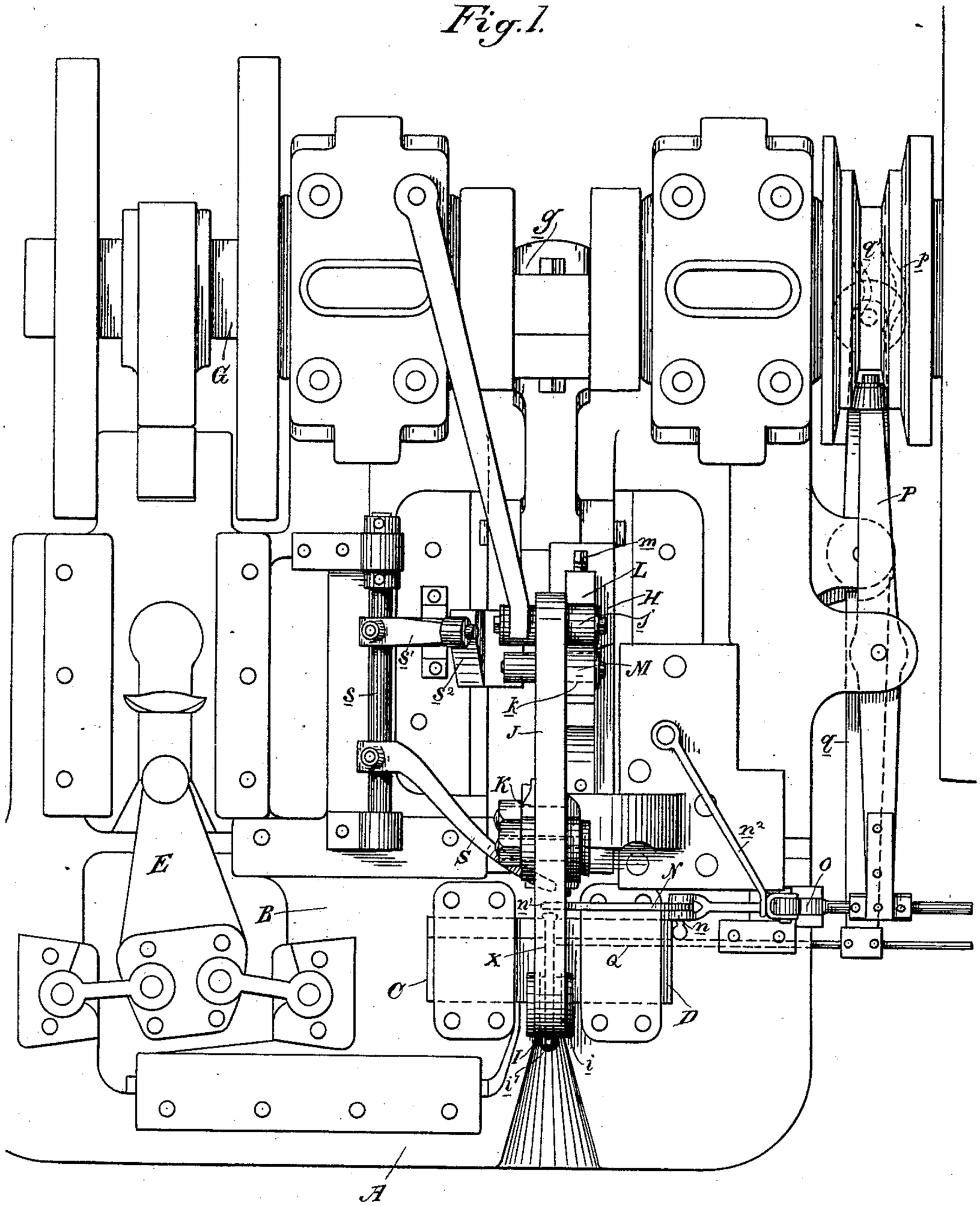
(No Model.) 3 Sheets—Sheet 1.

S. UREN.

SPIKE MAKING MECHANISM.

No. 428,733. Patented May 27, 1890.

Fig. 1.



Witnesses,
Geo. H. Strong.
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(No Model.) 3 Sheets—Sheet 2.

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SPIKE MAKING MECHANISM.

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Fig. 2.

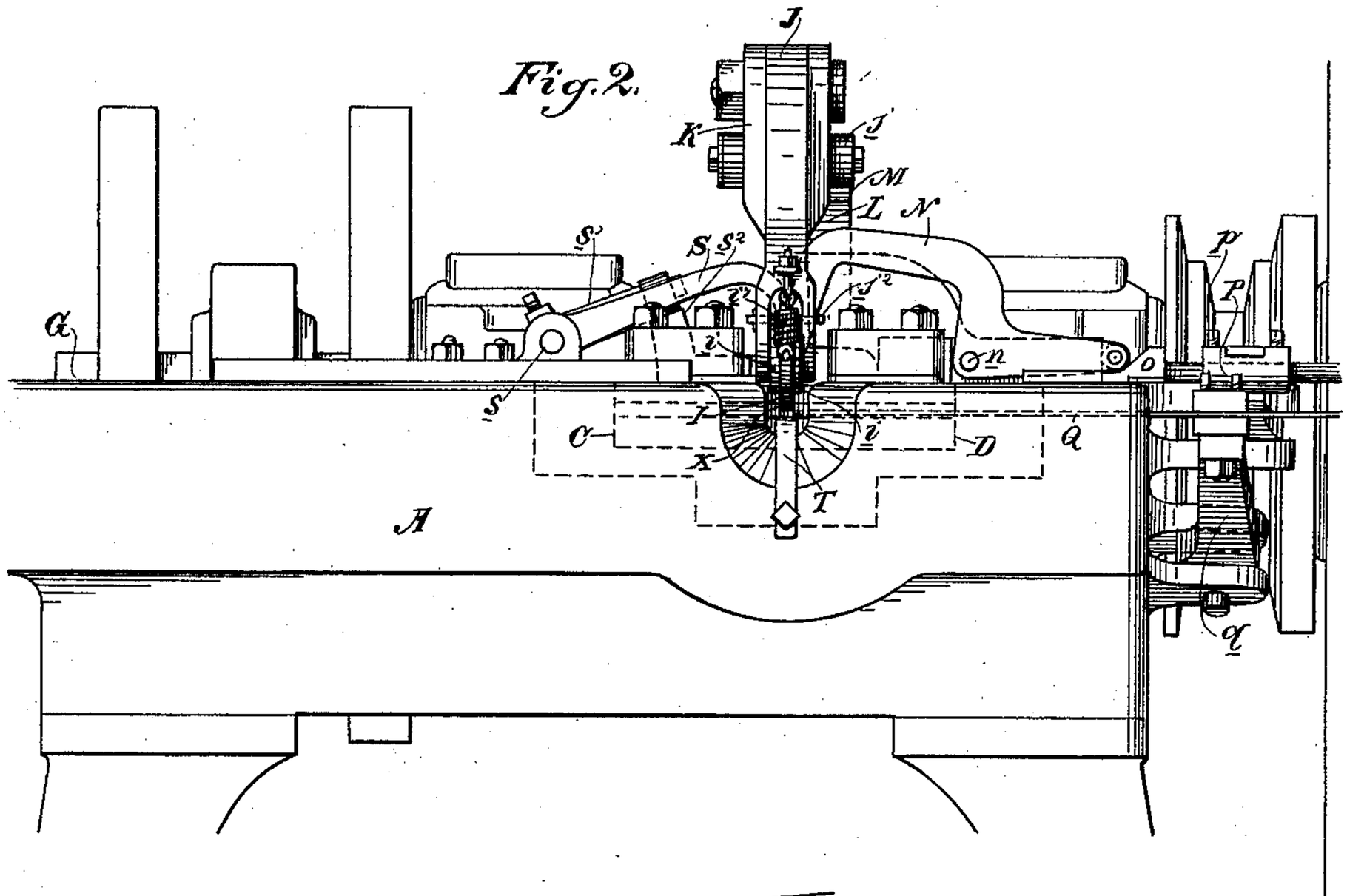


Fig. 3.

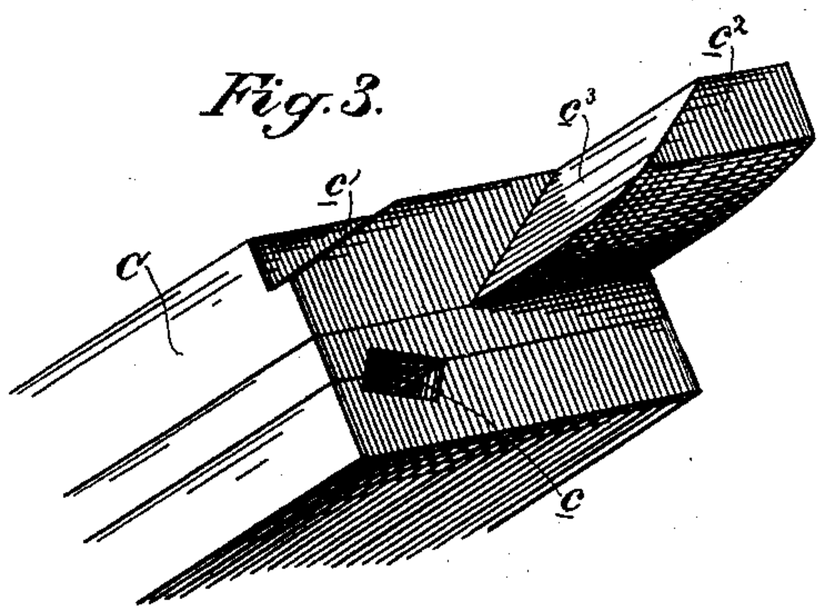


Fig. 4.

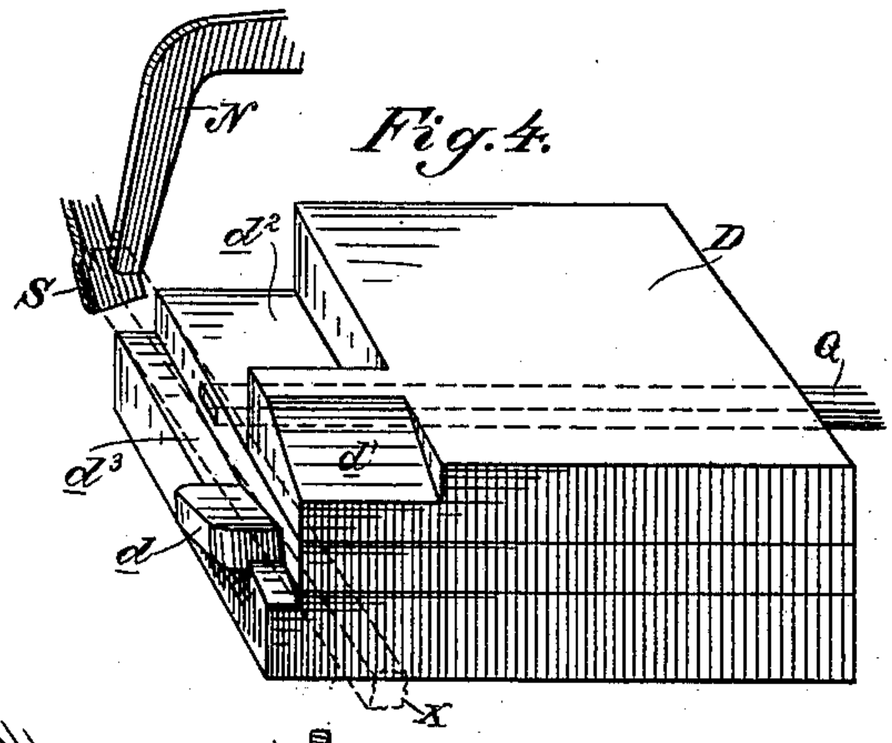
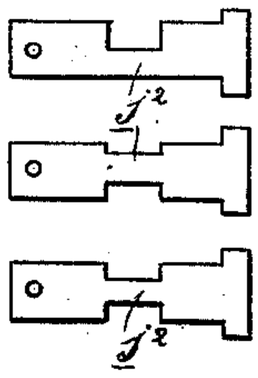


Fig. 5.



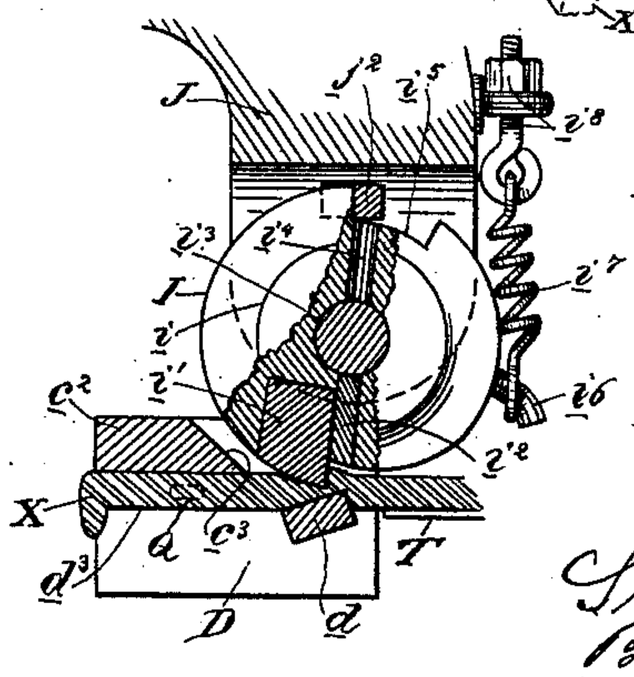


Fig. 6.

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(No Model.) 3 Sheets—Sheet 3.

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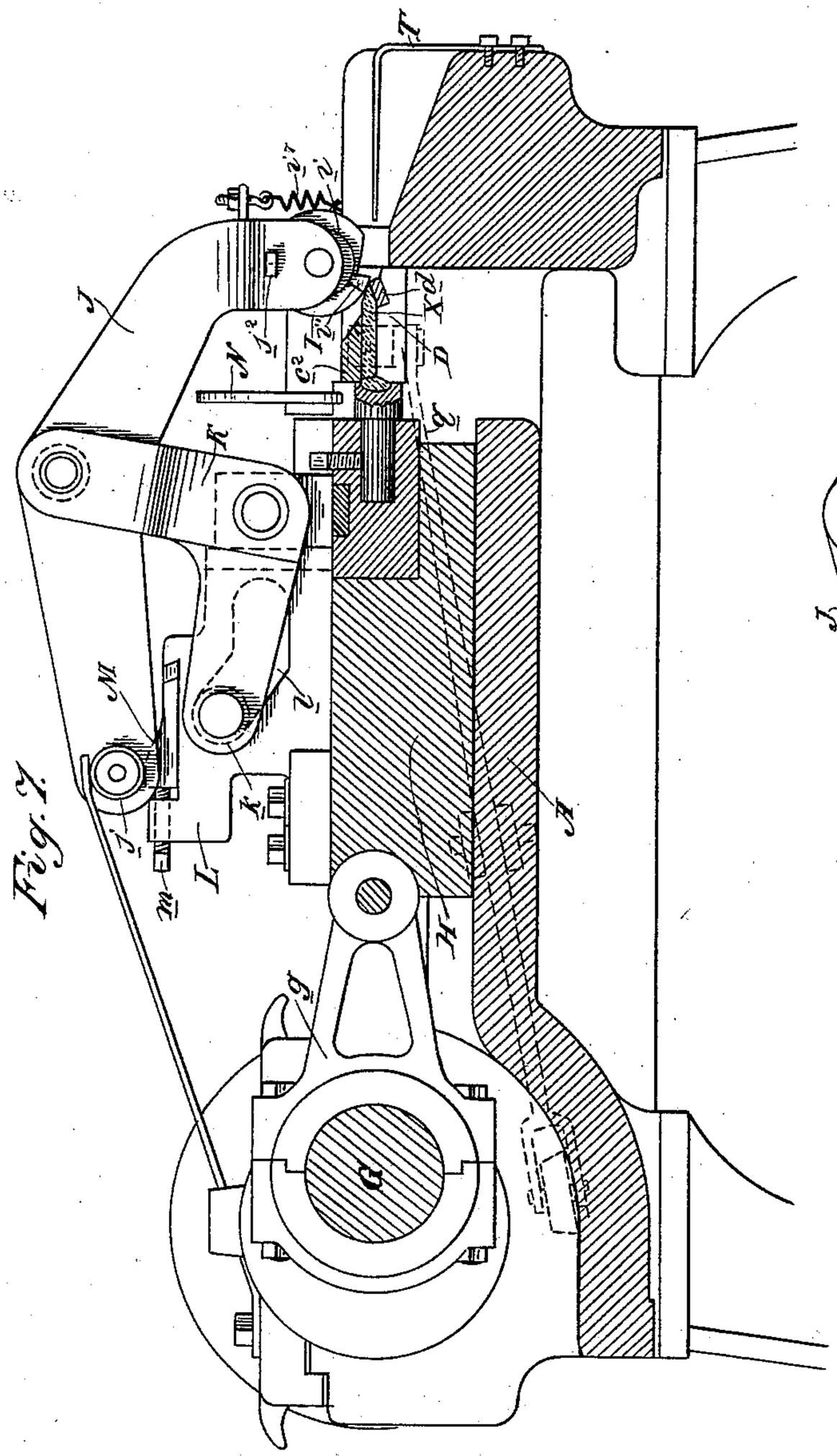

Fig. 7.

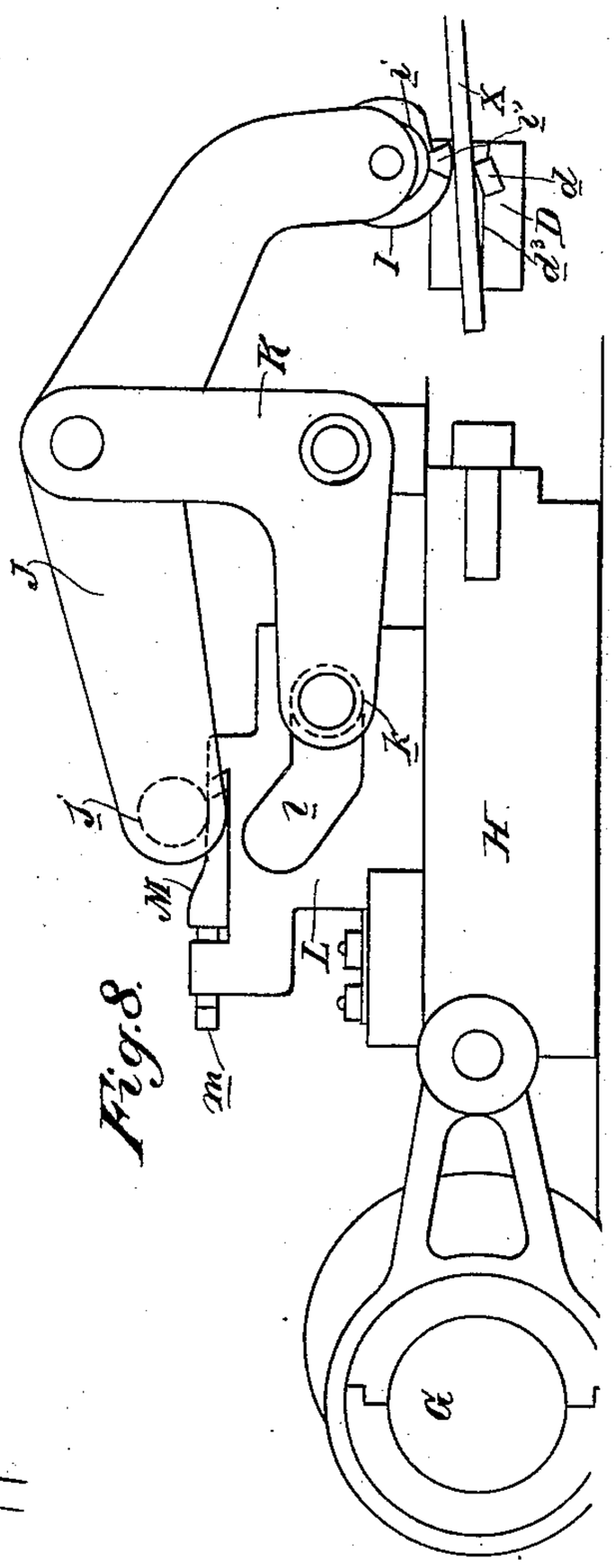

Fig. 8.

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UNITED STATES PATENT OFFICE.

STEPHEN UREN, OF SACRAMENTO, CALIFORNIA.

SPIKE-MAKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 428,733, dated May 27, 1890.

Application filed March 3, 1890. Serial No. 342,449. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN UREN, a citizen of the United States, residing at Sacramento, Sacramento county, State of California, have invented an Improvement in Spike-Making Attachments for Bolt-Heading Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of spike-making machinery, and especially to that form in which the bar is clamped sidewise, resting upon a suitable die, and its tapering point is made by the action of a small wheel or roller which bears down upon it.

My invention is properly an attachment to a bolt-heading machine, as I have adapted it to be readily applied to such a machine, using the power-transmitting devices and operative parts, such as the frame and plunger and gage of said machine, to effect similar operations in connection with the operations of the spike-making attachment.

My invention consists in the novel constructions, combinations, and arrangements hereinafter fully described, and specifically pointed out in the claims.

The subject of spike-making has lately received more consideration, and attention has been directed more particularly to making a proper tapering point which will adapt the spike to enter the wood and hold better without breaking the fiber—a point which is of greater importance than formerly by reason of the use of softer wood for ties as material becomes scarcer.

The main object of my invention is to form a perfect point to the spike, thus insuring its best use and results.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a plan of my machine. Fig. 2 is a front elevation. Figs. 3 and 4 are perspective views of the jaws C and D. Fig. 5 shows the interchangeable stop-pins j^2. Fig. 6 is a view of the roller, showing its operation. Fig. 7 is a side elevation of the roller-operating mechanism, showing it at the completion of its movement. Fig. 8 is a view showing the mechanism at the beginning of its movement.

In order to understand my attachment, I will first describe briefly and in a general manner those parts of a well-known form of bolt-heading machine which will be sufficient to illustrate the application and use of my attachment.

A is the frame of the machine, having at one end the sliding carriage B, to which is clamped the movable jaw C, opposing which and fixed to the frame is the stationary jaw D. The carriage B is made to move back and forth by means of suitable mechanism (designated by E) operated by power from the shaft G.

H is the plunger which upsets the end of the bar as it is held between the jaws, said plunger being reciprocated by a crank g of the power-shaft G in the usual manner. The operation of these parts is obvious. The bar from which the bolt is to be made is fed in between the jaws and is clamped by them, and while so clamped the plunger advances and forms the head.

Although I have here spoken of the jaws C and D as being the ordinary jaws of a bolt-heading machine, I construct them in detail differently when I use the machine for a spike-making machine—that is to say, I remove the ordinary jaws of the bolt-heading machine and substitute therefor the properly-constructed jaws for the spike-making attachment, said jaws having, however, as far as the clamping effect is concerned, the same function as the jaws of the bolt-heading machine, but having a further function for their special purpose. Both jaws are formed in detachable sections for convenience. The movable jaw C has in its lower portion near one side a socket c and in its upper inner edge an inclined plane c'. It has also at its upper outer edge a projecting presser c^2, the under surface of which is slightly beveled or inclined, and its upper inner edge is inclined, as at c^3. The stationary jaw D is provided at its lower inner side with a die d in the shape of a long bar, which is fitted in a socket in the jaw and is adapted to be adjusted longitudinally therein. This die is set at an inclination, as shown, and is projected from the end of the jaw D, so that its end may readily enter the socket c of the opposing jaw C. The upper inner surface of the jaw D has an inclined plane d', corresponding to the inclined plane c' of jaw C, and said jaw D has a cut-out or recessed por-

tion d^2, which receives the projecting presser c^2 of the jaw C. Along the entire adjacent end of the jaw D is formed a plane-surfaced bed d^3, which is intersected at its inner portion by the die d at an angle, as shown. To avoid confusion I will at this point explain the operation of these two jaws upon the bar. The bar from which the spike X is to be made is introduced between the jaws when they are separated. It is passed in over the inclined die d and rests its inner end upon the bed d^3. In this position it does not lie flat upon the bed because of the inclined die d. Then the sliding jaw moves up to it, receiving the projecting end of the die d in its own socket c, while its projecting presser c^2, passing freely with its beveled under surface over the top of the bar, forcibly presses said bar down to a level with the base of the recess d^2, thereby partially straightening the bar on the bed d^3 and conforming its outer end to the inclination of the die d. The reason for the adjustability of die d is, that it may be constantly fed forward as it becomes dull or wears out, thus presenting a new surface for action, and this surface is always a clean-cut one and sharp, as the end of the die finds a protecting seat within the socket c of the jaw C.

To form the beveled or tapering point I have the roller or wheel I. This roller is mounted and carried in the end of a bent lever J, which is supported by a bell-crank lever K, which is pivoted at its angle to a bracket on the frame of the machine, and has in its rear arm a projecting roller or stud k.

Firmly secured to the frame of the plunger is a block L, which has in it a slot l, one portion of which is horizontal and its rear portion inclined, thus forming a cam-slot. In this slot the stud k of the bell-crank lever fits and operates. The block L carries in its top a cam M of an inclined-plane pattern, which is secured in a socket or recess in the block and is set by a screw m, whereby it may be adjusted forward and back to regulate its position. This cam operates under a stud or roller j on the rear end of the bent lever J. The operation of these parts is as follows: When the plunger is at the limit of its backward stroke, the stud or roller k of the bell-crank lever is in the forward end of the horizontal portion of the cam-slot l and the cam M is removed from under the roller j, whereby the bent lever J is pressed down at its rear end by a spring j', so that its roller end is raised, thus permitting the bar to be fed in between the jaws, which are then separated. The jaws now close upon the bar, as heretofore described, and the plunger moving forward produces no effect at first, for the reason that the horizontal portion of the cam-slot l is traveling on the stud or roller k; but as soon as the inclined portion of the cam-slot comes to said stud or roller it rocks the bell-crank lever K, so that the bent lever J is moved forwardly. Then the inclined-plane cam M begins to operate under the roller j, whereby the lever J is also thrown downwardly, thus carrying the roller or wheel I forcibly down upon the upper side of the bar. These combined movements cause the roller to press down powerfully upon the bar, conforming it fully on its under side to the inclined die d, the edge of which cuts into it, rolling it out on its upper side, thereby forming at one operation the taper or bevel of both sides of the spike. The parts are so regulated and adjusted that, notwithstanding that the bent lever J is carried forward by the bell-crank lever moving with the plunger, this forward movement is not so rapid as the movement of the plunger itself, whereby the inclined cam M is enabled to catch up with the rear end of the bent lever and produce its effect, as heretofore described. Now, while the parts thus far described are sufficient to effect the rolling of the tapering point of the spike, it becomes of the greatest importance to cut off the spike clean and sharp. To accomplish this, the roller I is constructed and mounted as follows: It is formed with a flange i on each side, which rolls down upon the inclined planes c' and d' of the jaws, which serve as guides or tracks for both guiding the roller and limiting its movement, so that it will not come into injurious contact with the sharp edge of the die d below. The roller at one side has let into its periphery a cutter i', which continues the periphery of the roller to its forward or cutting edge, where said roller being cut out provides for the operation and effect of the cutter. This cutter is set into its seat and is held by a key i^2. The roller has a hollow center i^3, and to this center the key i^2 extends. A hole i^4 is made through the opposite side of the periphery of the roller and in line with the inner end of the key, so that an instrument can be inserted through the hole and come in contact with the key to drive it out when it should be found necessary to remove the cutter. In the periphery of the roller, opposite to the cutter, is made a notch i^5, and screwed into said periphery at a point between the cutter and the notch is a pin l^6, with which a spring l^7 is connected, said spring having its other end connected adjustably by a screw-bolt l^8 with the bent lever J. Extending outwardly from the side of the bent lever J is a stop-pin j^2, which engages the notch i^5 of the roller.

The operation of the roller is as follows: As it is brought downwardly and forwardly upon the bar it rolls on its axis, pressing down said bar completely to its seat until, reaching the point of its cutter, its notch i^5 comes in contact with the stop-pin j^2. This stops its further rolling; but, the movement of the arm J continuing, said roller is forcibly slid along the bar, and the point of its cutter snips off the bar right at the point of the spike, said bar being partially cut off, as heretofore described, by the edge of the die d. This stoppage of the axial movement of the roller at the desired point, causing said roller

to slide instead of moving axially, effects the much-desired object of making a clean-cut sharp point. The spring i^7 returns the roller to position again. Now, as the cutter wears off and its point has to be cut back, I provide for bringing said point back to its proper place again by means of a peculiar construction and interchangeableness of a series of stop-pins j^2. These are shown in Fig. 5, and consist of pins having notches of different sizes. When first set the pin is turned with its straight or shallower side to the stop-wall of the notch i^5; but when the cutter is worn back or cut off said pin is reversed to present its notched or deeper side, thereby allowing the roller to be thrown back farther to bring the cutter to the same place again, and for different degrees of this the different-sized pins are used. As the parts return for another operation the flanges i of the roller traveling up the inclined planes c' and d' of the jaws raise the roller from the bar, and this raising is further effected by means of the spring j', heretofore described.

T is a spring-rest secured to the front of the frame and having its upper end horizontal and projecting toward the bar-seat of the jaw. This forms a support for the bar in feeding it in, and as the roller presses down the bar in forming the point the spring yields with the bar, but when free rises again to raise the end of the bar to a level with the seat, so that it can readily be fed in.

The object of the incline c^3 of the presser c^2 of the jaw C is to allow the roller to get in and down onto the bar.

The head of the spike is made by the following construction: A spike-head differs from a bolt-head in that it is one-sided, and is so much longer that it has been found best to positively bend the end of the bar before it is upset by the plunger. To effect this I have the bender-lever N, which is pivoted at n to the frame of the machine, and has a point n', which is adapted to come down upon the inner end of the bar and bend it downwardly before the plunger reaches it. This bender-lever is operated by means of a sliding cam O, operating under the outer end of the lever, said cam being reciprocated by a connection with a pivoted lever P, operated by a cam p on the drive-shaft of the machine. A spring n^2 lifts the bender-lever again. The spike, after being formed, is discharged from the jaws by means of the discharging-rod Q, which passes through the stationary jaw, and is adapted to come in contact with the side of the spike and throw it out. This rod is operated by a pivoted lever q, which is itself operated by a cam q' on the drive-shaft of the machine. The usual gage for limiting the insertion of the bar is here used, and is shown by the arm S, which plays down in the line of the inserted bar, and is operated by a rock-shaft s, having a crank-arm s', upon which a sliding cam s^2 operates.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a spike-making attachment, the combination of a jaw having a bed for the reception of the bar, said bed being intersected by an inclined die, upon which one end of the bar rests, a second jaw opposing the first and clamping the bar between itself and the first jaw, and a roller or wheel above adapted to come down upon the bar above the inclined die and form the point, substantially as herein described.

2. In a spike-making attachment, the combination of a jaw having a plane-surfaced bed for the reception of the inserted bar, said bed being intersected by an inclined die, upon which one end of said bar rests, a second jaw opposing the first, and having a projecting presser portion for pressing down the bar upon the bed and partially conforming it to said bed and inclined die, and a roller or wheel above adapted to come down upon the bar above the inclined die and completely conform it to said bed and die and form the point of the spike, substantially as herein described.

3. In a spike-making attachment, the combination of opposing jaws for holding the inserted bar, one of said jaws having a plane-surfaced bed and an inclined die intersecting said bed, and the other having a presser projection adapted to partially conform the bar to the surface of said bed and die, and a roller or wheel adapted to be forced down upon the upper surface of the bar in a plane above the inclined die, whereby the bar is completely pressed down and formed with a beveled point, said roller or wheel having a cutter for severing the bar between itself and the edge of the die below, substantially as herein described.

4. In a spike-making attachment, the combination of opposing jaws for holding the bar, one of said jaws having a plane-surfaced bed intersected by an inclined die and the other having a presser projection for forcing the bar to partially conform to the surface of the bed and die, an axially-mounted roller or wheel adapted to be brought forward and downward upon the top of the bar in a plane above the inclined die to completely press it down, said roller having a cutter in its periphery, and a stop for limiting the axial movement of the roller or wheel, whereby its cutter is caused to sever the bar between itself and the edge of the inclined die below, substantially as herein described.

5. In a spike-making attachment, the jaws for holding the inserted bar, a roller adapted to be brought down upon the bar to form the spike-point, and the means for operating the roller, consisting of the swinging bent lever J, in the end of which the roller is mounted, the pivoted bell-crank lever K, carrying the bent lever, the reciprocating plunger-frame, the block thereon, the cam-slot in said block having a straight portion and an inclined portion,

and in which a stud or roller of the bell-crank lever operates, and an inclined-plane cam on the top of said block operating under the end of the bent lever, substantially as herein described.

6. In a spike-making attachment, the combination of the opposing jaws, one of which has the plane-surfaced bed intersected by the inclined die and the other has the presser projection, the roller adapted to operate upon the upper surface of the bar, and the means for operating the roller, consisting of the pivoted bent lever J, the pivoted bell-crank lever K, carrying lever J, the reciprocating plunger-frame, the block thereon having the cam-slot with a horizontal and an inclined portion, the stud or roller of the bell-crank lever operating in the slot, and the inclined-plane cam in the top of the block operating under the end of the bent lever J, substantially as herein described.

7. In a spike-making attachment, the axially-mounted roller or wheel provided with the cutter, in combination with the stop-pin for limiting its axial motion and the spring for returning it to position, substantially as herein described.

8. In a spike-making attachment, the combination of the jaw having the plane-surfaced bed intersected by the inclined die, the opposing jaw having the presser projection adapted to force the bar to partially conform to the surface of the bed and die, the axially-mounted roller adapted to bear upon the upper portion of the bar above the inclined die and completely press it down, said roller having a cutter for severing the bar, the means for operating the roller, consisting of the bent lever J, the pivoted bell-crank lever K, connected therewith, the reciprocating plunger having the block with the cam-slot by which the bell-crank lever is operated, and the inclined-plane cam by which the bent lever is operated, and the limiting-pin in the bent lever engaging the roller for stopping its axial motion, substantially as herein described.

9. In a spike-making attachment, and in combination with the roller or wheel having the cutter in one side and a notch in the other, the notched reversible limiting-pin for adjustably limiting the movement of the roller, substantially as herein described.

10. In a spike-making attachment, the jaw D, having the inclined longitudinally-adjustable die *d*, substantially as herein described.

11. In a spike-making attachment, the combination of the jaw D, having the inclined die *d*, and the jaw C, having the socket *c*, for receiving said die, substantially as herein described.

12. In a spike-making attachment, the opposing jaws C and D, for binding the bar inserted between them, said jaws having the inclined guide-planes, in combination with the pressing-roller having the side flanges moving upon said planes, substantially as herein described.

13. In a spike-making attachment, and in combination with the jaws for receiving and holding the inserted bar, the means for bending the head of the bar, consisting of the pivoted bender-lever having a spring for controlling it, the reciprocating cam for operating the bender-lever, and the pivoted lever and power-cam for operating the reciprocating cam, substantially as herein described.

14. In a spike-making attachment, and in combination with the jaw having the seat for the reception of the bar and the roller for operating on and cutting it off into suitable lengths, the spring-rest T, forming a yielding support for the bar and raising it, so that a fresh length can be fed in, substantially as herein described.

In witness whereof I have hereunto set my hand.

STEPHEN UREN.

Witnesses:
S. SOLON HOLL,
T. W. HUMPHREY.