E. H. Collier,

Making Nails by Rolling,

No. 7,437 Patented June 18, 1850.

Fig. 5.

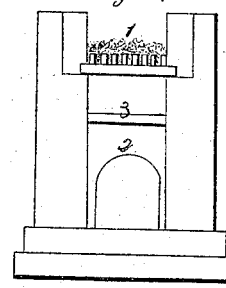


Fig. 1.

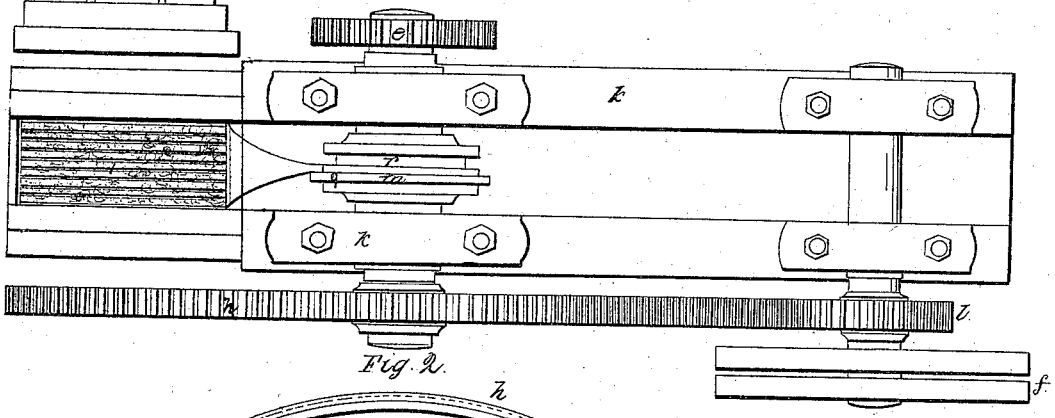
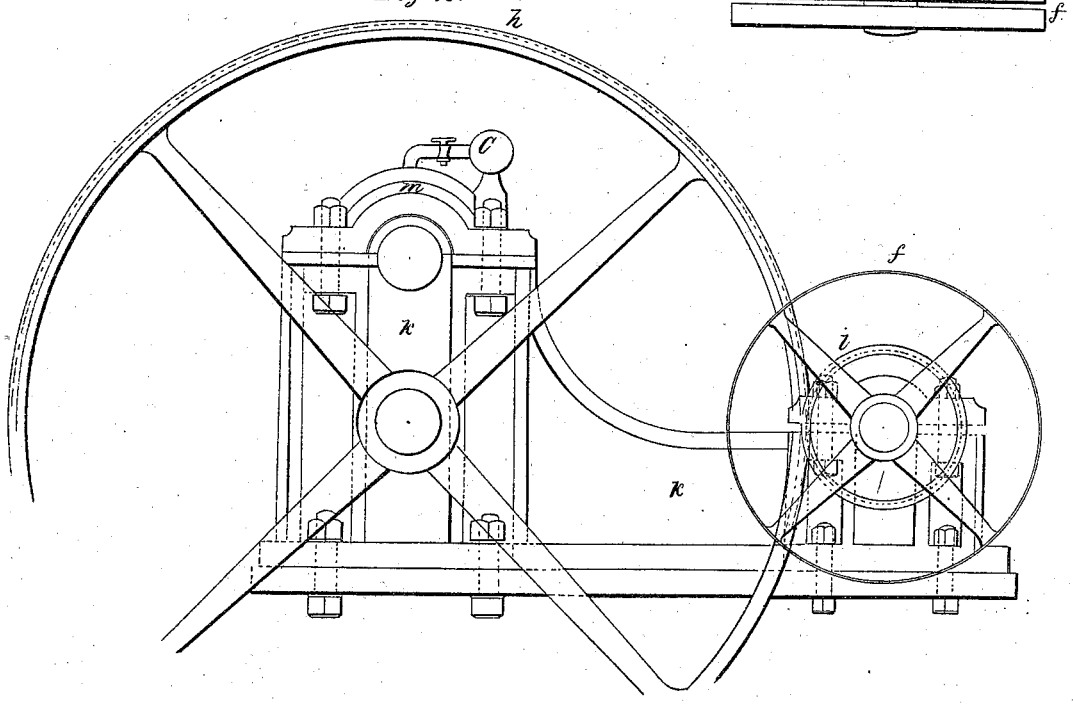


Fig. 2.



Scale of feet.

Inches: 12 9 6 3 0 1 2 3

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Fig. 3.

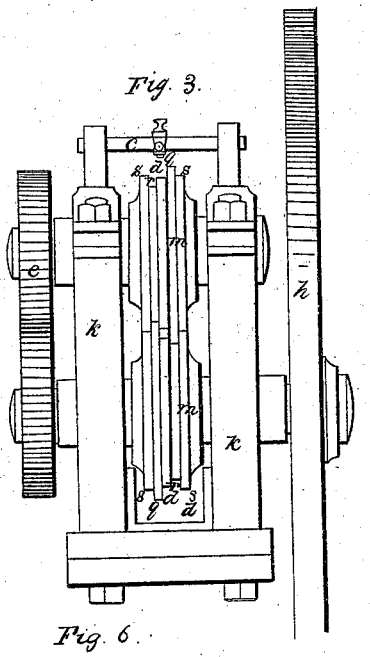


Fig. 4.

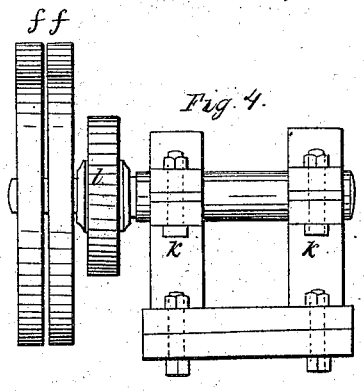


Fig. 10.

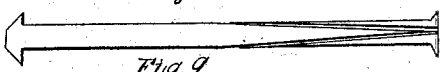


Fig. 9

Fig. 6.

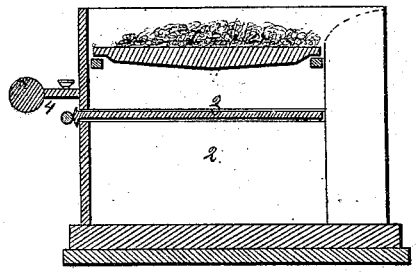


Fig. 7.

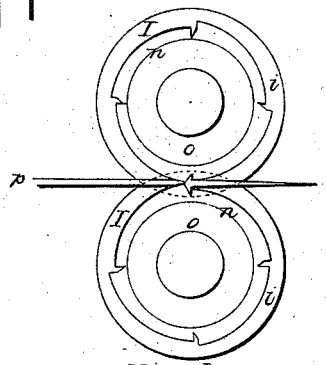


Fig. 8.

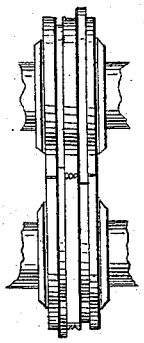


Fig. 11.

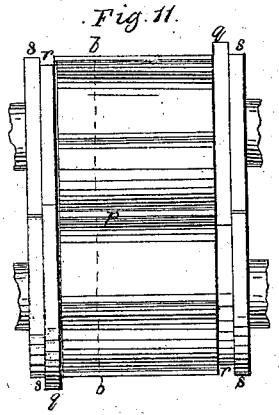


Fig. 12.

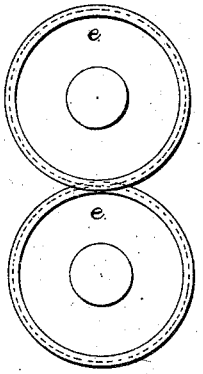
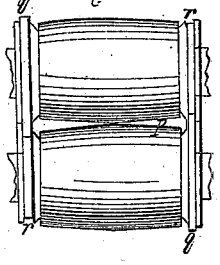


Fig. 13.



UNITED STATES PATENT OFFICE.

ELISHA H. COLLIER, OF SCITUATE, MASSACHUSETTS.

METHOD OF MAKING RAILS BY ROLLING.

Specification of Letters Patent No. 7,437, dated June 18, 1850.

To all whom it may concern:

Be it known that I, ELISHA HAYDON COLLIER, a native of Scituate, in the county of Plymouth and State of Massachusetts, residing in London, England, have invented or discovered certain new and useful Improvements in Machinery for Rolling and Cutting Metals into Nails, Spikes, Railway-Pins and other Fastenings, and that the following is a full, clear, and exact description of the principle or character which distinguishes them from all other things before known and of the usual manner of making, modifying, and using the same, reference being had to the accompanying drawings, of which—

Figure 1, is a top plan of the machine with the flanged and grooved rollers as hereafter described adapted to rolling spikes, nails, &c., out of plates of iron. Fig. 2, is a side elevation; Fig. 3, a front end elevation, and Fig. 4, a back end elevation of the same. Figs. 5 and 6, show the furnace for retaining the heat in the plates or rods. Fig. 7 is a section through the rollers in the lines *a a*, Fig. 3, and *b b*, Fig. 11. Fig. 11, shows a pair of rollers with flanges and grooves on opposite ends, as hereafter described, for rolling out a plate having the longitudinal section of the nails which are afterward to be cut into nails by the shears or cutters in Fig. 14. Fig. 12 is a side view of the gearing wheels on the journals of the rollers. Fig. 13 is a pair of rollers for rolling a sheet having the section of the nails transversely to its length; the sheets to be afterward cut across into nails.

The letters refer to the same parts in all the drawings.

(*k*) is the frame in which the several pairs of rollers are made to revolve, by the large spur wheel (*h*) on the journal of the upper roller, which is driven by the pinion (*l*) and the pulleys (*f*). The spur gearing wheels (*e*) cause the rollers (*m*) to revolve together.

(*n*) Fig. 7 shows the dividing line between the steel ring (*i*) which forms the rolling surface and in which the depressions are sunk for giving the requisite shape to the nails, and the body of the roller (*o*).

(*p*) shows the metal in the act of its formation into nails or the sheets from which the nails are afterward to be cut.

(*q*) are the flanges on the rollers, and (*r*) the grooves in the opposite rollers in which the flanges run.

(*c*) is a pipe and cock to keep the rollers cool by a stream of water.

(*d*) is a trough in which the lower roller runs which is filled with water for the same purpose.

(*s*, s,) are the bearing surfaces, of equal diameter on each roller for keeping the rolling surfaces a proper distance apart.

In machinery as hitherto constructed with a view to making nails, &c., by passing the rods or plates out of which they were to be formed through rollers, by which they are pressed or cut into shape, much difficulty has arisen by the nails, &c., sticking fast between the flanges of the rollers. This difficulty is not so much felt in ordinary slitting rollers, as the thickness and strength of the rolled bars being continuous they are easily detached from the rollers; but in rolling nails, spikes, &c., they are nearly if not quite cut off or separated from each other, by the pressure of the rollers, and when they stick or become jammed between the flanges it is extremely difficult to extricate them.

In the form given to my rollers I avoid all difficulty from this cause, by making the rollers with one flange and one groove on each, the flange on one roller projecting into the groove in the other, instead of making both flanges on one roller and both grooves on the other. It will be seen that by this arrangement the plates from which the nails are to be cut after passing between the rollers and being pressed into the required form are immediately released from the rollers, as the flanges which confined them and prevented them from spreading laterally while receiving the pressure, (being one on the upper and the other on the lower roller,) separate from each other and leave the plate or sheet of nails free to be removed.

These rollers may be applied to rolling nails, spikes or fastenings of any form, and in sheets of any width which are afterward cut into separate nails, by shears or cutters

The rollers are constructed of wrought iron with a ring of steel welded between disks of wrought iron by which method I am able to construct these rollers and harden them without the risk of cracking them in that process. (*n*) Fig. 7, shows the line where the steel ring is welded to the rollers.

The bearing surfaces (*s*, s,) serve to keep the rolling surfaces at a proper distance apart as well as to prevent the rollers from moving laterally apart from each other by the pressure of the rolled metal against the flanges, and enable me to dispense with the under bearings of the upper roller.

For the purpose of maintaining the heat of the plates while being rolled into nails, and preventing them from cooling down to too low a temperature, which would be likely to occur with the thin plates used for making small nails, I employ an auxiliary furnace as represented in Figs. 1, 5 and 6, on which the rods or plates are laid (a number at a time as they are brought from the heating furnace, and the heat being thus kept up to the best temperature for rolling, the process is much better performed, and the nails thus made are not found to have those laminated cracks, which are common in nails where they are rolled too cold. Another advantage is that the dies or rollers keep in better repair, as they are not subject to have the iron passed cold through them. (1) is the fire bed or grate, (2) the ash pit, having a sliding damper (3) which forms a chamber under the fire, into which the blast is admitted through the pipe (4).

Having thus fully described my improvements in the manufacture of nails, &c., what I claim as new therein, and which I desire to secure by Letters Patent is—

The auxiliary furnace in combination with the machinery for rolling nails, &c., as above described for retaining the heat of the plates or rods of iron, while they are separately passed into the machine.

E. H. COLLIER.

Witnesses:

EDWARD EVERETT,

WM. GREENOUGH.