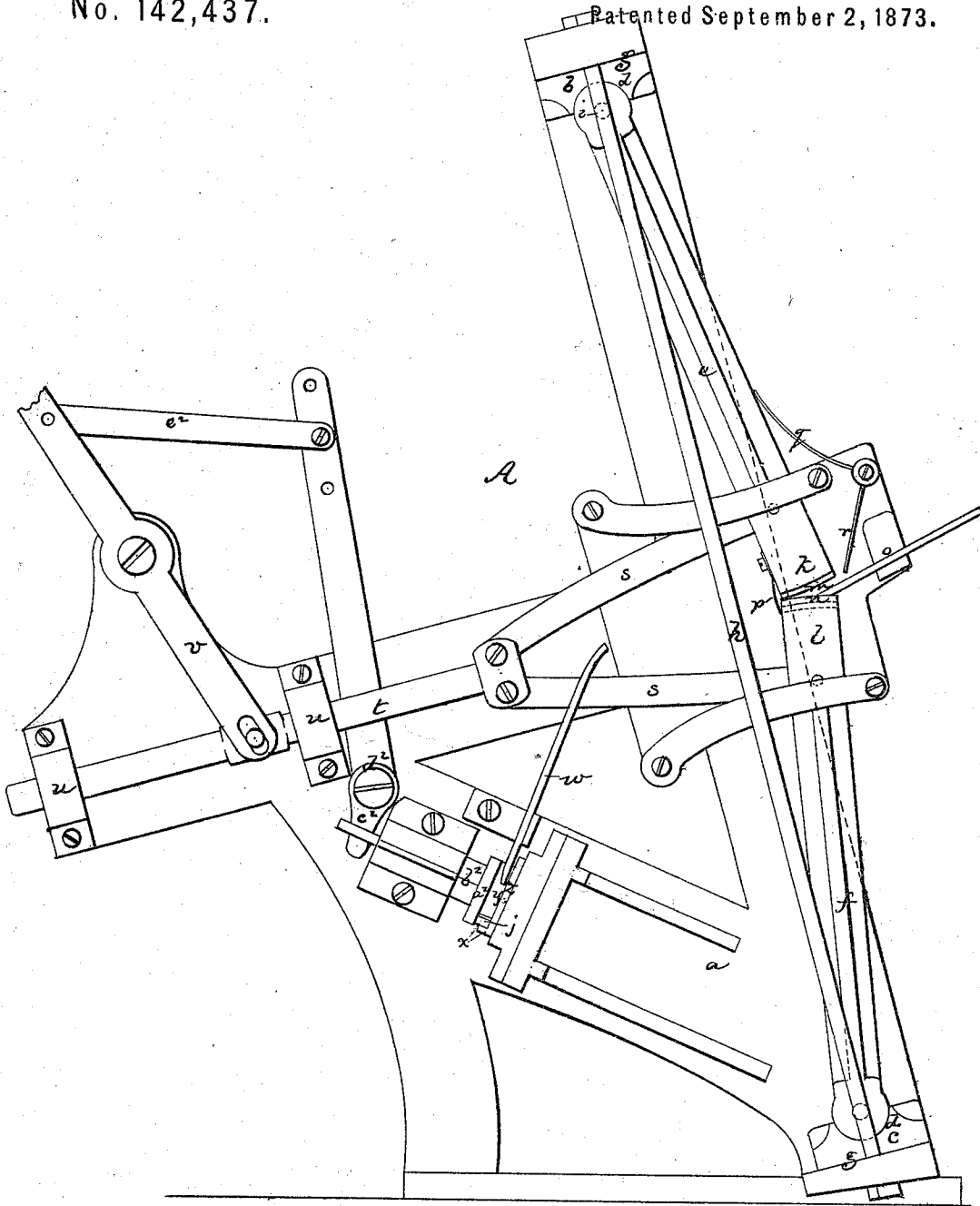


A. H. CARYL.

Machines for Making Horseshoe Nails.

No. 142,437.

Patented September 2, 1873.



Witnesses

Wm. W. Frothingham.

John A. Timmer.

Inventor,

Alexander H. Caryl.

By his Atty.

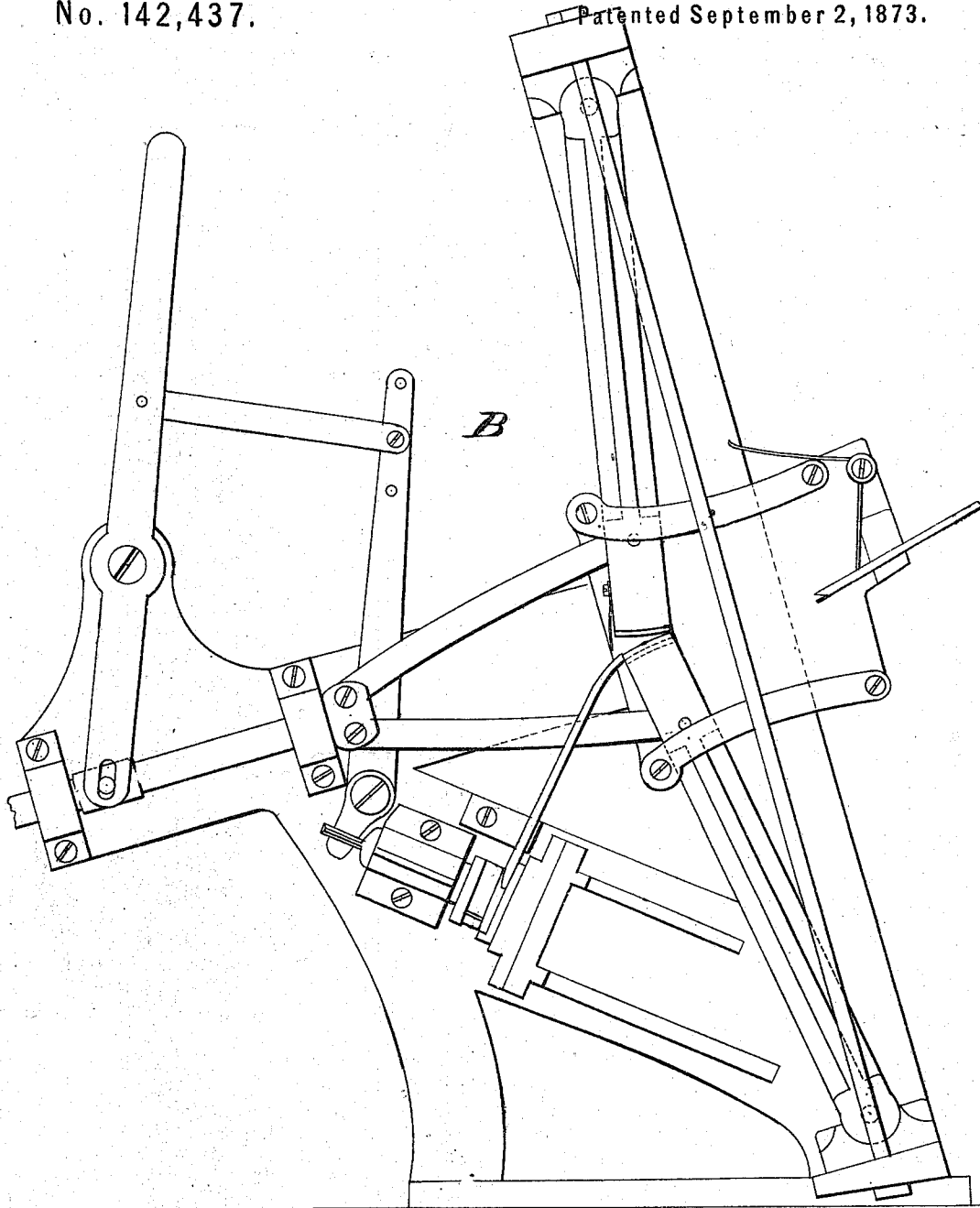
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UNITED STATES PATENT OFFICE.

ALEXANDER H. CARYL, OF GROTON, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR MAKING HORSESHOE-NAILS.

Specification forming part of Letters Patent No. 142,437, dated September 2, 1873; application filed September 25, 1872.

To all whom it may concern:

Be it known that I, ALEXANDER H. CARYL, of Groton, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Machines for the Manufacture of Horseshoe-Nails; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

The invention relates particularly to the manufacture of horseshoe-nails from punched blanks, by compressing, spreading, and beveling the point end of the shank or body, and removing the redundant side metal by a punch and die; and the invention consists in the peculiar arrangement and method of operation of the compressing, spreading, and pointing mechanism and the punching mechanism.

In such arrangement, a pair of dies, male and female, are used, the respective dies being at the inner ends of two toggle-arms, pivoted at their outer ends, the arms, when thrown in one direction to open the dies, bringing the dies into position to receive from a suitable guide or presenting mechanism the shank of a blank, head first or point first, with the head or point against a suitable stop at the front end of the dies. When the arms are moved forward the dies pass their length upon the blank, and compress and spread it, and bevel it at the end, bringing it into proper form for the finished shank, except as to its width, the dies spreading the metal laterally only, and not shaping the edges.

By such action and movement of the dies they not only condense and compact its fibers, but they also discharge the blank as they finish their action upon it, the blank being dropped by them into a guide or conductor that presents it to the action of a punch and die; and the mechanism is so arranged and operated that at each rear movement of the dies to bring them to position to receive a blank the punch and die operate to finish a previously-drawn shank, and at each forward movement of the pair of dies to compress and bevel-point a blank the punch and die open to receive the blank compressed by the pair of dies.

The drawing represents a machine embodying the invention.

A shows an elevation of the mechanism, with the pair of dies in position to receive a blank. B shows the parts in the position they occupy when the blank has been drawn.

a denotes a strong metal upright or frame. *b c* are two bearings, having sockets *d*, in which are supported the outer ends of the two toggle-arms *e f*. Each bearing is sustained by a shoulder, *g*, and the two shoulders are united by a tie-rod, *h*. Each arm is pivoted, as seen at *i*, and at the inner ends of the two arms are two die-plates, *k l*, one having at its end the male die *m*, and the other the female die or socket *n*, the adjacent die-faces forming the compressing-surfaces, which, passing upon the shank of the blank, compress and spread such shank, and impart to it its ultimate or finished thickness throughout, the acting die-surfaces being so shaped, in connection with their movement from their centers of motion, that they thus reduce the blank in thickness, and shape it as to thickness, but without attempting to impart or retain the proper width, the metal only spreading laterally.

When the dies *m n* are open to receive a blank, as seen at A, the blank slides down from a conductor, *o*, between the dies, its head being in advance, and bringing up against a stop-plate, *p*, the arm *e* striking an arm, *q*, and thereby lifting an arm, *r*, that by its rise permits the blank to slide forward out from the conductor.

The two arms *e f* are connected, by two links, *s*, to a slide bar or shaft, *t*, sliding in suitable bearings *u*, the slide being actuated by a lever, *v*, or other suitable mechanism, and as the slide is drawn forward the dies move forward, with the blank between them, and pass or act upon the shank to compress and shape it; and as they open, in finishing their action upon the shank, they discharge the blank into a conductor, *w*, the side walls of which guide it accurately, so that when it is arrested by a suitable stop, *x*, it will be in such position with relation to a punch, *y*, and a correspondingly-shaped die in a die-plate, *z*, that the head of the blank (which head is finished before the action of any of this mech-

anism) is precisely in line with or between the head j of the punch and the corresponding head portion of the open die.

The punch projects from a plate, a^2 , that is at the end of a slide or plunger, b^2 , to the outer end of which is jointed one arm, c^2 , of a lever, fulcrumed at d^2 , the other arm of said lever being jointed, by a link, e^2 , to the lever v , that operates the slide, as seen in the drawing; the drawing-dies and the punch and die acting conjointly, and so that by the forward movement of the lever-arm v the dies $m n$ are caused to act upon and compress the blank, and discharge it into the conductor, down which it slides into position for the action of the punch and die, and the punch y is raised from the die-plate to permit the entrance of such blank, while at the opposite movement of the lever the punch descends and forces the blank through the die-opening, trimming from the shank its redundant edges, and finishing the shank; and the pair of compressing-dies are carried back to position to receive a new blank from the conductor o , which blank is released by the rise of the arm r , and slides into the dies with its head against the stop-plate p .

By this organization and method of operation, blanks punched from rolled plates, or having finished heads, may be rapidly and easily converted into finished nails having perfect or perfectly-shaped shanks and beveled points.

In my method of making the nails, the shanks of the blanks are punched to the full length of the finished nail, or to a close

approximation to such length, and the condition of the metal in the shank is not materially changed, except for about half the length of the shank, the point end being spread and beveled by the dies, and then trimmed by the punching operation.

In the drawing, the dies are shown as arranged to seize the blanks head first; but they may equally well be arranged to take the blanks point first, as their operation is simply to compress the metal and move it laterally, shaping it as to thickness, without affecting the length of the shank.

I claim—

1. In combination with the segmental vibrating dies, the stop r , actuated automatically by the die-arm e to let a blank into the dies, and automatically assuming its normal position to retain the next blank as the arm moves forward.

2. In combination with the segmental dies $m n$, the stop or gage against which the head of the nail strikes when it enters the dies, and whereby the nails are successively and uniformly held to the same proper position for the action of the dies.

3. In combination with the swinging dies $m n$ and the inclined grooved conductor w , on which the blank is supported and slides, the punch and die $y z$, arranged in relation to the dies $m n$ and operating substantially as shown and described.

A. H. CARYL.

Witnesses:

S. A. HAMLIN,

A. H. CARYL, Jr.