

Aug. 21, 1956

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2,759,389

SQUARE SHANKED, BARBED WIRE NAIL

Filed Aug. 24, 1953

2 Sheets-Sheet 1

FIG. 1

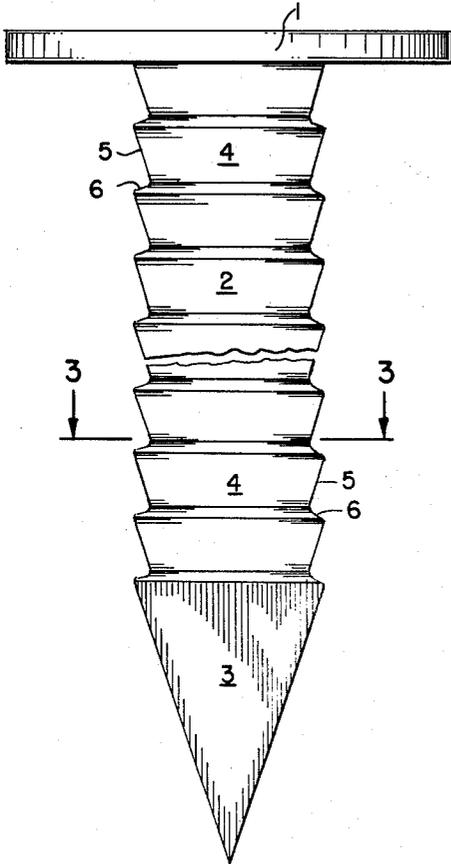


FIG. 2

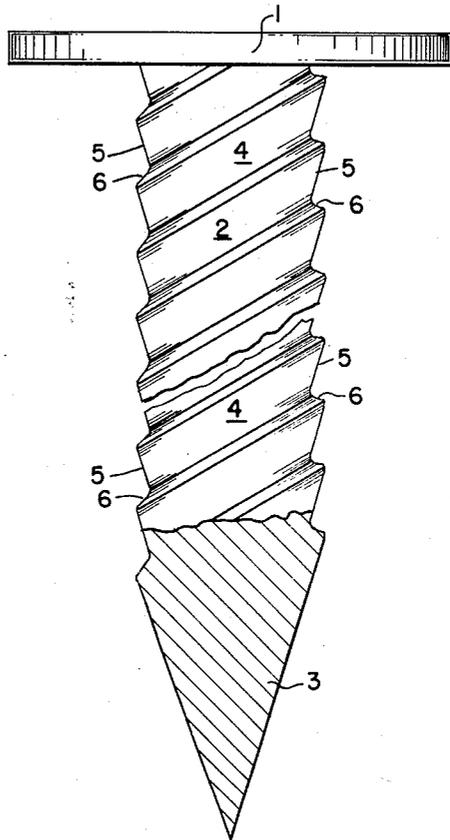


FIG. 3

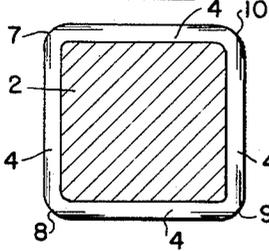


FIG. 4

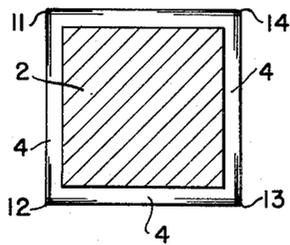
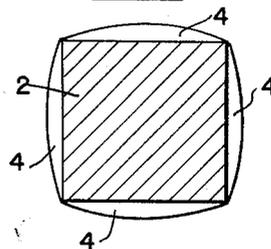


FIG. 5



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FIG. 6

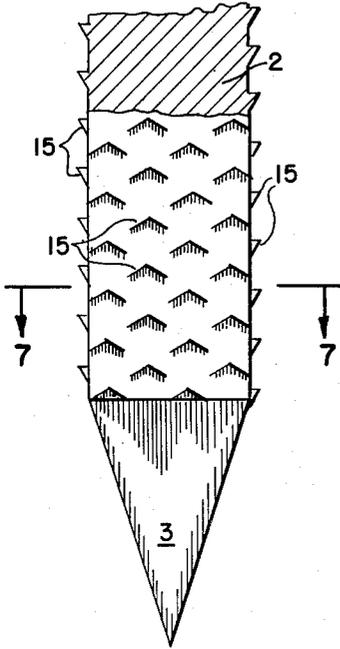


FIG. 8

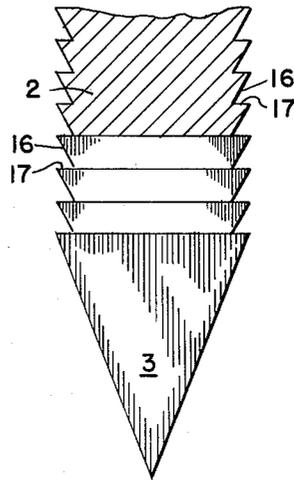


FIG. 7

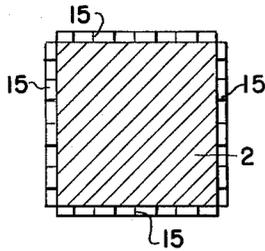
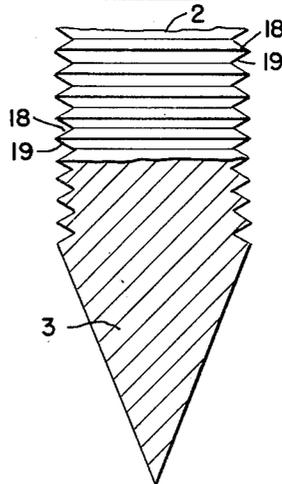


FIG. 9



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SQUARE SHANKED, BARBED WIRE NAIL

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2 Claims. (Cl. 85—21)

The present invention relates to an improved wire nail and in particular to the formation of the shank and penetrating portion of such nails.

One of the objects of the invention is to provide a nail having a plurality of transverse barbs or holding elements which, upon driving the nail into a piece of wood, will firmly engage the severed grains of the wood and will increase the resistance to the withdrawal of the nail from the material.

Another object of the invention is to provide a method of manufacturing a nail of the present design from a continuous strand of suitable wire.

A further object of the invention is to provide the nail with a penetrating portion of such a design as to sever the fibers through which it passes.

Other objects, uses and advantages of the improved nail will become more apparent as the nature of the invention is more fully disclosed, preferred embodiments of which are illustrated in the accompanying drawings and described in the following detailed description, in which:

Figure 1 is a fragmentary view in elevation of one form of the nail.

Figure 2 is a fragmentary view in elevation of a modified form of the nail.

Figure 3 is a sectional view taken along line 3—3 of Figure 1.

Figures 4 and 5 are other cross-sectional modified forms of the nail.

Figure 6 is a fragmentary vertical view of a further modified form of the nail, shown partly in elevation and partly in section.

Figure 7 is a sectional view taken along line 7—7 of Figure 6.

Figure 8 is a view similar to Figure 6 partly in elevation and partly in section of still another modified form.

Figure 9 is a view of another modified form of the nail showing the shank in elevation and partly in section.

In referring to the drawings, similar reference characters will be used to designate similar parts throughout the several views.

The nail in general comprises a head, and an angular cross-sectioned shank with barbs thereon and a penetrating portion. The angular shank and point cut the wood fibers, rather than spreading them as with a round nail. The sides of the shank are preferably parallel, with projecting barbs, so that after the penetrating portion has entered the wood, no more breaking of the wood fibers is effected and the hole made by the penetrating portion is no larger regardless of the depth to which the nail is driven into the wood. Therefore, the cut fibers will have the same uniform pressure against the entire area of the shank occupying the material. That is, if the nail is driven into the wood up to the head, the shank adjacent the head would have the same holding power as the portion of the shank adjacent the penetrating end.

Referring now to the specific forms shown in the illus-

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trations, in Figure 1 the head, shank and penetrating portion are designated by numerals 1, 2 and 3 respectively. This particular embodiment is formed from a segment of substantially square wire as shown best in Figure 3. Beginning above the penetrating portion, or section 3 are barbs or shoulders 4. These barbs extend around each of the four faces of the nail, in a plane perpendicular to the vertical axis of the nail and are of the buttress or wedge type, that is, they have a long side 5 and a short side 6. The long side of the shoulder 5 extends to ward the penetrating end of the nail, so that, when the nail is driven into the wood a more inclined angle will be presented to the ends of the severed fibers. However, if an attempt is made to remove the nail, or strain is placed on the nail to dislodge it, the short side, or more abrupt angle of the shoulder will be engaged by the separated fibers and the resistance to withdrawal will be greatly increased. In Figure 3 the shoulders 4 are shown to be rounded at the corners as shown at 7, 8, 9 and 10.

In Figure 4 a modification of the shank 2 is shown with sharp shoulder corners 11, 12, 13 and 14.

In Figure 5 a further modified form of shoulder is shown, in which the shoulders are of arcuate design, while the solid center section of the shank 2 is substantially square.

Figure 2 shows a modified form of nail in which the same form of shoulder is used as previously described and shown in Figure 1, except that the shoulders are at an angle with the vertical axis of the nail. The same advantages are also present in this modification as previously recited for the shoulders shown in Figure 1.

The form of shoulders shown in Figures 1 and 2 may have any of the cross-sectional forms shown in Figures 3, 4 or 5.

In Figures 6 and 7 there is shown a further modification of the nail. In place of the shoulders 4 as described in Figures 1 and 2 there are provided a plurality of individual barbs 15 which extend along the sides of the shank 2 in uniform rows, formed in crossing diagonal lines. These barbs are adapted to present their ends to the severed ends of the wood fibers after the fibers have been cut by the penetrating end. As the outer ends of the barbs are pointing upwardly toward the head of the nail, the ends of the fibers will more readily engage the barbs when the nail is being pulled outwardly from the material.

In Figure 8 the grooves are arranged somewhat similar to those shown and described for Figure 1 and are likewise of the buttress type. In this form the wall 16 of the several shoulders, which is the wall nearest the point, forms the arcuate angle with the vertical axis of the nail, while the companion wall 17 is in a plane perpendicular to the vertical axis of the nail.

The modification shown in Figure 9 is quite similar to that shown in Figure 8, except the side walls forming the shoulders are of equal taper. Both side walls 18 and 19 of the shoulder are formed at the same angle with the vertical axis of the nail.

The penetrating portion or point is tapered inwardly from the shank to a point falling within the vertical axis of the nail, whereby the penetrating portion is in the form of a pyramid. The length of this pyramid is substantially the same as the diagonal of the shank between its diagonal corners, that is, between 7 and 9 or 8 and 10 (see Figure 3). This has been found to give the nail good driving qualities and at the same time to sever practically all fibers of the wood coming in contact with the penetrating shank, which allows the irregularities in each of the side walls to be engaged by the several ends of the fibers.

In manufacturing the nails, long strands of wire of the proper size and cross-sectional form are run longitudinally through pairs of rolls (not shown) which cut or roll

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the selected type shoulders on each of its four sides, after which the wire is cut to proper length by a special die which forms the penetrating portion, or the end to be driven into the wood. After the nail has been cut to length the head is formed on its opposite end from sufficient stock allowed for that purpose.

All modifications of the nail are constructed from square, or substantially square stock wire, or wire that has been formed to such shape during the process of making the nail.

It is to be understood that the present barbs or shoulders are not in the form of a screw thread, but each shoulder is formed separate and independent from each other.

In practically all woods the grain runs in one direction. Therefore, by employing this type of nail, any two sides of the nail extending in the direction of the grain when driven into the wood will sever the fibers, which will be also compressed slightly by the tapered penetrating portion 3 of the nail and will engage the shoulders or barbs as the nail is driven into the wood.

While certain preferred embodiments of the invention have been illustrated and described, it will be understood that the invention is not limited to the forms shown and described, but shall include any and all forms coming within the scope of the appended claims.

What is claimed as new and is desired to be secured by Letters Patent is:

1. A metal wire wood nail comprising a substantially square shank portion, a head formed integral with the shank on one end and a penetrating portion on the opposite end, the shank having the same cross-sectional dimensions throughout its length and a uniform barbed surface on each of the four sides extending throughout the length of the shank to the nail head, the body of the barbs being inclined transversely to the nail axis on all four sides to produce a maximum periphery of the nail normal to its axis for any given cross-section shank area to increase the strength of the shank and to give minimum disturbance to the wood fibers cut and to hold them immediately upon cutting and continuously thereafter upon continued penetration of the nail, the barbs on each face being closely spaced, contiguous, parallel and each of uniform wedge shape, sloping toward the nail point, each barb wedge having transversely inclined edges which are substantially straight and parallel to each other, the penetrating portion, free of barbs, extending inwardly from all four sides of the shank in a gradual taper to a point

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in line with the longitudinal axis of the shank, whereby the penetrating portion will have the form of a pyramid, said penetrating portion being of substantially the same length as the diagonal of the cross-section area of the shank.

2. A metal wire wood nail comprising a substantially square shank portion, a head upset from the shank on one end and a penetrating portion on the opposite end, the shank having the same cross-sectional dimensions throughout its length and a uniform barbed surface on each of the four sides extending throughout the length of the shank to the nail head, the body of the barbs being inclined transversely to the nail axis on all four sides to produce a maximum periphery of the nail normal to its axis for any given cross-section shank area to increase the strength of the shank and to give minimum disturbance to the wood fibers cut and to hold them immediately upon cutting and continuously thereafter upon continued penetration of the nail, the barbs on each face being closely spaced, contiguous, parallel and each of uniform wedge shape, sloping toward the nail point, each barb wedge having transversely inclined edges which are substantially straight and parallel to each other, the penetrating portion, free of barbs, extending inwardly from all four sides of the shank in a gradual taper to a point in line with the longitudinal axis of the shank, whereby the penetrating portion will have the form of a pyramid.

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