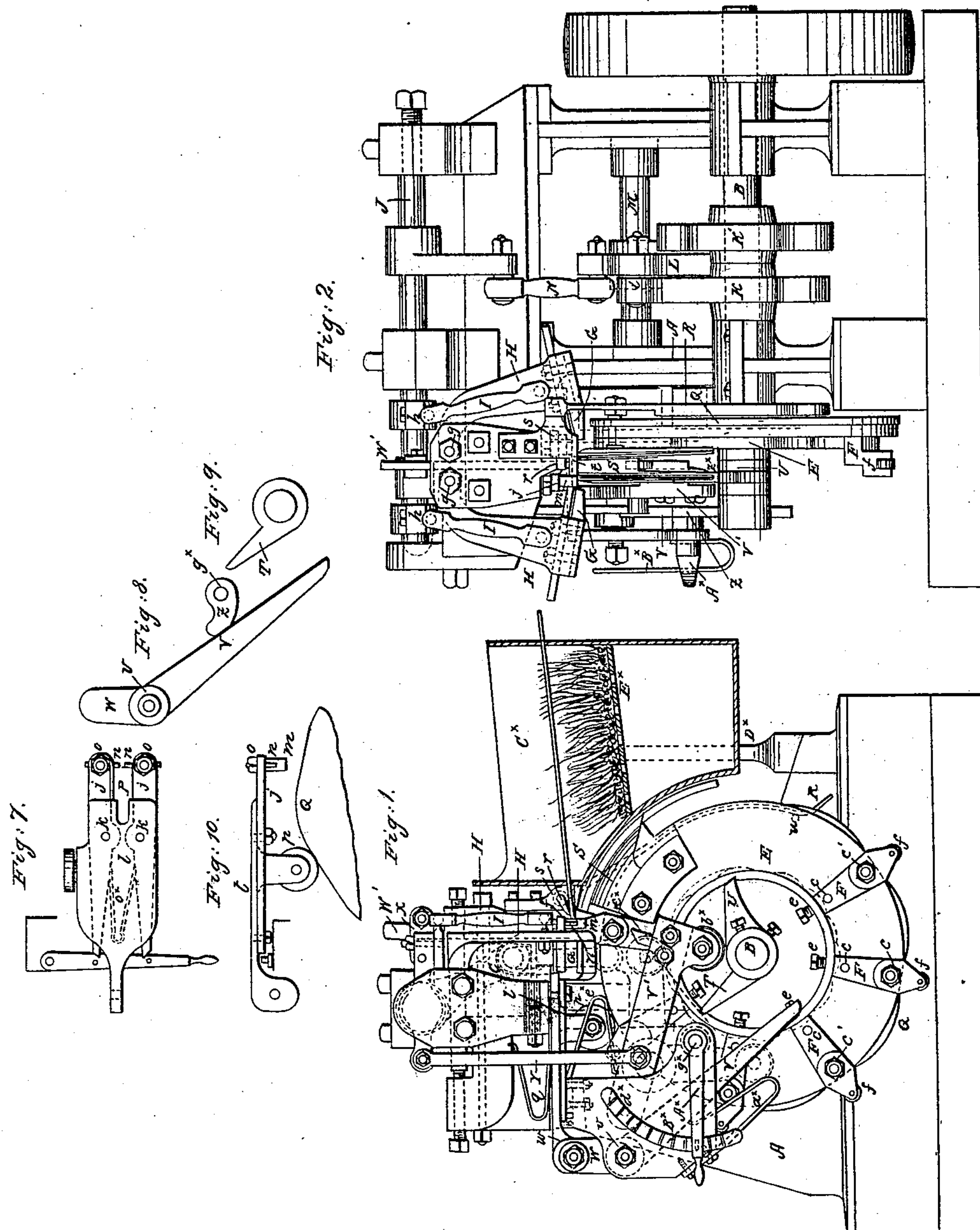


G. D. WALCOTT.

Machine for Making Horseshoe Nails.

No. 79,417.

Patented June 30, 1868.



Witnesses:
Geo. Tusche,
W. Freun.

Inventor:
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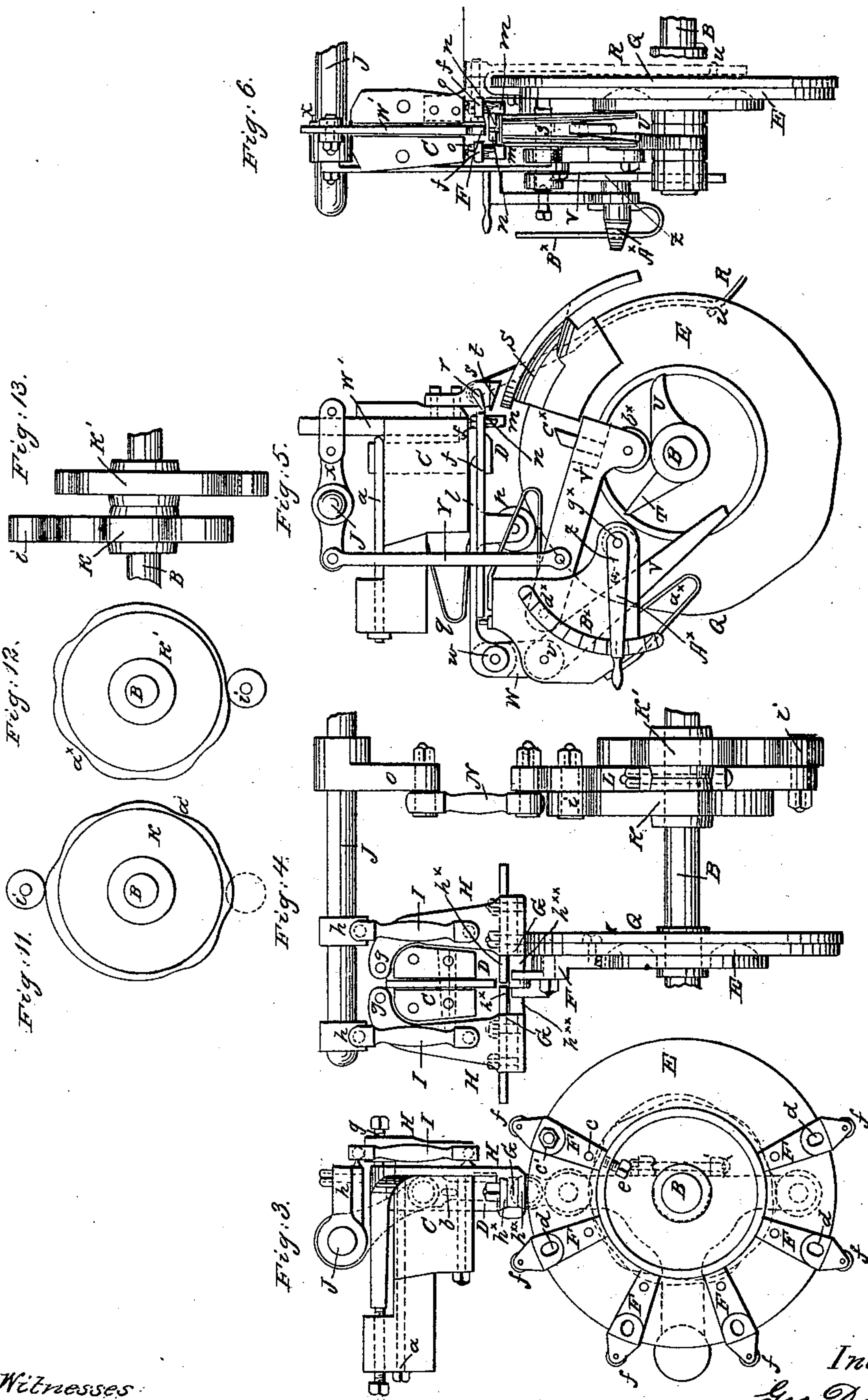
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

GEORGE D. WALCOTT, OF JACKSON, MICHIGAN.

IMPROVED MACHINE FOR MAKING HORSESHOE-NAILS.

Specification forming part of Letters Patent No. 79,417, dated June 30, 1868.

To all whom it may concern:

Be it known that I, GEORGE D. WALCOTT, of Jackson, in the county of Jackson and State of Michigan, have invented a new and useful Improvement in Machine for Making Horseshoe-Nails; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The nature of my invention consists in a novel construction and arrangement of parts, as hereinafter fully shown and described, whereby, in connection with a heater or furnace, a machine is obtained which will work up into horseshoe-nails a rod of any proper or desired length, without any other work or labor than the introducing of the rods to the machine and the keeping of the fire in proper order.

In the accompanying sheets of drawings, Figure 1, Sheet No. 1, is a side view of my invention, the heater or furnace being in sections; Fig. 2, Sheet No. 2, a front view of the same; Figs. 3 and 4, Sheet No. 3, detached views of parts pertaining to the same; Figs. 5 and 6, Sheet No. 4, and Figs. 7, 8, 9, 10, 11, 12, and 13 of Sheet No. 5, views of parts pertaining to the same.

Similar letters of reference indicate like parts.

A represents the frame of the machine, which may be constructed in any proper manner to support the working parts; and B represents the driving-shaft, from which motion is communicated to all the working parts of the machine. C is the anvil-block, attached to one side of the upper part of the frame A, and containing the anvil D, which projects down below the anvil-block a short distance, and is secured in position by bolts *a*, and adjusted by a key, *b*. (See more particularly Fig. 3.)

E is a wheel, placed on one end of the driving-shaft B, and having a series of arms, F, attached radially to it by bolts *c c'*, said bolts passing through oblong slots *d* in the arms F, to admit of the latter being adjusted farther in or out by set-screws *e*. (See Figs. 1 and 3.) In the outer ends of the arms F there are placed rollers *f*, which, as the wheel E rotates,

and, in connection with the anvil D, draw out the rod from which the nails are made and alternate and upset it, compacting the fiber of the metal and reducing the portion of the rod acted upon to a suitable thickness.

G G represent two "edgers," which operate laterally upon the rod. These edgers are fitted transversely in the lower parts of pendent vibrating or oscillating bars H, having their axis at *g*, the bars receiving their motion through the means of rods I from arms *h h* on a rock-shaft, J, placed in the upper parts of the frame A. (See more particularly Fig. 4.) This rock-shaft receives its motion from two cams, K K', on the driving-shaft B, said cams working against rollers *i i* at the ends of a bent lever, L, on a shaft, M, one arm of the bent lever being connected by a rod, N, with an arm, O, on the rock-shaft J. (See Figs. 2 and 4.)

The edgers work in connection with the rollers *f*, the latter, in connection with the anvil, acting upon the rod vertically, and the edgers acting upon the rod laterally. The edgers operate directly after each roller *f*, the former giving a blow to each pressure of a roller, *f*, or the former may give two blows to one pressure of each roller, or, vice versa, two operations of the rollers to one blow of the edgers. This may be arranged or modified to suit circumstances.

The cams K K' act alternately against the rollers *i i* at the ends of the bent lever L, said cams being simply wheels provided with an undulating periphery, as shown clearly in Figs. 11 and 12 at *a*^x. It will be seen, therefore, that the edgers are operated by a positive mechanism, and it will further be seen that the blows of the edgers may be made heavy or light, slow or quick, by varying the shape and size of the prominences and cavities of the cams K K', and it is designed to have said prominences and cavities of such a size and form that the edgers G will operate against each nail with heavy blows at first, and gradually decrease in force until the nail is finished.

The rods I are attached to the arms *h h* of the rock-shaft J by ball-and-socket joints, for the reason that the arms *h h* move in planes at right angles to those in which the pendent bars H move.

The feed-motion and cutting-off mechanism will be understood by reference to Figs. 5, 6, 7, 8, 9, and 10.

The tongs P, by which the rod is held while the nail is being formed, are composed of several parts, as follows: Two bars, *j j*, are fastened by screw-bolts *k* to a vibrating plate, *l*, each bar having a pendent stud, *m*, at its front or outer end, each stud being provided with a griper, *n*. (See Figs. 5, 6, and 7.) The grippers, passing through slots in the studs, are held in position by screwing up the nuts *o* on the tops of the studs. To the under side of the plate *l*, between the bars *j j*, a spring, *o*^x, is secured, which has a tendency to press the studs *m m* toward each other, and constitute the gripping power, as will be fully understood by referring to Fig. 7.

The vibrating plate *l* moves the nail-rod from between the edgers G G to the anvil D, the tongs, as above explained, being attached to said plate. This plate is operated by a cam-rim, Q, on the periphery of the wheel E, said rim Q acting against a roller, *p*, at the under side of the plate, the roller being kept in contact with the cam-rim by means of a spring, *q*, which presses down on the top of plate *l*. (See Fig. 5.) The plate *l* is raised by the action of the cam-rim Q against the roller *p*, and lowered by the spring *q*, the grippers *n* raising the rod from between the edgers up to the anvil D each time the plate *l* rises.

There is, in addition to the above, another gripping device, composed of a lever, R, having a jaw, *r*, extending at right angles from its upper end, and passing through a bearing, *s*, which has a fixed jaw, *t*, formed on it, the fixed jaw being directly under the movable one, *r*. The lever R is operated by a pin, *u*, on wheel E.

To the wheel E, at its periphery, there is attached what I term a "spreader," S, which is designed to open the tongs P—that is to say, spread apart the studs *m*—at every revolution of the wheel E.

On the driving-shaft B, adjoining the wheel E, there are two arms, T U, one of which, T, acts against a lever, V, attached to a shaft, *v*, which has an arm, W, upon it, to which the rear end of the plate *l* is attached by a pivot-bolt, *w*. This lever V has a spring, *a*^x, bearing against it, as shown clearly in Fig. 5.

It will be understood that the edgers G G act upon the sides of the rod each time the plate *l* descends, the rod being raised up underneath the anvil D directly after each operation of the edgers, in order to be prepared for the operation of a roller, *f*. At each revolution of the wheel E the spreader S spreads apart the studs *m*, and at the same time the arm T strikes the lever V, and the plate *l* with the tongs attached is forced forward, and the grippers *n n* grasp the rod after the spreader S has passed between the studs *m*, and the plate *l* and tongs P are drawn back under the influence of spring *a*^x, and the rod drawn for-

ward for the making of a succeeding nail. During the time the spreader is passing between the studs *m m*, and the grippers *n n* are not in contact with the rod, the latter is held between the jaws *r t*, in consequence of the pin *u* on wheel E striking the lever R, the rod being released from the jaws *r t* as soon as the grippers *n n* come in contact with them, so that the grippers may feed the rod forward.

At the completion of the formation of each nail it is cut off, as follows: The arm U strikes a roller, *b*^x, at the end of a bar, V', in which a cutter, *c*^x, is fitted. This bar V' is fitted on a shaft, *d*^x, and has a spring, *e*^x, bearing upon it, which has a tendency to keep the cutter *c*^x down. An upper cutter, *f*^x, is also used, which is at the lower end of a vertical sliding bar, W', the upper end of which is connected by a bar, X, on the rock-shaft J, and an upright rod, Y, connects the bar V' with the bar X, as shown in Fig. 5.

It will be seen from the above that the two cutters *c*^x and *f*^x act simultaneously, and the finished nail is cut off from the rod just as the spreader S completes its passage between the studs *m m* of the tongs.

The lever V, which carries the plate *l*, and the tongs, which are attached thereto, to be shoved forward in feeding the rod, is always moved back under the influence of spring *a*^x, and the rod moved or fed into the machine the required distance, whether it be greater or less, by means of a cam, Z, on a shaft, *g*^x, the latter having a lever, A^x, on its outer end, which lever extends over a graduated bar, B^x; and by adjusting this lever, and consequently the cam, the distance of the backward movement of the plate *l* and tongs P may be regulated according to the length of feed required for the nail-rod.

The edgers G G are composed of two dies each, *h*^x *h*^x, (see Fig. 4,) the upper dies *h*^x being the working ones, and the lower ones, *h*^x, the bumpers, to prevent the working dies from coming too near together. (See Fig. 4.)

C^x is the heater or furnace, which is fitted on a vertical rod, D^x, in such a manner that it may be turned freely thereon. This heater or furnace is simply a metal box provided with a fire-grate, E^x, and having apertures in it, through which the nail-rod passes into the machine. (See Fig. 1.) This heater or furnace admits of the nail-rod being kept in a properly-heated state during the whole of the operation, and the time expended with ordinary machines in withdrawing the rod for heating is saved.

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

1. The combination of the tongs P and supplemental grippers *r t* with the furnace, all constructed and arranged substantially as shown and described.
2. The tongs P, constructed and arranged

as shown, when said tongs are placed in such a relation with a heater or furnace, C^x , that they will grasp the nail-rod between the fire and the working parts of the machine.

3. The supplemental grippers or jaws $r\ t$, in combination with the grippers $n\ n$ of the tongs P, all constructed and arranged substantially as described.

4. The plate l , to which the tongs P are attached, when said plate is operated in a vertical and longitudinal direction, for the purpose of actuating or moving the nail-rod during the formation of the nails, in the manner and by means substantially as shown and described.

5. The cam-rim Q on wheel E, roller p , and spring q , in combination with plate l and the lever V, spring a^x , arm W on shaft w , and the arm T on shaft B, all arranged as shown, for the purpose of operating the plate l , as set forth.

6. The pendent anvil D, fitted in an overhanging block, C, and the devices for lifting and holding the nail-blank thereto, in combination with the adjustable rollers f , so arranged that the nail-rod will be operated upon at the under side of the anvil, as shown and described.

7. The rollers f , fitted in adjustable arms F, applied to the wheel E, substantially as shown, in combination with the anvil D, all arranged substantially as and for the purpose specified.

8. The edgers G G, fitted in pendent oscillating bars H, hung on the anvil-block C, combined and arranged to operate in connection with the rollers f and anvil D, substantially as and for the purpose set forth.

9. The edgers G G, each provided with two dies, $h^x\ h^{xx}$, constructed and arranged substantially as shown and described, so that the upper dies h^x will serve as working-dies, and the lower ones, h^{xx} , as bumpers, to prevent the upper dies coming in contact.

10. The cam-wheels K K', in combination with the bell-crank lever, rollers, arms, and other devices for giving motion to the edgers, substantially as shown and described.

11. The two cutters $c^x\ f^x$, applied respectively to a swinging bar, V' , and a vertically-sliding bar, W' , connected by the bars X Y, the former of which is on the rock-shaft J, and all arranged so that the two cutters will be operated by a single cam or arm, U, on driving-shaft B, and the finished nail cut off at the spot where it was made, substantially as shown and described.

12. The combination of the cam Z, lever V, and plate l , arranged and operating substantially as described.

13. The spreader S, in combination with the wheel E, tongs P, and grippers $n\ n$, all arranged in the manner substantially as and for the purpose specified.

14. The combination of the wheel E, provided with the rollers f , the anvil D, plate l , with tongs P attached, and the edgers G, all arranged and operated in the manner substantially as and for the purpose set forth.

15. The combination of the two cam-wheels with varying radii, one the counterpart of the other, with the bell-crank lever, the rollers attached thereto, and other devices or their equivalents, as shown and described.

16. The cam Z, lever A^x , and graduated bar B^x , in combination with the lever V and the other parts necessary for adjusting the feed of the nail-rod, substantially as herein shown and described.

17. The lever R, having jaw r , the fixed jaw t in the bearing s , and the pin u upon the wheel E, in combination with the grippers $n\ n$, all arranged substantially as described.

18. The combination of the cutters $c^x\ f^x$ with the cam-wheels K K' and edgers G G, with their intermediate mechanism, whereby the force of the blows of the edgers is increased for the first blow upon the nail, and the time required for such increase of force made available for the operation of the cutters, substantially as herein shown and described.

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