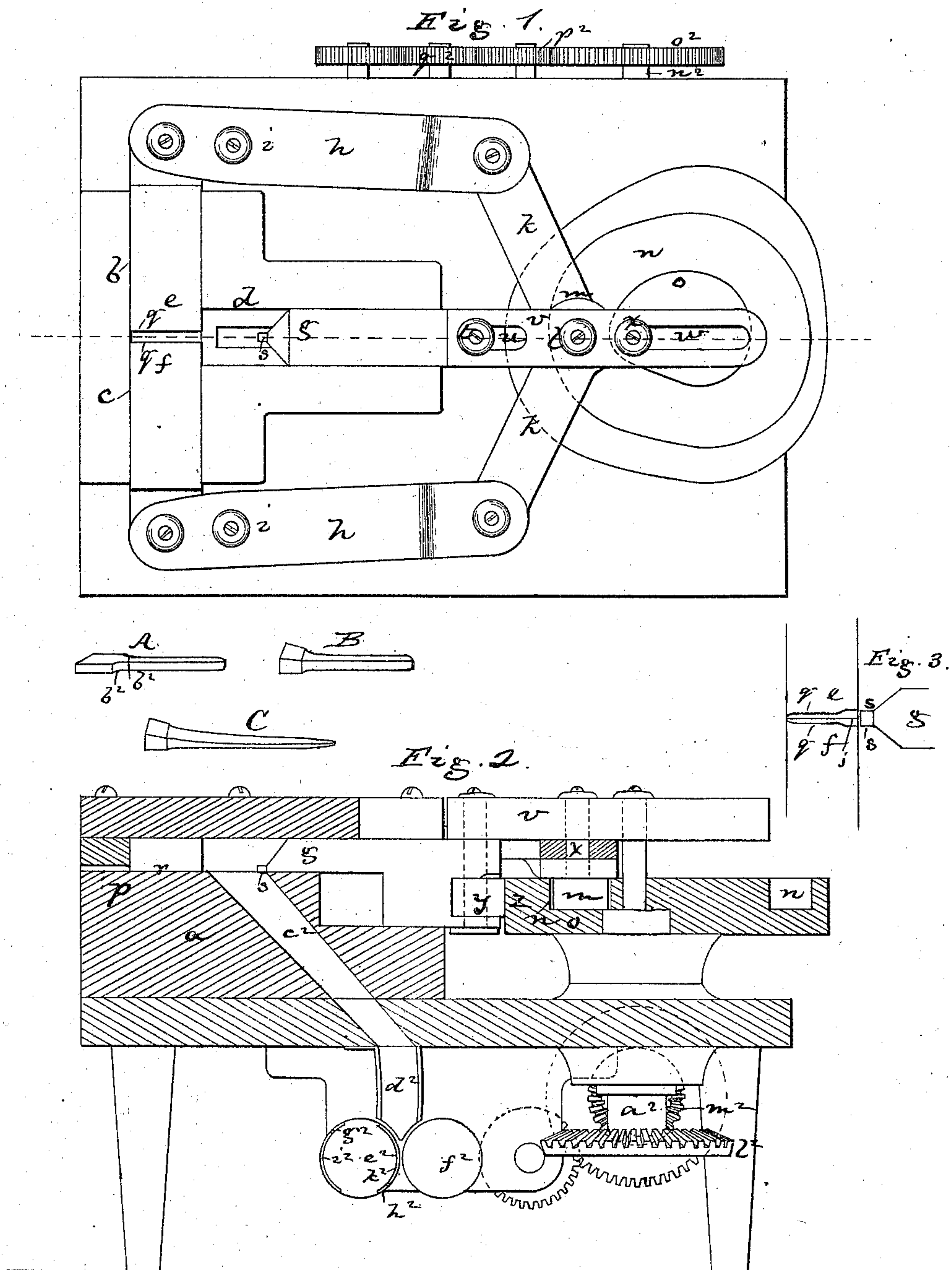


D. TURBAYNE.

Manufacture of Horseshoe Nails.

No. 142,597.

Patented September 9, 1873.



Witnesses.
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UNITED STATES PATENT OFFICE.

DAVID TURBAYNE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO GLOBE NAIL COMPANY, OF SAME PLACE.

IMPROVEMENT IN THE MANUFACTURE OF HORSESHOE-NAILS.

Specification forming part of Letters Patent No. 142,597, dated September 9, 1873; application filed July 24, 1873.

To all whom it may concern:

Be it known that I, DAVID TURBAYNE, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in 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 blanks punched from plates of uniform thickness, each blank having a parallel-sided shank, at one end of which is a head of greater width than the shank. To form the nail from such a blank the head is upset between suitable dies to give it the proper thickness and shape, and the shank is drawn by suitable rolls to impart the proper length, thickness, and hardness. The invention consists in the combination of the head-upsetting and shank-drawing mechanism, and in the process of making a nail by first cutting out such a blank, then upsetting the head, or a portion thereof, between suitable dies, by which the requisite shape of head is obtained, and then drawing the shank by rollers, to impart the proper length, thickness, and condition.

The drawing represents a mechanism embodying the invention.

Figure 1 shows the machine in plan, the cap-plate being removed. Fig. 2 is a longitudinal central section. Fig. 3 is a bottom view of the dies.

a denotes a bed, in the top of which are slots *b*, *c*, and *d*, for receiving sliding dies *e*, *f*, and *g*. The two dies *e* *f* are alike, and slide laterally, being jointed at their outer ends to the outer ends of levers *h* *h*, which levers are pivoted, as seen at *i* *i*, and are connected at their inner ends by toggle-links *k* *k*, the pivot-pin *l* bearing a roll, *m*, that works in a cam-groove, *n*, in a cam-wheel, *o*. These two dies are simply gripping-dies, so far as their positive action is concerned, the blank to be operated upon entering between them through a throat, *p*, and their die-surfaces *q* fitting to and gripping the opposite edges of the blank. The blank lies upon a flat surface, *r*, and at their inner

ends the die-surfaces are enlarged, forming, when the dies are brought together, a socket to contain the blank-head, the walls of the socket being of the shape to be imparted to the head of the blank. The die-slide *g* has a slide movement at right angles to the movement of the dies *e* *f*, and upon the end of the slide is a header or die, *s*, of form in cross-section, corresponding to the form of the end of the head of the finished nail, said die just fitting into and entering the mouth of the die-socket containing the head of the blank. The bottom of the head-socket is formed by the bottom of the slots *b* *c*, and the header *s* slides on the bottom face of these slots, the bottom face of the whole blank being flat, and being supported upon the bottom faces of the slots. The slide *g* has extending up from it a pin, *t*, that enters a slot, *u*, in a link, *v*, that is jointed to the pivot-pin *l*, and has a guide-slot, *w*, into which extends a pin, *x*, projecting up from the axial center of the cam-wheel *o*. At the end of the slide is also a roll, *y*, that is acted upon by a peripheral cam, *z*, of the cam-wheel.

The blank is introduced through the throat *p* when the dies are open, the three slides being all drawn outward. Then, as the shaft *a*² is rotated, the cam-slot *n*, acting on the roll *m*, throws in the toggle-links and actuates the levers *h* *h*, and the levers drive in the gripping-dies *e* *f*, causing them to gripe the shank of the blank, leaving the head inclosed in the socket *j*. The gripping-dies complete their movement before the heading-die reaches the socket, said die being moved forward by the action of the cam *z* on the roll *y*, and the header *s*, as it enters the socket, meeting the end of the blank-head and upsetting the metal, causing the metal to fill the die or socket space in front of the header, and changing the head of the blank from the form shown at A to the form shown at B.

Although the socket may be of any form to impart to the upset head any form suitable for a horseshoe-nail, I prefer to make it of such form as to leave the back of the head flat and in a plane with one face of the blank, as shown in the drawing, the thickening of the blank in the upsetting operation being entirely on the opposite surface. The edges of the head adja-

cent to the shoulders b^2 may be left unchanged, and the end face of the header-die may be formed to make an end face to the nail-head that shall be right angular to the flat face of the nail, or to stand at an obtuse angle thereto.

In upsetting the head of the blank, the shoulders b^2 rest against the inner end wall of the socket, the end pressure being therefore against them rather than against the shank. As the toggles straighten, the link slides upon the pin t , and as the shaft a^2 continues to rotate the header-die and the griper-dies draw outward, thereby releasing the blank which has thus had its head upset. As the dies thus open, the next blank is automatically presented and introduced by any suitable feeding mechanism, and such blank drives forward the upset-head blank, which, passing over an incline or chute, c^2 , drops into and slides through the same and a conductor, d^2 , down to the die-rolls $e^2 f^2$, the head striking the rolls, and resting against them in position to be taken by the head-receiving recesses $g^2 h^2$ of either of a pair of dies, $i^2 k^2$, in a die-roll, e^2 , acting in connection with a roll, f^2 , to draw the shank of the blank to form the nail, the head-receiving recess being of a shape to receive and pass upon the head without changing its form, and the shank-receiving die, groove, or recess being preferably of such form as to impart to the shank the requisite thickness throughout, the form of the

die being also preferably such that the metal is spread laterally at and adjacent to the point, so that the finished form is imparted by clipping off or removing the side metal. When the blank has its head thus upset, and its shank thus rolled and trimmed, its form is that shown at C.

The shaft a^2 is shown as carrying a bevel-gear, l^2 , driven by a bevel-pinion, m^2 , on a driving-shaft, n^2 , on which shaft is shown a gear-wheel, o^2 , meshing into a pinion, p^2 , that drives a pinion, q^2 , on one of the die-roll shafts, said pinion meshing into and driving a similar pinion on the other die-roll shaft.

I claim—

1. The combination and arrangement of the gripping-dies $e f$, upsetting-die g , conductor d^2 , and die-rolls $e^2 f^2$, operating substantially as described.

2. The process of forming a nail or blank by cutting from a plate of uniform thickness a blank with a shouldered head, upsetting the head to impart the requisite shape thereto, and drawing the shank by rollers, all substantially as described.

Executed this 26th day of June, A. D. 1873.
DAVID TURBAYNE.

Witnesses:

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