(No Model.)

W. C. MARR.

PLIERS.

No. 382,712. Patented May 15, 1888.

Fig. 1.

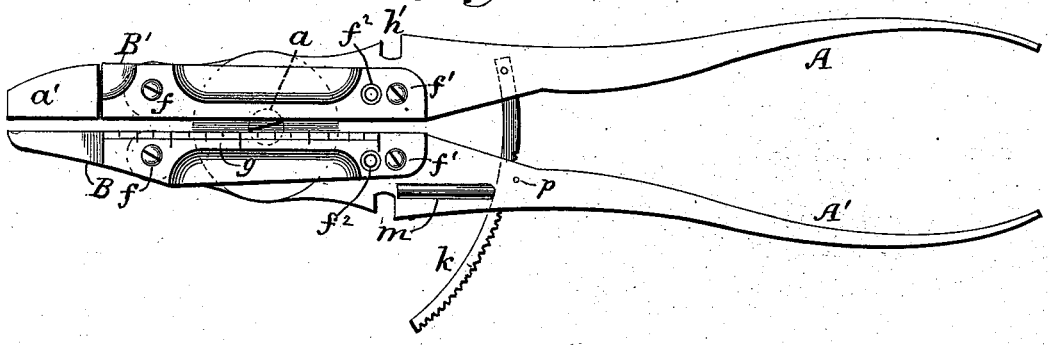


Fig. 2.

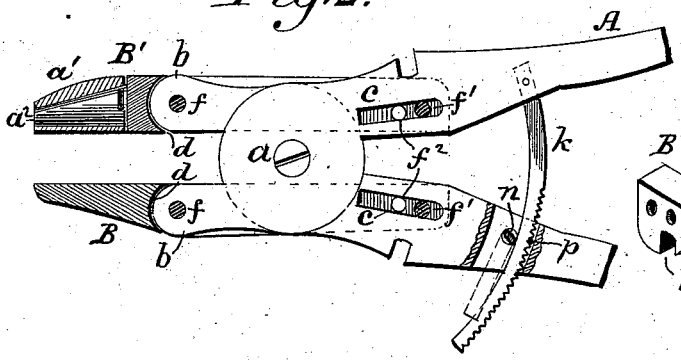


Fig. 4.

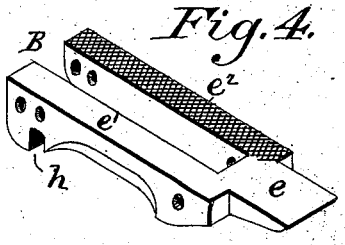


Fig. 3.

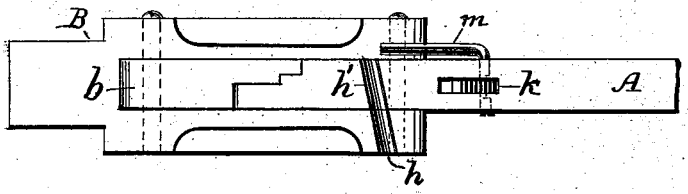


Fig. 6.

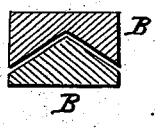
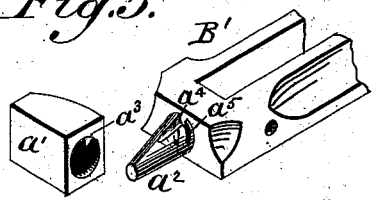


Fig. 5.



Witnesses,

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UNITED STATES PATENT OFFICE.

WILLIAM C. MARR, OF ONAWA, IOWA.

PLIERS.

SPECIFICATION forming part of Letters Patent No. 382,712, dated May 15, 1888.

Application filed August 11, 1887. Serial No. 246,717. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. MARR, a citizen of the United States of America, residing at Onawa, in the county of Monona and State of Iowa, have invented certain new and useful Improvements in Pliers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a tool commonly known as "pliers;" and the invention consists in certain improvements in the construction of such tools, as hereinafter fully set forth and claimed.

In the accompanying drawings, Figure 1 represents a side view of pliers provided with my improvements. Fig. 2 is a side view, the jaws being shown in section. Fig. 3 is an edge or back view of the pliers. Fig. 4 represents one of the jaws detached. Fig. 5 illustrates a jaw with removable nose. Fig. 6 shows in cross-section a modified form of jaws.

A and A′ designate the handles of the pliers, which are connected together by a rule-joint and pivoted together at *a*, and are provided at the rear of the pivotal connection with the slots *c*, for the purpose hereinafter stated.

B B′ designate the gripping-jaws, which are bifurcated and constructed to fit over and are removably connected with the forward parts of the tool, each jaw being provided with the recess *d* to receive a rounded end, *b*, of the jointed portion of the handles. The jaws extend forward and backward beyond the pivotal point *a*, forming the several gripping-surfaces, *e*, *e′*, and e^2, for various purposes. (See Fig. 6 of the drawings.) One or more gripping-surfaces may be milled or serrated, to enable the tool to hold an article more firmly, and the other surfaces may be left smooth for handling finished articles. The jaws are each removably connected with both of the handles of the pliers, the forward portion of each jaw being pivoted by a pin at *f* to the forward portion of one handle, and the rear portion of the same jaw being pivoted to the other handle by a pin inserted through an aperture in the jaw at *f′* and through a slot, *c*, in the handle. The front pivotal points, *f*, and the rear pivotal points, *f′*, being equidistant from the central pivot, *a*, the jaws when thus connected with the handles are held parallel with each other, as indicated in Fig. 2. The pivotal pins may be rendered removable by any suitable construction of the pins and the holes through the handles and jaws. At present I construct the pins with ordinary screw-heads and round stems having short threaded portions near their ends to be screwed tightly into threaded portions of the holes through one part of the bifurcated jaws, the holes through the other part of the jaws and through the handles being smooth and of suitable size to fit neatly, but loosely, the unthreaded portions of the pins. The rear portion of each jaw is provided with several additional holes, f^2, to enable the jaws to be placed and held out of parallel with each other for gripping and firmly holding articles not having parallel opposite surfaces. These additional holes are located in the required positions to enable either the front or rear portions of the pliers to be widened by the proper adjustment of the pins to conform to the shape of the article to be gripped.

The pliers are best adapted for handling some articles by allowing free lateral movement to the rear portions of the jaws, in which case the rear pins are removed, allowing the jaws to adjust themselves lengthwise to the shape of the surfaces of the articles thus gripped by them.

The gripping-surfaces e' e^2 are convenient for various uses, as for holding and marking a piece of wire to be cut or bent at a certain length, and to facilitate the measurement a scale, *g*, is marked on the edges of the jaws, as shown.

The jaw B′ is provided with a conic point, a^2, having a longitudinal groove, a^4, and a cross-groove, a^5, to receive and hold in place a removable nose, *a′*, which is provided with a socket to fit neatly over the conic point, and with a pin, a^3, fastened within the socket and adapted to extend in and slide along the grooves, for the purpose of detachably connecting the nose with the jaw. By means of this construction the nose *a′* has a pivotal connection with the jaw, and in gripping an article whose opposite sides are not parallel this nose *a′* adjusts itself automatically to the inclined surface.

The jaw B′, provided with the conic point,

having its inner gripping-surface flush with the inner face of the jaw, is capable of use with and without the removable nose. Without that removable nose such jaws are adapted for use as round-nosed pliers for bending wires, strips, &c.

The jaws being all readily detachable, each tool is provided with a full set of them, embodying all the different modifications of construction—for example, the flat-nosed jaws, the milled-faced jaws, the smooth-faced jaws, the angular-faced jaws, (shown in Fig. 7,) and the conic-pointed jaws, adapted for use as round-nosed pliers, and with the pivoted removable nose a', adapting the tool for use for all the various purposes for which such pliers are employed. The contiguous portions of at least one jaw and one handle are provided with the grooves h h', having cutting-edges, adapting the tool for cutting wires, as hereinafter fully explained.

It will be seen that by the construction and arrangement of the jaws and handles the grooved portion of a jaw and the contiguous portion of the grooved handle occupy positions in relation to each other similar to toggle-levers. In opening the handles the groove in the jaw is placed in range with the groove in the handle, and a wire being placed in the grooves the cutting is performed, not by two pivoted jaws, but by a jaw and its contiguous handle, as these two parts are moved toward a straightened position, similar to the operation of the levers of a toggle-joint.

By this construction and mode of operation this tool possesses much greater cutting power than the two grooved jaws or levers of ordinary pliers, which possess none of the toggle-joint principle.

A segmental bar, k, toothed on its convexed edge, is extended through a slot in one of the handles, and is pivoted at one end to the other handle, and the pliers are locked firmly in position upon any article gripped by them by means of this segmental arm and a rod, m, constructed with a cam, n, and inserted through the slotted handle in position for the cam to be impinged against the concaved edge of the bar, so as to press the toothed edge against a pin, p. This pin is inserted through the handle in position to engage the teeth when they are thus pressed against it, but to be free from the teeth, so as to allow the bar to move freely through the slot, when the bar is released from the pressure of the cam. The extended part of the cam-rod is bent so as to form a crank or lever arm for operating the locking devices. These locking devices for this purpose are preferable to the ordinary set-screw, because the cam-rod may be adjusted quicker than a screw, and the bar having its toothed edge pressed by the cam against the pin will be held much firmer than it could be held by a set-screw.

I claim—

1. The combination, with the pliers-handles A A′, pivoted together and having the holes and slots, as set forth, of two bifurcated jaws, each provided with one pivotal hole through its front portion and a plurality of pivotal holes through its rear portion, and removably connected with the handles by means of the removable pins at f f', substantially as and for the purposes described.

2. In pliers, a removable jaw, B′, provided with a conic point, a^2, having a longitudinal groove, a^4, and a cross-groove, a^5, in combination with the removable nose a', provided with a socket to fit over the conic point, and having a pin, a^3, adapted to extend into the grooves of the point, the said conic point having its inner gripping-surface flush with the inner face of the jaw, and being adapted to be used separately from the removable nose as a round-nosed jaw of pliers, substantially as described, for the purposes set forth.

3. The combination, with the handles A A′, pivoted together and provided with the slots c, and having a wire-cutting groove, h', of the bifurcated jaws B B′, provided with a wire-cutting groove, h, each jaw having its forward portion pivoted to one of the handles by a pin inserted through perforations at f, and the same jaw having its rear portion connected with the other handle by a pin inserted through perforations in the jaw at f' and through slot c in the handle, in which construction and arrangement of the parts in the cutting operation the jaw and handle having the wire-cutting grooves approach a straightened position, substantially as and for the purposes described.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM C. MARR.

Witnesses:
A. J. MAUGHLIN,
W. J. MAUGHLIN.