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H. S. STRONACH

2,175,228

DIE CONSTRUCTION FOR MAKING NONSPLITTING NAILS

Original Filed Dec. 4, 1935

Fig. 1

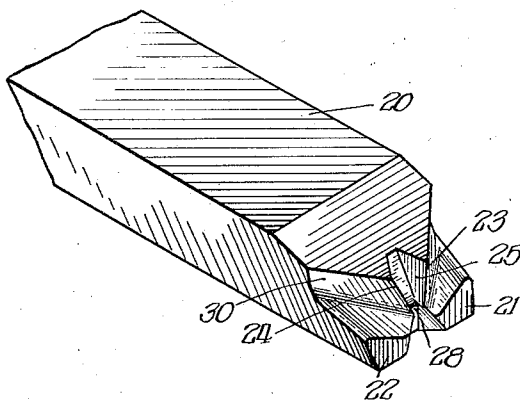


Fig. 2

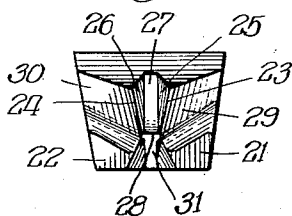


Fig. 3

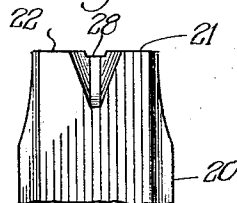
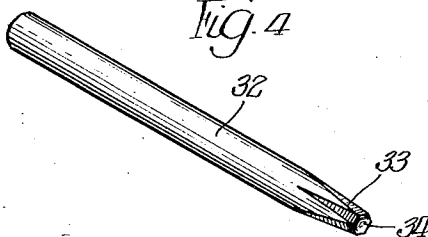


Fig. 4



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UNITED STATES PATENT OFFICE

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DIE CONSTRUCTION FOR MAKING NON-SPLITTING NAILS

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Original application December 4, 1935, Serial No. 52,744, now Patent No. 2,044,740, dated June 16, 1936. Divided and this application February 27, 1936, Serial No. 66,113

1 Claim. (Cl. 10—53)

The present invention relates to a new and improved die construction for making non-splitting nails.

The invention relates to dies for making nails of the non-splitting type as shown in my prior Patent No. 2,044,740, June 16, 1936, and this new nail is in the nature of a modification and improvement of the nails shown in my prior Patents No. 1,466,676 and No. 1,771,867.

This application is a division of my application Serial No. 52,744, filed December 4, 1935, issued June 16, 1936, as Patent No. 2,044,740.

It has been found that the splitting of wood by nails may be very greatly reduced by the use of nails with an entering face which is comparatively blunt and largely crushes the fibres of the wood rather than splitting them apart. The usual type of diamond pointed wire nail merely separates the fibres. A blunt ended nail with the end having an area which represents a substantial portion of the cross sectional area of the nail, will crush the fibres by means of the blunt end. When this end is joined to the body of the nail by sloping surfaces, the fibres will be pushed apart as the body enters the wood sufficiently so that the wood grips the nail firmly. It has been found by repeated tests that improved nails of this character have materially greater holding power in wood than have the usual type of diamond pointed nails.

In my first prior patent above identified, I have shown blunt ended nails with the ends of different cross sections. In the second patent I have shown nails of this character having cupped ends. The nails of the third patent may also be made with ends of different cross section and with cupped ends.

I have shown herein means for forming these nails. Usual types of nail making machines make nails from wire by cutting off portions of the wire to form the points. This is done by means of registering dies which meet to shear off the pieces of metal and to cut the wire. Hammer means are used to form the heads on the ends of the wire, usually before the other end of the nail is pointed and severed from the wire. These nails sell at a price but little above the cost of the wire from which they are formed, and nail manufacture to be commercially practical must be capable of being carried out upon usual types of machines with the nails being formed rapidly and automatically. I have shown herein dies by which my improved nails may be made on the usual types of nail machines at usual operating speeds. I have also shown nail mak-

ing dies and nails made therewith which very materially reduce the loss of metal sheared off in pointing the nails over the loss in making usual types of diamond pointed nails.

It is an object of the present invention to provide a new and improved die construction for making non-splitting nails.

It is an additional object to provide means for making nails whereby the metal loss in making the reduced entering end of the nails is minimized.

It is a further object to provide new and improved dies whereby these improved nails may be made commercially upon usual types of nail making machines.

Other and further objects will appear as the description proceeds.

I have shown certain preferred embodiments of my invention in the accompanying drawing, in which—

Figure 1 is a perspective view of a die for forming a nail having an hexagonal end or entering face;

Figure 2 is a plan view of the working face of the die shown in Figure 1;

Figure 3 is a view of the die shown in Figures 1 and 2 as seen from below in Figure 2; and

Figure 4 is a perspective view of the entering end of a nail formed on the die shown in Figures 1, 2 and 3.

Referring first to the form of dies shown in Figures 1, 2 and 3, it should be understood that two dies are used, these dies being exact duplicates of each other and meeting to form the ends of the nails. The die body 20 is provided with contact shoulders 21 and 22 which serve as abutments when the die meets a similar die in the forming operation. The die is provided with cutting edges 23 and 24 which substantially meet similar edges on the opposite die in order to shear off metal from the sides of the wire to reduce the end to the desired size and shape. The end forming recess between the edges 23 and 24 is provided with lateral faces 25 and 26 and with the bottom face 27. The bottom face 27 rises abruptly adjacent the cross edge 28. These three faces form one-half of the end of the nail, the adjacent die forming the remaining three surfaces of the hexagonal end.

The cutting edges 23 and 24 are joined by an edge 28 which, with its cooperating edge on the adjacent die, serves partially to cut off the wire. The sides of the die adjacent edges 23 and 24 are cut away at 29 and 30 to permit disposal of the portions of metal sheared off by the cutting

edges. The die is also cut away at 31 adjacent the cross cutting edge 28 so as to provide clearance for the end of the wire from which the pointed nail is sheared. As clearly shown in Figure 3, the cutting edge 28 of the form of die shown in Figures 1, 2 and 3 is below the level of the abutment shoulders 21 and 22.

The nail formed by these dies is shown in Figure 4. It has the circular body portion 32, with the reduced entering portion 33 and the cup-shaped hexagonal end 34. It is found in operating the dies that due to the slope of the forming portions 25, 26 and 27, as the nail is sheared there is a tendency for the nail to be forced away from the cutting edge 28 by the angular compression of these surfaces and particularly by the abrupt rise of the lower surfaces 27 adjacent the partial cutting edges 28. This occurs while the compression is taking place and results in a cupping of the entering end of the nail.

The result of the fact that the partial cutting edges 28 are below the abutments 21 and 22 is that the coacting edges 28 on the two dies do not quite meet and consequently do not fully shear the nail from the wire. In usual types of nail machines a kicker is provided to knock the nail from the dies so as to prevent it getting in the way of the head forming hammer if it should not of its own accord drop freely from the dies after the point is formed.

In using dies such as shown in Figures 1 to 3 the nail is deliberately not fully cut and the uncut surface is fractured by the action of the kicker which knocks the nail off the end of the wire. This broken surface formed in this man-

ner has been found to be generally cup-shaped, similar to that shown in Figure 4. By breaking the nail away, sharp edges are formed at the edge of the cup which assist in holding a nail in place on wood when it is pressed slightly against the wood, and which also are efficient in starting the shearing action as the nail is driven into the wood. By only a partial cutting of the wire the wear on the cutting surfaces of the dies is reduced and they have longer life.

While in the drawing I have shown dies for making nails, and nails with hexagonal shaped entering ends, it is to be understood that ends may be made in various other forms with various numbers of lateral faces joining the body of the nail and the entering end. The forms of dies and nails shown are to be understood to be illustrative only and I contemplate such changes and modifications as come within the spirit and scope of the appended claim.

I claim:

A die element for forming non-splitting nails with multi-sided entering ends, comprising a body with lateral cutting edges thereon inclined toward each other, the more closely adjacent ends of the cutting edges being spaced apart, a plurality of angularly disposed forming surfaces between the cutting edges, and an end cutting edge joining the adjacent ends of the lateral cutting edges, the end cutting edge being located below the lateral cutting edges and above the forming surfaces, the lower forming surfaces rising abruptly adjacent the end cutting edge.

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