

(No Model.)

G. GODDU.
STRING NAIL.

No. 599,933.

Patented Mar. 1, 1898.

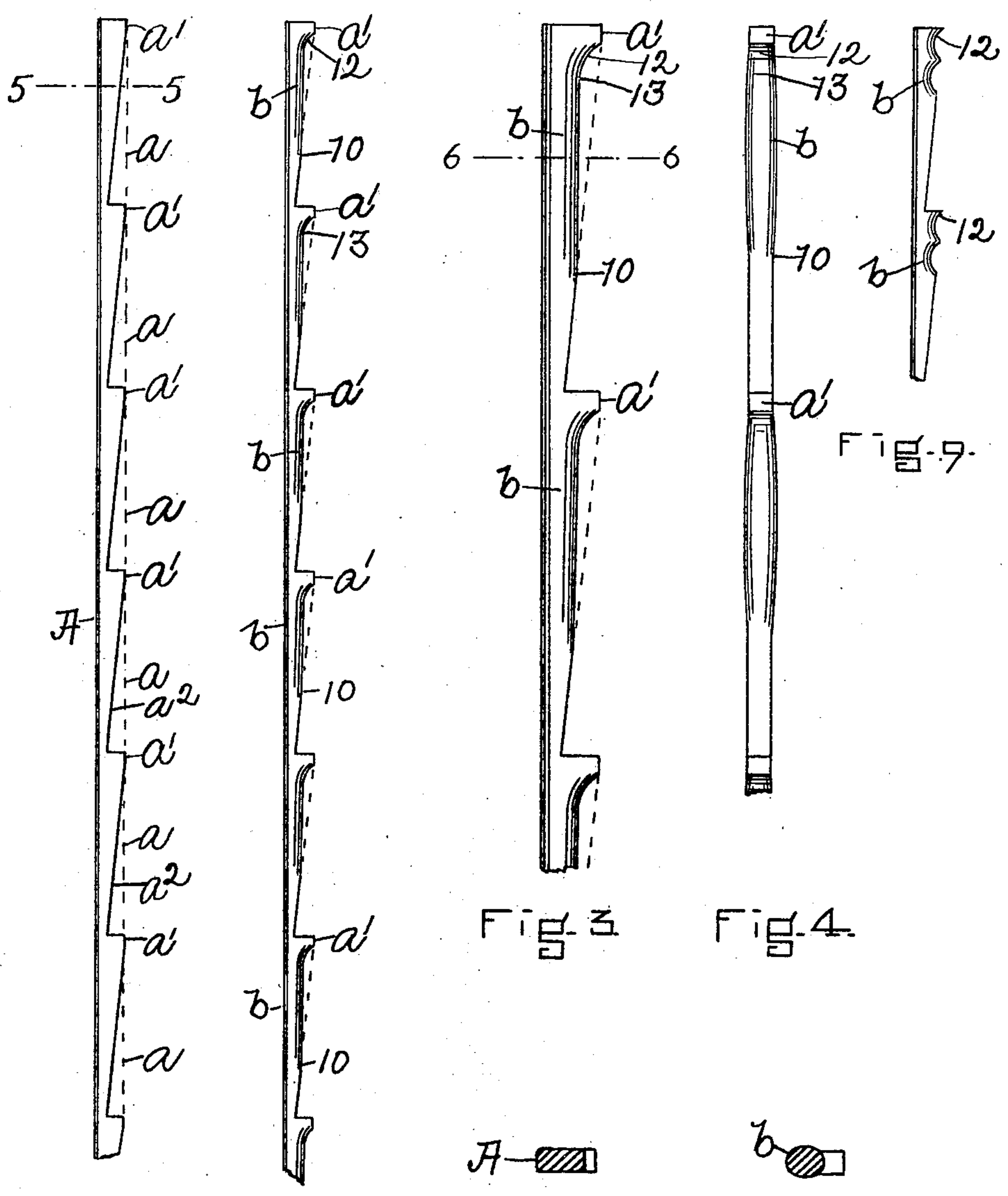


Fig. 1. Fig. 2. Fig. 3. Fig. 4. Fig. 5. Fig. 6.

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STRING-NAIL.

SPECIFICATION forming part of Letters Patent No. 599,933, dated March 1, 1898.

Application filed October 12, 1897. Serial No. 654,974. (No model.)

To all whom it may concern:

Be it known that I, GEORGE GODDU, residing in Winchester, in the county of Middlesex and State of Massachusetts, have invented an Improvement in String-Nails, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to an improvement in string-nails commonly employed in the manufacture of boots and shoes and which are formed by cutting a substantially flat ductile strip of metal so as to form a series of connected tapering nails, the tapered side of each of which may extend from or near the point of one nail to or near the head thereof.

String-nails of the class referred to possess among other advantages that of retaining the ductility of the metal strip from which they are cut; but they are defective in that the individual nails when cut off from the string-nail and driven into the stock are liable to bend, buckle, or cripple intermediate of the point and head when the point of the nail meets with a hard surface—such, for instance, as hard leather, or the horn or work support, or such as the bottom surface of a last. As a result of this buckling or bending of the nail the clench of the nail thus bent is materially reduced, and in some cases is none at all, and the holding power or effect is deficient and weak.

My present invention has for its object to provide a string-nail of the class referred to which is free from the defects or objections pointed out and which retains the same or substantially the same ductility of the strip at its point, so as to enable the said point to readily clench, but which is stiffened or hardened intermediate of the head and point for a portion of its length, which may be designated the "shank," and which, further, is provided with a regular or strictly-defined head on one or both sides. This result is effected by compressing the individual nails of the string-nail transversely for a portion of their length, as will be described, so that the individual nails of the string-nail are strengthened in their shank without decreasing the ductility of the point of the nail, so that the connec-

tion of one nail to another of the string is not rendered brittle and thereby weakened, and so that when a nail is driven into the work its tendency to buckle or bend at its middle or near the head is resisted and overcome, and the ductile point is thereby caused to turn on itself and clench the stock in the desired and proper manner, which, coupled with the regular or defined head on the nail, serves to increase the holding effect and efficiency of the nail, especially in thin or soft stock or material. These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 represents in full lines a portion of one form of string-nail blank from which my improved string-nail may be made. Fig. 2 represents the improved string-nail which is formed from the strip shown in Fig. 1, the dotted lines representing the original width of the blank before compression. Fig. 3 is a side elevation, on an enlarged scale, of a portion of the string-nail shown in Fig. 2; Fig. 4, a front elevation of the string-nail shown in Fig. 3; Fig. 5, a section of the blank on the line 5 5, Fig. 1, drawn on a larger scale; Fig. 6, a section on the line 6 6, Fig. 3; and Figs. 7, 8, and 9, modifications to be referred to.

Referring to Fig. 1, A represents one form of string-nail blank from which my improved string-nail may be made, which blank may be formed by cutting a substantially flat thin ductile metal strip having one side or edge represented by full lines and the other side or edge by dotted lines a and full lines a' , so as to leave a series of connected headed and pointed tapering nails, the tapered side a^2 of each of said connected series of nails extending, as shown in Fig. 1, from the point of said nail toward and near to the head of the said nail, where it meets the short substantially straight side a' . The string-nail blank A (shown in Fig. 1) forms in itself a string-nail having the points of its connected nails of substantially the same ductility as the strip before it was cut; but said string-nail is defective in the particulars above mentioned.

In accordance with this invention the string-nail A, (shown by full lines in Fig. 1,) which for the purpose of making my improved string-nail forms a string-nail blank, has the indi-

vidual nails of the series of connected headed and pointed nails stiffened or hardened for a portion of their length by compressing the metal transversely of the wider portion of the blank and above the point, which may be effected by suitable dies, press, or hammer.

The length of the nail above its point, which is subjected to compression, may vary; but I prefer to compress the nail-blank from or near the head of each nail toward the point, but not to the said point, so that the point of the nail may be left ductile, in order to enable the completed string-nail to be coiled and uncoiled without danger of breaking, and also to enable the point to clench properly. In the present instance I have represented in Fig. 2 the compression as taking place from the end of the substantially short straight face or edge a' and extending to about the point 10, and the dies or other tools by which the compression is effected are preferably shaped to compress the metal so as to form a curved or beveled surface 12 and a substantially straight rounded or oval shank b from about the point 13 to the point 10, while the lower portion of the nail from the point 10 to the upper surface of the head of the next adjacent nail is left uncompressed and of its original shape and ductility.

In Figs. 3 and 4 I have represented the compressed string-nail shown in Fig. 2 as drawn on a much larger scale, so that the effect of the compression may be more readily comprehended, and the change in the form of the shank may be clearly seen by reference to Figs. 5 and 6.

Fig. 5 represents the blank shown in Fig. 1, but on a larger scale, while Fig. 6 represents the same blank compressed.

By reference to Figs. 2, 3, 4, and 6 it will be seen that the shank of the individual nails comprising the string-nail is materially hardened or stiffened, while the point of the nail is left ductile, and also it will be noticed that a well-defined head is imparted to each nail of the string-nail, which results in a string-nail composed of a series of connected headed and pointed nails cut from a substantially flat metal strip and having a substantially flat ductile point to enable the nail to clench easily and properly, a stiffened or hardened shank to enable the nail to enter hard material without bending, and also to avoid crippling or bending of the shank when the point strikes a hard surface, such as the bottom of a last or other work-support, and a well-defined head which gives increased holding power, especially when the nail is driven into thin or soft material.

In Figs. 2, 3, and 4 I have represented the compression as commencing at the end of the substantially short straight side or edge a' ; but I do not desire to limit my invention in this respect, as the point at which the compression commences may be varied, and, if desired, it may commence at the upper surface of the head or it may commence slightly

below said upper surface, as represented in Figs. 7 and 8. So, also, I may prefer to form the curved surface 12 only on one side of the blank, so as to define the head on one side, as represented in Figs. 2 and 3; but, if desired, I may also form the curved surface 12 on opposite sides of the blank, as represented in Fig. 8. Furthermore, I may prefer to make the compression of the shank continuous or regular, as shown in Figs. 2 and 3; but, if desired, it may be made irregular, as represented in Fig. 9.

Prior to this invention I am aware that string-nails have been made from a round wire by the action of dies, which cut into and upset the wire, so as to form the point of one nail and the head of the next adjacent nail, as shown in United States Patent No. 190,575, dated May 8, 1877; but this construction of string-nail is defective, for the reasons that the fiber or grain of the metal is injured and the point is also hardened by the action of the upsetting tools or dies, which hardening of the point renders it brittle and thereby weakens the string-nail at the junction of the points of the nails with the heads of contiguous nails, so that when bent into the form of a coil or roll the string-nail is liable to become broken during its feed or passage through the nail-driving machine in which the wire is straightened, and in this straightening operation the brittle connection of the nails one to the other is frequently broken. So, also, the nails comprising the strip are defective in clenching by reason of the increased hardness at their points.

In contradistinction to such a string-nail as shown in the United States Patent above referred to is the string-nail forming the subject of this invention, which is cut from a substantially flat ductile strip or sheet of metal, so as to form a series of connected tapering nails which retain the ductility of the strip or sheet from which they are cut and which are then compressed or swaged transversely at a considerable distance above the point toward the head, so as to form individual nails of the string-nail, each having its shank compressed transversely of the portion of the blank, so as to stiffen or strengthen the nail in its shank and thereby resist buckling or bending, so as to form a well-defined head to impart increased holding properties, and so as to give these additional advantageous properties to the string-nail without decreasing or injuriously affecting the ductility of the point or tapered end of the nail and thereby without decreasing the clenching properties of the nail.

I claim—

1. A string-nail consisting of a series of connected headed and pointed tapering nails formed from a substantially flat ductile strip of metal and characterized in that the said nails have a tapering point of the original ductility of the metal strip, a defined head, and an intermediate transversely-compressed

shank portion of greater stiffness or hardness than the point and than the original metal strip, substantially as described.

2. A string-nail consisting of a series of
5 connected headed and pointed tapering nails
formed from a substantially flat ductile strip
of metal, and characterized in that the said
nails have their shank compressed trans-
versely for a portion of the length of the nail
10 near its upper end to impart to the nail in-
termediate of its head and point greater stiff-
ness or hardness than the original metal strip
without decreasing the ductility of the point
of each of the connected nails, substantially
15 as described.

3. A string-nail consisting of a series of

connected headed and pointed tapering nails
formed from a substantially flat ductile strip
of metal and characterized in that each of said
nails has a substantially flat ductile point, a 20
transversely-compressed rounded shank of
greater stiffness or hardness than the original
strip and of the point of the nail, and a de-
fined head, substantially as described.

In testimony whereof I have signed my 25
name to this specification in the presence of
two subscribing witnesses.

GEORGE GODDU.

Witnesses:

JAS. H. CHURCHILL,
J. MURPHY.