W. A. BERNARD.

HAND TOOL.

APPLICATION FILED JAN. 13, 1915.

1,206,198.

Patented Nov. 28, 1916.

Fig. 1.

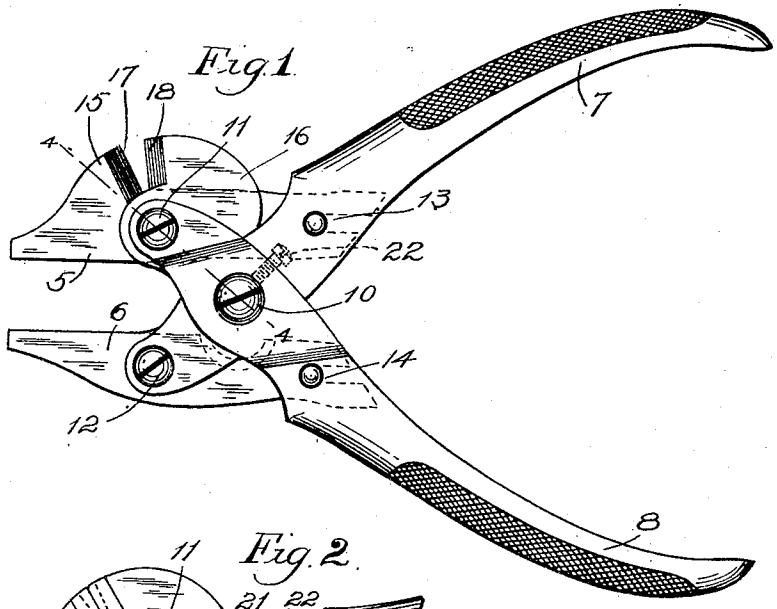


Fig. 2.

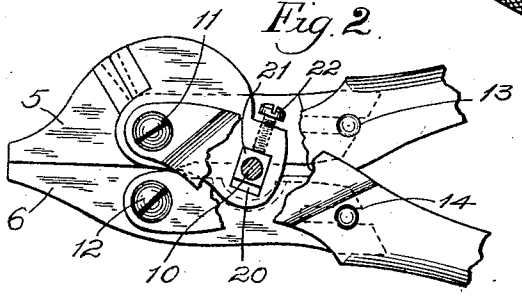


Fig. 3.

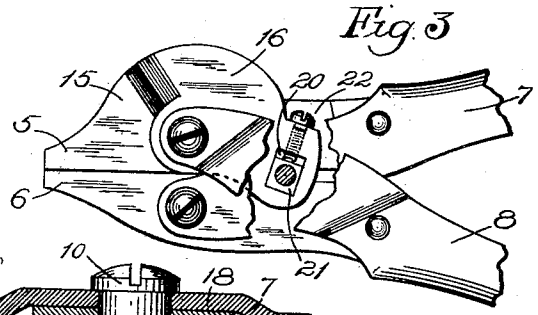
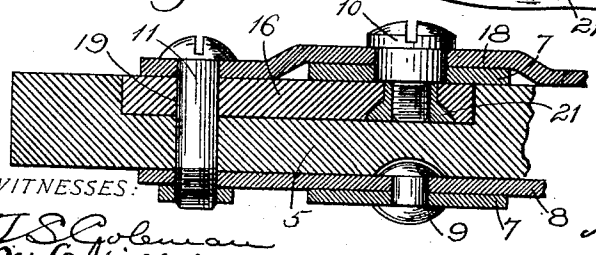


Fig. 4.



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HAND-TOOL.

1,206,198. Specification of Letters Patent. Patented Nov. 28, 1916.

Application filed January 13, 1915. Serial No. 1,987.

To all whom it may concern:

Be it known that I, WILLIAM A. BERNARD, a citizen of the United States, residing in the city and county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Hand-Tools, of which the following is a full, clear, and exact description.

This invention relates to hand tools, and it has special reference to tools of the plier or lever handle type, such as shown, for example, in Patent No. 479,113, granted to me on July 19, 1892, or my Reissue Patent No. 13,657, dated December 16, 1913, although certain features of my present invention are applicable to tools of other types.

One of the primary objects of the invention is to provide improved means for adjusting the jaws of a cutter, or like device, relatively to each other, so that as the cutting edges are worn down and re-sharpened, they can be maintained in proper relation to each other.

Another object of the invention is to provide a compound tool having a plurality of pairs of movable jaws, and a single operating means therefor, in combination with improved means whereby the tool may be so adjusted that both, or all, of said pairs of jaws will close together completely at the same time, even though one or more of said pairs of jaws are considerably worn or ground down.

Another object of the invention is to provide improved means for adjusting the throw or movement of a pivotally mounted jaw, actuated by lever handles, or the like.

To these and other ends, the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawing, Figure 1 is a side elevation of a pair of pliers embodying my improvements, with the jaws open; Fig. 2 is fragmentary elevation, showing the jaws closed, and with certain parts broken away, illustrating one adjustment of the pivoted adjustable jaw; Fig. 3 is a view similar to Fig. 2, showing the adjustable jaw in another position after it has been worn away and re-sharpened; and Fig. 4 is an enlarged detail section on line 4—4 of Fig. 1.

In the drawing, I have shown my improvements applied to pliers of the kind illustrated in Patent No. 479,113 mentioned above, and I shall proceed to describe the details of construction in that particular connection, but it will be understood that in many phases of the invention the general type of the tool may be considerably varied.

Referring to the drawing, the tool comprises jaws 5, 6 adapted to be operated by pivoted levers or handles 7, 8. The jaws 5, 6, which may be called the main jaws, are of the so-called parallel type. The handles 7, 8 are forked at their forward portions, as usual, and these forked portions are crossed and pivoted together by means of separate pivots 9, 10 at opposite sides of the tool. In other words, the side portion or tine of one fork is pivoted to the adjacent side portion or tine of the other handle by a separate pivot at one side of the tool, and substantially the same arrangement is adopted at the opposite side. The jaws 5, 6 have the usual form of plier jaws. The jaw 5 is pivoted by a pin or bolt 11 to the forward extremity of the fork of the handle 8, and the jaw 6 is similarly pivoted by means of a pin or bolt 12 to the forward extremity of the fork of the handle 7. The jaws 5, 6 are slotted at their rear portions, as shown by the dotted lines in Fig. 2, and the slots engage the pins 13, 14 mounted in the handles in the usual manner. This is a well-known method of mounting the jaws for parallel movement, to which I make no claim.

The jaw 5 is provided at its outer part, *i. e.*, at the side opposite its inner working surface, with an enlargment 15, which forms in effect an auxiliary jaw. Coöperating with this auxiliary jaw 15 is a pivoted auxiliary or subsidiary jaw 16. In the form shown, the subsidiary jaws 15, 16 form a so-called side cutter, for which purpose they are provided with beveled coöperating cutting edges 17, 18 respectively. The jaw 16 is provided with a perforation 19, engaging the pivot bolt 11, whereby said jaw is pivoted to the forward extremity of the handle 8. The jaw 16 is likewise pivoted on the axis of the screw 10 so that as the main jaws 5, 6 are closed together by the handle levers, the subsidiary jaws 15, 16 will approach each other at the same time. Similarly, when the jaws 5, 6 are separated by the actuation of the lever handles 7, 8, the subsidiary jaws 15, 16 will likewise be separated.

The pivoted subsidiary jaw 16 is adjust-

able relatively to its coöperating jaw 15, and relatively to the main jaws 5, 6. To this end, the jaw 16 is adjustable with respect to one of its pivotal points of support, and in the embodiment illustrated, it can be adjusted to a certain extent relatively to the pivot screw 10, which forms a common pivot for the lever handles. For this purpose, the screw 10 has a bearing in the jaw 16, which is adjustable transversely with respect to said jaw. In the example shown, the jaw 16 is provided with a transverse slot 20 engaged by a nut 21, into which the pivot 10 is screwed. The jaw 16 can be moved transversely relatively to the nut 21 by means of an adjusting member, such as a small screw 22, which is readily accessible when the tool is in the closed position shown in Fig. 2. The screw 22 has a threaded shank engaging a threaded opening in the jaw 16. The inner end of the screw is adapted to engage one side of the nut 21, and the head of the screw is preferably provided with a nick for a screw driver, so that when the adjustment of the tool is necessary, the screw 22 may be readily turned in the proper direction. The nut 21 is preferably held in the slot 20 by beveling the side walls of the slot and the side walls of the nut, as shown in Fig. 4. The arrangement is such that as the screw 10 is screwed into the nut 21, it will pull the nut firmly into the guide slot and hold it securely therein.

It is obvious that when a tool of this character leaves the factory, both pairs of jaws should close together perfectly. In other words, when the plier jaws 5, 6 are in light contact the cutting edges 17, 18 of the auxiliary or subsidiary jaws ought to be in light contact. Supposing that the cutting edges 17, 18 are worn away by constant use and and are re-sharpened along the dotted lines in Fig. 2, it will be obvious that the proper adjustment of the two pairs of jaws relatively to each other is no longer maintained. I can provide this adjustment, however, by the construction described, wherein it is merely necessary to turn the screw 22 in such a direction as to move the jaw 16 toward the jaw 15. The nut 21 is of course held absolutely stationary by means of the pivot member 10, and, consequently, when the screw 21 is turned in one direction, the threaded part of the jaw 16, engaging the adjusting screw, acts in the nature of a nut and travels upward on said screw from the position shown in Fig. 2 to the position shown in Fig. 3, to compensate for the wear of the subsidiary jaws. Thus the adjusting means for the jaw 16 permits the subsidiary jaws to be brought fully together, even after they have become considerably worn. On the other hand, if the subsidiary jaws meet each other before the main jaws are closed, the screw 22 is turned in the opposite direction so as to permit the subsidiary jaws to move away from each other to a certain extent. The subsidiary jaws are obviously set so that they will meet each other at exactly the same time that the main jaws contact with each other, and this is a feature of considerable importance in a tool of this type.

In assembling the tool, the nut 21 is screwed down as far as possible in the guide 20, by means of the screw 22, as shown in Fig. 3, so as to clamp the nut tightly in place during the operation of assembling Thus, the nut 21 forms, for all practical purposes, an integral part of the jaw 16 and will not fall out of the same. The jaw 16 and its adjusting mechanism, are placed in the tool as a unit in the proper relation to the other parts, the screw 11 is passed through the opening 19, and the screw 10 is screwed into the nut 21. The adjusting screw 22 is then turned in such a direction, and into such a position, that the two pairs of jaws will meet each other at the same time, as indicated in Fig. 2. In this position, the nut 21 is substantially at the upper end of the slot 20, so as to provide for considerable adjustment to compensate for wear. Thus it will be understood that with my adjusting mechanism, the jaws can be accurately adjusted in the factory without complicating to any extent the process of manufacture, and that afterward when the tool is worn, or needs adjustment for some other reason, such adjustment can be readily effected to provide the desired co-ordination between the different sets of jaws.

Of course, it is not always necessary to use the adjusting mechanism for closing all of the various jaws at the same time, because in some cases it might be desired to close one pair of jaws before the jaws of another pair came into full contact with each other.

I have only shown and described one embodiment of my invention, but it will be understood that the invention is susceptible of numerous other embodiments within the scope of the claims.

I do not claim broadly as my invention a hand tool having a pair of parallel jaws, a pivoted subsidiary jaw, a pair of lever handles for operating all of said jaws, and mechanism for adjusting the subsidiary jaw relatively to the other jaws, as claimed in the application of Charles W. Blodgie, Serial No. 1,794, filed January 12, 1915.

What I claim is:

1. In a hand tool, a pair of parallel jaws, a pair of lever handles, a device for pivoting said lever handles together, devices for pivoting the respective jaws to the respective extremities of said lever handles, a subsidiary jaw pivoted coincidently with the pivot of one of said parallel jaws, and also pivoted on said first-named pivoting device, and screw operated adjusting means for posi-

tively moving said subsidiary jaw relatively to said first-named pivoting device; substantially as described.

2. In a hand tool, the combination of a pair of parallel jaws, a pair of crossed lever handles, a pivot member for pivoting said lever handles together at the point where they intersect, means for pivoting the forward ends of the lever handles to said parallel jaws, means guiding said jaws for parallel movement, a subsidiary jaw pivoted coincidently with one of said parallel jaws and carrying a relatively movable member engaging said first-named pivoting member to pivot said subsidiary jaw thereto, and a screw for positively adjusting said subsidiary jaw with respect to said relatively movable member so as to shift said subsidiary jaw relatively to said first-named pivot member; substantially as described.

3. In a hand tool, a pair of parallel jaws, a pivoted subsidiary jaw, a pair of lever handles for operating all of said jaws, and screw mechanism for adjusting the pivoted subsidiary jaw relatively to the parallel jaws; substantially as described.

4. In a hand tool, the combination of a pair of parallel jaws, a pair of crossed lever handles, a pivot screw for pivoting said lever handles together at the point where they intersect, means for pivoting the forward ends of the lever handles to said parallel jaws, a subsidiary jaw pivoted coincidently with one of said parallel jaws and having a slot therein, a member having a threaded engagement with said pivot screw and held in said slot thereby, and a screw for adjusting said subsidiary jaw relatively to said last-named member and said pivot screw; substantially as described.

5. In a hand tool, the combination of a pair of parallel jaws, a pair of crossed lever handles, a screw for pivoting said lever handles together at the point where they intersect, means for pivoting the forward ends of said lever handles to said parallel jaws, a subsidiary jaw pivoted coincidently with one of said parallel jaws and having a slot, said slot undercut at the side opposite the head of said pivot screw, a nut fitting said slot and having threaded engagement with said pivot screw, whereby the pivot screw holds said nut in position in said slot, and means for adjusting said subsidiary jaw relatively to said nut; substantially as described.

6. In a hand tool, a pair of main jaws, a pair of lever handles, means of connection between said lever handles and said jaws for giving the latter a parallel movement, a pivot interconnecting said lever handles, a subsidiary jaw pivoted to one of said parallel jaws and likewise pivoted on the last named pivot, and a device accessible at the edge of said subsidiary jaw for adjusting the same relatively to said last named pivot; substantially as described.

7. In a hand tool, a jaw having a slot with beveled side edges, a nut fitting said slot and movable lengthwise thereof, a pivot member for said jaw screwed into said nut and holding the same in said slot, a second jaw cooperating with the first, and means for operating said jaws; substantially as described.

In witness whereof, I have hereunto set my hand on the 12th day of January, 1915.

WILLIAM A. BERNARD.

Witnesses:

HENRY E. ROCKWELL,

M. OLIVE WILLIAMS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."