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W. A. PETERSON

1,772,224

PLIERS

Filed May 27, 1929

Fig. 1.

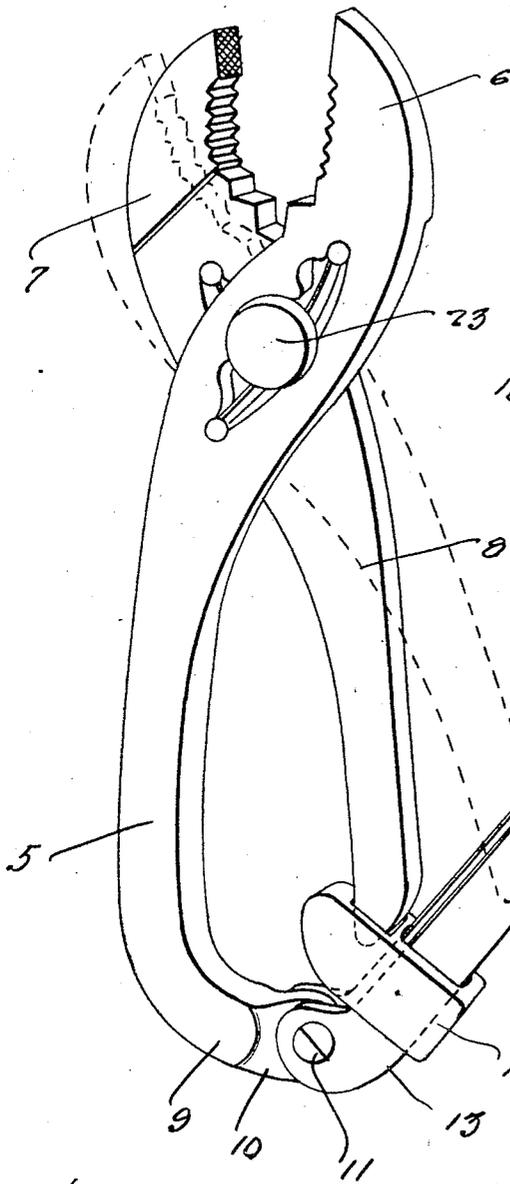


Fig. 2.

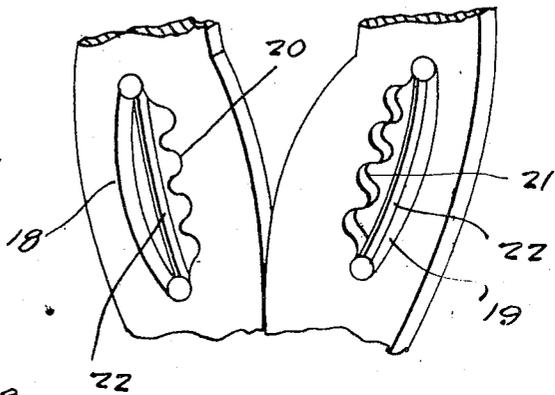


Fig. 3.

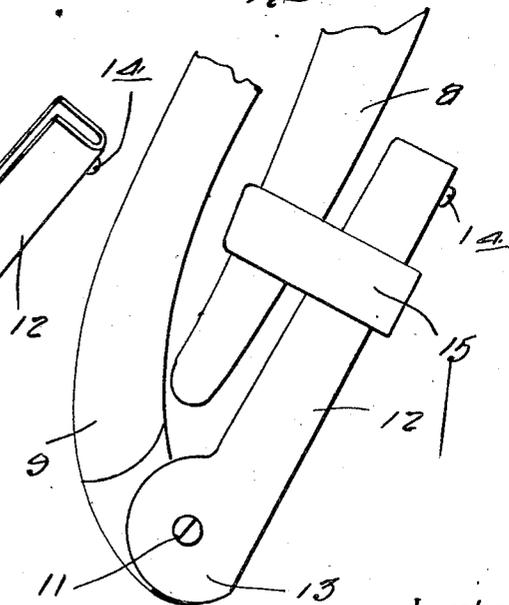
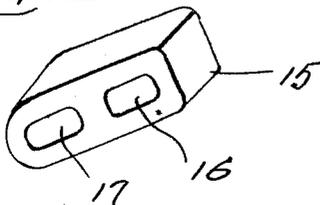


Fig. 4.



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PLIERS

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This invention relates to an improved tool of the compound variety which is characterized by structural features so constructed and associated as to permit it to serve as ordinary pliers and to also serve as a plier wrench.

In carrying the invention into practice, I provide a structure which in general appearance, resembles an ordinary pair of pliers, wherein novel devices are attached thereto to provide means for multiplying the leverage of the plier handles and for also locking the handles together to relieve the hand of the operator of undue resisting pressure.

It follows that one of the principal features of the invention is the incorporation in a novel plier of a third lever which cooperates with the handle levers of the plier in a manner to provide for increased leverage and locking of the handle levers together.

An equally important feature is the novel pivot joint construction which comprehends the provision of intersecting longitudinally elongated slots at the crossed juncture of the jaws, said slots being especially constructed to accommodate an adjustable pivot pin, maintained in operative position through the medium of spring means.

Referring to the drawings:

Figure 1 is a perspective view of the complete tool.

Figure 2 is a fragmentary view of the intersecting portion of the jaws or main handle forming levers.

Figure 3 is a fragmentary perspective view showing the operation of the locking means as well as the supplemental or third lever.

Figure 4 is a perspective view of the slidable retainer.

Referring now to the drawings by reference numerals, it will be seen that 5 designates one of the main levers which is provided at its outer end with a jaw of ordinary shape as indicated at 6, for cooperation with the complementary jaw 7 of the second main lever 8. This lever 8 is comparatively short in length to permit it to become nested into the curved end portion 9 of the first lever 5, as shown for example in Figure 3. This curved end terminates in a flat extremity 10,

functioning as an ear and pivoted to this ear as at 11 is the third or supplemental lever 12. This lever 12 has a curved section as at 13 and is channel shaped in cross section and provided adjacent its free end with a stop 14.

The channel is of a width to permit the lever 8 to be folded thereinto or to merely permit the end of the lever 8 to be seated therein for a novel fulcrum and cam action, produced when the lever 12 is closed. Slidable on the lever 12 is a retainer block 15 which is prevented against endwise displacement by the stop 14. This is provided with an opening 16, forming a guide which is slidable on the lever 12 and is provided with a similar opening 17, which constitutes a keeper and which is slidable on the lever 8, as shown in Figure 3. As before indicated the crossed portion of the jaw end of the levers 5 and 8 are provided with longitudinal arcuate slots 18, and 19, respectively. These are disposed in intersecting relation and formed along opposite edges with complementary keeper seats. These seats are formed by providing longitudinally spaced notches. The notches of the slots 18 are distinguished by the reference character 20 and the complementary notches of the slot 19 by the reference character 21. The reference numerals 22 denote flat retaining springs which are disposed centrally in the slots and suitably anchored at their opposite ends. These springs serve to hold the shank portion of the pivot bolt in place. This pivot bolt is provided on one end with an enlarged head 23, which covers the complementary slot as shown in Figure 1.

On the opposite end is the retaining nut (not shown).

The purpose of this slotted pivotal arrangement is to permit the pins to be adjusted into corresponding notches 20 and 21 to increase or decrease the "spread" of the jaws 6 and 7. Thus the jaws are permitted to have a wide range of adjustment. The feature of this arrangement is that the spring permits the adjustment of the pivot pin to be quickly made and yet retains the pin in its respective keeper seat to insure a non-slipping pivotal joint.

The feature which I desire to emphasize in particular is the multiplied leverage structure which is produced by the presence of the third lever 12 cooperating with the relatively short lever 8 and pivotally connected with the longer lever 9. Obviously, by engaging the jaws with the object to be turned and placing the end of the lever 8 in the channel, then pressing on the lever 12, a cam action is produced, whereby to force the lever 8 toward lever 9 by the closing action of the supplemental lever.

It is obvious too, that the sliding retaining block 15 is advantageous in that it may be slid on the levers 8 and 12 respectively to hold these levers in set position whereby to permit the tool to be employed in the nature of a wrench. It is thought that by considering the description in conjunction with the drawings, a clear understanding of the construction, operation, and features and advantages of the improved tool will be had.

Therefore a more lengthy description is deemed unnecessary. Minor changes in the shape, size and rearrangement of details coming within the field of invention claimed may be resorted to, in actual practice, if desired.

I claim:

1. In a tool of the class described, a pair of crossed pivotally connected levers provided at their outer ends with object gripping jaws, and a third lever pivotally connected with the handle end of one lever and cooperable with the corresponding end of the remaining lever to permit the last named lever to be forced mechanically toward the first named lever, together with a slidable locking device carried by said third lever and cooperable with the adjacent lever of said pair of levers.

2. In a tool of the class described, a pair of crossed pivotally connected levers provided at their outer ends with work engaging jaws, one lever being comparatively long and having its handle end curved and terminating in an attaching ear, the second lever being comparatively short, a third lever pivotally connected to said attaching ear, said third lever being of channel shaped cross section with its open side disposed toward the second named lever to permit the adjacent end of the second named lever to be disposed therein, whereby to permit the second named lever and third lever to be moved toward the first lever.

3. In a tool of the class described, a pair of crossed pivotally connected levers provided at their outer ends with work engaging jaws, one lever being comparatively long having its handle end curved and terminating in an attaching ear, the second lever being comparatively short, a third lever pivotally connected to said attaching ear, said third lever being of channel shaped cross section with its open side disposed toward the second named lever to permit the adjacent end of the second

named lever to be disposed therein, whereby to permit the second named lever and third lever to be moved toward the first lever, and a retaining block slidable on the third lever and having an opening formed therein for passage of the second lever.

4. In a tool of the class described, a pair of main levers disposed in crossed relation and having their outer ends formed with work engaging jaws, the crossed portions of said levers being provided with longitudinally disposed slots disposed in intersecting relation, the opposite edges of said slots being formed with longitudinally spaced notches constituting keeper seats, a flat retaining spring arranged centrally in each slot cooperable with the seat, and a pivot bolt passing through the slot and maintained in the seats through the medium of said springs whereby to permit the spread of said jaws to be regulated.

5. In a tool of the class described, a pair of main levers disposed in crossed relation and having their outer ends formed with work engaging jaws, the crossed portions of said levers being provided with longitudinally disposed slots disposed in intersecting relation, the opposite edges of said slots being formed with longitudinally spaced notches constituting keeper seats, a flat retaining spring arranged centrally in each slot cooperable with the seat, and a pivot bolt passing through the slot and maintained in the seats through the medium of said springs whereby to permit the spread of said jaws to be regulated, and a supplemental lever pivotally connected to the handle end of one of said main levers and cooperable with the corresponding end of the remaining main lever to provide a mechanical closing action of said main lever.

In testimony whereof I affix my signature
WILLIAM A. PETERSON.

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