(No Model.)

C. B. RUSSELL.

TACK AND METHOD OF MAKING SAME.

No. 583,946. Patented June 8, 1897.

Fig. 1.

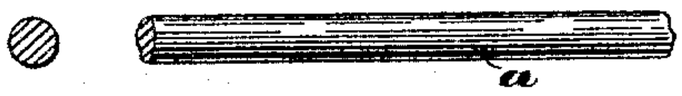


Fig. 2.

Fig. 3.

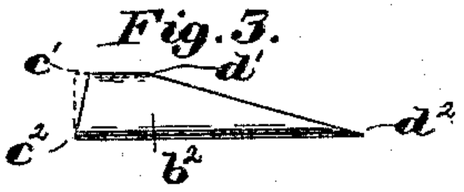


Fig. 4.

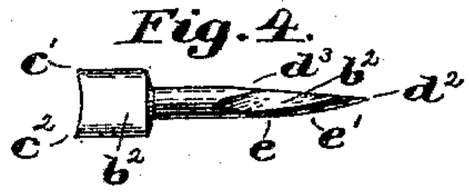


Fig. 5.

Fig. 6.

Fig. 8.

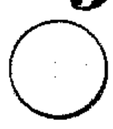


Fig. 7.

Fig. 9.

Fig. 10.

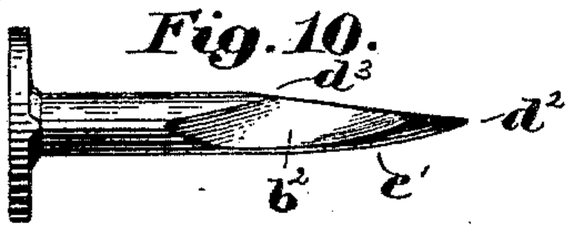
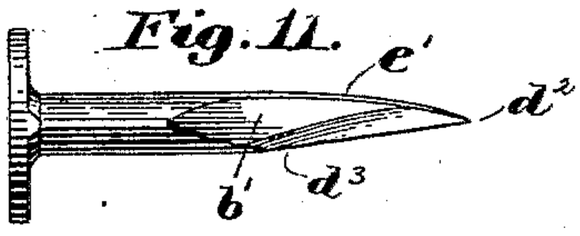


Fig. 11.



Witnesses:
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Edward H. Allen.

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UNITED STATES PATENT OFFICE.

CHARLES B. RUSSELL, OF HANOVER, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO RODOLPHUS C. WATERMAN, OF SAME PLACE.

TACK AND METHOD OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 583,946, dated June 8, 1897.

Application filed January 15, 1897. Serial No. 619,303. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. RUSSELL, of Hanover, county of Plymouth, State of Massachusetts, have invented an Improvement in Tacks and Methods of Making the Same, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

Heretofore tacks have been made from plates cut to width and thickness according to the size or length of the tack to be made. It has also been proposed to make tacks from wire having the characteristics of plate-tacks, although no practical tack has resulted.

According to my invention I make tacks from wire having all the desirable features of appearance and essential qualities of the tacks cut from plate, the tacks made according to my method also possessing many points of superiority over the ordinary plate-tacks, as will be more definitely pointed out later on.

In following out my method preferably soft round wire is taken and flattened to suit the proper gage of the particular tack being made and is severed transversely with a slightly diagonal or oblique cut for a purpose presently to be explained to provide the body of metal for the head, being also severed with an extreme diagonal cut in an opposite direction to provide the body of metal for the shank. The body of the shank is then grasped to hold the stock while the head is being formed, the holding and heading being accomplished in the ordinary manner. The pressure brought to bear on the shank for holding the blank in the process of heading also forms the shank, but the latter having one straight side and one tapered or oblique side offers more resistance on the straight side than on the tapered side, and hence the metal crowds over more or yields to a greater extent on the tapered side, inasmuch as this, as we have seen, is the weaker or less resisting side. The result is that the metal forming the body of the head bulges up or is raised somewhat on each side of the blank, the metal being raised more, however, on the side corresponding to the tapered side of the shank, and as this side of the head was originally cut lower or thinner than the opposite side it follows that the body of the head becomes now symmetrical or uniform in proportions, so that the heading pressure thereon flattens out the metal into a perfectly even head, centered with the shank and possessing uniform strength and thickness, and also the point having been set over centrally with the head and shank the tack is evenly balanced and proportioned in every respect. A tack thus formed by my method presents all the desirable features of the plate-tack, having the tapered or wedge-shaped or slab-shaped sides and other structural features for holding or gripping the material in which it is driven, the quick sheared point for catching in the material, and the central evenly-balanced head. These features have never been accomplished in a wire tack prior to my invention, wire tacks having been formed similar in shape and appearance to wire nails. My tack, moreover, is superior to the plate-tack in many respects.

The essential parts of a tack are its head and its point, and it is extremely desirable that neither of these should be rough, as a rough point in being driven will catch a fiber and tear or break it, to the injury of the material, and a rough head, if driven by machinery, will catch and clog in the hopper and runway of the machine, preventing the flow of the tacks, or, if driven by hand, will injure the mouth of the operator, it being customary for hand-operators to carry the supply of tacks in their mouths.

Plate-tacks invariably have rough heads and points, but by my method I produce tacks having smooth even heads and points without the slightest unevenness to catch and injure.

Furthermore, plate-tacks have a ragged prong extending at the point, producing what is known as a "mosquito-bill point," which easily breaks off, deflects the tack when driven, and is otherwise objectionable. This feature is entirely obviated by my method, a ragged point being impossible.

Besides the advantages resulting from the use of wire in having the grain lengthwise of the tack and having the tack extremely smooth on account of the smooth wire employed, the tack is stiffened and toughened by the successive steps of rolling or flattening and of compressing or swaging; and a further advantage is that the point, while still as sharp and delicate as in the plate-tack, is

stiffened and supported by having one rounded side of the wire extended down to the extreme point. Furthermore, in setting over the point of the tack, as explained, a slightly-spiral deflection of the opposite flattened sides takes place, this spiral feature enabling the tack to grip and hold most tenaciously into the fibers of the wood or other material into which the tack is driven.

Preferably steel wire is used, as this wire under the compound pressure exerted thereon as above described will yield evenly, producing a head having perfectly smooth edges.

In the accompanying drawings, Figure 1 shows the wire stock from which the tacks are made. Fig. 2 is a similar view showing the wire after it has been flattened. Fig. 3 is a side elevation of the blank before it is compressed. Fig. 4 is a similar view after the blank is compressed, showing the effect thereof on the metal of the head. Fig. 5 is an edge elevation looking at the under side or edge of Fig. 4. Fig. 6 is an edge view looking at the opposite edge from that shown in Fig. 5. Fig. 7 is a similar view to Fig. 4, viewing the tack from the opposite side, the head having been swaged down. Figs. 8 and 9 are end views of Fig. 7, looking, respectively, at the adjacent ends of the tack. Figs. 10 and 11 are greatly-enlarged views of headed tacks, viewing the sides shown, respectively, in Figs. 4 and 7 and showing more definitely the opposite spiral deflections, by means of which the tack gets increased gripping qualities.

In making my improved tack I take suitable wire *a*, of copper, brass, iron, steel, or other metal, preferably Swedish steel, of size and quality adapted to the particular size, finish, and style of tack to be formed, straighten it carefully, then flatten it, as shown at *b*, Fig. 2, preferably by running it between rolls, as described in my Patent No. 583,420, thereby giving the wire the oppositely-flattened surfaces b' b^2. This flattening of the wire tends to crystallize it and renders the metal more rigid and unyielding, at the same time getting it in shape to be cut. The more or less flattened wire is then cut transversely at *c* on a line somewhat oblique to the length of the wire and at *d* on a line acutely oblique or diagonal to the wire, thus forming blanks of the shape shown in Fig. 3 longitudinally of the wire and lying successively in reverse direction. (See Fig. 2.) The line *d* extends from the head at d', Fig. 2, toward and to form the point d^2 of the blank, and the line *c* extends from c' transversely to the wire in an opposite direction, or away from the point, thereby making the blank higher at c^2 than it is at c' by a difference indicated by the dotted line, Fig. 3. The purpose of this provision is as follows: As the grippers seize the blank to hold it for the heading process, meanwhile compressing the metal and properly forming the shank of the tack, the metal spreads out in lines of least resistance, as shown in Fig. 4, and hence, there being more resistance offered by the straight side of the blank, the metal is spread out less by the grippers at that side than it is at the opposite side, and the weaker shorter side is thereby raised up level or even with the longer side, Fig. 4. The line *c* will be more or less oblique, according to the metal and its quality and according to the style and size of head desired. The head is then swaged or compressed by direct endwise pressure, the result being a perfectly-formed smooth-edged head, as shown in Fig. 8, having also equal thickness on all sides. (See Fig. 7.)

The head may be flat, convex, or otherwise, as preferred.

As the head is being formed the point d^2 is crowded over or centered, being preferably bent from a point *e*, (clearly seen in Fig. 4 and indicated by dotted line in Fig. 5,) this point corresponding approximately to the lower limit d^3 of the gripper action in compressing the shank, the setting over of the point at the same time deflecting or spirally bending the opposite sides b' b^2, as shown in Figs. 10 and 11.

It will be noted that the point d^2 is supported on its lower side, Figs. 4 and 10, (the near side, Fig. 5,) by the original smooth and rounded or convex side e' of the wire, the point being thereby rendered stronger, smoother, and more delicate and accurate; also, the edge *f* of or leading to the point being cut, as shown, diagonally across a convex surface presents a smooth strong edge without the least tendency to be ragged and firmly supporting and strengthening the point, no matter how fine and attenuated the latter may be.

When the knives in cutting on the line *d* are set very close together, the cut surface or side of the tack is dished or concaved slightly, still remaining substantially flat, however; also, the upper knife in cutting down carries the point d^2 with it, as shown in Fig. 5, thereby producing the shear edge *f*, the slant of the opposite edge f' depending upon the shearing-angle given to the knives in cutting the wire.

If shorter or longer tacks are desired, I change the obliquity of line *d*, starting, however, from the point d'—that is to say, I leave a portion or body of wire above d' to form the head, the line *c* when observing this feature of my invention never intersecting the line *d*, as a ragged head would thereby result if swaged down, as above described.

Various changes in form and proportion of the tack may be resorted to within the spirit and scope of my invention, and by the term "tack" I mean to include any and all fastening means having the requirements hereinafter claimed.

I regard my improved method as novel not only as a whole, but also in various of its separate parts or steps, and therefore I lay claim to these features whether used together or in connection with otherwise old methods.

Having described my invention, what I

claim, and desire to secure by Letters Patent, is—

1. As an article of manufacture, a tack having a centered cut point, said point being sharp with all its sides long and tapering, one of said sides forming a convex portion *e'* extending at one side from the body of the shank to the point of the tack, substantially as described.

2. As an article of manufacture, a tack made of wire, and having its point provided on one side with a cut surface, and on another side with a rounded surface, and on a third side with a flat straight side, substantially as described.

3. As an article of manufacture, a tack, having its point approached on one side by a straight edge and on its opposite side by a curved edge *f*, the opposite sides between said edges being flat and convexed respectively, substantially as described.

4. As an article of manufacture, a tack, having a sharp point between converging edges, one side between said edges being flat and straight, and the opposite side being convexed, substantially as described.

5. The herein-described method of making a tack from wire, which consists of severing the wire obliquely toward the point to form the body for the shank, and obliquely away from the point to form the body for the head, the blank being thereby higher at its head on the point side thereof than on its opposite side, compressing the body below said head to form the shank of the tack, thereby crowding up the metal on said lower side to approximately equal the metal on the opposite side, and while the grain of the tack is still substantially straight from end to end heading the tack by a downward swaging longitudinally of the tack substantially as described.

6. The herein-described method of forming the head of a tack, consisting of cutting the metal obliquely transverse to the length of the tack, crowding up the metal on the lower side thereof to equal the metal on the opposite higher side, maintaining the blank otherwise undeflected, and swaging down the said metal to constitute the head, substantially as described.

7. The herein-described method of making a tack from wire, which consists of severing the wire on the oblique lines *c* and *d*, compressing the body of the blank inwardly to form the shank of the tack and longitudinally to form the head, and crowding over the point end thereof to center the point of the tack, substantially as described.

8. A blank, having a straight cut edge *d*, an opposite and divergent rounded edge, a straight end *c* extending at an acute angle from said rounded edge, a straight edge opposite and parallel to the latter joining the adjacent convergent edges, said cut edge *d* extending in a straight line from said latter straight edge to the point formed therewith by said rounded edge, and flat sides, substantially as described.

9. As an article of manufacture, a tack provided with a head, and body terminating in a point, one of the sides of said body having a flat surface leading to said point, and another side having a spirally-deflected surface, substantially as described.

10. As an article of manufacture, a tack provided with a head and body, the latter having two of its opposite sides spirally deflected, and having another of its sides formed with a plane cut surface, substantially as described.

11. In making a tack, the method of giving the tack increased gripping qualities, which consists in providing the blank with a flattened surface adjacent the point, and then setting over the point substantially in the direction of the plane of said surface, whereby a spiral deflection is given to said flattened surface, substantially as described.

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

CHARLES B. RUSSELL.

Witnesses:

GEO. H. MAXWELL,

FREDERICK L. EMERY.