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G. E. INGRAM
WIRE CLAMPING TOOL

2,923,008

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2 Sheets-Sheet 1

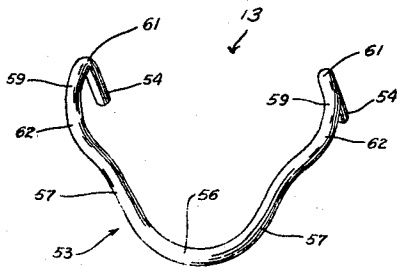


Fig. 2

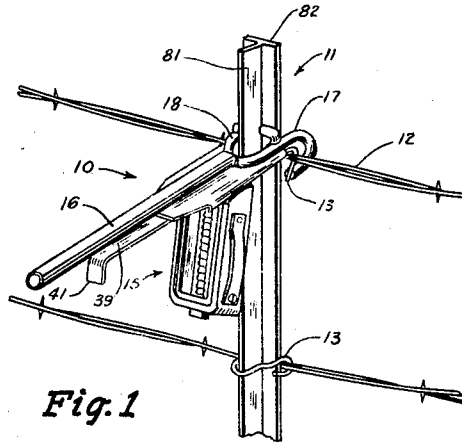


Fig. 1

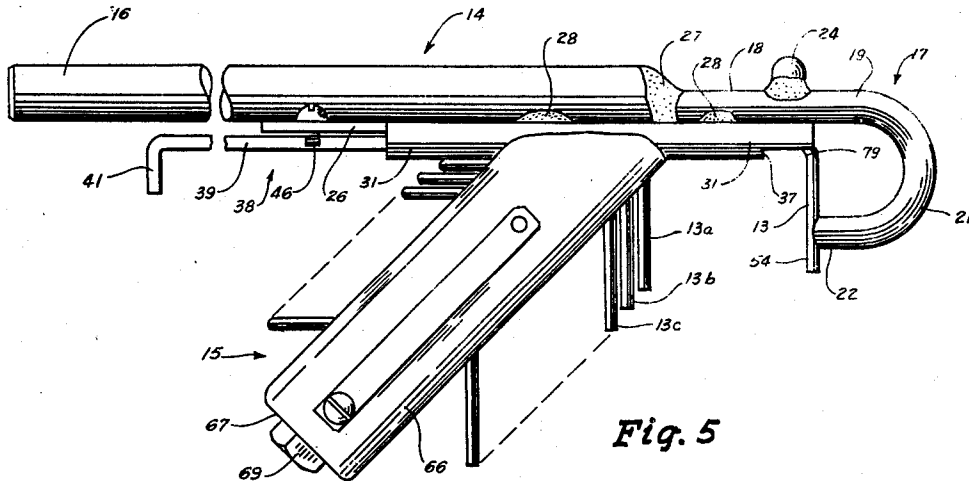


Fig. 5

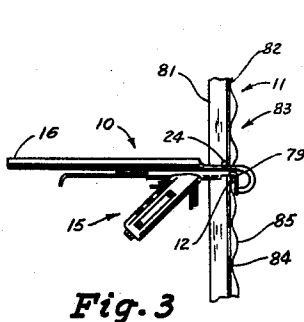


Fig. 3

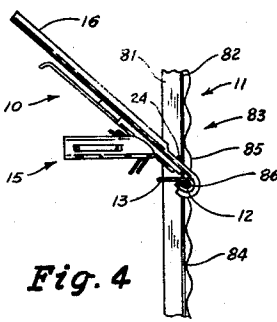


Fig. 4

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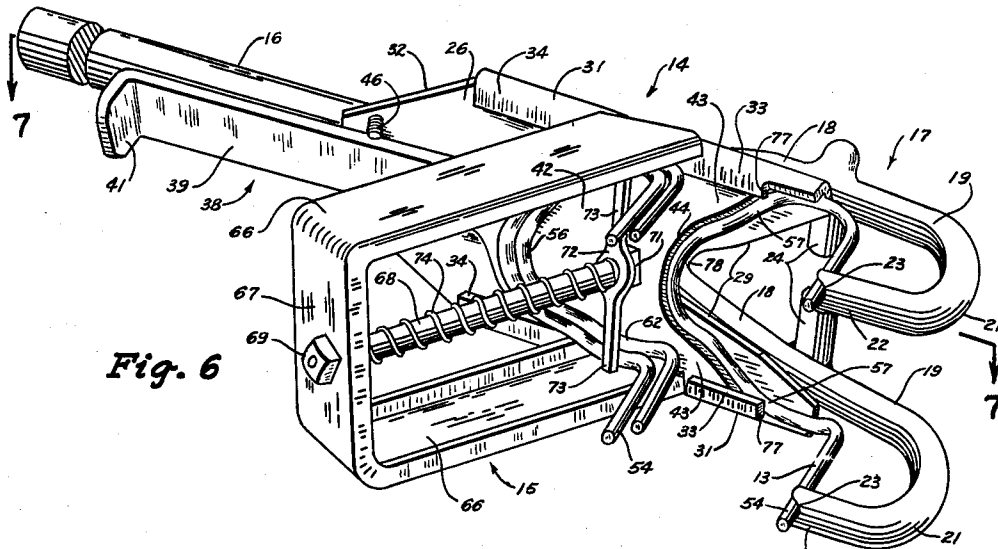


Fig. 6

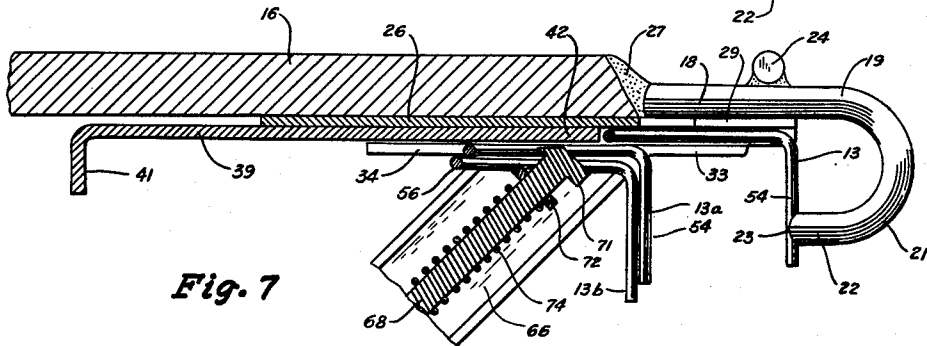


Fig. 7

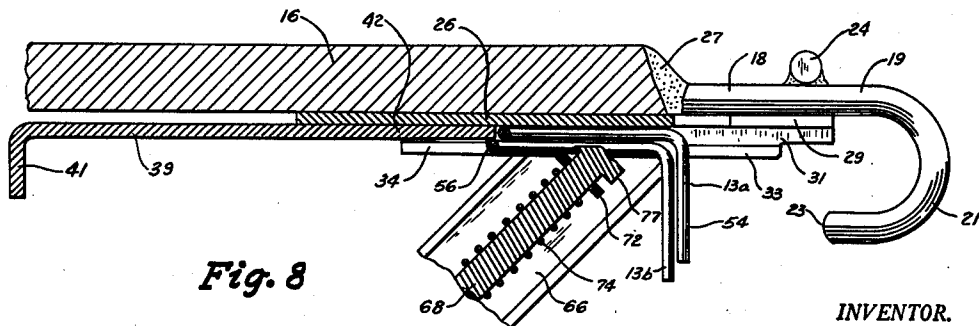


Fig. 8

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1

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WIRE CLAMPING TOOL

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1 Claim. (Cl. 1—210)

This invention relates generally to wire bending tools and more particularly to a wire bending or clamping tool for applying wire clips to fence posts so as to clamp fence wires to such posts.

An object of this invention is to provide an improved tool for applying wire clips to fence posts so as to hold fence wire on such fence posts.

A further object of this invention is to provide a wire clamping tool which is adapted to releasably hold a wire clip in a position to be assembled with a fence post and a fence wire to be supported thereon by the clip.

Another object of this invention is to provide a wire clip holding and clamping tool for applying wire clips to fence posts in which the tool is operated by a pivotal movement about the fence post as a fulcrum.

A further object of this invention is to provide a wire clamping tool which is adapted to hold a plurality of wire clips for release, one at a time, into a position to be assembled with a fence post and a fence wire therefor.

Another object of this invention is to provide a novel and improved wire clip particularly adapted for use with the wire clamping tool of this invention.

Yet a further object of this invention is to provide a wire clip holding and clamping tool which is rugged in construction, economical to manufacture, and efficient in operation to easily and quickly apply wire clips to support fence wire on fence posts.

Further objects, features and advantages of this invention will become apparent from a consideration of the following description when taken in connection with the accompanying drawings in which:

Fig. 1 is a perspective view of the wire clamping tool of this invention shown in assembled relation with a fence post and wherein the tool is in a position to bend a wire clip about the fence post;

Fig. 2 is an enlarged perspective view of the wire clip used with the wire clamping tool of Fig. 1;

Fig. 3 is a reduced side elevational view of the wire clamping tool in the position of Fig. 1;

Fig. 4 is a side elevational view illustrated similar to Fig. 3 and showing the position of the tool after the same has been operated to bend a wire clip to support a fence wire on a fence post;

Fig. 5 is an enlarged foreshortened side elevational view of the wire clamping tool;

Fig. 6 is a foreshortened perspective view of the wire clamping tool and showing the magazine structure thereof;

Fig. 7 is a cross sectional view taken along the lines 7—7 in Fig. 6 showing the clip positioning mechanism in a forward position for holding a wire clip in place for clamping purposes; and

Fig. 8 is a cross sectional view illustrated similar to Fig. 7 and showing the clip positioning mechanism in a retracted, rearward position for feeding a clip.

With reference to the drawings, the wire clamping and holding tool of this invention is shown at 10 in Fig. 1 applied to a fence post 11 for supporting a fence wire 12. The tool 10 is used on wire clips 13 (Figs. 1 and 2) to

2

first position a clip about the fence post 11 and then bend the clip about the fence wire 12 to support the wire upon the post 11.

The tool 10 includes an elongated body member 14 having a handle section 16, a head section 17 formed at the working end of the tool, and a magazine unit 15 attached to the handle section. The head section 17 is of a substantially V-shape and consists of a pair of diverged jaw members 18 formed at their outer or free parallel ends 19 with reversely bent hook portions 21, the ends 22 of which face in the direction of the handle section 16. A groove 23 (Fig. 6) is formed in each end 22 for the reception of a wire clip 13, as will be described hereinafter. A pair of elements 24, corresponding to and secured to the jaw members 18 substantially intermediate the lengths thereof, extend laterally inwardly from the jaw members toward each other. For the purpose of convenience of description, the hook end of the clamping tool 10 will be hereinafter referred to as the front end, and the handle section 16 as the rear end thereof.

The handle section 16 is secured at the front end thereof to the head section 17, by a weld 27 (Fig. 5). A substantially flat plate member 26 is secured to the body member 14 by welds 28 and includes a V-shaped forward face 29 (Fig. 6) the inner sides of which are substantially aligned with the diverging jaw members 18. The plate 26 includes further a pair of parallel sides 31 extending rearwardly of the face 29 and terminating in angularly inwardly extending edges 32. Each side 31 is flanged inwardly at longitudinally spaced portions 33 and 34 to overlap a portion of the plate 26 whereby opposed guideways are formed along the parallel sides of the plate 26.

A relatively flat, clip moving member 38 (Fig. 6) is adapted for movement over the flat surface of the plate 26 and comprises a handle 39 having a depending flange 41 at the rear end thereof and a pusher member 42 formed at the front end thereof. The pusher member 42 includes a pair of forwardly, laterally extending prongs 43 (Fig. 6) the inner sides of which form an outline at 44 similar to the body of the clip 13, for a purpose hereinafter described. The width of the pusher 42 is such that the outer sides thereof will slide within the guideways 33 and 34. Forward movement of the pusher, by actuation of the handle 39, is limited, without clips being assembled in the tool 10, by the forward edges of the prongs 43 contacting the rear edges of the hook portions 21. Rearward movement of the pusher 42 is limited by a stop member 46 (Fig. 6) attached to the rear of the plate 26 contacting a rear edge of the pusher 42.

The magazine unit 15 is utilized to hold a plurality of clips 13 in a stacked manner and is secured at the base to the handle section 16. Each clip member 13 (Fig. 2) comprises a base section 53 extending in substantially one plane and a pair of legs 54 extending at substantially right angles from the plane of the base section 53. The base section is generally V-shaped and includes a semi-circular base portion 56 having a pair of side members 57 extending laterally outwardly from each end of the base portion in a reversely curved manner. The outer ends 59 of the side members 57 are curved inwardly whereby the terminal ends 61 of the outer ends 59 are spaced apart a distance less than the lateral distance between the outermost portions 62 of the sides 57. The legs 54 extend from the terminal ends 61 in a parallel manner.

The unit 15 comprises a U-shaped member formed to include a pair of laterally spaced side members 66 and a rear member 67 connecting the rear ends of the side members 66. The unit 15 extends angularly from the handle section 16 and toward the head section 17

3

as indicated (Fig. 5). A plurality of clips 13 are placed in a stacked manner in the magazine unit 15, whereby the side portions 62 of the clips ride within the side members 66. A device for biasing the stack of clips 13 toward the handle section 16 comprises a rod 68 secured at one end 69 to the rear member 67, the other end 71 of the rod being supported a spaced distance from the upper surface of the plate 26. A force bar 72 is movably secured onto the rod 68 as indicated (Fig. 6), and has a pair of laterally extending arms 73, the ends of which extend closely adjacent the inner surfaces of the magazine side members 66. A coil spring 74 is mounted on the rod 68 between the rear member 67 and the force bar 72, whereby the expansion force of the spring continually urging the force bar 72 downwardly toward the flat plate 26.

A plurality of clips 13 are placed within the magazine unit 15 between the force bar 72 and the flat plate 26 (Fig. 6), whereby the outer ends 73 of the bar 72, under pressure of the spring 74, contact the side portions 62 of the uppermost clip 13, thereby forcing the lowermost clip 13 (Fig. 6) into engagement with the flat plate 26. The arrangement is such that the flat base section 53 of the lowermost clip 13 will rest against the plate 26, with the base portion 56 extending rearwardly and the outermost side portions 62 lying closely adjacent the respective sides 31 of the plate 26, the legs 54 of the clip 13 being in a leading position (Figs. 7 and 8).

The wire clamping tool 10 of this invention is particularly useful in clamping fence wires 12 to fence posts 11 which are of a substantially T-shape in transverse sections (Fig. 1). Such fence posts 11 include a leg 81 and a cross arm 82 perpendicular to the leg 81 and extended in opposite directions therefrom. The outer surface 83 (Figs. 3 and 4) of the cross arm 82 is of a corrugated contour, namely, formed with alternately arranged depressions 84 and extensions 85, whereby, as a wire is secured within a depression 84, the wire will not slip downwardly on the fence post 11.

In applying a clip 13 to a fence post 11 by means of the wire clamping tool 10, the clip moving member 38 is normally in rearward position and the lowermost clip 13 is located on the plate 26 directly in front of the forward face 44 of the pusher portion 42 of the member 38. The handle 39 of the member 38 is then moved forwardly whereby the pusher 42 forces the clip 13 forwardly over the plate 26, the side portions 62 of the clip moving within the guideways 33 and 34 until the legs 54 of the clip 13 receivably contact the grooves 23 in the hook portion ends 22 (Fig. 7). Of importance, the forward corners 77 (Fig. 6) of the front guideways 33 extend laterally over a portion of the sides 57 of the clip 13 to prevent the clip from falling from engagement with the tool 10 when the tool is in its commonly used position (Fig. 1) wherein the clip is facing downwardly.

With the clip 13 thus retractably held, the tool 10 is manipulated to position the jaws 18 at opposite sides of the post 11, as best shown in Figs. 1 and 3, such that the free end of the post leg 81 is adjacent to the junction 78 of the jaws 18 (Fig. 6) to provide for the location of the fence wire 12 to be secured at the junction 79 of the clip legs 54 with their corresponding sides 57 (Fig. 3). The wire 12 extends transversely of the post 11 within one of the grooves 84. It is seen, therefore, that the jaws 18 are greater in length than the width of the leg 81 of the post 11 so that the leg 81 is arranged between the junction 78 of the jaw members 18. Also, it will be noted that the base 56 of the clip 13 is adjacent the junction 78 of the jaw members 18, so as to be in a position opposite from, and close to, the free end of the post leg 81. With the tool 10 in a substantially horizontal position, with the handle 16 extended from the leg 81 of the post 11, the leg extensions 54 of the

4

clip 13 project vertically, or longitudinally of the post 11. The handle section 16 of the tool 10 is then swung or pivoted upwardly, as viewed in Fig. 4, about the shoulder forming elements 24 which are in engagement with the sides of the cross arm 82 opposite the wire contacting side thereof, and which thus function as a fulcrum for the pivotal movement of the tool 10.

As the tool 10 is pivoted about the elements 24 (Fig. 5), the elements 24 slide a relatively short distance upwardly on the post 11 to provide for movement of the hook portions 21 toward the post 11 to bend the legs 54 of the clip 13 about the fence wire 12. A slight pivotal movement of the tool 10 is sufficient to draw the corners 77 of the front guideways 33 away from their underlying position with respect to the sides 57 of the clip 13, whereby the clip and the tool are free to separate. Concurrently with the bending of the legs 54, the base portion 56 of the clip 13 is moved into contact with the fence post leg 81. As a result, the wire 12 is positively held within a depression 84 of the post by virtue of its reception within a pair of loops or hooks 86 formed by the clip legs 54, and by the engagement of the clip base section 56 with the post 11 at the free end of the leg 81. The tool is disengaged from the wire 12 and the fence post 11 by merely returning the tool to a horizontal position and then moving the hook portions 21 away from the supported wire 12.

To reload the tool 10, the clip moving member 38 is retracted from its forward position to a rear position by actuation of the handle flange 41, it being noted that the next lowermost clip 13a (Fig. 7) has been held in an elevated position from the plate 26 by the thickness of the pusher member 42 during the movement of the member 42 with respect to the clip 13. Thus, upon retracting the member 38 to its rear position, the withdrawal of the portion 42 of the member 38 from beneath the next clip 13a (Fig. 8) allows that clip to be forced against the plate 26 by the action of the spring 74 and the force bar 72. The tool 10 is thus ready to be used to clamp the wire clip 13a, as well as the clips 13b, 13c, etc., in the same manner as hereinbefore described.

It is seen therefore that this invention provides a wire clip holding and clamping tool 10 that releasably holds a plurality of clips 13 and which is easily operated to apply the clips, one by one, to a fence post 11 so as to secure a fence wire 12 to the fence post 11.

Although the invention has been described with respect to a preferred embodiment thereof, it is not to be so limited. On the contrary, various modifications and alternate constructions can be made without varying from the scope of the invention as defined in the appended claim.

I claim:

A tool for holding a plurality of wire clips so that the clips can be successively applied to a fence post and a fence wire, said tool comprising, a body member having a head section at one end and a handle section at the other end, said head section including a pair of diverging jaw members having reversely bent hook portions formed at the free ends thereof, a fulcrum portion formed at the junction of said jaw members, said handle section including guide means having a flat surface and upstanding sides, plate means movable along said surface toward and away from said hook portion ends, and U-shaped frame means including a pair of parallel side members having corresponding ends thereof secured to a side of said guide means and extended angularly therefrom, with the other ends of said side members being connected by a base member, rod means secured at one end to said base member and extended parallel to and intermediate said side members to a position spaced from said surface, an element slideably mounted on said rod means and having end portions each extended adjacent a side member, and spring means mounted on said rod means between and in contacting relation with said base member and

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5

said element whereby to urge said element toward said
guide means surface.

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