

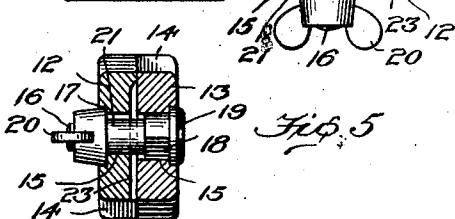
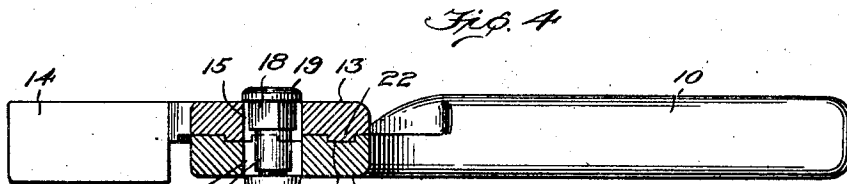
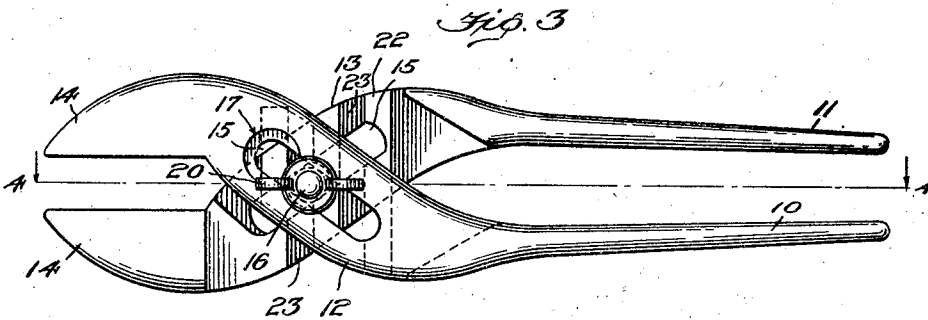
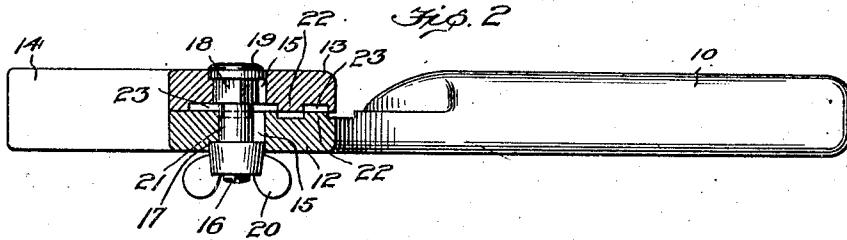
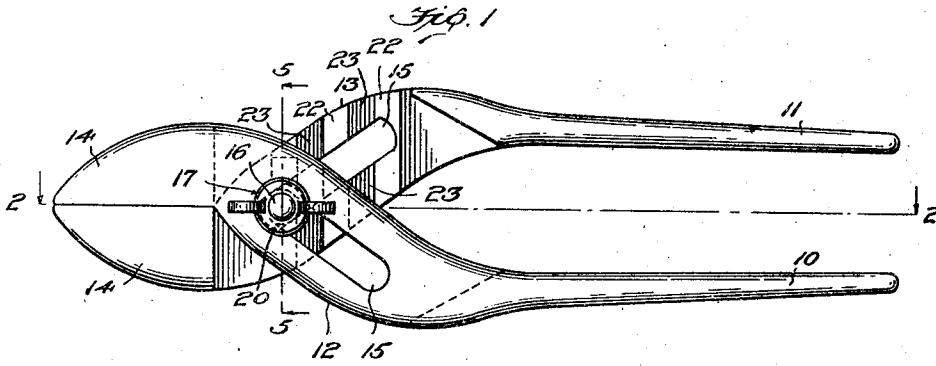
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PLIERS

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UNITED STATES PATENT OFFICE.

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PLIERS.

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This invention relates to improvements in pliers.

The primary object of the invention is to provide a pair of pliers which may be converted into a tool usable as a wrench.

Another object of the invention consists in details of construction, such as will render the tool easily convertible from pliers to a wrench or vice-versa or which will result in a comparatively strong tool that will stand up efficiently under heavy uses.

In the accompanying drawings,—

Figure 1 is a plan view of the tool adjusted so as to be used as pliers.

Fig. 2 is a sectional view on the line 2—2 of Fig. 1.

Fig. 3 is a plan view of the tool adjusted for use as a wrench.

Fig. 4 is a sectional view on the line 4—4 of Fig. 3.

Fig. 5 is a sectional view on line 5—5 of Fig. 1.

While the handles and jaws of the tool need not be of any specific formation the tool, in the present instance, is illustrated as comprising the handles 10, 11, what might be termed for convenience, body portions 12 and 13 which terminate in the jaws 14. The body portions 12, 13 cross each other, being provided with elongated slots 15 through which the pivot pin 16 extends. The slots 15 are elongated in order to permit adjustment of the jaws toward and from each other when the tool is to be used as a wrench as will hereinafter be explained, but when the tool is used as pliers the pivot pin 16 must be held stationary in said slots. For this purpose one face of each jaw is countersunk or recessed at one end of its slot 15. This recess is shown at 17 in the outer faces of said body portions 12, 13. Preferably, the pivot pin has a portion of its shank formed with parallel sides 18 which engage the walls of slot 15 in handle 11 so as to prevent said pin turning and adjacent parallel side portion 18 the end of said pin is formed with an integral enlarged head 19 adapted to seat in the recess 17 in the body portion of said handle. The opposite end of said pin is threaded for the reception of a nut 20, preferably a butterfly nut, which is adapted to be screwed down so that a portion thereof is entered in the recess 17 of the body portion of handle 10. The nut 20 forms an enlargement at one end of the pivot pin and the integral head 19 forms an

enlargement at the other end of said pin.

When these two heads are seated in the recesses 17 in the outer faces of the handles said pin will be held against longitudinal movement in the slots 15 while, at the same time, handle 10 will be free to pivot on the circular portion 21 of the pin shank intermediate the screw threaded portion and the portion which is formed at parallel sides.

In order to permit the tool to be converted into a wrench the contacting faces of the handles at the point where their body portions cross each other are formed with means for preventing said handles turning on their pivot pin. When used as a wrench it is essential that the jaws be maintained parallel to each other and rigid. For this reason said contacting faces are preferably formed with a plurality of ribs 22 forming a corresponding series of recesses 23 between them. These ribs and recesses extend transversely of slots 15 and when the tool is used as pliers the ribs of one handle are disposed transversely of those of the other whereby, when the jaws of the pliers are opened and closed the ribs on one jaw simply ride on those of the other. However, when it is desired to convert the tool into a wrench, nut 20 is backed partially off of the pivot pin 16 so that the enlargements may be withdrawn from recesses 17. The handles are then turned with respect to each other until the ribs 22 on one handle register with and seat in the recesses 23 in the other handle. After the handles have been placed in this position, nut 20 is then screwed tight on pin 16 so that the two handles are firmly clamped together. By having removed the head 19 and nut 20 of the recesses in the outer faces of the handles the pivot pin 16 is free to move longitudinally of the slots 17 so that the jaws 14 may be adjusted toward and from each other. It will be noted that the jaws lie parallel to one another and the extent to which they may be adjusted solely by the width of the body portions of the two handles. It will be understood that nut 20 will have to be released slightly whenever it is desired to adjust the jaws of the wrench toward and from each other.

With the present construction the pliers are capable of use as any ordinary pliers and when the tool has been converted into a wrench it will be found that it will stand severe uses, all strains which tend to turn the

jaws with respect to each other when the tool is used as a wrench being imposed upon the ribs 22 which, it will be appreciated, are of such construction as to withstand tremendous strains. The only pressures exerted on the pivot pin are those which are utilized in clamping the two handles together. By reason of this arrangement it will be found that the tool, as a wrench, is very strong. Furthermore, the arrangement for rendering the tool convertible is such that the cost of producing the same is kept at a low figure; no complicated operations or parts are present so that it may be produced at a figure which will not render its commercial production prohibitive.

What I claim is:

1. In a pair of pliers convertible into a wrench, a pair of handles each having a body portion, a jaw on each body portion, said body portions crossing each other and having slots therein adapted to register with each other, a pivot pin extending through and slidable longitudinally in said slots, means for preventing longitudinal movement of the pin in said slot when the tool is to be used as pliers, and means on said body portion for preventing the same turning on said pivot pin when the tool is to be used as a wrench.
2. In a tool designed for use as pliers or as a wrench, a pair of handles extending across each other, a jaw member on each handle, the crossing portions of said handles having registering slots therein, a pivot pin extending through said slots, means for preventing said pin moving longitudinally of the slots when the tool is used as pliers, and means formed integrally on said crossing por-

tions of the handles for preventing said handles turning on the pivot pin when said tool is used as a wrench.

3. In a tool designed for use as pliers or as a wrench, a pair of handles extending across each other and having registering slots therein, a jaw on each handle, a pivot pin movable longitudinally of said slots, means for preventing movement of the pin in the slots when the tool is used as pliers, the contacting surfaces of crossing portions of said handles having cooperating projections and recesses therein for preventing the handles turning on the pivot pin when the tool is used as a wrench.

4. In a tool designed for use as pliers or as a wrench, a pair of crossed handles, a jaw on each handle, a pivot pin on which said handles may turn, the crossed portions of said handles having ribs and elongated recesses formed integrally therewith whereby turning may be prevented by placing said ribs in said recesses.

5. In a tool designed for use as pliers or as a wrench, a pair of crossed handles having slots therein, a pivot pin in said slots, a jaw on each handle, one face of each handle being recessed at one end of the slot therein, enlargements on the ends of the pin engageable in said recesses in the handles to prevent movement of said pin longitudinally in said slots when the tool is used as pliers, and cooperating slots and ribs in the other faces of said handles, engageable with each other to prevent said handles turning on said pivot pin when the tool is used as a wrench.

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