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H. L. BALL ET AL

2,881,649

PLIERS WITH HANDLE LATCHING MEANS

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Fig. 1

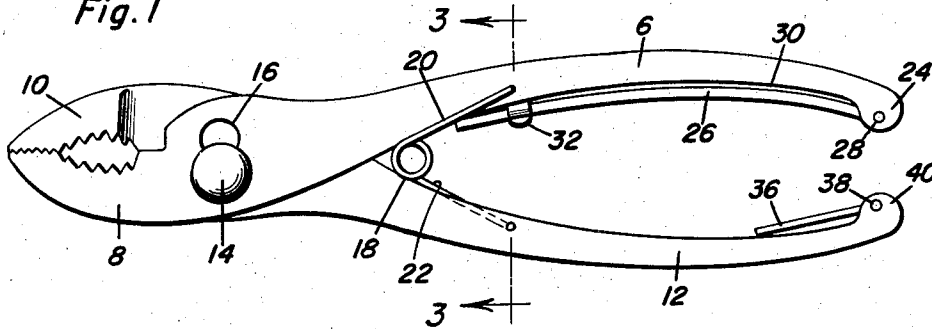


Fig. 2

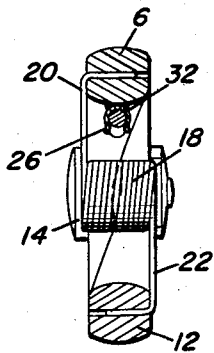
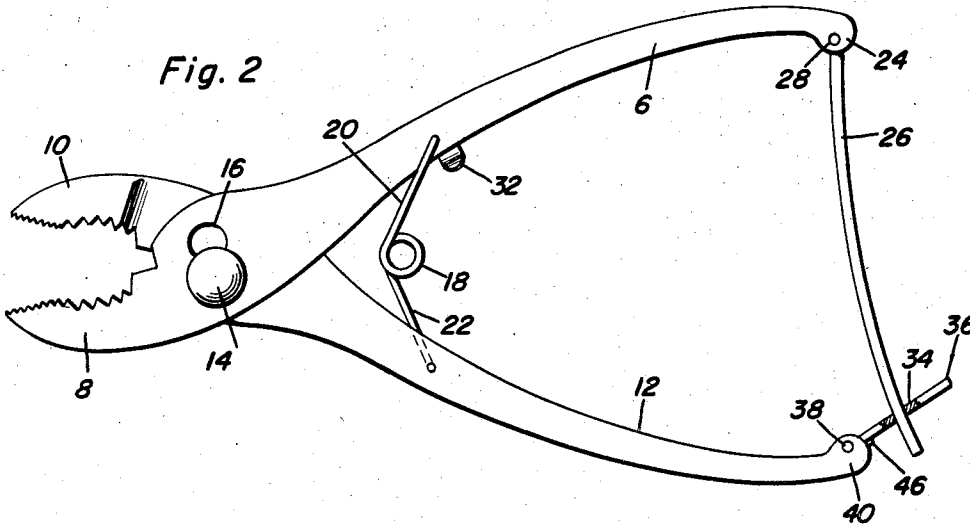
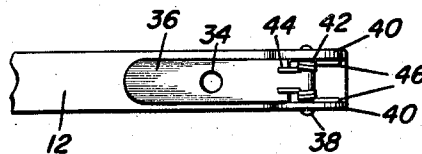


Fig. 3

Fig. 4



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PLIERS WITH HANDLE LATCHING MEANS

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3 Claims. (Cl. 81—339)

The present invention relates to certain new and useful improvements in a pair of pliers and has reference in particular to latching and fastening means for the outer or free end portions of the handles of the customary crossed levers.

It is to be pointed out, at the beginning of the description here, that providing locking means for the end-portions of tool handles is old and a number of reference patents could, of course, be cited in visible proof of this. It will suffice, it is believed, to merely mention a structurally and functionally analogous patent issued to Stratman under No. 1,944,116 on January 16, 1934. Particular reference is made, of course, to the latching or locking plate which is pivotally mounted on one of the handles and has an aperture to accommodate an arcuate rod carried by the opposed handle. Locking devices along this line have been appropriated to any number of uses in various lines of endeavor, as for example, bumper jacks, pipe wrenches, woodworking vises and so on. The instant disclosure has reference to a generally similar rod and pivoted latch combination. In carrying out the improved adaptation the locking devices, however, are located at the rear or free end portions of the handles where it has definite advantages. To this end one advantage is that when the parts are so located the handles, while being satisfactorily locked, are not too close to the work and are therefore less likely to interfere with the operation and use of the pliers by a user.

The invention also has to do with the advantage in the construction utilized here because there is less chance of personal injury when gripping the handle portions of the pliers. Another advantage is that by having the latch rod and latch plate located in the positions disclosed there is less wear by reason of the fact that a more satisfactory leverage is provided and a more satisfactory distribution of stress and strain is had.

Also by having the improved cooperating latching members at the ends of the handles greater efficiency can be relied upon by reason of the natural springiness in the plier handles.

The invention also features an improvement in that the pivotally mounted rod and latching plate are provided with spring means which functions to normally retract and retain the parts in folded positions between the handles, thus doing away with any protruding or in-the-way parts.

More specifically, the invention has to do with opposed handles with each handle provided with spaced ears at its outer or free end portion. A rigid longitudinally bowed latching rod has one end hingedly mounted between the ears on one handle and this is passed through an opening provided therefor in a cooperating latching plate and the latching plate is spring-hinged between the ears on the other handle.

Other objects, features and advantages will become more readily apparent from the following description and the accompanying drawing.

In the drawing, wherein like numerals are employed to designate like parts throughout the views:

Fig. 1 is a side elevation of a pair of pliers improved in accordance with the principles of the invention herein under consideration and with the latch rod and latch plate folded or retracted inwardly to their out-of-the-way position.

Fig. 2 is a similar side elevation but with the handles spread apart and the latch members in cooperating and handle retaining relationship.

Fig. 3 is an enlarged view on the plane of the vertical line 3—3 of Fig. 1.

Fig. 4 is a fragmentary view detailing the latch plate retracted.

Referring now to the drawings the two levers are much the same as in any ordinary pair of pliers and each comprises a handle carrying a jaw, one handle being denoted at 6 and having a jaw 8 opposed to a complementary jaw 10 on the other handle 12. The crossed portions of the handles are hingedly and adjustably connected by way of a headed hinge and assembling pin 14 cooperating with a keyhole slot 16. The coil spring 18 with its anchored arm portions 20 and 22 is an optional part and does not necessarily enter into the improved combination.

The improvement has to do with the latching members which serve to retain the handles in differently adjusted positions relative to each other. The handle 6 has terminal spaced parallel ears 24 between which an end portion of the longitudinally bowed latching rod 26 is hingedly mounted at 28. The spring means is not detailed but is the same as that shown in Fig. 4. It follows that the latching rod is spring biased and when it is not in use automatically swings in alongside the inner surface 30 of the handle 6 where it is retained in an out-of-the-way position by way of a fixed retaining clip 32.

The free end portion of the latching rod is adapted to pass through a hole 34 provided therefor in the cant-type latching plate 36. This plate is hingedly mounted at one end by way of a hinge pin 38 passing between the spaced parallel ears 40 on the free or right hand end portion of the lever 12. The coil spring is denoted at 42 with its ends 44 bearing on the plate and its other ends 46 bearing against the handle itself. Thus, both latching members 26 and 36 are hingedly mounted between their respective spaced parallel ears and are thus swingable under the action of the spring means into the folded out-of-the-way position as shown in full lines in Fig. 1. However, the members may be projected and engaged with each other in the manner seen in Fig. 2 whereupon the cant-action of the latching plate 36 serves to establish a desired connection between 26, and 36 depending on the given or selected positions of the two handles 6 and 12.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In a tool or implement, a pair of members having cooperating jaws at one end and handles at the other end and crossed and pivotally connected to each other, a latch plate having one end hingedly mounted on an end portion of one of said handles, a latch rod having an end portion pivotally mounted on a corresponding end of the other handle, said latch rod being longitudinally bowed and adapted to be passed through a central retaining aperture in said latch plate, the end portions of said handles being provided with spaced parallel ears and

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the adjacent end portions of said latch plate and said rod, respectively, being hingedly mounted between said ears, spring means in said ears biasing said latch plate and latch rod toward retracted positions, and said spring means holding said rod and plate in an out-of-the-way position when not in use.

2. The structure defined in claim 1 and wherein said latch rod is of a length less than the over-all length of said other handle so that when the rod is retracted for retention in the aforementioned out-of-the-way position the then inner free end portion thereof terminates in a satisfactory position, and a resilient retaining clip fixed on a cooperating portion of said other handle, the adjacent portion of the latch rod being releasably connected with said clip.

3. A pair of pliers comprising a pair of similarly constructed and performing members having cooperating jaws at distal ends and handles at proximal ends, median portions of said members being crossed and pivotally connected to each other, the proximal end portions of said handles being provided with spaced parallel ears, a spring biased latch plate having one end hingedly mounted be-

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tween the ears provided therefor on one of said handles, said latch plate normally occupying a retracted out-of-the-way position against an inner side of said one handle and being adapted to be swung manually against spring biasing tension to project to and assume a position extending outwardly of said one handle, the median portion of said latch plate having a latch rod hole, and a longitudinally bowed latch rod having one end spring biased and hingedly mounted between the ears provided therefor on the other end, said latch rod being of a length slightly less than the length of said other handle, said latch rod being smooth-surfaced and adapted to pass slidably and releasably through the hole provided therefor in said latch plate.

References Cited in the file of this patent

UNITED STATES PATENTS

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