Dec. 28, 1948. W. H. KOCH 2,457,382

FENCE REPAIR TOOL

Filed May 28, 1945 2 Sheets-Sheet 1

Fig. 1

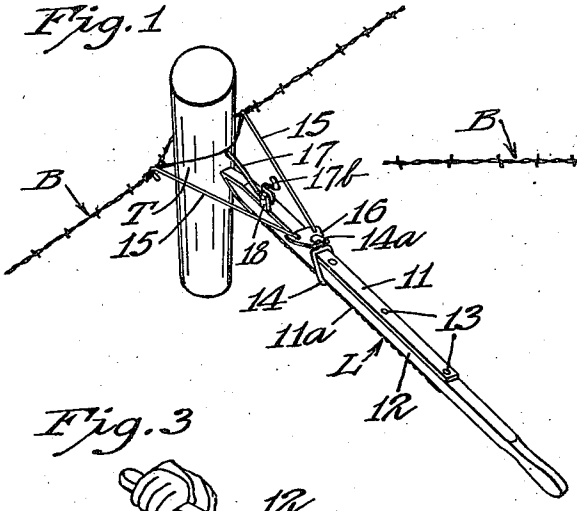


Fig. 2

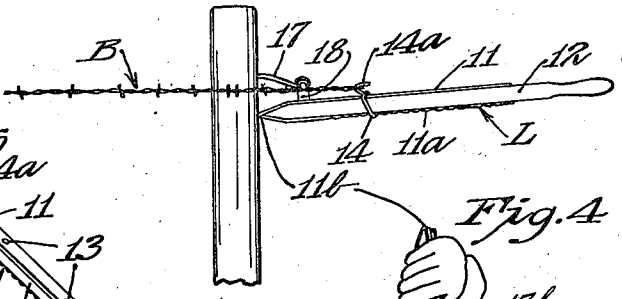


Fig. 3

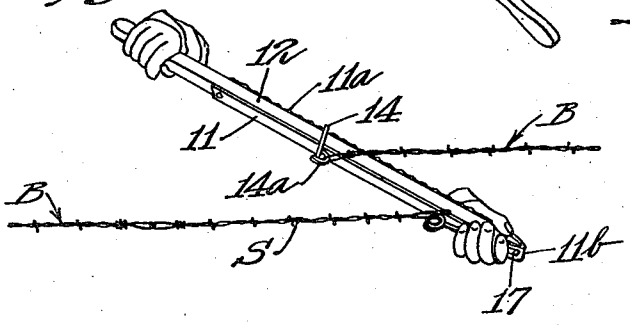


Fig. 4

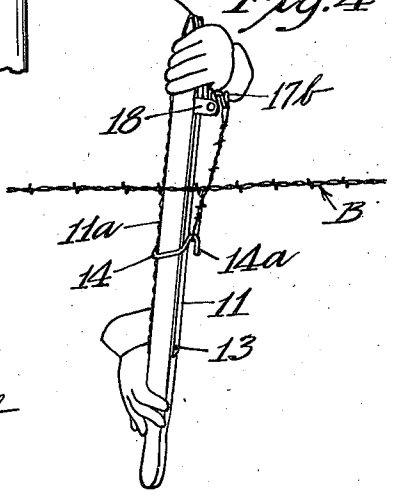


Fig. 5

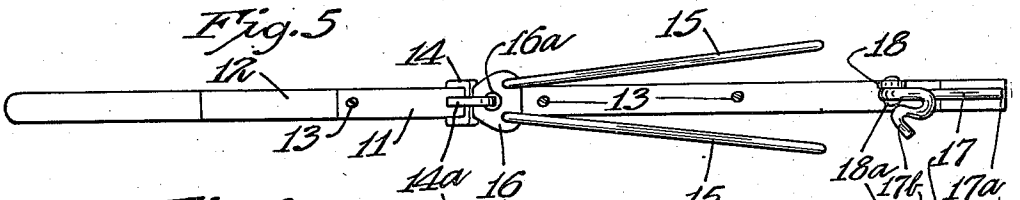


Fig. 6

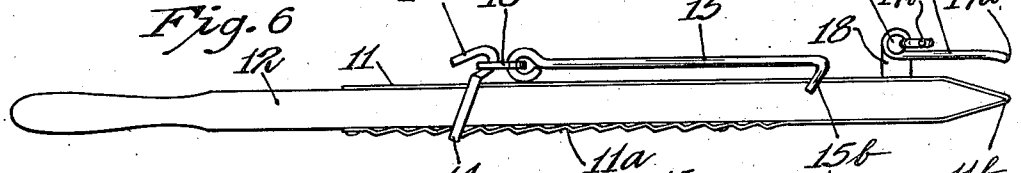
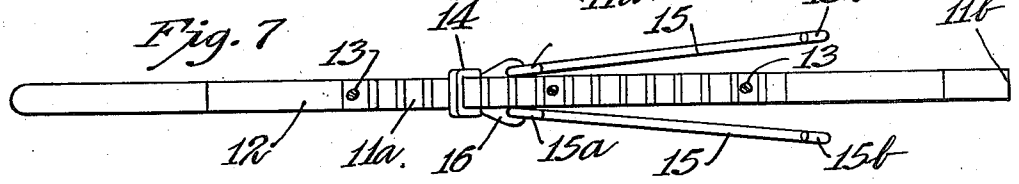


Fig. 7



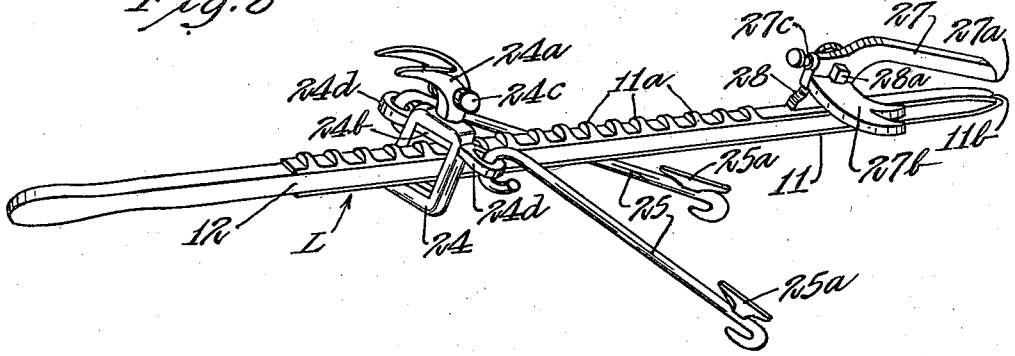
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FENCE REPAIR TOOL

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Fig. 8



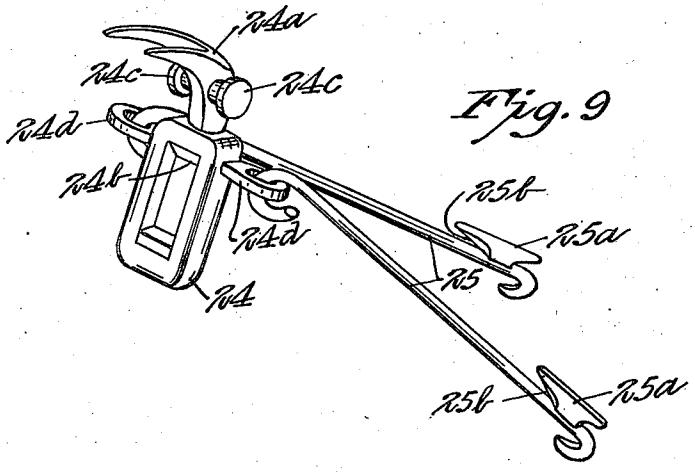
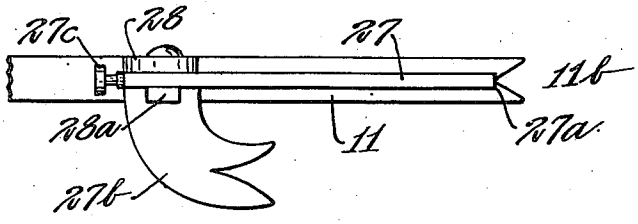


Fig. 9

Fig. 10



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2,457,382

FENCE REPAIR TOOL

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Application May 28, 1945, Serial No. 596,114

2 Claims. (Cl. 140—123.5)

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This invention relates to a tool for repairing and installing wire fencing and is an improvement upon the fence tool disclosed in my U. S. Letters Patent No. 2,158,128.

It is an object of my present invention to provide a simplified and improved tool adapted to splice, stretch or take up slack in wire fencing of all types.

More specifically, it is an object to provide a multi-purpose fence tool of the general structure disclosed in my herein identified patent, but wherein certain advantages in the cost of manufacture and the cooperation of the wire engaging parts, are accomplished.

Another object is the provision of an improved fence tool utilizing a minimum amount of metal and thereby lessening production costs as well as the weight of the device, but constructed nevertheless, to give the maximum rigidity and leverage action required, as well as afficient cooperative relationship between the adjustable and wire-engaging parts.

These and other objects and advantages of my invention will be more apparent from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same parts throughout the several views and in which—

Fig. 1 is a perspective view showing the application of my improved tool in taking up slack in a fence wire at both sides of the post;

Fig. 2 is a side elevation illustrating the use of my tool for stretching a wire;

Fig. 3 is a perspective view showing the beginning of a splicing operation in broken fence wire;

Fig. 4 is a view showing my tool used in a second or twisting operation in splicing;

Fig. 5 is a top plan view of my improved tool with the grab hooks attached to the slide block;

Fig. 6 is a side elevation of the same;

Fig. 7 is a bottom plan view of the same;

Fig. 8 is a perspective view of a somewhat different and somewhat more costly embodiment of my invention;

Fig. 9 is a perspective view of the slide block and grab hook of the second embodiment, detached; and

Fig. 10 is a top plan view of the outer portion of the lever bar with the lock arm fulcrumed thereto, in post-engagement position.

Referring first to the embodiment of my invention illustrated in Figs. 1 to 7 inclusive, I provide an elongated, substantially straight lever bar designated as an entirety by the letter L, comprising, as shown, a heavy bent metal strap or sheathing 11 and an elongated wooden handle and core 12 to the medial and outer portion of which the elongated U-shaped strap 11 is secured by suitable means such as screws 13. The stem portions of the bent strap 11 lay flat against opposite longitudinal edges of the core and handle member 12 and one of the stem portions thereof, as shown, (the upper) is straight and has a smooth exterior guiding surface for reception of a slide block. The opposite stem of the narrow U strap 11 is provided throughout the greater part of its length, with a series of longitudinally spaced, retaining shoulders 11*a* as shown, being in the form of corrugations for engagement with an edge of an adjustable slide block 14. Strap 11, at its forward end is bent in V-shape to provide an edge or post-engaging element 11*b*.

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Slide block 14 may be in the form of a metal casting or a heavy looped rod shaped to loosely surround the medial portion of the lever bar with adequate clearance in its longitudinal dimensions to permit ready sliding adjustment to be made when the block 14 is disposed perpendicularly to the center line of the lever bar. The block on its inner periphery, is provided with an edge or edges defining a shoulder for retaining engagement with the retaining shoulders or corrugations 11*a* of the strap. The slide block 14 carries a wire retaining hook 14*a*, the outer end of which is directed rearwardly of the lever bar for connection with the loop or enlargement of a fencing wire.

In cooperation with the slide block 14 for certain operations of my fence tool, I provide a pair of wire engaging grab hooks 15, pivoted by eyes 15*a* to an attachment plate 16 which is provided with an enlarged attachment aperture 16*a* adapted to be slipped over the hook 14*a*. The grab hooks 15, when used, extend forwardly at the two sides of lever bar L and have wire-engaging hooks 15*b*, at their outer ends for engagement with fence wire.

A combination lock arm and tightener 17 is fulcrumed adjacent the forward end of lever bar 12, preferably being pivotally mounted upon an upstanding metal lug 18 which is welded or otherwise rigidly affixed to the upper stem portion of metal strap 11 at a point a few inches rearwardly of the tip or post-engaging element 11*b* of the strap. As shown, lock arm 17 comprises a bent, substantially rigid rod having a loop portion fulcrumed by a rivet or other pivot means 18*a* to the lug 18 and having an outer extremity 17*a* which is preferably edged or sharpened to slightly penetrate a wooden post. The lock arm

17 rigidly carries a laterally projecting coupling hook 17*b* which is adapted to engage the loop or an enlargement on a fence wire and which, it will be noted, is disposed slightly below the fulcrum of pivot 18*a*, when arm 17 is disposed forwardly as shown in Fig. 6.

Operations

In Fig. 1 the use of my tool in taking up slack, at both sides of a fence post, without removal of the staples, is illustrated. Here the grab hooks 15 are utilized by attachment of the plate 16 with the hook 14*a* of the slide block. Slide block is properly adjusted adjacent the forward portion of the lever bar; the post-engaging point 11*b* is thrust against the face of the post and the two hooks 15*b* are engaged with the fence wire at opposite sides of the post and the lever is then swung downwardly, tensioning the wire and wrapping the same slightly about the post, away from the stapled portion, in both directions. The lock arm 17 is then swung from the dotted line position of Fig. 1 into locked position, as shown by the full lines, with its edged outer end engaging the post an inch or two above the point 11*b* of the lever bar. Thereafter, a tie wire T may be applied by twisting the ends thereof, tightly about the fence wire at the sides of the post. The hands are free to perform this twisting operation since the tool is locked in the position indicated in Fig. 1. The tool is removed with the slack of the fence wire taken up and it will be noted, the staples need not be removed for this operation.

In Fig. 2, with the grab hooks removed, my device is employed for stretching a wire in installing a fence or replacing a wire. Here a loop is made in the end of the fence wire and is connected with the hook 14*a* of the slide block and the post-engaging element 11*b* is thrust against the side of the post and lever force is transmitted, substantially in the line of the staples so that the staples will not be ripped out but may be slightly loosened in the operation, or if new fencing wire is being installed, may be driven after the wire is tensioned. Stretching is applied by swinging the handle of the lever bar downwardly whereafter the locking arm 17 may be swung forwardly to engage the post and secure the device with the wire caught. Thereafter, both hands are free to staple or tighten the staples on the post.

In Figs. 3 and 4, the use of my fence tool for a splicing operation is illustrated. Where a fence wire is broken, it is usually necessary to add a short extra section S as shown in Fig. 3, in order that the ends to be joined, may be overlapped. The slide block 14 is adjusted on the bar L while the wire is slack and loops on the end of the two wires to be joined, are engaged by the hook 14*a* and the hook 17*b* respectively, as shown in Fig. 3. The lever bar grasped by its ends with two hands, is then swung or twisted as indicated by the arrows in Figs. 3 and 4 to tension the two ends of wire and make the first twist between the two ends, thereby clinching the joint. Thereafter, the wire is further twisted by swinging the lever bar another ninety degrees from the position shown in Fig. 4, whereupon the clinched ends may be grasped with one hand and the tool released by swinging the locking arm 17 upwardly and rearwardly to release the loop of one of the wires. Thereafter, the loose ends of the two joined fence members may be wrapped securely around the adjacent tensioned portions of the wires to complete the splice.

In this splicing operation, my improved structure has some very definite advantages over the structure of my fence tool disclosed in Patent No. 2,158,128. The hook 17*b* being outturned and extended laterally from the arm 17, facilitates the engagement of the second wire since the loop of the second wire is disposed laterally outward of the point of connection of the first wire with hook 14*a*. In the second place, since the engaged portion of hook 17*b* in its coupled position, is slightly below the axis of pivot 18*a*, arm 17 will not inadvertently be swung in the twisting of the wire to form the clinch to release its engaged loop. From the described relationship, it will be seen that since the pull of a wire S (see Fig. 3) is imparted to the lock arm of the attachment element or hook 17*b* below the fulcrum of the lock arm, an "over-dead-center relation" is obtained which prevents the lock arm from being inadvertently swung backwardly to release the wire. With my old device, the lock arm 17 had to be held forwardly against the forward end of the bar L and if inadvertently released, one of the wires would be uncoupled and the free end might injure the hand of the operator, particularly if barbed wire was being spliced.

In addition to the several uses previously described the device may be utilized to pull staples from a post, by looping or otherwise securing the end of a wire to the hook 14*a* and then prying with the lever against the post, in a direction to cause the wire to transmit an outward pulling on the staples or staple.

In Figs. 8 to 10, I illustrate another embodiment of my invention which includes some additional features. In this form, the lever bar L is of generally similar construction to that of the form first described, comprising a narrow, U-shaped strap 11, bent upon itself to form a relatively sharp post-engaging element B at the forward end of the tool and overlying opposite longitudinal edges of a combination handle and core member 12, but as shown, having teeth or corrugations 11*a* formed on the upper side thereof.

The slide block 24 of this last mentioned embodiment as shown, is in the form of a metal casting, having a V edge 24*b* for engagement with the shoulders 11*a* and carrying at its upper end, a rearwardly curved bifurcated, wire clinching claw 24*a*. Claw 24*a* has a converging entrance defined by longitudinal edges of the material whereby the fence wire having barbs or other enlargements thereon, may be firmly grasped and gripped. The claw 24*a* at one or both sides thereof, carries short, spools 24*c* upon which a smooth wire may be wound and hitched to secure the same to the claw.

The grab hooks 25 have their looped rear extremities detachably connected with eyes 24*d* extending laterally from the sides of the slide block 24 and in addition to the hooks at the forward end, are provided as shown, with converging clinching elements 25*a* which are adapted to grasp and clinch fencing wire of any type, including smooth wire.

In this connection, it will be seen that the clinching edge 25*b* of each of the hooks, is straight and is angled at a sharp, acute angle to an edged portion to the shank of the hook. The two edges will grip even a smooth wire to hold the same securely. The grab hooks may be crossed and the edges and elements used to pull staples by grasping the wire adjacent the staple.

The lock arm 27 of this embodiment is in the form of a metal casting having the outer extremity thereof, 27*a*, edged to slightly penetrate and engage a fence post. The arm is pivoted by a bolt or rivet 28*a* to a heavy, upstanding lug 28, rigidly affixed to the upper section of the strap 11 and adjacent the forward end of the lever bar. Integrally formed with the arm 27, is a laterally projecting outwardly and forwardly curved claw 27*b*, disposed it will be noted, slightly below the fulcrum axis of arm 27 and with its converging wire grasping portions disposed laterally outward of one of the sides of the lever bar. A short spool element 27*c* is integrally formed with the arm 27 disposed adjacent the fulcrum upon which a smooth wire may be wound several times and hitched if desired, to secure the same for splicing, pulling or other purposes.

The operations of the embodiment of Figs. 8 to 10 are similar to those of the embodiment first described, but in addition to all advantages of the first form, fence wires of different types may be secured either by clinching or winding of a smooth wire without the formation of loops at the ends of the wire, as is necessary in the first form.

With both forms of my invention, it will be seen that the weight and cost of the elongated lever bar are materially reduced without sacrificing any necessary strength. The combined core and handle member is completely reinforced throughout its medial and outward portion by the narrow, U-shaped strap which also forms the post-engaging point or element at its forward end and which, in addition, furnished the spaced shoulders or notices for adjustment of the slide block.

From the foregoing description, it will be seen that I have provided a simplified, but highly efficient, fence repair tool for performing a number of needed operations including the taking up of slack and stretching of fence wires without removing staples; the tightening of a wire in replacement or installation work; the splicing of broken wires, as well as the removal of staples.

It will of course, be understood that various changes may be made in the form, details, arrangements and proportions of the parts without departing from the scope of my invention.

What I claim is:

1. A tool for repairing wire fences comprising an elongated lever bar having a forward end adapted to be engaged against a fence post to facilitate lever action, a slide block embracing said bar and selectively adjustable in a multiplicity of positions on the medial portion of said bar, said slide block carrying a laterally projecting flanged spool for winding connection of a smooth fence wire thereon and a lock arm fulcrumed to the forward portion of said lever bar and having an outer end adapted to be swung into projecting engagement with the post in spaced relation to the engagement element of said bar, said lock arm also carrying a laterally projecting flanged spool for winding connection of a smooth fence wire therewith.

2. A tool for repairing wire fences comprising an elongated lever bar having a forward end adapted to be engaged against a fence post to facilitate lever action, a slide block embracing said bar and selectively adjustable in different positions throughout the medial portion of said bar, said slide block carrying an element for attachment to an end of a fencing wire and a lock arm fulcrumed to the forward portion of said lever bar above the same longitudinal side of said bar as said attachment element of the block is disposed; said lock arm having an outer handle end extending longitudinally of said bar and carrying a wire attachment element disposed outwardly and laterally of said handle end and adjacent the fulcrum of said lock arm and disposed eccentrically of and slightly below the fulcrum axis of said lock arm when said arm is swung forwardly to effect in reference to a wire connected with said lock arm and with said fulcrum axis, an off-set dead center relation when a rearward pull is imposed upon said attached wire.

WILLIAM H. KOCH.

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