(No Model.)

W. A. BERNARD.

PLIERS.

No. 427,220. Patented May 6, 1890.

Fig. 1.

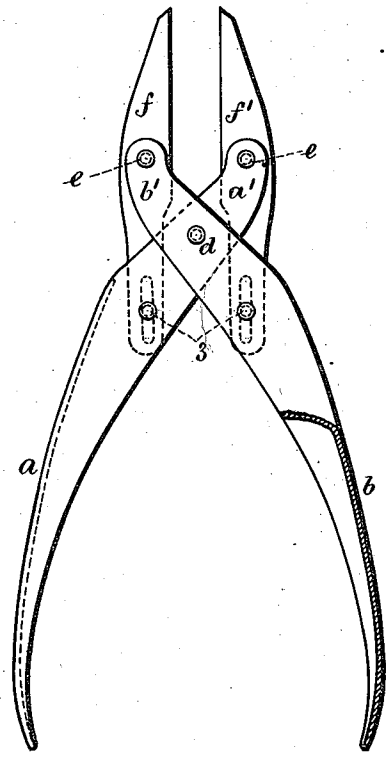
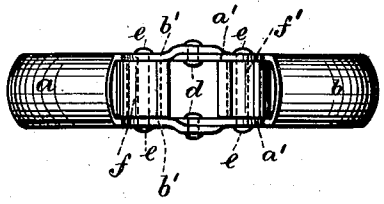


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM A. BERNARD, OF NEW YORK, N. Y., ASSIGNOR TO BERNARD, WALKER & RICE, OF SAME PLACE.

PLIERS.

SPECIFICATION forming part of Letters Patent No. 427,220, dated May 6, 1890.

Application filed May 13, 1889. Serial No. 310,517. (No model.)

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 State of New York, have invented an Improvement in Pliers, of which the following is a specification.

Handles for various tools have been made of sheet metal, and in some instances pliers have been made with jaws that are opened and closed parallel to each other; but there has not been opportunity for passing a long rod or tool through between the jaws and handles.

The object of the present invention is to provide an unobstructed opening through between the parallel jaws for the passage of a rod, wire, or tool, and to adapt sheet-metal handles to the jaws in such a manner that the power will be applied equally at both sides of the jaws to insure the proper strength and uniformity of movement.

In the drawings, Figure 1 is an elevation of my improved pliers, and Fig. 2 is an endwise view of the jaws and handles.

The handles *a b* are made of sheet metal of the proper thickness for obtaining the necessary strength. The blank is cut out by dies of the required shape and pressed up to form the hollow handles, that are rounding in exterior shape. I have shown one of the handles as partially in section.

The sheet metal forming the lever portions *a' b'* is flat, or nearly so, and parallel at opposite sides of the jaws *f f'*.

The lever portions *a' b'* cross each other and are pivoted by the two rivets *d*, that are in line with each other and at opposite sides of the jaws *f f'*, so that there is no obstruction between the jaws, and a long rod or tool can be passed entirely through between the jaws.

The jaws *f f'* are connected with the respective handle-levers *a' b'* by the rivets *e e*, that pass through the sheet metal and through the jaws, and in order to give to the jaws a parallel movement by the action of the handles the jaws are slotted at their inner ends for the rivets 3, which also pass through the bent-up sheet metal of the handles.

It will now be understood that, the lever portions *a' b'* being at both sides of the jaws and crossing each other and the rivets *e e d* and 3 3 being parallel, the movements of the jaws in opening and closing are parallel, there is nothing to obstruct the opening through between the jaws, and the tool is very strong and light, and there is no part that requires to be welded or cast, as in ordinary pliers, and by removing the rivets or pins the jaws can be disconnected from the handle-levers and others substituted.

It will be seen by reference to Fig. 2 that the lever portions *b'* are bent at their ends toward the jaws to allow for the thickness of the portions *a'*.

I claim as my invention—

1. The combination, with the solid jaws *f f'*, of the lever-handles *a a' b b'*, of sheet metal, bent up to form hollow hand portions, the parts *a' b'* being flat, or nearly so, and crossing each other at opposite sides of the jaws and connected by the pivot *d*, substantially as set forth.

2. The combination, with the parallel jaws *f f'*, of the lever-handles *a a' b b'*, of sheet metal, bent up to form hollow hand portions, the parts *a' b'* being flat, or nearly so, and crossing each other at opposite sides of the jaws, the pivotal rivets *d d* in line with each other, the rivets *e*, passing through the respective parts *a' b'* and the jaws, and the rivets 3, passing through the metal of the handles and through slots in the jaws, substantially as set forth.

Signed by me this 2d day of May, A. D. 1889.

WILLIAM A. BERNARD.

Witnesses:
GEO. T. PINCKNEY,
HAROLD SERRELL.