Oct. 21, 1952 H. D. BROCK 2,614,894

PIVOT FOR PLIER TYPE TOOLS

Filed Nov. 14, 1949 2 SHEETS—SHEET 1

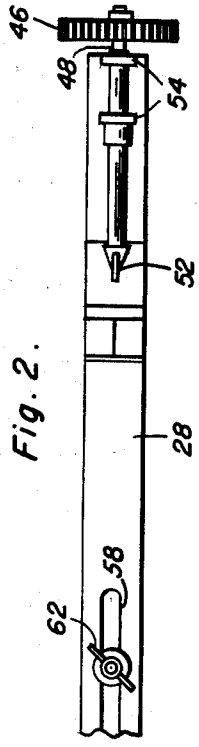


Fig. 2.

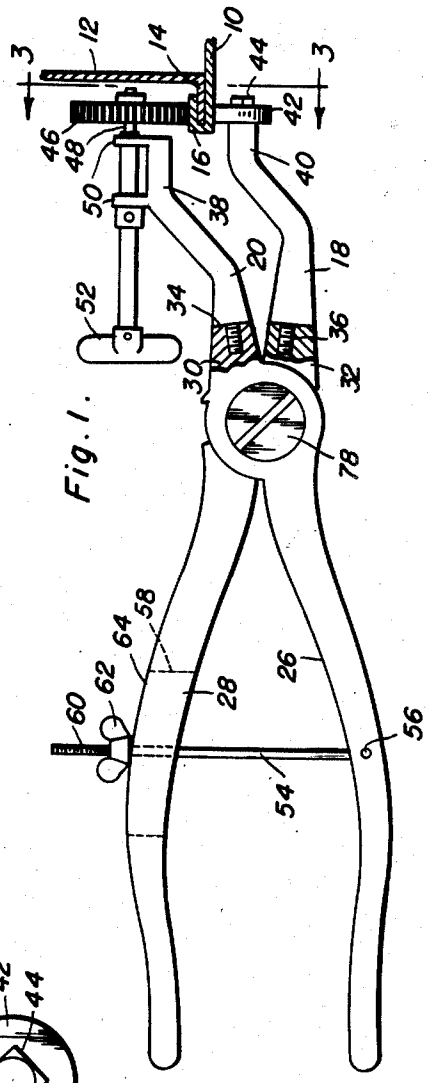


Fig. 1.

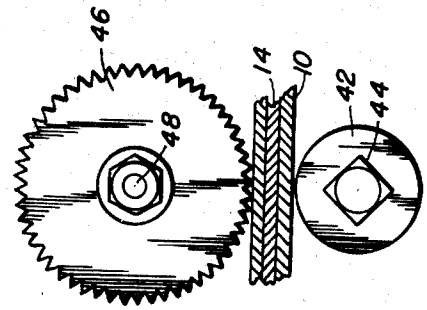


Fig. 3.

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Oct. 21, 1952 H. D. BROCK 2,614,894

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Filed Nov. 14, 1949 2 SHEETS—SHEET 2

Fig. 5.

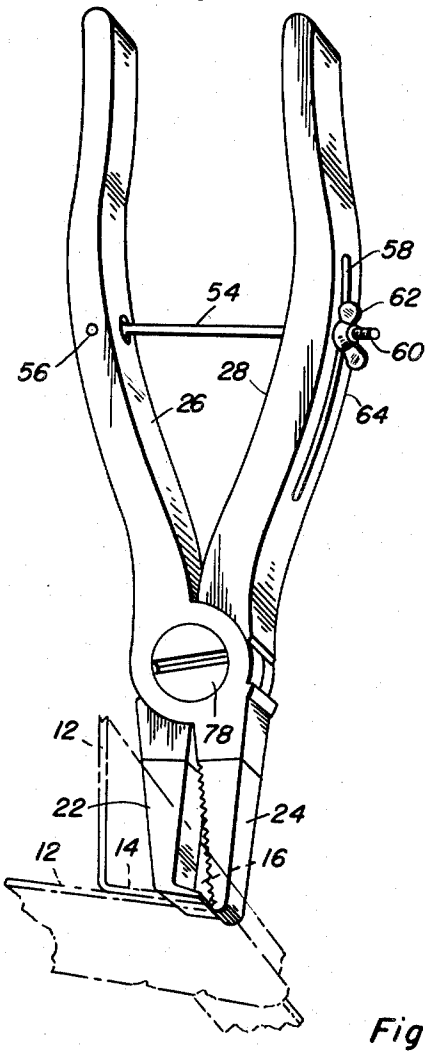


Fig. 6.

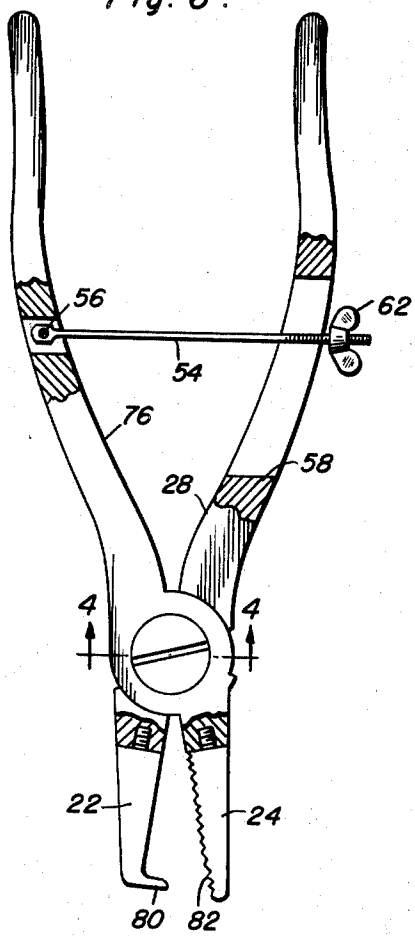
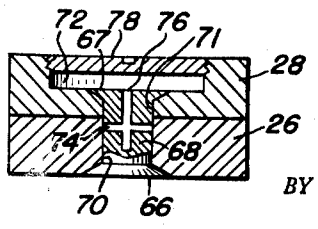


Fig. 4.



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PIVOT FOR PLIER TYPE TOOLS

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1 Claim. (Cl. 308—2)

1

This invention relates generally to tools, and more particularly to a tool of pliers character comprising a pair of crossed pivoted handles having interchangeable tip members, locking means for the handles adjustable for use with different tip members, and novel means for lubricating the pivot connection of the handles.

An object of this invention is to provide a pliers construction in which the handle connection means has novel and improved lubrication means incorporated therewith.

And the last object to be specifically mentioned is to provide a pliers construction which renders the pliers relatively inexpensive and practicable to manufacture, extremely simple, convenient and safe to use, and which will give generally efficient and durable service.

With these objects definitely in view, this invention resides in certain novel features of construction, a combination and arrangement of parts and portions as will be hereinafter described in detail in the specification, particularly pointed out in the appended claim, and illustrated in the accompanying drawings which form a material part of this application, and in which:

Figure 1 is a side elevational view of the improved pliers with a set of tips having crimping rollers operatively mounted thereon, the view including a portion of a header plate and tank of a radiator being operated on by the pliers, the portions of the radiator being shown in vertical section, and certain portions of the handles being broken away to illustrate how the removable tip members are secured to these handles;

Figure 2 is a top plan view of the structure illustrated in Figure 1, with the parts of the radiator removed;

Figure 3 is a transverse vertical sectional view, taken through Figure 1 on the line 3—3, the rollers being shown in elevation;

Figure 4 is an enlarged detail transverse sectional view, taken through the pivotally connected portions of the handles and the figure is adapted to illustrate the special construction provided whereby the pivot means is lubricated;

Figure 5 is a three dimensional view of this invention with another pair of tip members secured to the handles, these tip members being shown as used for loosening a header plate from a flange on the tank of a radiator, the particular function for which these specific tip members are developed; and

Figure 6 is a similar view, with portions of the handles being broken away to show the construction thereof.

2

Similar characters of reference designate similar or identical parts and portions throughout the specification and throughout the several views of the drawings.

Referring now to the drawings in detail, it will be noted that the environment wherewith this invention was specially designed to be used is illustrated in Figures 1, 3 and 5 as including an edge portion 10 of the header plate of a cooling radiator core such as are used in automotive vehicles and a portion of a tank 12 incorporated with such radiators and having an outturned flange portion 14. It will be noted that the portion 16 of the header plate 10 is turned upwardly and inwardly toward the tank 12. This invention proposes to provide convenient means for crimping the portion 16 and the portions 14 and 10 together, or alternatively for disassembling these parts. It is customary usage to secure these parts together by first turning the portion 16 on the edge of the portion 14 as indicated in the drawings, then crimping the parts together and thereafter soldering along the seam so formed. When it is desired to disassemble this structure, it is usual to heat the seam with a blowtorch to loosen the solder connection and thereafter to pry the turned portion 16 outwardly away from the portion 14.

This invention provides sets of interchangeable tip members, indicated at 18, 20, 22 and 24 to effect these operations.

The pliers include a pair of handles 26 and 28 which are crossed and pivoted in a novel manner hereinafter described more fully, to extend into stub portions 30 and 32, respectively. The stub portions are formed with flat end faces 34 and are axially bored and internally threaded to receive threaded attaching extensions 36 on the ends of the tip members 18–24.

Referring now particularly to the tip members illustrated in Figure 1, it will be noted that these members have offset shank portions 38 and 40, the shank portion 40 having rotatably mounted thereon a plain roller 42, the drawing illustrating a simple construction in which the roller 42 is held in place on the end of the shank portion 40 by means of a headed bolt 44. Another roller 46 is formed with a serrated periphery and is rigidly mounted on the end of a shaft 48 which is rotatably mounted in a pair of alined lug bearings 50 which may be integral with the shank portion 38. One end of the shaft 48 carries a handle member 52 whereby the shaft and the crimping roller 46 may be turned manually. It will be here noted that the offsetting of the shank

portion 48 allows the handle 52 to be made in simple form and in a size facilitating the turning of the crimping roller, all without complicating the structure.

A locking bar 54 is pivotally secured, as at 56 to the handle 26, and the handle 28 is longitudinally slotted at 58 to receive one end of this locking bar, this one end being threaded, as indicated at 60 to receive a wing nut 62. It will be carefully noted that the slotted portion of the handle 28 has an outside face 64 which is arcuate, the radius of curvature of this face being greater than the dimensional length of the locking bar 54 which is operatively effective in determining the relative positioning of the handles when they are locked by this means. The face 64 will, of course, be normal or substantially normal to the bar 54.

This invention includes novel means for connecting the handles together in pivotal relationship, this means including a rivet having two heads 66 and 67 and a shank 68. The rivet may be integral with one of the handles if preferred but Figure 4 shows a construction wherein a head 66 occupies a bevel portion of a bore 70 in the handle 26, and the other handle is provided with a coaxial bore 71 and a grease receiving recess of larger diameter 72 communicating directly with the bore 71. The shank 68 is transversely channeled or bored at 74 and another bore 76 extends longitudinally through the head 67 and a portion of the shank for communication with the bore 74. A closure comprising a screw cap 78 is threadedly mounted on the handle 28 to close the recess 72. Alternative positioning of the recess 72 in the other handle 26 is within the scope of this invention. The heads 66 and 67 seat in bevels provided in the handles and the head 67 is preformed while the head 66 will be formed by a peening operation during the assembly of the tool. The ends of the bore 74 register with the bore 70 in the handle not having the grease receiving recess and the bore 76 need not extend to the end of the rivet remote from the recess 72. If the rivet in its preformed state is provided with a bore 76 coextensive in length with the rivet, the peening operation on the head 66 will close the corresponding end of the bore 76.

The operation of this invention will be clearly understood from the foregoing description of the mechanical details thereof, and taken in connection with the above recitation of the objects sought to be achieved by this invention. In recapitulation, it may be added that grease will be provided in the recess 72 and that the lubrication of the pivotal connection of the handles is assured by the gradual movement of this grease through the bores 76 and 74 into the frictional contacting areas of the handles. Such proper lubrication will, of course, lessen wear, improve the facility with which the pliers may be opened and closed, and will increase the useful life of the tool.

Modified forms of the tip members may include the tip members 22 and 24, the former being provided with a terminal hook portion 80, disposed as toward the opposing tip member when in operative position, while a co-acting tip member 24 will preferably be formed with a serrated face 82. The method of using the different tip members is well illustrated in Figures 1 and 5, it being only necessary to add that the offsetting of the shanks 38 and 40 allow the fingers of the operator to easily manipulate the handle 52 to turn the crimping roller 46 making the same advance along the turned portion 16 of the radiator header plate, while the roller 42 contacts the opposite side of the parts to be seamed together to provide sufficient pressure. When such pressure has been applied, the handles 26 and 28 are locked by means of pivoting the locking bar 54 about its pivot point 56 and turning the wing nut 62 so as to contact the face 64.

The use of the tip members 22 and 24 has already been mentioned.

Obviously many minor variations may be made in this structure and details of proportionment of the various elements of this invention, all without departure from the spirit and scope thereof. Accordingly, limitation of this invention should be only as determined by a proper interpretation of the terminology of the subjoined claim.

Having described the invention, what is claimed as new is:

A plier type tool comprising a pair of handles including crossed end portions having aligned transverse bores therein, one of said end portions further having a threaded lubricant chamber in its outer face communicating with the bores, a rivet in the bores pivotally connecting the handles and including enlarged end portions countersunk in the outer end portions of the bores, said rivet having lubricant passages therein communicating with its periphery and with the chamber, and a removable closure disc threadedly mounted in the chamber and substantially flush with said outer face of said one end portion.

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