No. 648,298. Patented Apr. 24, 1900.

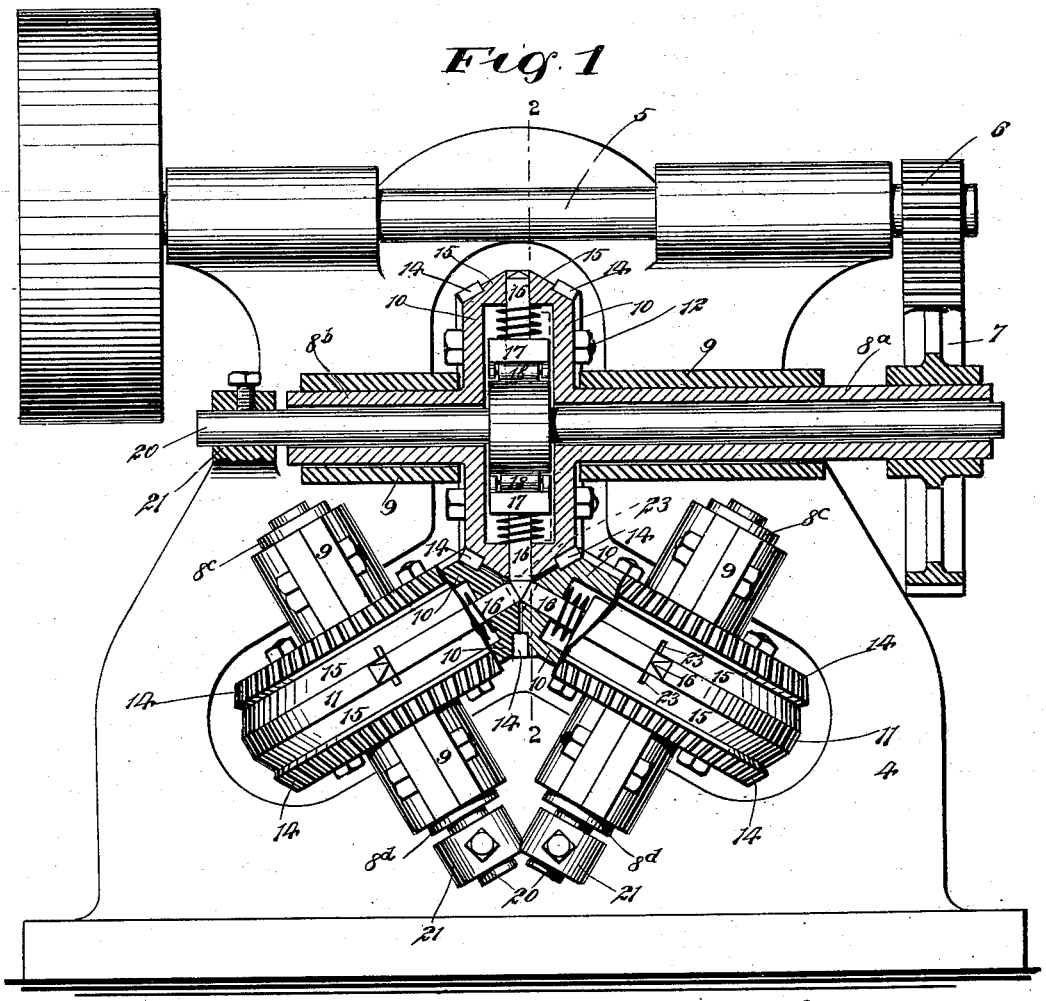
S. L. REED.

NAIL FORMING MACHINE.

(Application filed June 13, 1899.)

(No Model.)

Fig. 1



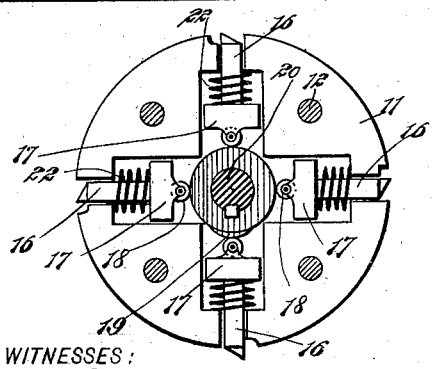


Fig. 2

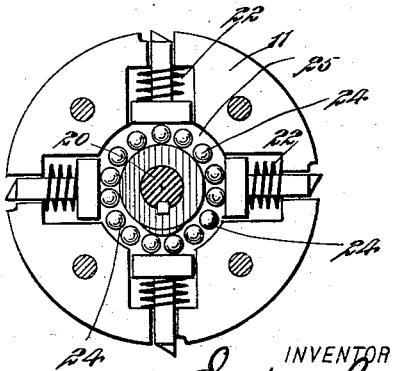


Fig. 3

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SEXTUS LOUIS REED, OF GALLATIN, TENNESSEE.

## NAIL-FORMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 648,298, dated April 24, 1900.

Application filed June 13, 1899. Serial No. 720,350. (No model.)

*To all whom it may concern:*

Be it known that I, SEXTUS LOUIS REED, of Gallatin, in the county of Sumner and State of Tennessee, have invented a new and Improved Nail-Forming Machine, of which the following is a full, clear, and exact description.

The purpose of this invention is to provide a superior apparatus for rolling nails from a continuous length of stock, the apparatus being designed especially to produce a triangular nail, although other forms of nails may be produced thereby; and it embodies certain peculiar means for cutting the stock into lengths and for forming the points and heads of the nail.

This specification is the disclosure of two forms of my invention, while the claims define the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is an elevation of the machine with parts in section. Fig. 2 is a fragmentary sectional view on the line 2 2 of Fig. 1, and Fig. 3 is a similar view of a slightly-modified construction.

The apparatus comprises a frame 4, on which is mounted a primary movement-shaft 5, carrying a pinion 6, engaging a spur-gear 7, secured fast to a hollow shaft formed in two sections $8^a$ and $8^b$. Two additional hollow shafts, each being formed in two sections $8^c$ and $8^d$, are also provided, the three hollow shafts being arranged in triangular disposition with respect to each other and being revolubly carried in boxes 9, suitably mounted on the frame. Each of the hollow shafts carries one of the dies employed to roll the nails. These dies are therefore three in number and are arranged with respect to each other, as indicated in Fig. 1. Each die comprises two circular side sections 10, between which is sandwiched an intermediate or face section 11, the whole being secured rigidly together by means of bolts 12. The side sections 10 may, if desired, be formed integral with the respective sections of the hollow shafts or they may be fastened thereto, if desired. Each side section 10 has a line of miter gear-teeth 14 formed on its periphery, and each side section 10 further comprises a plane portion 15, such plane portions running against each other, as shown in Fig. 1, so as to cause the several dies to run true and so, also, as to hold them with sufficient rigidity to enable them properly to perform their functions. The gear-teeth 14 mesh with each other, so as to cause all of the dies to turn in unison. The face-sections 11 have plane edges or faces, as indicated in Fig. 1, and these faces when the dies are meshed in operative position are disposed triangularly to each other, they serving to engage and roll the stock. For this purpose the face-sections 11 may be formed of hardened steel. The stock when passed through the dies will be rolled into triangular form, thus to produce the shanks of the nails.

For cutting the nails into lengths and for pointing and heading the nails I provide a number of radially-movable punches 16, which have enlarged butts 17, carrying rollers 18, which rollers ride around a cam 19, the cam being fast on a stationary shaft 20. The stationary shaft 20 of each die passes through the corresponding hollow shaft and is held rigidly by means of a box or like device 21, rigid with the frame. The cams 19 being held stationary by the shafts 20 and the dies moving around the shafts and cams, the punches 16 will be periodically projected outward, so that they pass the periphery of the corresponding face-sections 11, thus cutting the stock. The punches are thrown inward automatically by springs 22, situated in cavities formed in the face-sections 11 and side sections 10 of each die. The punches 16 are of a width equal to the width of the face-sections 11, and the butts 17 of the punches 16 are of larger size. The punches are situated only in openings formed in the face-sections 11, while the butts 17 of the punches extend into openings formed in the side sections 10. The outer or cutting ends of the punches 16 are beveled, as shown, and the side sections 10 of the dies are formed with transverse recesses 23, extending oppositely from the several openings in the face-sections 11, through which openings the punches 16 pass. These openings 23 are adapted to have the stock pressed thereinto to form the head of the nail, while the beveled cutting ends of the punches 16 serve to form the points of

the nail, all of which will be fully described hereinafter.

The several dies may be provided with any desired number of punches. For example, I have shown four punches for each die, and with this arrangement four nails are produced at each revolution of the dies. The dies are arranged so that the several punches register with each other as the dies turn, and the cams 19 are so disposed that when three of the punches come point to point in the manner shown in Fig. 1 the cams will throw the punches outward, causing the points of three punches to meet and by the joint action of the three points to sever the stock, thus forming one nail. The beveled ends of the punches meeting with each other, as indicated, will form a taper or point on the end of the stock which will serve as the point for the nail. At the same time the stock will be pressed into the openings 23 of the side sections 10 of the dies, thus forming the head of the nail. It will be understood that these operations just described are performed on different sections of the stock, the nail having its point formed by one set of punches and having its head formed in the recesses 23 which follow such set of punches as contradistinguished from the recesses 23 which are immediately adjacent to the said set of punches. The dotted lines in Fig. 1 illustrate the recesses 23 when matched with each other, such lines showing the triangular form described by the recesses when in registry with each other, and it will be understood that this is the form given the head of the nail.

The modification illustrated in Fig. 3 consists simply in the substitution of antifriction-balls 24 for the rollers 18 in the other views, the balls being arranged to travel through a race formed around the cam 19.

By changing the form of the face-sections 11 nails of various cross-sectional form may be produced.

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

1. The combination of a revolubly-mounted hollow shaft formed in two sections, a die carried by the shaft and comprising two circular side sections respectively rigidly carried by the sections of the hollow shaft, and having transverse recesses produced therein for forming a head or enlargement on the work, and an intermediate or face section sandwiched between the side sections, fastening devices passed through the side and intermediate sections, the side sections being formed with gear-teeth adapted to mesh with a mating die and the intermediate section being formed with radial passages, the outer ends of which communicate with the transverse recesses produced in the side sections, a stationary shaft extended through the hollow shaft, a cam attached to the stationary shaft, and punches mounted between the side sections and adapted to move through the radial passages in the intermediate or face section, the punches being actuated by the cam.

2. The combination of a hollow shaft formed in two sections and revolubly mounted, a die consisting of two side sections respectively fastened rigidly to the contiguous ends of the sections of the hollow shaft, and an intermediate section fastened between the side sections, the side sections being provided with gear-teeth adapted to mesh with a mating die and the intermediate section being provided with radial passages, the ends of which communicate with transverse recesses in the side sections, a stationary shaft passed through the hollow shaft, a cam attached to the stationary shaft between the side sections of the die, and punches mounted to move in the passages of the intermediate section and actuated by the cam.

SEXTUS LOUIS REED.

Witnesses:
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