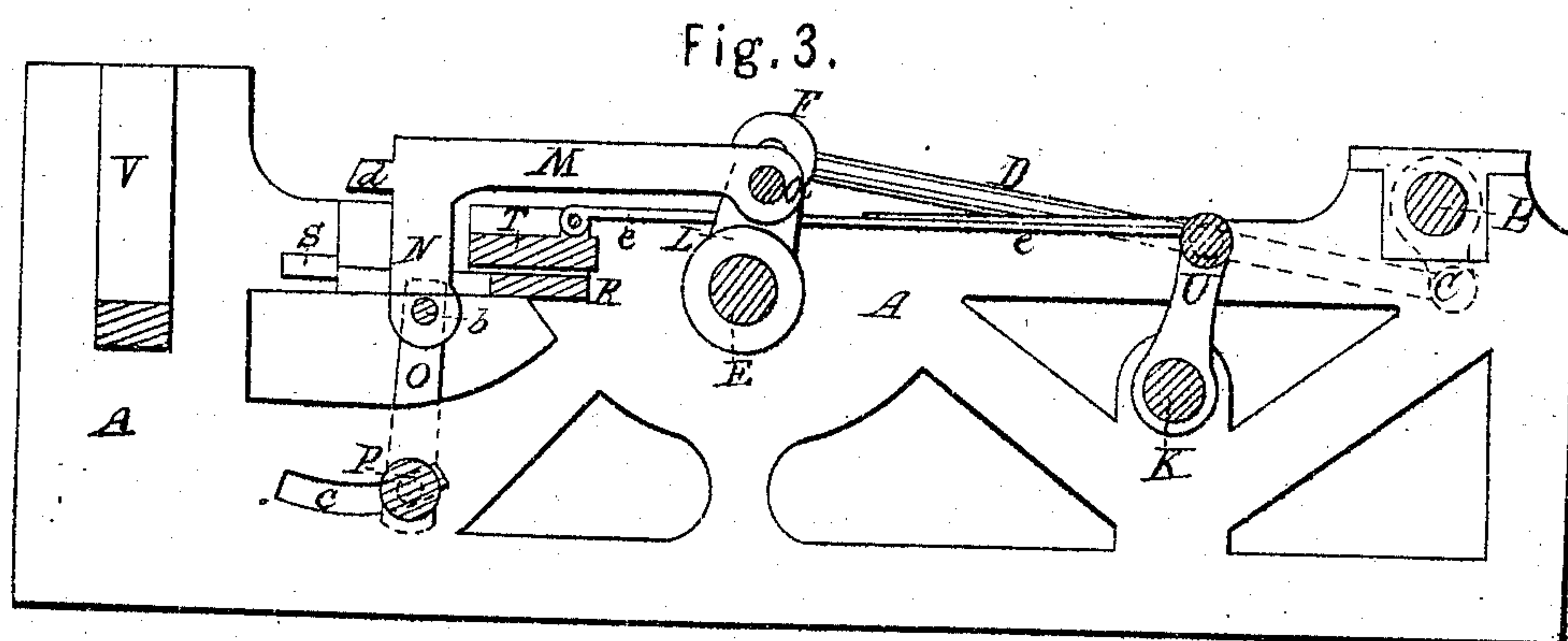
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UNITED STATES PATENT OFFICE.

JAMES H. SWETT, OF PITTSBURG, PENNSYLVANIA.

SPIKE-MACHINE.

Specification of Letters Patent No. 32,213, dated April 30, 1861.

To all whom it may concern:

Be it known that I, JAMES H. SWETT, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain
5 new and useful Improvements in Spike-Machines; and I do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a perspective view of the machine omitting the pointing rolls and gripping jaws or lever which may be the
15 same as those shown on the machines heretofore patented to me, or of other construction. Fig. 2 represents a top plan. Fig. 3 represents a longitudinal vertical section through the machine as shown in Figs. 1, 2. Fig. 4
20 represents a vertical cross section through the machine in rear of the heading tool.

Similar letters of reference where they occur in the several figures, denote like parts of the machine in all the drawings.

25 The nature of my improvements in spike machines consists in the following points, and for the purpose and objects hereinafter stated, viz: First, so arranging the arms, that carry the heading tool forward and
30 back, on the outside of the main frame, as that they shall have the support of said main frame to resist the lateral or wabbling motion of said heading tool, and thus enable the header to make uniformly shaped
35 heads, and true, on the shank of the spike. Second, in hanging the journals or supports of the arms that carry or operate the header, in curved slots, for the purpose of changing the inclination of the header. Third, in
40 making the ways upon which the nipper slide works adjustable, for the purpose of causing the nippers to grip more or less hard upon the blank for drawing forward more or less of the blank, or to separate it
45 entirely from the rod, in case the pointing dies fail to separate it. Fourth, in an adjustable arm, for giving the nippers more or less advancing motion, so as to draw out
50 from the rolls or dies, more or less of the blank or spike rod to form the head, as may be required by the heat on the rod or blank or by the working of the machine.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.
55

The adjustments of a spike machine in order to adapt its parts at all times, to the heat of the blanks or spike rod, should be so arranged as that they may be changed
60 while the machine is in motion. The hotter the rod or blank, the less metal it requires to form the head, and as the furnace, as well as the rod is constantly varying in the density of its heat, no permanent adjustment
65 will answer for any length of time; and many spikes, or much time is lost, in consequence of not being able to regulate the machine to the condition of the heat of the spike rod. The nippers at times draw
70 out too much, and again too little metal to just form the head, and either spoils the spike. When the spike rod is highly heated, the head is of course more easily formed or upset, and in this condition the nippers
75 need not seize the blank so hard or draw forward so much of it. When the rod becomes cooler, the power required to upset and form the head is greater, and the nippers
80 should then grip the blank with more force and draw it out farther. The same condition of heat, affects in the same way the header, it should be adjusted, just to suit the particular heat of the rod or blank,
85 and the operator stands by to adapt each part, or the whole, to the condition of the heat of rod or spike blank, without stopping the machine. If the machine were stopped to adjust it to the then condition of the
90 spike rod or blank, by the time it was started again that condition would be changed, and hence the adjustment would not suit.

The immense number of misshapen spikes that come from machines as heretofore constructed, notwithstanding the greatest care,
95 and the nicest adjustments, have led me to the reorganization of the whole machine as herein set forth. Sufficient firmness and rigidity to the heading tool, is necessary too, to perfect spike making. If by wear of
100 parts, or vibration of the metal, the header has the least lateral motion the head will be formed to one side or the other of the shank, and however slight it may be, it is easily discernible when the spike is driven, as it
105 will turn in driving and is thus objectionable. Having discovered these difficulties in spike machines as heretofore constructed, by actual experience, for several years, I have devised the remedies herein stated as constituting the nature and object of my invention.
110 A, A, represents the frame of the machine

substantially built of iron. B, is a shaft suitably supported on said frame, to which motion is communicated from the engine or other power, and from which motion is transmitted to all the other moving parts of the machine. From a crank C, on one end of the shaft B, extends a pitman, D, which is connected by its other end with a crank or cross head F, on the end of a shaft, E, so as to impart a rocking motion to said shaft, E, and on the opposite end of the rock shaft, E, from the crank or cross head, F, there is fastened an arm, G, in, on, or against which a second arm, H, is made to slide or be adjusted by means of a hand wheel, screw, or any other well known device which can be operated while said arm is in motion, to lengthen or shorten said arm with regard to the center of the shaft on which it is placed. To this sliding arm, H, is connected one end of a rod or pitman, I, the other end being connected to the wrist pin of the crank, J, fastened on the end of a shaft, K, through which connection a rocking motion is also given to said shaft, K, and this motion can be varied in extent by lengthening or shortening the sliding arm, H, on the crank arm, G.

On the central part of the shaft E, is secured a hub and arm, L, to which latter the rear end of the heading lever or bar M, is pivoted as at *a*, and by which said lever receives its forward and receding motion. At the front of the heading lever or bar, M, an arm, N, extends downward, through which a shaft, *b*, passes, said shaft extending through to the outsides of the side pieces of the frame, A, where they are united to two arms, O, O, that rise up from a shaft, P, whose journals rest, rock, and are supported and adjusted, in the curved slots *c, c*, in the frame. The arm, N, is keyed or otherwise fastened to the shaft, *b*, and the upper ends of the arms O, O, move against the side pieces, A, so that the point of the heading lever, M, can have no lateral motion, but must work in the line in which it is set or adjusted. The object of hanging the shaft, P, in the curved slots, *c, c*, is to give the heading lever, more or less inclination, which also inclines the head of the spike to one side, as for hook heated spikes, or allows it to move in a horizontal plane to make boat or other spikes.

d, is the heading tool, it may be of the form shown, or of any other form to suit the form of head desired—the present header being designed for hook headed spikes.

Q, Q, are the nipper jaws which seize and bring forward the blanks and deposit them in the gripping dies which rigidly hold the blank, while the header advances to form the head; the nipper jaws are hung and operated as follows: R, is a nipper slide, hav-

ing grooves cut in its edges, or recesses, so as to catch and move on the ways or guides, S, S, one on each side of the frame. Upon this nipper slide, R, is arranged a second slide, T, which has also suitable ways or guides to move on, on the first named slide, and this second slide T is connected by the rods *e, e* to an arm, U, on the rock shaft K which gives motion to both slides. Now the nipper jaws Q, Q, are pivoted to the slide R, at *f*, and their rear ends have cam slots, *g*, in them through which studs or pins, *i*, pass into the second slide T—thus the first slide, R, traverses the nippers, causing them to seize the blank, draw it forward far enough from the rolls to drop it into gripping dies where it is firmly held while the header, *d*, comes up to form the head upon it—the opening and closing of the nippers being done by the slots, *g*, and studs or pins, *i*, and the relative motions of the two slides; though both slides are operated from the same rock shaft K through its arm U, as follows: The slide, T, is connected to the arm, U, by means of the rods, *e, e*, and thus receives its traverse movement, and the slide, R, is connected to the slide, T, by means of the nippers, Q, Q, through the oblique slots, *g*, and studs or pins, *i*, this gives to the slide, T, a greater range of motion than it in turn gives to the slide, R, because the latter (R) remains stationary while the pins, *i* in the slide, T, are traversing through the slots, *g*. But after the studs or pins reach the ends of the slots, then the two slides move together. And this loss of motion of one, and gain of motion of the other takes place at the beginning and end of each traverse. The object of this difference in range of motion of the two slides is that, the nippers may reach forward to seize the blank, and bring it into the gripping dies where the header heads it.

In order that the slide, R, may not move by the weight or friction of the slide, T, lying upon it, the ways, S, S, (see Fig. 4) upon which the slide, R, moves, are made adjustable by means of set screws, *h, h*, so as to hold it just tight enough on its ways, to allow the slide, T, to move on without moving it, until the studs, *i*, have traversed their slots, *g*, and then for both to move together. The nippers may be changed for others at any time when desired by detaching the screws which connect them with the slides.

It will be seen by reference to Fig. 2, that there are two arms, F, F. One imparts a rocking motion to the shaft, E, and the other is designed for another connecting rod, to operate the pointing dies, and heading dies which may be arranged in the slots, V, V, as in a patent heretofore granted to me—said pointing and gripping dies not being shown in this drawing. The grippers rigidly hold the blank while being headed

after the nippers have brought it up to, and dropped it into the heading die. The tightening of the slide, R, on its ways, S, also causes the nippers to close more tightly on the blank. The screws that tighten the slide against the nipper frame are intended also to create friction enough to separate the blank from the rod in case the pointing dies fail to so separate it. I have said that the quantity of metal required to form the head depends upon the heat of the rod. It may however be partially due to the spring or yield of the machinery, as there is more resistance on the cooler than on the less cool condition of the spike rod. The spike when headed may be raised up slightly in the die by a rod or pusher, and the succeeding blank pushes or throws it entirely out.

Having thus fully described the nature and object of my invention what I claim therein as new and desire to secure by Letters Patent is,

1. Supporting the header against lateral vibration, by means of the shaft b, and arms O, O, the latter moving against the

outside of the frame substantially as described.

2. Hanging the journals of the rock shaft P, to which the header is connected in curved slots, for the purpose of changing the inclination of the header, to correspondingly change the position of the head upon the finished spike, substantially as described.

3. The adjustable ways, S, S, for the purpose of so clamping the slide, R, as that it shall not move by the weight or friction of the second slide, T, until forced to move with it, substantially as and for the purpose described.

4. The adjustable slide H, in the arm G, for the purpose of varying the motion of the nippers in relation to the motion of the header, and to draw out more or less of the blank, as the condition of the heated bar may require, as set forth.

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Witnesses:

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