G. GODDU.

MANUFACTURE OF NAILS.

APPLICATION FILED AUG. 24, 1914.

1,237,325.

Patented Aug. 21, 1917.

2 SHEETS—SHEET 1.

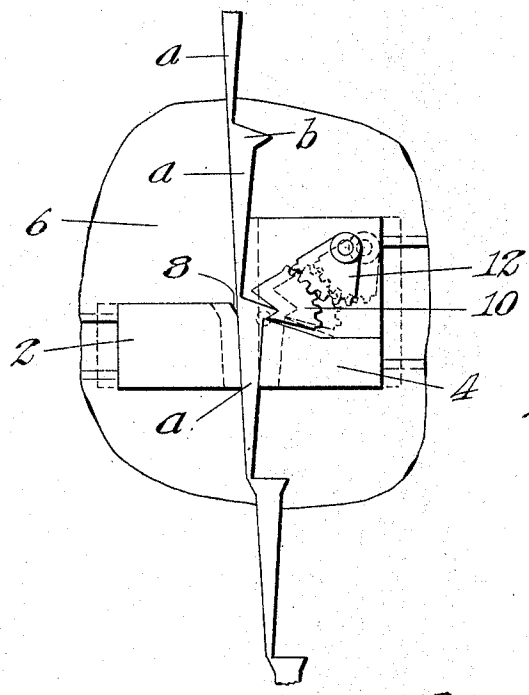

Fig.1.

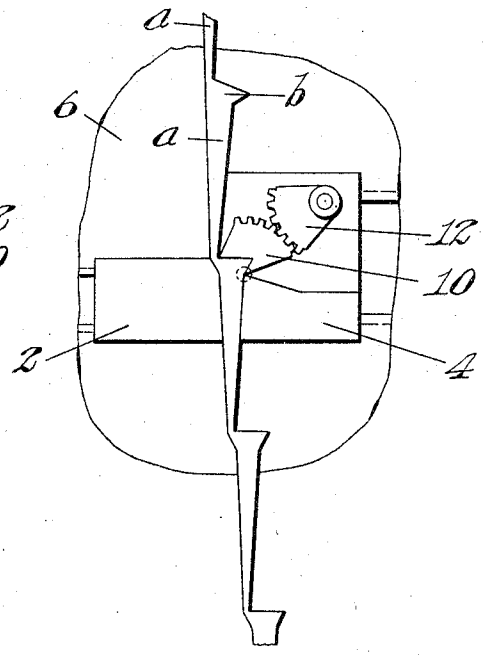

Fig.2.

Fig.3.

WITNESSES.
Chester E. Rogers
Ruth M. Snell

INVENTOR.
George Goddu

G. GODDU.

MANUFACTURE OF NAILS.

APPLICATION FILED AUG. 24, 1914.

1,237,325.

Patented Aug. 21, 1917.

2 SHEETS—SHEET 2.

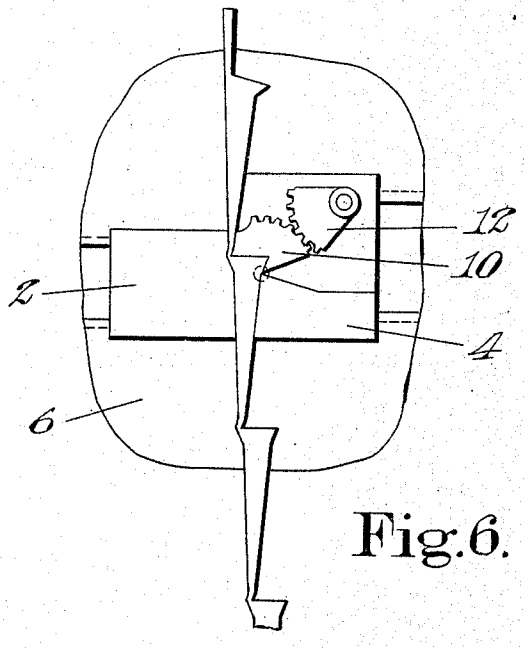

Fig. 6.

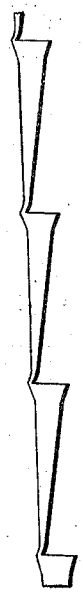

Fig. 4.

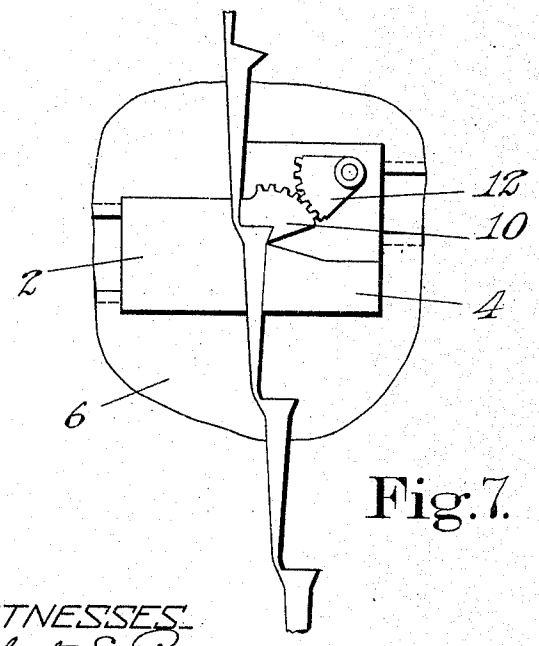

Fig. 7.

Fig. 5.

WITNESSES:
Chester E. Rogers
Ruth W. Snell

INVENTOR.
George Goddu

UNITED STATES PATENT OFFICE.

GEORGE GODDU, OF WINCHESTER, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MANUFACTURE OF NAILS.

1,237,325. Specification of Letters Patent. Patented Aug. 21, 1917.

Application filed August 24, 1914. Serial No. 858,214.

To all whom it may concern:

Be it known that I, GEORGE GODDU, a citizen of the United States, residing at Winchester, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in the Manufacture of Nails, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to the manufacture of nails and particularly to the manufacture of what are known as string nails which comprise a plurality of individual nails connected in series end to end in a long string which is usually coiled and is supplied thus to one type of nailing machine wherein the nails are severed in turn from the string and driven.

One form of nail string in extensive use, particularly in the manufacture of boots and shoes, comprises a series of nails connected head to point, with the sides of the nails substantially straight and in alinement at one side of the string and the defined heads, if any, forming projections at the opposite side of the string. Such a nail string has advantages in use in that the nails may be disconnected by means of a single cutter operating against a support at the straight side of the string; and moreover in the process of manufacture the nails may be formed conveniently and economically from the metal strip or wire by cutting or upsetting the material at one side only of the strip. Such nails, however, are deficient in holding power at one side, and because of their unsymmetrical character are difficult to drive with accuracy and precision.

An object of this invention is to provide an improved process of making nail strings whereby the nails produced have advantageous features including those of previous nails without the disadvantages above referred to, and to effect improvements in processes of manufacture whereby the improved nails may be produced conveniently and economically.

In the nail string of this invention the points are connected to the heads adjacent to the sides of the heads for convenience in disconnecting the nails, and the heads form defined projections at that side of the string at which the points are located, as well as at the opposite side of the string, and preferably project symmetrically at both these sides. In accordance with a further improvement embodied in one form of the invention the points of the nails in the string are slightly bent adjacent to their connections with the heads, thereby insuring that the nails on being driven shall clench in the particular direction desired.

The invention also provides an improved process of manufacture whereby nail blanks are first formed by shaping the material at one side of a metal strip and the blanks are then treated to shape the heads without disconnecting the heads from the points of adjacent blanks, and if desired also to shape the points so as to form a slight bend at each point adjacent to the connected head.

The invention will be more fully explained in the following detailed description with reference to the accompanying drawings which illustrate the improved nail string and one form of apparatus which may be used in carrying out the improved process.

In the drawings,—

Figure 1 shows portions of an apparatus for forming string nails, sufficient to illustrate the distinctive characteristics of the improved process, with the head forming parts in the positions that they assume prior to their operation upon a nail blank,

Fig. 2 shows the subsequent positions of the parts after the blank has been operated upon,

Fig. 3 shows a nail string of the present invention,

Figs. 4 and 5 illustrate different forms of nail string in which the nails are bent slightly at the point, and

Figs. 6 and 7 show modifications of the apparatus illustrated in Fig. 1 for the purpose of forming the nails illustrated in Figs. 4 and 5 respectively.

The novel nail string produced by the practice of the process herein described is not herein claimed but is claimed in my divisional application Serial No. 4363, filed January 25, 1915.

By reference to Figs. 3, 4 and 5 it will be seen that each of the nails is provided with a head which forms defined projections, preferably of equal extent, at opposite sides of the nail, and the points of the nails are

all located at the same side of the nail string and are connected with the projecting portions of the heads contiguous to the edges of the heads. As thus constructed the nails may be readily severed from the string in the usual manner, and by reason of the form of the head may be driven accurately in the direction desired and when driven serve to hold the material effectively at opposite sides. The shanks of the nails are preferably tapered, as shown, and the longitudinal axes of the nails are substantially parallel. In the form of the invention shown in Fig. 3 the points of the nails are substantially collinear with the shanks, while in Figs. 4 and 5 alternative forms are shown in which the points have a slight bend adjacent to their connections with the heads of the adjacent nails. In each of the forms shown in Figs. 4 and 5 the points are all bent in the same direction with reference to the string, while the two figures illustrate respectively opposite directions of bend, one or the other of which may be adopted as choice or necessity demands. A nail formed with a slight bend at the point is advantageous for various purposes, where it is desirable that the nail shall clench in a predetermined direction, and particularly in sole securing operations in the manufacture of certain types of shoes as pointed out, for example, in the United States patent to Dobyne, No. 1,072,212, granted September 2, 1913. The present invention provides a novel nail string including nails of this form ready for use in nailing machines, and requiring only that the nails be severed and driven in the usual manner.

It is within the province of the invention to make the nails from material of various forms as, for example, from round wire or from flat metal strips. According to the preferred practice a flat strip is first formed to provide nail blanks shaped as shown at *a* in the drawings. This is effected by cutting away material at one side only of the strip, leaving the blanks *a* with head portions *b* projecting and inclined downwardly toward the tapered shanks at the cut side, the blanks on their opposite sides being substantially straight, that is, free from defined projections at the head ends. The blanks as thus formed are connected head to point with their straight sides in substantial alinement. This operation may be performed by the use of any suitable cutting or punching mechanism which may constitute a part of a machine which operates subsequently to shape the blanks in the manner to be described, or may be a separate machine in which the entire strip or coil is first treated. In either case the blanks are next operated upon by mechanism such as shown fragmentarily in Figs. 1 and 2, the string of blanks being advanced intermittently between dies 2 and 4 which slide in guideways in the frame 6 between the limits indicated respectively by full and by dotted lines in Fig. 1. When a blank *a* is advanced to the proper position between the dies, the latter close upon it and clamp the shank portion below the head end. This leaves the head *b* projecting out over a portion of the die 4. The die 2, it will be noted, has a cut-away portion 8 opposite to the head of the blank and formed to determine the shape of the nail head at this side in the next step of the process. This step consists in bending over and pressing the material at the head of the blank to conform it to the cut-away portion 8 of the die 2, thereby straightening the head with reference to the shank and rendering its projecting portions symmetrical at opposite sides. In the illustrative apparatus this is effected by means of a die 10 pivotally mounted upon the die 4 and properly shaped to engage beneath the head on the blank and bend the head over while forming the top and one side of the head. This die is operated by means of a suitably oscillated gear segment 12 also pivoted upon the die 4 and engaging teeth on the die 10. As shown in Fig. 2, which illustrates the completion of this step of the process, that portion of the string above the blank which is in the dies is displaced slightly during the head forming operation above described, so that finally the point of each nail of the string is contiguous to the edge of the completed head on the next nail. After the completion of a head forming operation the dies are retracted and the string advanced to bring the next blank into position to be operated upon.

The process above described may be employed to produce nails of the forms shown in Figs. 4 and 5. In this case, however, the process includes the bending of the points of the nails adjacent to their connections with the heads. This operation may be performed simultaneously with that of forming the head of a blank through the provision of dies suitably shaped to bend and form the point of a blank during the shaping of the head of the next blank to which this point is connected. Modifications of the apparatus of Figs. 1 and 2 suitable for the production of the nails of Figs. 4 and 5 are illustrated respectively in Figs. 6 and 7. In both these modifications the die 2 is extended upward above the head of the nail which is clamped between the dies and is suitably recessed or curved to impart the desired shape to the point of the nail which is next above the clamped nail. The die 10 also has an extended portion shaped to conform to the curve of that portion of the die 2 which is opposite thereto, so that during the straightening and pressing of a nail head the end of the shank of the next blank

will be pressed between the dies 2 and 10 and thereby bent or curved, the degree or form of curvature depending upon the shape of the dies which may be altered as desired. It will be apparent on reference to the drawings that although the nails are slightly offset laterally with reference to one another as a result of these operations, the substantially parallel relation of the longitudinal axes of the blanks or nails is not materially affected.

Although portions of an apparatus have been shown and described for the purpose of explaining more clearly the steps of the improved method, it should be understood that the invention is by no means dependent upon the use of this or any particular apparatus and that the method may be practised by the aid of various mechanical means.

Having explained the nature of the invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. That improvement in methods of making string nails which consists in forming a string of nail blanks connected in series end to end and having defined heads projecting at one side of the string and sides substantially straight at the opposite side of the string, and operating upon the blanks to cause the heads to project also at said opposite side of the string without disconnecting the blanks.

2. That improvement in methods of making string nails which consists in forming a string of nail blanks connected in series head to point with their heads forming defined projections at one side of the string and their sides substantially straight at the opposite side of the string, and displacing the heads to cause them to project also at said opposite side of the string without disconnecting the heads from the points of the adjacent blanks.

3. That improvement in methods of making string nails which consists in forming a string of nail blanks connected in series head to point with their heads forming defined projections at one side of the string and inclined with reference to the longitudinal axes of the blanks and with their sides substantially straight at the opposite side of the string, and bending and pressing the heads to straighten them and cause them to project also at said opposite side of the string without disconnecting the heads from the points of the adjacent blanks.

4. That improvement in methods of making string nails which consists in forming a string of nail blanks connected in series head to point with their sides substantially straight at one side of the string, and displacing the material at the head ends of the blanks with reference to other portions of the blanks to form on each blank a defined head projecting at the side of the blank at which the point of the adjacent blank is connected.

5. That improvement in methods of making string nails which consists in forming a connected series of nail blanks with their sides substantially straight and alined at one side of the string and shaped at the other side to provide defined heads and tapered shanks, and displacing the material at the head ends of the blanks to cause the heads to project a substantially equal amount at both said opposite sides of the string.

6. That improvement in methods of making string nails which consists in forming a string of nail blanks connected in series head to point with their heads forming defined projections at one side of the string and angularly disposed with reference to the longitudinal axes of the blanks and their sides substantially straight and alined at the opposite side of the string, and displacing the material at the head ends of the blanks angularly to straighten the heads and cause them to project also at said opposite side of the string.

7. That improvement in methods of making string nails which consists in forming a connected series of nail blanks in substantial alinement at one side of the string and shaped at the opposite side to provide defined heads and tapered shanks, clamping the shank portion of a blank adjacent to the head, and then subjecting the head to pressure to cause it to project also at said first named side of the string.

8. That improvement in methods of making string nails which consists in forming a string of nail blanks each having a substantially straight side with the blanks connected in series head to point and the points adjacent to the straight sides of the connected blanks, supporting a blank upon its straight side below the head, and pressing the head end of the blank over from its opposite side to form a head projecting at said first named side of the blank without disconnecting the blank from the point of the next blank of the series.

9. That improvement in methods of making string nails which consists in forming a string of nail blanks each having a substantially straight side with the blanks connected in series head to point and the points adjacent to the straight sides of the connected blanks, subjecting the blanks to pressure to form on each blank a head projecting at that side at which the point of the adjacent blank is connected, and forming a bend at the point of each blank without disconnecting it from the head of the adjacent blank.

10. That improvement in methods of making string nails which consists in forming a string of nail blanks connected in series

head to point with their heads forming defined projections at one side of the string and their sides substantially straight at the opposite side of the string, clamping a blank below the head, and then displacing the material at the head of said blank to cause the head to project also at the last named side of the string and simultaneously bending the point of the adjacent blank.

11. That improvement in methods of making string nails which consists in forming a string of nail blanks each having a substantially straight side with the blanks connected in series head to point and the points adjacent to the straight sides of the connected blanks, and subjecting the blanks to pressure upon said straight sides and the sides opposite thereto to form heads projecting a substantially equal amount at both said sides and to bend the points of the blanks adjacent to their connections with the heads.

12. That improvement in methods of making string nails which consists in forming a string of nail blanks connected in series head to point with their longitudinal axes in substantially parallel relation, and forming a bend at the point of each blank adjacent to its connection with the head of the next blank without altering the substantially parallel relation of the blanks.

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

GEORGE GODDU.

Witnesses:
CHESTER E. ROGERS,
RUTH W. SNELL.