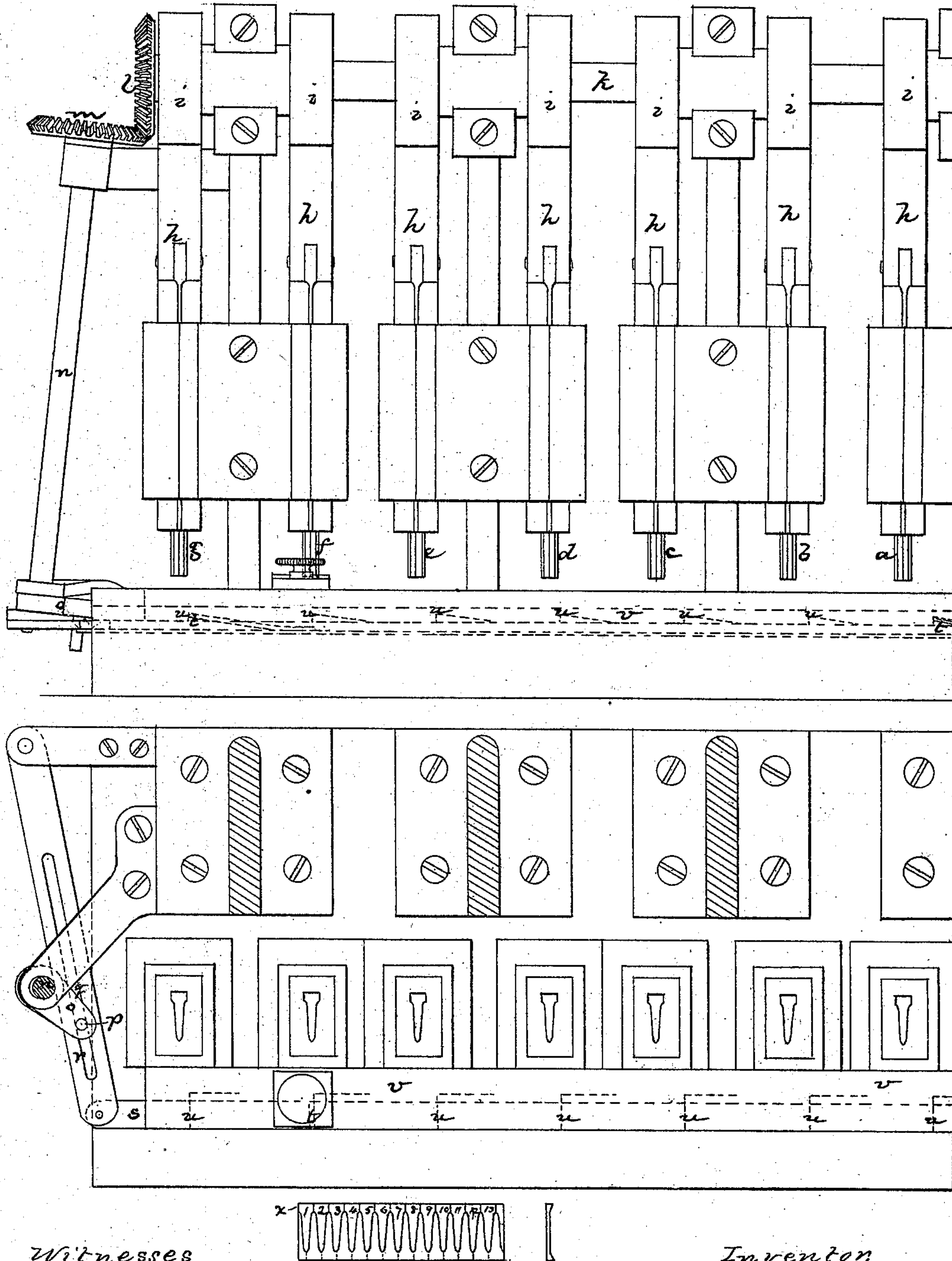


A. H. CARYL.

Improvement in the Manufacture of Horse-Shoe Nails.

No. 131,664.

Patented Sep. 24, 1872.



Witnesses
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN THE MANUFACTURE OF HORSESHOE-NAILS.

Specification forming part of Letters Patent No. 131,664, dated September 24, 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 the Manufacture of Horseshoe-Nails; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates to a method of cutting up rolled nail-plates to form therefrom nail-blanks, to be finished by being drawn and pointed, the invention being particularly adapted to and intended for use in the manufacture of horseshoe-nails, and the invention having reference to a method of punching the blanks by which the operation is made very simple, and a minimum of waste is incurred in the cutting operation.

In practicing my improved method I use a strip of metal, the width of which is of the full length of one blank, plus the length of head of another, the head-forming portions or edges of the plate being so rolled that each edge forms a series of nail-heads—by being cut or punched from the plate—side by side, with no waste or space between adjacent heads, while the thin web or portion of the plate between the thick head-forming edges embraces the material and only the material for the shanks of the series of nails or nail-blanks of which the opposite edges of the plate form the heads.

In my process of punching the blanks I feed the plates into the machine in succession, or one after and against another; or, in other words, I make the machine with a gang of punches, to be simultaneously acting upon several plates, and I place the punches at such respective distances apart as will bring the plates, by regular and successive equal feed-movements, into positions for the respective blanks to be cut therefrom, the punches being so arranged that the first punch cuts the first nail of each plate; the second punch cuts the third nail—on the same side of the plate; the third punch cuts the second nail; the fourth punch cuts the fifth nail, and the fifth punch cuts the fourth nail, and so on, the nail-plates being fed by the reciprocating feed-bar, having equal movements, and each feed-movement of

the bar carrying an entire plate from one punch to the next punch—as, for instance, if the nail-plate be four inches long, then each feed-movement of the bar—the punches being properly spaced—is six inches. It is in this method of cutting up the nail-plates that my invention consists; or in a machine having a gang of simultaneously-acting punches, and a feed mechanism for presenting the nail-plates, the extent of each feed-movement being in excess of the length of the plate, the feed mechanism presenting each plate, so that the first punch, at each descent, cuts the first nail from a plate, the second punch, at the same time, cutting the third nail from the plate in advance; the third punch cutting the second nail from the plate in advance of the plate acted upon by the second punch, and so on, there being, when all the punches are punching, as many plates simultaneously operated upon as there are punches in the gang, and each plate having only one blank cut from it at a time. It is in this method of punching nail-blanks from rolled nail-plates that my invention primarily consists.

The drawing represents, in front elevation and in sectional plan, a punch and plate feeding mechanism arranged to operate in accordance with my invention.

a b c d e f g denote seven punches of a gang, designed to cut, at each operation, after the first plate has reached the seventh punch, seven blanks from seven plates, each plate being of a length sufficient for seven blanks to be cut therefrom. These punches are all affixed to carriers *h*, connected to and operated by eccentrics *i* on a driving-shaft, *k*, all the punches moving simultaneously and cutting together. On the end of the shaft *k* is a bevel-gear, *l*, which meshes into and drives a bevel-gear, *m*, on the upper end of a shaft, *n*, at whose lower end is a crank-arm, *o*, the pin *p* of which extends into a slot, *q*, of a pawl-lever, *r*, the end of which lever is jointed to a pawl-slide, *s*, having pawl-teeth *t* that engage with ratchet-teeth *u* of a feed-bar, *v*, each rotation of the driving-shaft effecting a descent of all the punches, and a rotation of the crank, and a consequent feed-movement of the bar. The front or first nail-plate is clamped to the feed-bar in such position that when the first ratchet-tooth of the bar is in engagement with the first pawl of the

pawl-slide, and said slide has been once moved forward by the ratchet-bar, the end of the nail-plate is under the first punch *a*, and, preferably, in such position that the end of the plate forms the outer-side edge *x* of the first nail 1. As the punches now descend the punch *a* cuts the blank 1, the ratchet-bar and plate remaining stationary, and the pawl-slide moving back to engage with the next tooth of the ratchet-bar. The next feed-movement of the bar carries the plate entirely beyond punch *a*, but brings the front end of the next plate, which abuts against the rear end of the first plate, into the same position previously occupied by the first plate, or a position in which, at the next descent of the punches, the punch *a* will punch nail 1 of the second plate, just as, by its previous descent, it punched nail 1 of the first plate, the same result taking place at every successive descent of the punches, the punch *a* always punching the first nail of a new plate so long as new plates are presented to be punched. The feed-movement that next feeds the first plate forward, or that feeds each plate forward after the first nail is punched therefrom, carries the plate into position for the punch *b* to cut nail 3 from the plate, this punch always cutting nail 3 of a plate, and no other nail being cut from the same plate by the same descent of the punches. The next feed-movement carries the plate entirely beyond the punch *b*, and into position under the next punch, *c*, for said punch to cut the nail 2, or the nail between 1 and 3. The next feed-movement similarly carries the plate into position under the punch *d*, for said punch to punch nail 5; the next movement taking it into position for the punch *e* to punch nail 4. After the next movement punch *f* cuts nail 7; and at the next punch *g* cuts nail 6, this finishing the cutting up of the plate, if its length be just sufficient for seven nails.

It will be obvious that there must be a loss of material to the amount existing in half of a nail at each end of the plate, the stock being otherwise all utilized. The action of the punches leaves a comb-like plate at the opposite edge of the nail-plate, with teeth composed of the punched shanks extending from a head piece composed of the head-forming portions, the heads having simply to be separated to form the separate blanks like those punched out, one by one, by the punches *a*, *b*, &c.

I prefer, in practicing the invention, to use a gang consisting of fourteen punches, and with plates four inches long just fourteen common horseshoe-nails or nail-blanks can be cut from one side thereof; and when all the plates are fed so that the first plate reaches the last punch, the equivalent of the whole of one side of the plate will be punched into nails at each descent of the punches, the first punch cutting the first nail of one plate when the last or fourteenth punch is punching the last nail from the first plate. To cut these nail-blanks the punches are arranged, as to distance apart, as follows: From the center of punch *a* to the center of punch *b* the distance is five and three-eighths inches; from punch *b* to punch *c* six and three-eighths inches; from punch *c* to punch *d* five and one-eighth inches; from punch *d* to punch *e* six and three-eighths inches; from punch *e* to punch *f* five and one-eighth inches; from punch *f* to punch *g* six and three-eighths inches; and so on, the punches alternating, as to distance apart, from five and one-eighth inches to six and three-eighths inches, the alternating distances being the same, except the first distance, which is five and three-eighths inches instead of five and one-eighth inches.

I claim—

1. The method of punching nail-blanks by means of a gang of simultaneously-acting punches, the first of which punches the first nail of a plate; the second of which punches the third nail of the same plate at the next descent of the punches—the first cutting the first nail of another plate; the third of which punches, in succession, the second nail of each plate; the fourth the fifth nail of each plate in succession; the fifth the fourth, and so on, the plates having a regular intermittent feed-movement, after each action of the punches, that shall carry each plate to the action of the next punch.

2. In combination with the gang of simultaneously-acting punches, the feed mechanism, arranged to feed the ratchet-bar for the action of the successive punches, substantially as described.

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Witnesses:

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