

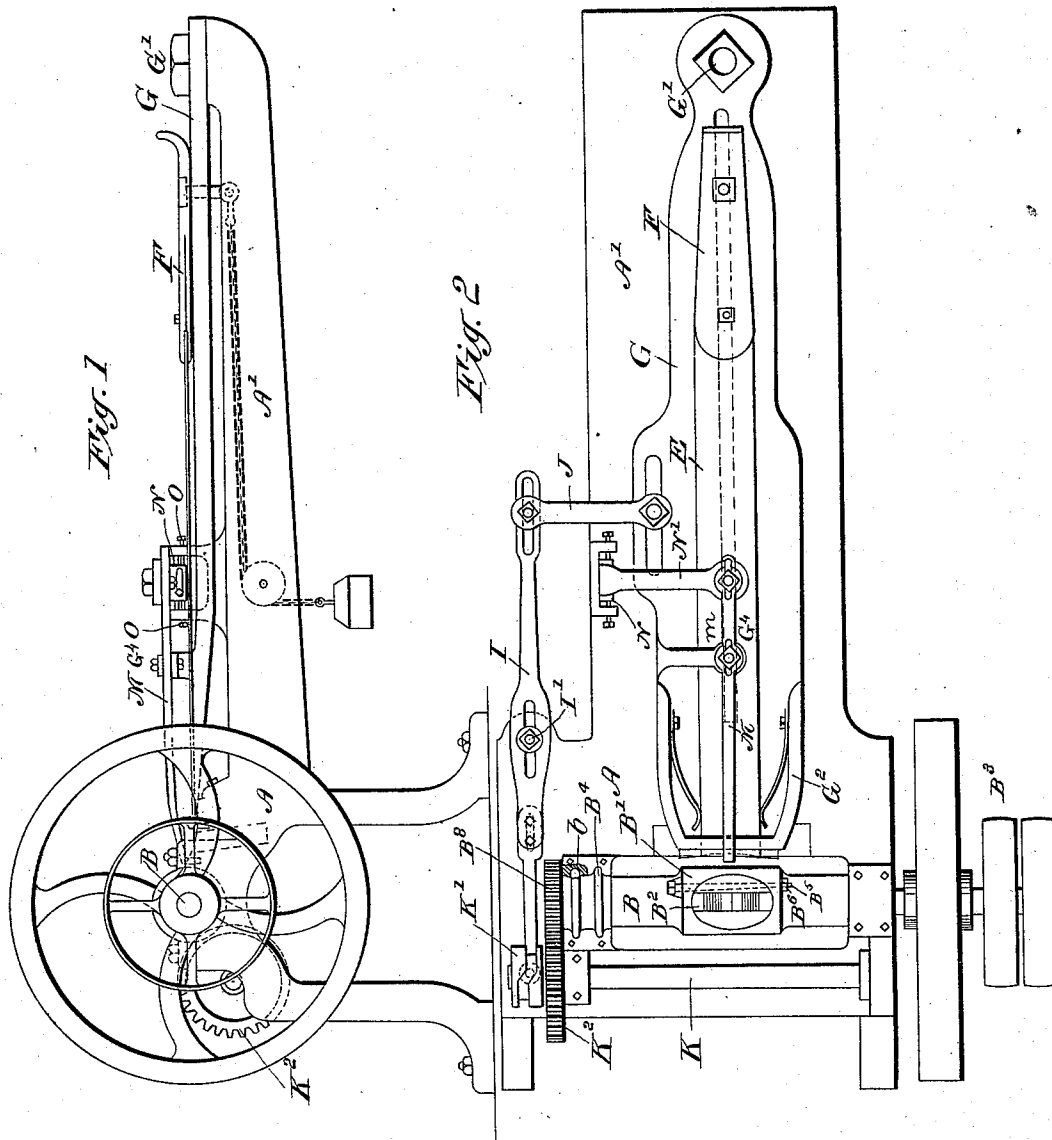
(No Model.)

3 Sheets—Sheet 1.

G. D. BARTLETT.
MACHINE FOR MANUFACTURING NAILS.

No. 578,385.

Patented Mar. 9, 1897.



WITNESSES:
M. B. Harris
H. F. Boyle

INVENTOR
G. D. Bartlett
BY
Thomas D. Stewart
ATTORNEY

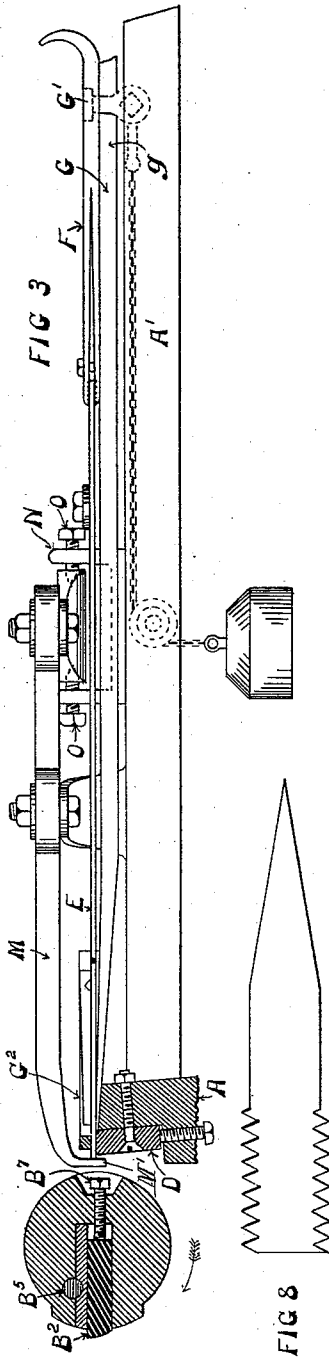
(No Model.)

3 Sheets—Sheet 2.

G. D. BARTLETT.
MACHINE FOR MANUFACTURING NAILS.

No. 578,385.

Patented Mar. 9, 1897.



WITNESSES
D. C. Giles
H. F. Boyle

FIG 3

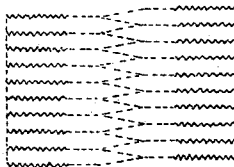
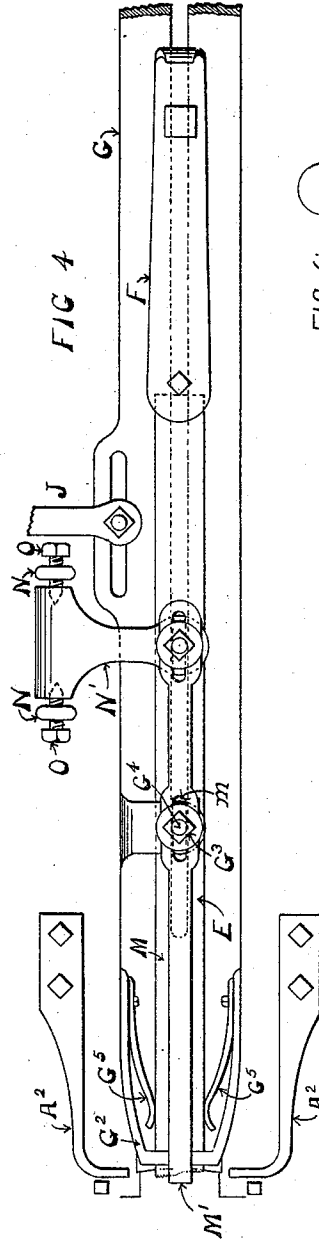


FIG 7

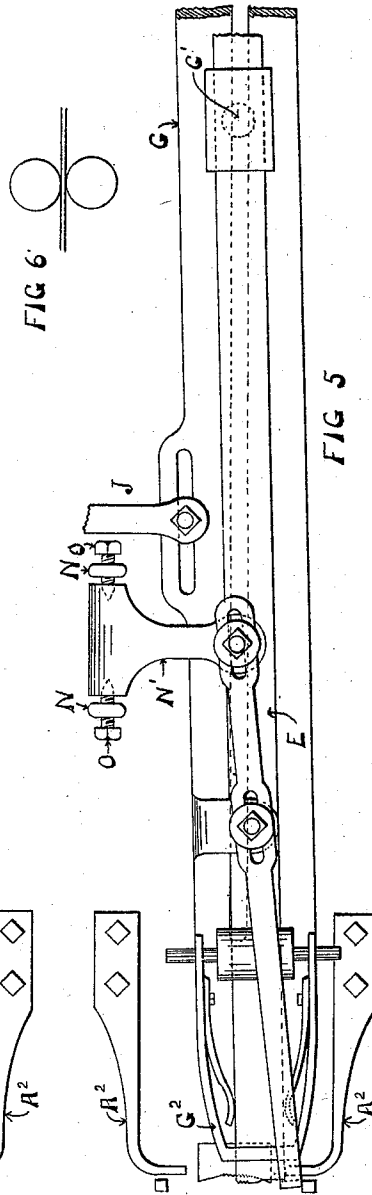


FIG 5

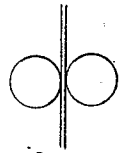


FIG 6

INVENTOR
George D. Bartlett
BY
James D. S. S. S.
ATTORNEY.

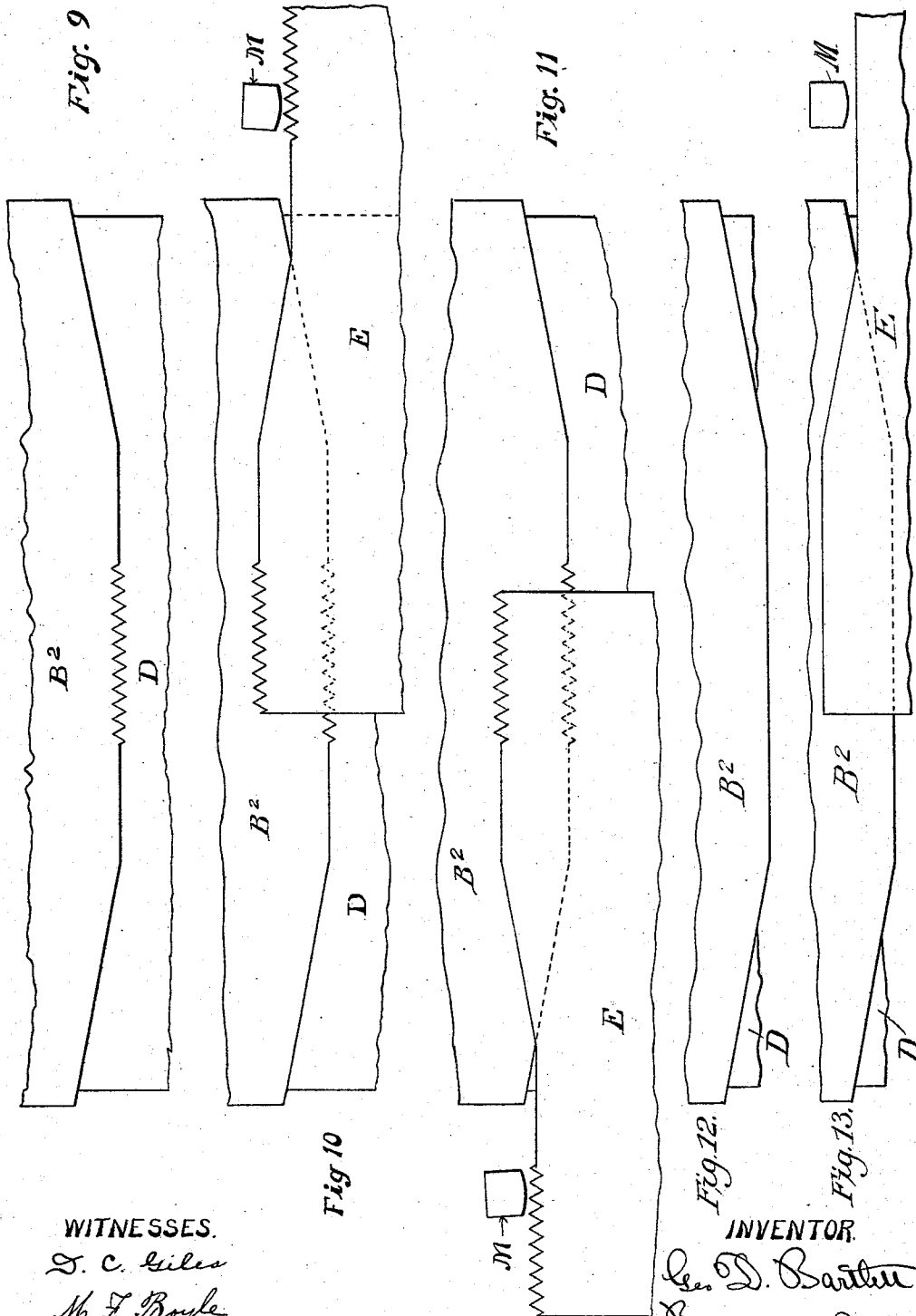
(No Model.)

3 Sheets—Sheet 3.

G. D. BARTLETT.
MACHINE FOR MANUFACTURING NAILS.

No. 578,385.

Patented Mar. 9, 1897.



WITNESSES.

S. C. Giles

M. F. Boyle

INVENTOR.

G. D. Bartlett

By James D. Newell

Attorney

UNITED STATES PATENT OFFICE.

GEORGE D. BARTLETT, OF PLYMOUTH, MASSACHUSETTS.

MACHINE FOR MANUFACTURING NAILS.

SPECIFICATION forming part of Letters Patent No. 578,385, dated March 9, 1897.

Application filed April 30, 1895. Serial No. 547,632. (No model.)

To all whom it may concern:

Be it known that I, GEORGE D. BARTLETT, nail manufacturer, a citizen of the United States, residing at Plymouth, in the county of Plymouth and State of Massachusetts, have invented a certain new and useful Improvement in Machines for the Manufacture of Nails, of which the following is a specification.

The improvement applies to the manufacture of a class of nails which do not require to be gripped and headed, but are produced by simply cutting in a peculiar form from a plate of proper thickness, which is just sufficiently wider than the length of the nail, and may be smooth. The nails are all alike, each having the point properly tapered, a portion of the body nearest the point smooth and parallel and the remainder of the body parallel and roughened. I have discovered that it is practicable to manufacture such nails by machinery by matching together knives adapted to cut parallel lines to produce the required parallel bodies, and also to cut oblique lines to give the required tapering points, making the very obtuse angles equal on each side and feeding the iron thereto with a liberal vibrating motion. A revolving cutter-head is employed to carry the moving knife. It is important to roughen, by suitable projections and depressions, a considerable portion of the body, so that the leather will be effectually held in all stages of wear. I produce the nails with the required amount of roughness by making the middle portion of the cutting edges of the knives with notches and ridges, which also match together. I have devised a gage which vibrates from side to side simultaneously with the vibration of the plate and to a greater extent, adapted to accurately gage the amount of the plate cut off at each revolution, and also to allow great freedom and perfection of the feed. I provide convenient means for adjusting such gage to make nails broader or narrower at will. The machine may run at a high speed and will take in plates of any length.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is a side elevation. Fig. 2 is a top plan view. Fig. 3 is a view of the main portion on a larger scale. It shows the revolving head and a portion of the main framing in section and the vibrating table and gage in elevation; and Fig. 4 is a corresponding plan view of the vibrating table, in the central position, in the act of being shifted from left to right. Fig. 5 is a plan view of the vibrating table, showing a modification of the feeding adapted to use long plates and showing the position of the gage and feed-table when it is completely vibrated to the right and is in position for the knives to set. Fig. 6 is a side elevation of the modified feeding means. Fig. 7 is a face view of a portion of the plate, on a larger scale, showing the lines on which it is cut to produce the nails. Fig. 8 is a view of a completed nail, on a still larger scale. Figs. 9, 10, and 11 are diagrams showing the form of the matched cutting edges and the shape in which the iron is cut. All these are corresponding plan views. Fig. 9 shows the knives alone. Fig. 10 shows the knives with a plate properly presented to be cut on the right-hand side of the knives; and Fig. 11 shows the same plate at the next cutting operation, having been cut and also shifted over to the left side ready for the next succeeding cut. Figs. 12 and 13 show a further modification. Fig. 12 is a diagram showing knives corresponding to Fig. 9, except that the roughening is omitted; and Fig. 13 is a diagram corresponding to Fig. 10, with the same exception. The nails made in accordance with Figs. 12 and 13 will be like those made in the preferable form shown in the previous figures, except that they will not be roughened.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

Referring to Figs. 1, 2, 3, 4, 7, 8, 9, 10, and 11, A is a bed-piece or massive frame of cast-iron or other suitable strong material, certain portions being designated when necessary by supernumerals. B² is the moving knife, carried in a head B', which is formed integral with a stout shaft B, revolving in stationary bearings and driven by a belt on a pulley B³. The bearings are formed with circumferential grooves b, and these, with the binder corre-

spondingly grooved, receive collars B⁴, formed on the shaft, and support the shaft so as to resist end motion. It is important that the knife be held firmly. I hold it by a tapering bolt or key B⁵, set by a nut B⁶. The knife is adjusted outwardly by a screw B⁷. (See Fig. 3.) The outer face of this knife is prominent at the mid-width, and a little breadth is grooved or corrugated in the line of its movement circumferentially. Near each side the face is beveled horizontally, the degree of inclination being carefully adapted to determine the required amount of taper at and near the point of the nail.

D is the bed-knife, correspondingly recessed and grooved at the mid-width, and correspondingly beveled on each side at the proper distance from the center line and to a degree exactly corresponding with the bevel of the adjacent portion of the upper knife. The bed-knife should be wide, so that it may properly support the plate as it is vibrated from side to side. Both knives must be wider than usual to allow the nails to be cut in two places on the right and left portions of the edges of the knives alternately.

The plates E, previously prepared, of proper thickness and of a breadth just sufficiently greater than the length of the nail, are held in the nippers F, urged forward by a cord and weight, and are guided in a slot *g* in a laterally-vibrating feeder G, which turns on a fixed pivot G', mounted on a stationary arm or boom A' and terminating in a nose-piece G² at the opposite end, (the rear end,) which is presented near the irregular line of junction of the knives B³ and D. The feeder is vibrated by means of a link J, which connects to a lever I, turning on a fixed center I', and vibrated by a grooved cam K', carried on a shaft K, which is driven by the engagement of a large gear-wheel K² with a gear-wheel B⁸, carried on the shaft B and having half the number of teeth, so that the shaft K revolves once for each two revolutions of the shaft B, and the motions being properly timed the vibrating mechanism presents the plate E alternately to the right and to the left of the center line at each successive passage of the moving knife.

M is the gage, which determines the extent to which the plate is fed forward at each movement. It is pivoted on an arm N' of a bearing-block N, which is adjusted by screws O in the fixed framing. It vibrates over the plate, with its free end M' extending downward, and may, by operating the screws O, be adjusted with delicacy to hold the turned-down hook M' at the end the proper distance behind the irregular line of cutting. It is vibrated by a pin G⁴, set in the vibrating feeder G, which, by a block G³, matches in a longitudinal slot *m*. The arrangement provides that the hook which constitutes the effective end of the gage shall be vibrated from side to side to a greater extent than the plate. It moves across from one side to the other dur-

ing the absence of the moving knife, and at the periods when the cuts are effected it is presented adjacent to that edge or side where the cut is to be made. It thus stands alternately on one side and the other of the moving knife. After each cut the plate is vibrated in the same direction to a still greater extent. It will be observed that the gage receives the impact of that portion of the plate which is to be cut at the second succeeding revolution, the part cut by the present revolution being near the opposite edge and not extending across to the part of the plate which now bears against the gage.

The bearing-block N is adjustable forward and backward by the screws O. By adjusting these forward and backward the position of the hook M' of the gage can be correspondingly adjusted forward and backward and the amount by which the plate is fed forward at each operation can be varied, correspondingly varying the breadth of the nail.

The position of the center I' of the lever I may be shifted forward and backward, and the point at which the link J is connected to the lever I and also the point at which such link is connected to the vibrating feeder G may be adjusted, these connections being made by pins with proper confining means, as bolts and nuts. By making the proper changes it is practicable to vary the extent of the vibrating motion of the table.

I provide the interior of the nose-piece G² with a spring G⁵ on each side, secured firmly to the table or feeder G and vibrating with it. These springs insure that the plate shall be vibrated to about the same extent as the nose-piece, but the engagement of the parts with the plate is yielding. There is a liability to lost motion and to an elastic yielding in the vibrating parts, so that when driven at a high velocity the plate is liable to be moved too far or not far enough to the right and the left at each operation. I adjust the conditions to make a little excess of the vibrating motion, and arrest the movement of the plate to the right and the left at the right point by fixed guides A², which stand between the path of the nose-piece and the knives, as shown. These being set in the correct position, the plate is moved across to press it alternately against one and the other of these guides, and the resulting work is very uniform.

It is important that the edges of the knives which apply together shall be very accurately matched. I have experimented successfully by shaping the moving knife B carefully, and having hardened this knife I move it gradually outward in the revolving head and present the stationary knife D thereto in a soft condition. I thereby cause the moving knife to give, by successive operations, an exactly-corresponding shape to the adjacent edge of the bed-knife and subsequently harden the bed-knife. The latter should be held at a slightly-different angle during this shaping operation, so that when subsequently

hardened and set in position for use the edge of the moving knife will be in shearing contact with the edge of the stationary knife in passing, but will be slightly out of contact with the stationary knife after it has passed the cutting edge thereof.

While the details of construction shown in the drawings are the ones I prefer, they are subject to modifications which would not depart from the spirit of the invention and are intended to be included by the claims. The forms of all the parts, and especially of the irregular line of cut, may be varied so as to induce changes in the roughness and in the taper of the nails. The nails may have a greater length roughened or they may be cut without any roughness, the parallel portion, as well as the taper, being smooth and plain, if preferred in any case. The vibrating feeder may be raised and lowered by correspondingly raising and lowering the boom or arm A', on which the pivot G' is carried, and thus the relative breadth of the upper and lower faces of the nails may be varied.

I can use longer plates than can be used with turning mechanism by providing rollers with a step-by-step motion (see Figs. 5 and 6) as a substitute for the nippers and weight. The plates may be the full length in which plates are provided for hoop-iron—forty or more feet. This gives economy of labor and less frequent loss of time in supplying the plates to the machine. The rolls should be mounted elastically, so that they will take a yielding hold on the plate and, being turned intermittently by suitable means (not shown) to an extent slightly in excess of the feed required, urge the plate forward against the gage at each movement with substantially the same effect as the nippers and weight shown. This mode of feeding gives the advantage that the machine may receive plates of indefinite lengths. (See Figs. 10 and 11.)

I do not herein claim the article made by the machine, as said article forms the subject-matter of another application of mine, filed February 6, 1896, Serial No. 578,181.

I claim as my invention—

1. In a machine for cutting nails, a pair of knives wider than the plate to be cut, one knife having a prominent portion at the mid-width, and the other knife correspondingly recessed and a fixed guide on each side and relatively wider than the width of the plate, in combination with mechanism for shifting the plate alternately to the right and left between the successive cutting operations so as to treat the plate alternately on the right and left sides of the space and thereby produce

nails each having substantially parallel body and tapering point with the point in the center line of the nail, and with means for arresting the forward motion of the plate at each side of the moving knife, substantially as specified.

2. In a machine for cutting shoe-nails and analogous nails, an actuated head carrying a knife having an irregular cutting edge, a bed holding a stationary knife correspondingly irregular, a vibrating carrier for the plate and plate-feeding mechanism, in combination with internal spring-guides G⁵, which carry the plate yieldingly to the right and left, all arranged for joint operation substantially as herein specified.

3. In a machine for cutting shoe-nails and analogous nails, a continuously-revolving head carrying a knife having an irregular cutting edge, a bed holding a stationary knife correspondingly irregular, a vibrating carrier for the plate, mechanism carried thereon for feeding the plate forward at each movement, internal spring-guides G⁵ which carry the plate yieldingly to the right and left, and external fixed guides A² which receive the impact of the plate and insure its exactly correct position at each cut, all combined and arranged for joint operation substantially as herein specified.

4. In a machine for cutting shoe-nails and analogous nails, having knives B² and D, with irregular cutting edges, the vibrating feeder G and means for actuating it to shift the plate to the right and left, and the single gage M actuated thereby through the connections I, J, so as to vibrate farther and be presented to arrest the plate by contact near its outer edge on each side respectively, as herein specified.

5. In a machine for cutting shoe-nails and analogous nails, having knives B² and D, the vibrating feeder G, and means for actuating it to shift the plate to the right and left, and the single gage M actuated thereby through the connections I, J, so as to vibrate farther and be presented to arrest the plate by contact near its outer edge on each side, and the pivot-block G³ and adjusting-screws O to allow of adjustment of such gage, all arranged for joint operation substantially as specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

GEORGE D. BARTLETT.

Witnesses:

FRED W. BARTLETT,
GEORGE S. DYER.