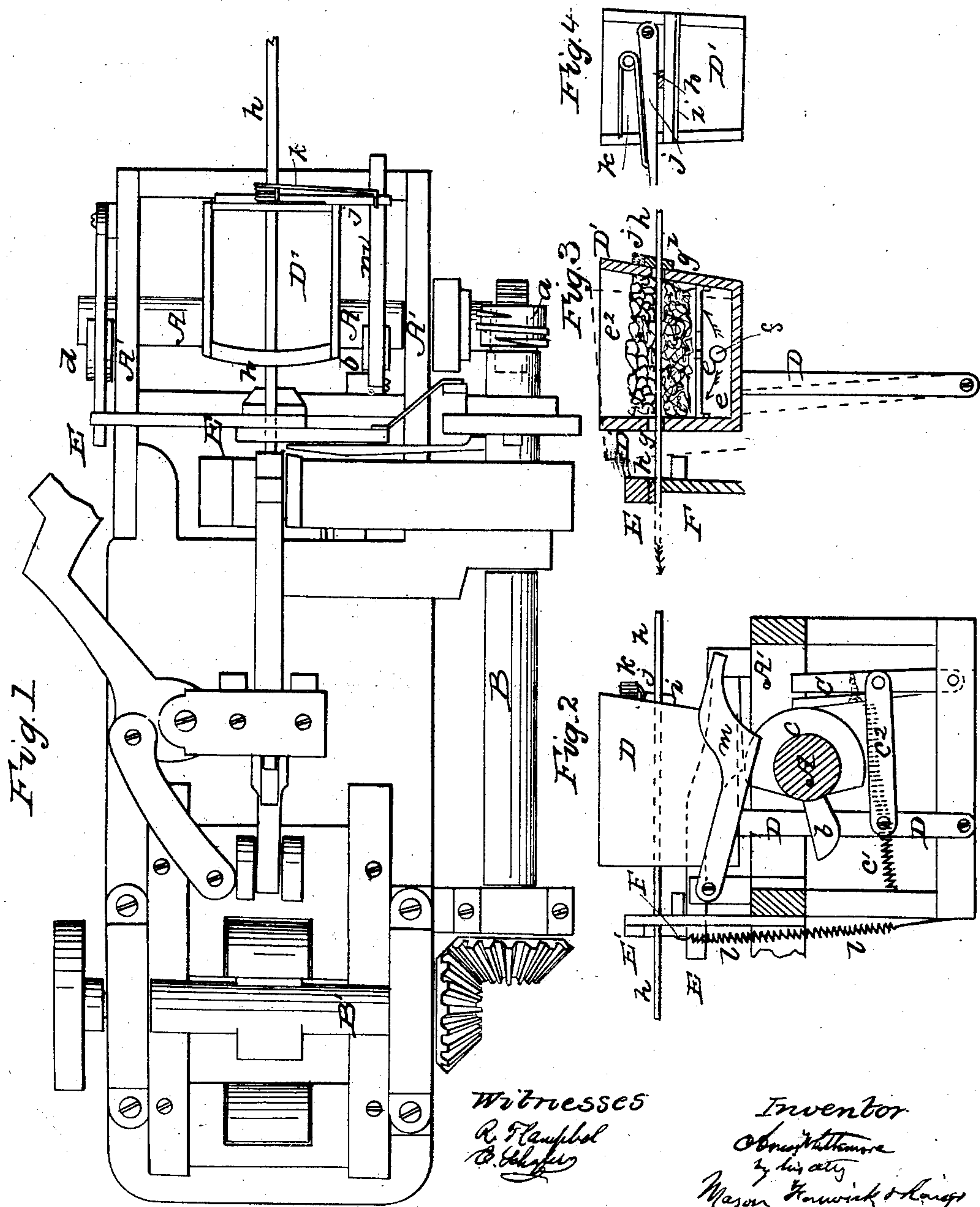


A. WHITTEMORE.
Horseshoe Nail Machine.

No. 41,251.

Patented Jan'y 12, 1864.



UNITED STATES PATENT OFFICE.

AMOS WHITTEMORE, OF CAMBRIDGEPORT, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR MAKING HORSESHOE-NAILS.

Specification forming part of Letters Patent No. 41,251, dated January 12, 1864.

To all whom it may concern:

Be it known that I, AMOS WHITTEMORE, of Cambridgeport, in the county of Middlesex, and State of Massachusetts, have invented a new and useful Improvement in Machinery for Making Horseshoe-Nails; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a top view of a machine for making horseshoe-nails, having my invention applied to it. Fig. 2 is a side sectional elevation of those parts of the machinery which feed the rod upon the anvil. Fig. 3 is a vertical longitudinal section through the furnace and through the thrusting-nippers, showing these parts in two positions. Fig. 4 is an elevation of the front end of the furnace, showing the thrusting-nippers, which are applied to it.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to an improvement in horseshoe-nail machinery, wherein a furnace is so applied that the rods of which the nails are made are passed directly through this furnace and brought under the swaging-hammers.

The object of my invention is to avoid any bending or buckling of the rods in the operations of heating them and introducing them at welding heat under the hammers, and at the same time to perform these operations by machinery which shall be entirely automatic, simple, and efficient, all as will be hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

I design to apply this invention to the machine which forms the subject of Letters Patent bearing date August 14, 1860, although it will be understood that I do not desire to confine its application to this particular machine exclusively.

The operation of the hammers upon the rod, and the method of forming the nails, and then cutting them off, has been fully described in my former patent, and it will not be necessary to refer to these parts again in this specification. They are only represented in Fig. 1 to

show how my invention can be applied to such a machine and made to operate in conjunction therewith. The cam-shaft A is supported in suitable bearings beneath the side rails A of the frame of the machine, and this shaft receives a slow rotary motion from a worm-wheel, *a*, which is keyed on the end of a longitudinal shaft, B, that receives its motion from the main driving-shaft B', as shown in Fig. 1. This cam-shaft A has three cams, *b c d*, affixed to it, which give all the required movements to the feeders. The central or intermediate cam, *c*, Fig. 2, operates upon the upright reciprocating arm C, and the helical spring *c'* returns this arm to its former position after being thrust out by the cam. The reciprocating motion thus given to the arm C is transmitted to the pivoted arm D, which carries on its upper end the furnace D', a connecting rod, *c''*, being employed to connect the two arms C and D together.

The furnace may be constructed like any ordinary furnace, with an ash-box, *e*, grate *e'*, and coal receptacle *e''*. A flexible tube communicating with the bellows-pipe will be connected to the furnace at *f*, for supplying the fire with blast of air for keeping up combustion. The furnace D' has a hole, *g*, made through each end, through which the rod *h* passes as it is fed up to the work. These holes should therefore be as near as possible in a line with the surface of the anvil upon which the nails are formed. The furnace is so constructed that the rod *h* will pass through the bed of coals, and be subjected to the most intense heat of the fire, so that it will be readily brought to the welding heat—a condition which is necessary for success in making a perfect nail. The metal is thus made very soft and requires to be moved through the furnace very carefully to prevent the rod from bending. I apply to one end of the furnace, directly under the hole *g*, a fixed jaw, *i*, which forms the lower support for the rod *h*, and directly over this jaw *i* is a pivoted jaw, *j*, which has a spring, *k*, applied to it for forcing it downward upon the rod *h*, thus gripping and holding this rod fast at this end of the furnace, so that when the latter advances toward the anvil the rod *h* will move with it and a sufficient length for a nail will be brought under the hammers. Before the furnace recedes

the cam *d* will operate upon the lifting-arm *E*, and cause this arm to release the jaw *E'*, when a spring, *l*, will pull this jaw down upon the end of the rod *h*, so as to hold it fast on the top of the upright plate *F*. The cam *b* is brought into operation simultaneously with this and throws up the pivoted jaw *j*, so as to release its hold and to allow the furnace to recede without the rod *h*, leaving this rod under the jaw *E'*. It will thus be seen that at each retrocession of the furnace *D'* the jaw *E'* will be brought down upon the rod *h*, and leave the end of this rod held by the jaw. When the furnace has completed its backward stroke, the tripping-arm *m* will be released from cam *b*, so as to allow the jaw *j* on furnace *D'* to grip the rod again, and at the same time the arm *E* will lift the jaw *E'*, so that when the furnace is moved forward again the rod *h* will be free to move with it, and a sufficient length of this rod to make a nail will be introduced under the hammers. When the nippers which are affixed to the frame of the machine are brought into action and confine the rod *h*, those which are applied to the furnace are thrown out of action, and the furnace is allowed to move back, the rod remaining stationary, and its heated end supported and held firmly by the nipper or jaw *E'*. It will be seen from this description that the furnace which is employed to heat the rods from which the nails are made is made to form a guide, and also a feeder for introducing the rod under the hammers. The rod is passed through the ends of the furnace, in order that it (the rod) will be exposed to the most intense heat, and thus brought to the "welding

heat" quickly, and the nippers are applied to the furnace so that in its forward movement the end of the rod will be carried into the machine and properly placed under the hammers, thus making the furnace self-feeding and entirely automatic in its operation. By this arrangement I am enabled to get the rods through the furnace the length of one nail at each operation, and then to introduce this projecting end under the hammers to be formed into a nail and cut off. Then at the next forward movement of the furnace another length is brought under the hammers, and so on the operation is repeated, and the rod is used up as fast as it is heated. The vibrations of the furnace should be regulated in accordance with the length of the nails to be made, so that the furnace will be drawn away from the end of the rod only the length of a nail at each backward stroke of the furnace.

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

1. A reciprocating furnace, in combination with nippers operating substantially as and for the purposes described.
2. Applying the thrusting-nippers which hold the rod during its forward movement to a reciprocating furnace, in combination with nippers applied to the frame of the machine, substantially as and for the purposes described.
3. A reciprocating nail-rod-heating furnace, substantially as described.

AMOS WHITTEMORE.

Witnesses:

R. T. CAMPBELL,
E. SCHAFER.