

(No Model.)

W. W. MINER.
Annealing Nails.

No. 230,644.

Patented Aug. 3, 1880.

Fig: 1.

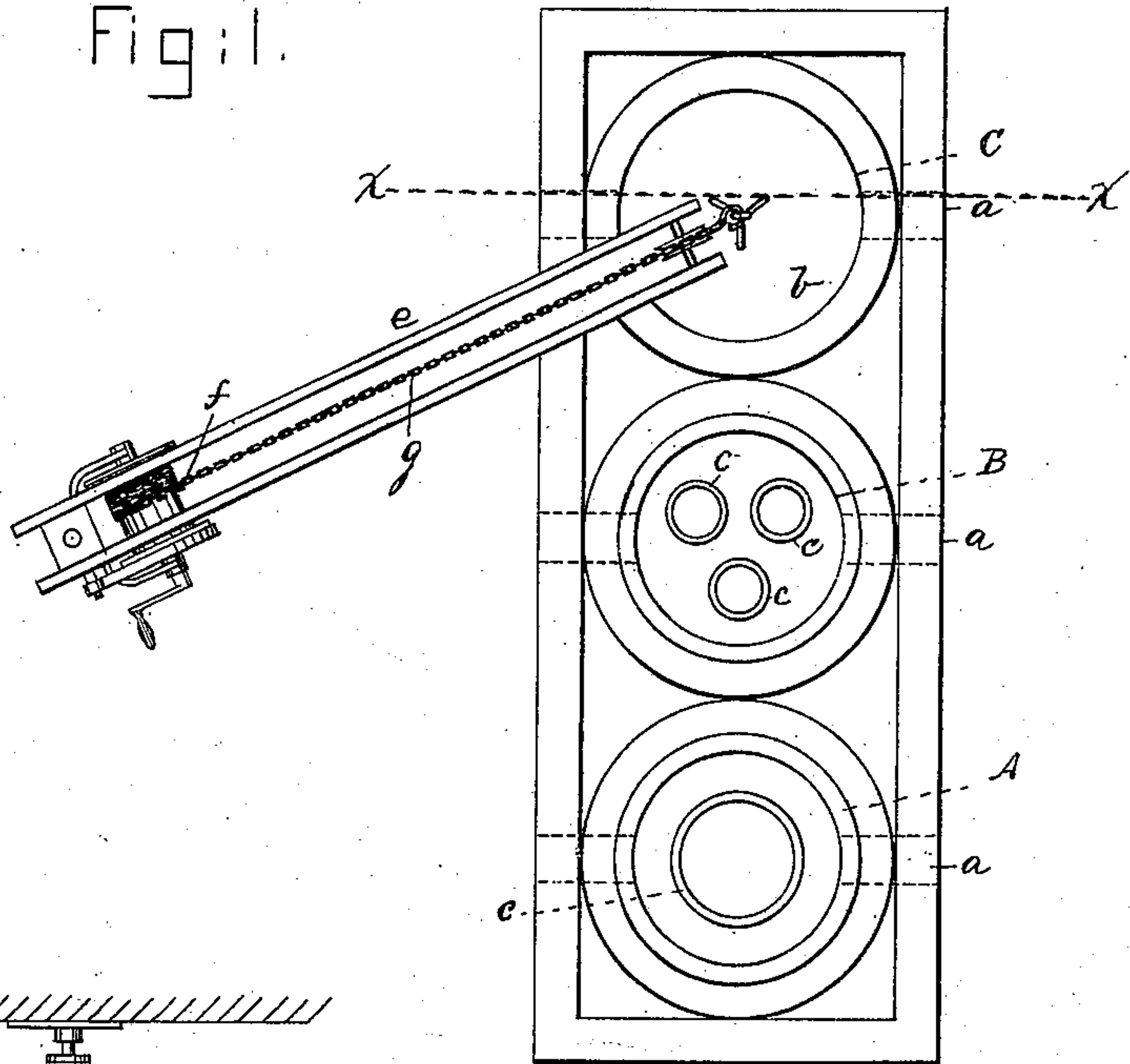
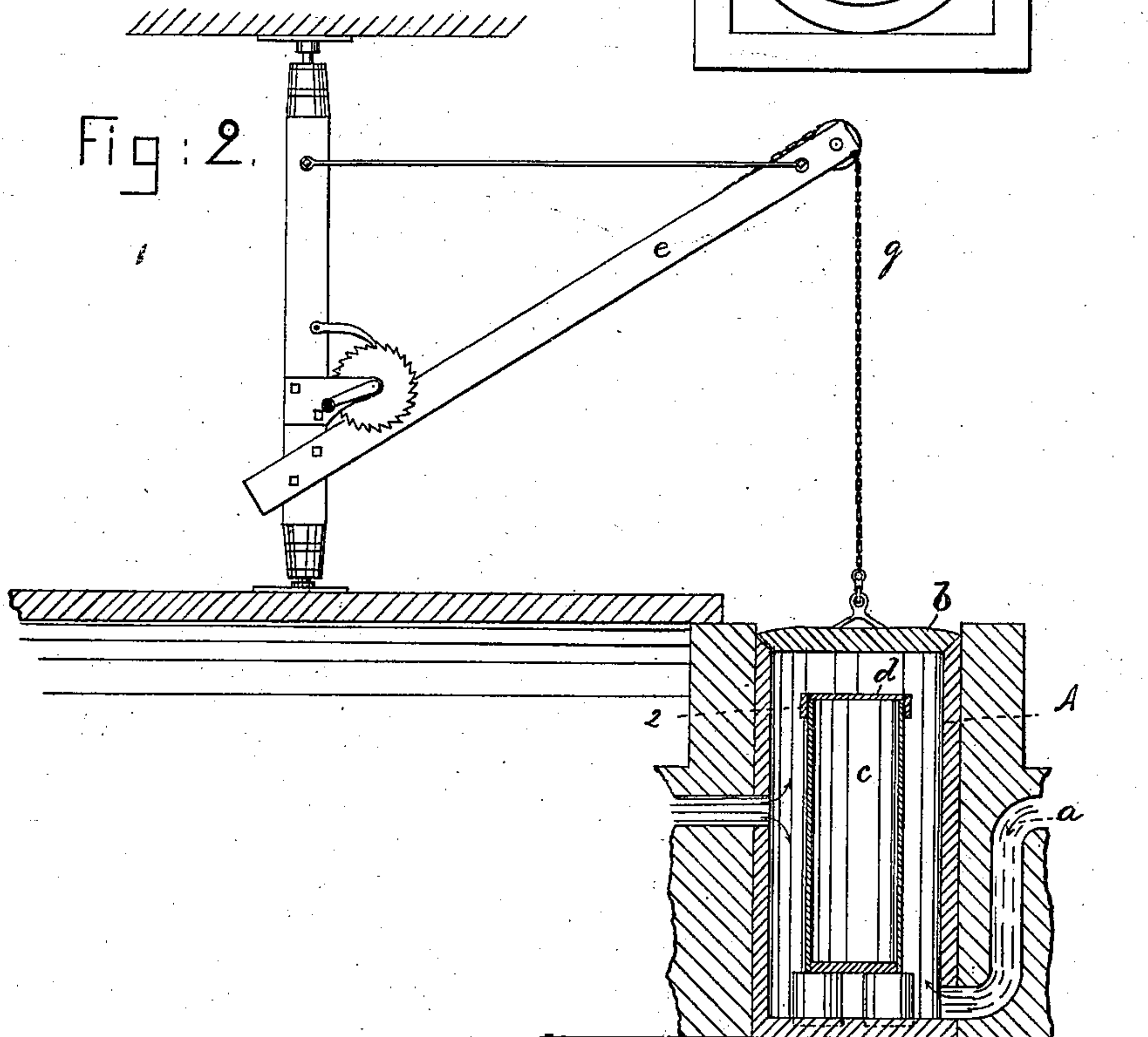


Fig: 2.



Witnesses:

L. F. Connor,
A. Reynolds.

Inventor:

William W. Miner.
by Crosby Gregory, Atty.

UNITED STATES PATENT OFFICE.

WILLIAM W. MINER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO GLOBE
NAIL COMPANY, OF SAME PLACE.

ANNEALING NAILS.

SPECIFICATION forming part of Letters Patent No. 230,644, dated August 3, 1880.

Application filed May 17, 1880. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. MINER, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in
5 Annealing Animal-Shoe Nails, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to an improved method of annealing animal-shoe nails, and also to
10 apparatus therefor, as hereinafter described.

A very large portion of the animal-shoe nails now in market are made from blanks cut from hot-rolled plates usually ribbed to form thick portions for the heads, and these blanks
15 are subsequently cold rolled or drawn to form nails of the proper taper and to stiffen their shanks.

The metal usually employed is that known as homogeneous, it having little or no grain.

20 I have discovered that an animal-shoe nail made from a blank punched cold from a rolled plate of homogeneous or steelified iron, or a hot-forged blank, if treated or annealed as hereinafter described, may be made to stand a
25 greater amount of strain, be bent more often without breaking or cracking, and consequently hold a shoe upon the hoof longer than if not so annealed.

In the practice of my invention I place or
30 pack the nail-blanks together as closely as possible, in, preferably, a wrought-iron retort, which is then covered and preferably hermetically sealed by clay or otherwise, so as to leave as little air as possible in the retort. Then I
35 place the said retort so filled with blanks in a furnace where the retort and its contents are raised to about a cherry-red heat, this usually requiring from eight to twelve hours, after which the retorts are removed from the fur-
40 nace, and, yet closed, are, with their contents, permitted to cool slowly and gradually, such cooling requiring from ten to fourteen hours, according to the state of the surrounding atmosphere, the cooling preferably being done
45 slowly.

The blanks punched from metal plates are more or less covered with oil, (for the plates are oiled before the blanks are punched out,) and in such condition they are thrown into
50 the retorts. The blanks are removed from the

closed retorts when they become sufficiently cool to be handled, or when they lose their red color; after which they are subjected, preferably, to a dilute sulphuric or other acid bath of low degree, to remove the dirt or the residuum of the oil left thereon after being heated,
55 as described; after which they are tumbled, cold rolled or drawn, beveled to form finished points, and sheared, all in the usual way. In this my plan the retorts are made as cylinders about
60 seven feet long by fifteen to twenty inches in diameter, and will hold from one to two thousand pounds of nail-blanks.

By keeping the oiled blanks in a sealed retort away from the air, I have found that they
65 do not oxidize and scale is not formed on them, as in the old plan. I believe the oil left on the blanks lessens the tendency of the blanks to scale or oxidize, makes them softer and tougher, and leaves the blanks in such con-
70 dition that they more readily take polish and become bright by subsequent tumbling or rolling in the usual way.

I have in some of my experiments exhausted the air from the retort after filling it with
75 blanks, and have heated the blanks in substantially a vacuum, and I have discovered that the more nearly the air is exhausted from the retort the lighter the color of the blanks, the softer the iron, and the less the scale. 80

The oil on the blanks materially assists in raising the heat within the retorts to a very high or intense degree, as the oil being consumed is converted into gas. The dark residuum or coating left on the oiled blanks af-
85 ter they are cooled, as described, may be very easily removed by rattling or tumbling.

Forged nail-blanks may be annealed in the manner above described; but before placing them in the retorts I prefer to coat them with
90 or dip them in oil.

Figure 1 is a top or plan view, showing a furnace containing three furnace-chambers, A B C, in a row. Furnace A contains one retort, and B three retorts, while the lid of the
95 furnace-chamber C is engaged by the chain of the crane, which is to lift it and uncover said chamber.

Fig. 2 represents, in section, on the line *xx*, Fig. 1, a furnace-chamber, A, shown as contain- 100

ing but one sealed retort filled with nail-blanks, a crane being located near the furnace by which to remove or replace the retorts when desired.

5 Let it be supposed that A B C represent furnace-chambers of refractory material, and of usual construction, suitably connected by passage *a* with any usual combustion-chamber or heat-generator, (not shown,) in which,
10 by the consumption of coal or other fuel, heat may be generated to raise the temperature of the furnace-chambers, one or more, to a very high degree.

The furnace-chambers may be of greater or
15 less size, to contain one or more retorts, *c*. Each furnace-chamber has a cover, *b*.

The retorts *c* consist of strong wrought-iron cylinders having bottoms inserted air-tight and provided with covers *d*, which may be
20 fitted thereto and be sealed air-tight.

About the top of each retort I have shown a flange or projection, 2, to receive within it the head or cover *d*, and preferably the flange 2 will be a little higher than the cover, to permit the joint or crack between the cover and
25 flange to be sealed air-tight.

The crane *e*, of usual construction, has a drum, *f*, and a chain, *g*, by which the cover *b* of the furnace-chamber and the retort may be moved or handled, as when placing the filled
30 retorts into or removing them from the furnace-chambers.

When moving the retorts the flange affords a ready means with which the usual hooks or chain of the crane may be engaged.
35

I claim—

That improvement in the method of manufacturing animal-shoe nails which consists in inclosing the oiled blanks, or blanks and oil, in an air-tight metal retort, subjecting the
40 blanks therein to a high or cherry-red heat, and volatilizing the said oil, as set forth, and then cooling the said blanks in the retort, as and for the purpose described.

In testimony whereof I have signed my name
45 to this specification in the presence of two subscribing witnesses.

WILLIAM W. MINER.

Witnesses:

G. W. GREGORY,
N. E. C. WHITNEY.