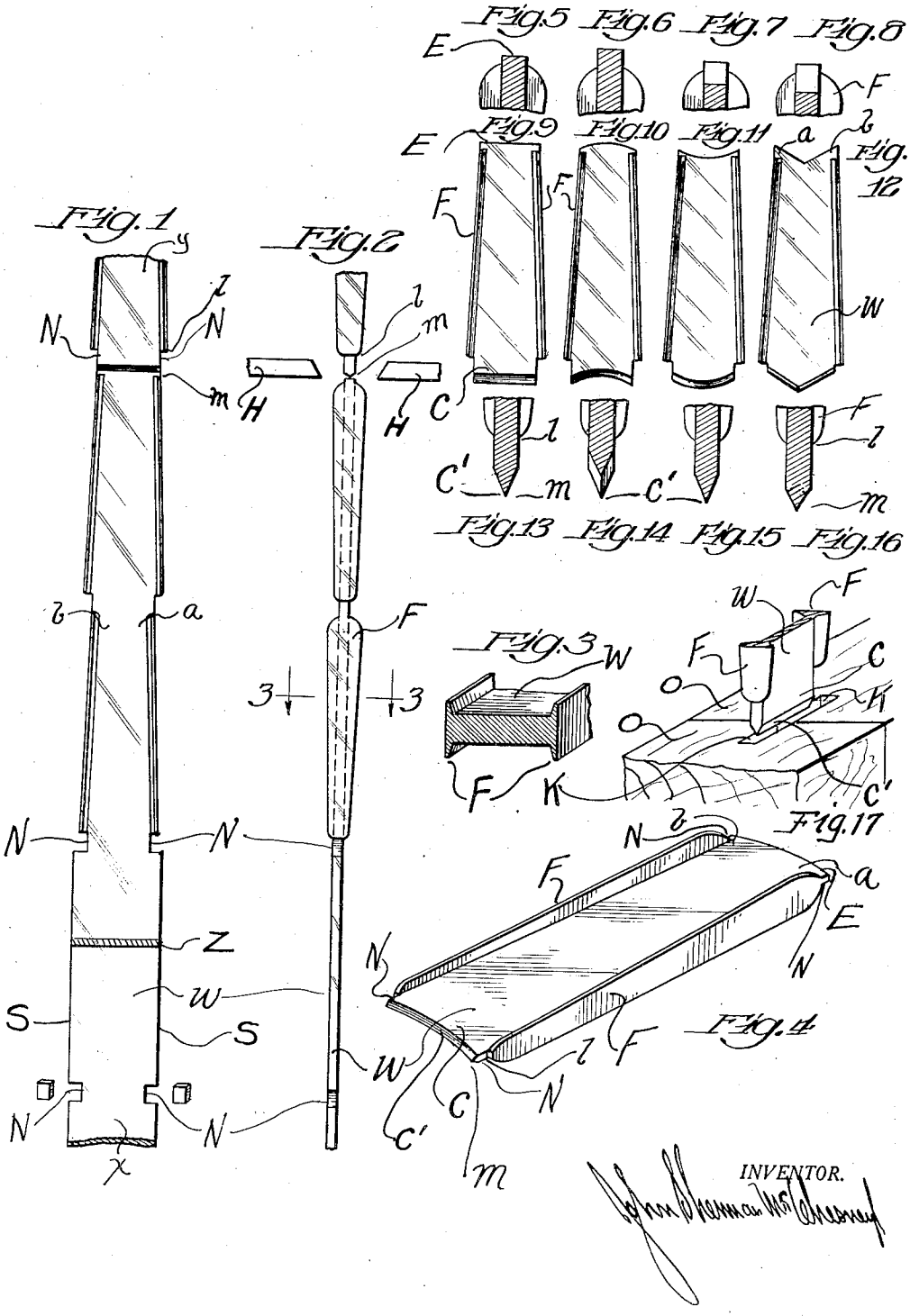
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JOINT NAIL

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JOINT NAIL

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The invention is a joint nail, the object in view being to so improve the construction as to result in drawing together two pieces of wood or other material into which the joint nail is adapted to be driven, and to impart to the penetrating end of the joint nail such formation as will insure easy driving of the joint nail either with or across the grain of the wood and to maintain alignment of the abutting joints or kerfs therein in advance of the divergent continuous tapered side flanges, with practically no tendency to deflection from a straight line in the driving operation, and to impart such formation to the uniformly increasing tapered side flanges of I-shaped cross section unitary with flat central web as will present increasing divergent gripping and cutting edges to the wood or other material as the nail descends during the driving operation.

A more specific object of the invention is to provide a novel means whereby a nail of the above type may be obtained complete directly and simultaneously from a continuous length of sheet metal of uniform cross section and parallel sides.

A still further object of my invention is to provide a nail formed from a continuous length of sheet metal of uniform cross section and parallel sides, having a sharp V-shaped penetrating end preferably provided with a pilot extending an appreciable distance beyond the divergent continuous tapered side flanges formed on the central flat web portion intermediate the tapered side flanges of I-shaped cross section, and a blunt driving end preferably extending beyond the divergent tapered side flanges.

My invention may be further modified without departing from the spirit thereof so as to provide a joint nail which may be driven directly into abutting joints in and after the same manner as corrugated fasteners, that is, without first preparing the abutting joints by cutting a kerf or saw cut to receive that flat wedge shaped central web of the joint nail; said joint nail of my invention being formed from a continuous length of sheet metal having parallel sides and uniform cross section comprising a relatively thin, flat central web portion of such thickness as not to displace sufficient matter of the abutting joints as to cause rupture or splitting thereof, said central web having a tapered portion increasing in width towards the penetrating end and provided with uniformly continuous increasing tapered side flanges positioned at right angles to the plane of the thin central web said uniformly increasing taper commencing at the penetrating end of the nail and increasing in width towards the driving end, a sharp knife edged penetrating point extending between the tapered side flanges of I-shaped cross section, said knife edge lying medially of the longitudinal plane of the relatively thin central web and extending preferably an appreciable distance beyond the side flanges thereof thereby forming an entering pilot functioning to prevent a tendency to deflection of the joint nail from a straight line in the driving operation.

Other objects will be in part obvious and in part pointed out hereafter.

In the accompanying drawings, wherein is shown one of the possible embodiments of my invention—

Figure 1 is a side elevation of a continuous length of sheet metal initially of uniform cross section and parallel sides, illustrating the notching or cutting out of sections of the parallel edges, the formation of side flanges unitary with tapered central web, and the point of severance of completed nail from the continuous length.

Fig. 2 is a side view of Fig. 1 illustrating the relative position of the nail severing means with respect to the uniformly increasing tapered side flanges and cut out sections.

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 2.

Fig. 4 is a perspective view of the completed joint nail embodying the improved features.

Fig. 5 is an enlarged cross section taken medially of the driving end of Fig. 9 illustrating the continuation of flat central web of uniform cross section extending beyond side flanges.

Fig. 6 is an enlarged cross section taken medially of the driving end of Fig. 10.

Fig. 7 is an enlarged cross section taken medially of the driving end of Fig. 11.

Fig. 8 is an enlarged cross section taken medially of the driving end of Fig. 12.

Fig. 9 is a plan view of the completed nail illustrating straight V-shaped penetrating end and pilot extending an appreciable distance beyond tapered side flanges, and the straight driving end.

Fig. 10 is a plan view of the completed nail illustrating concave V-shaped penetrating end and convex driving end.

Fig. 11 is a plan view of the completed nail illustrating convex penetrating end and concave driving end.

Fig. 12 is a plan view of a completed nail illustrating wedge shaped penetrating end and corresponding driving end.

Fig. 13 is an enlarged cross section taken medially of lower portion of Fig. 9 illustrating the V-shaped knife edged pilot the continuation of central flat web extending below the uniformly increasing tapered side flanges.

Fig. 14 is an enlarged cross section taken medially of the lower portion of Fig. 10.

Fig. 15 is an enlarged cross section taken medially of the lower portion of Fig. 11.

Fig. 16 is an enlarged cross section taken medially of the lower portion of Fig. 12.

Fig. 17 is a perspective view of the penetrating end of the joint nail positioned as it would appear in practice with respect to a saw cut or kerf in the abutting joints before commencement of the driving operation.

The nail embodies a central flat web W and converging uniformly inclined side flanges F, a penetrating end C, and a driving end E at the ends of the central flat web extended beyond the side flanges, the flat central web intermediate the side flanges having a wedge shaped appearance and thereafter extending an appreciable distance beyond the side flanges. The edges of the web on the sides thereof are inclined at *a b* so that the web is narrower at the driving end E than at the penetrating end C, the transverse edge of the wide end of the web is beveled or V-shaped on the opposite faces thereof producing a sharp cutting edge C′ said edge may be straight, convex, concave or of other desired shape and extending from notch N to notch N across the lateral plane of the web and at an appreciable distance *l m* beyond the side flanges F at the penetrating end, a blunt driving end E extending from notch to notch and across the narrow end of the web.

It is essential that the penetrating end C of the nail be provided with a sharp cutting edge C′, said edge lying in the plane of the medial line of the nail.

References being had to Fig. 1, the nail is produced from a continuous length of sheet metal X Y of uniform cross section Z and parallel sides S, by a notching or cutting out, swaging and severing process, either by a method of step by step operations or simultaneously, whereby notched or cut out sections N are formed on the parallel sides S, swaged converging smooth sharp inclined side flanges F at right angles to the central web extending continuously from notch to notch, a central web portion *l m* extending beyond the upset side flanges at the entering end and a driving and penetrating end formed simultaneously by co-acting severing means H Fig. 2 said co-acting severing means forming the sharp beveled cutting edge C′ on the penetrating end C of the completed nail Fig. 4 severed from the length X Y and producing a blunt driving end on the unsevered notched and swaged nail next in line on the continuous length X Y.

A preferred embodiment of the joint nail with curved penetrating and driving ends is illustrated in Fig. 4 and Fig. 10 and other modifications thereof appear in Fig. 9, Fig. 11 and Fig. 12. In Figure 11 is shown an arrangement where the tongue L M which projects forwardly from the entering end of the web is of lesser width than the distance between the flanges at that end.

Fig. 17 is illustrative of the usual method of applying nails of this type in the securing of joints in which saw cuts or kerfs are employed. Abutting pieces of wood or other material O are provided with kerfs K in the opposing faces thereof into which the joint nail is entered and thereafter driven. In the joint nail of my invention the central web W extends beyond side flanges F an appreciable distance forming a tongue *l m* at the penetrating end C, terminating in a V-shaped sharp cutting edge C′. It will be observed that when the penetrating end C enters into the kerfs K the extended portion of the central web *l m* of the nail enters the kerfs and affects registered aligned relations therebetween and in advance of the entrance of the side flanges F into material surrounding the kerfs and thereafter continues the function of aligning of the kerfs and guiding the flat central web during the descent of the nail. It is further pointed out that in one modification of my invention I employ a nail having a very thin flat central web portion W of such thinness as to permit the nail to be driven directly into the abutting joints without causing rupture or splitting of the joint and without the use of kerfs or saw-cuts. In this modification the extended portion of the web *l m* and the cutting edge C′ functions to prevent a tendency to deflection from a straight line in the driving of the joint nail either with or across the grain of the wood and enables the nail to penetrate the material and cut its way through the same

so that the nail drives easily and cuts cleanly through the wood.

The inclined wedge shaped formation of side flanges and their divergent relation with respect to the flat central web imparts to the nail characteristic action in drawing together two pieces of wood or other material so that the pieces are drawn into forcible contact by the act of driving the nail and the smooth sharp uniformly inclined side flanges cut their way into new fibre as the nail descends into the wood or other material.

Manifestly, the construction shown is capable of considerable modification and such modification as is within the scope of my claims I consider within the spirit of my invention.

I claim:

1. A metal nail comprising a transverse web, flanges projecting from the longitudinal edges thereof and diverging toward the entering end of the nail, and a pilot tongue projecting forwardly in continuation of the web beyond the ends of the flanges, the width of the tongue throughout its length being substantially equal to the distance between the inner boundaries of the flanges at their point of widest divergence.

2. A metal nail comprising a transverse web, flanges projecting from the longitudinal edges thereof and diverging toward the entering end of the nail, and a pilot tongue projecting forwardly in continuation of the web beyond the ends of the flanges, the width of the tongue throughout its length being substantially equal to the distance between the inner boundaries of the flanges at their point of widest divergence, the tongue being bevelled to provide a sharp entering edge.

3. A metal nail comprising a transverse web, flanges projecting from the longitudinal edges thereof and diverging toward the entering end of the nail, and a pilot tongue projecting forwardly in continuation of the web beyond the ends of the flanges, the width of the tongue throughout its length being substantially equal to the distance between the inner boundaries of the flanges at their point of widest divergence, the entering edge of the tongue being substantially perpendicular to the longitudinal axis of the nail.

4. A metal nail comprising a transverse web, flanges projecting from the longitudinal edges thereof and diverging toward the entering end of the nail, and a tongue projecting forwardly in continuation of the web beyond the ends of the flanges, the width of the tongue throughout its length being substantially equal to the distance between the inner boundaries of the flanges at their point of widest divergence, the tongue being bevelled to provide a sharp entering edge extending entirely across the tongue.

5. A metal nail comprising a transverse web, flanges projecting from the longitudinal edges thereof and diverging toward the entering end of the nail, a pilot tongue projecting forwardly in continuation of the web beyond the ends of the flanges, the width of the tongue throughout its length being substantially equal to the distance between the inner boundaries of the flanges at their point of widest divergence, and a driving head projecting rearwardly in continuation of the web beyond the driving ends of the flanges.

6. A joint nail comprising a flat web, cutting flanges arranged along opposed longitudinal sides thereof, the width of the web and so the distance between the flanges increasing progressively from the driving to the entering end of the nail, a pilot tongue projecting forwardly in prolongation of the nail beyond the forward extremity of the flanges, the width of the tongue being substantially equal to the distance between the opposed inner sides of the flanges at their point of greatest divergence, the forward edge of the pilot tongue being bevelled to provide a cutting edge, the length of which is substantially equal to the maximum width of the web, there being no part of the nail in front of the two ends of the cutting edge.

In testimony whereof, I affix my signature hereto.

JOHN SHERMAN McCHESNEY.