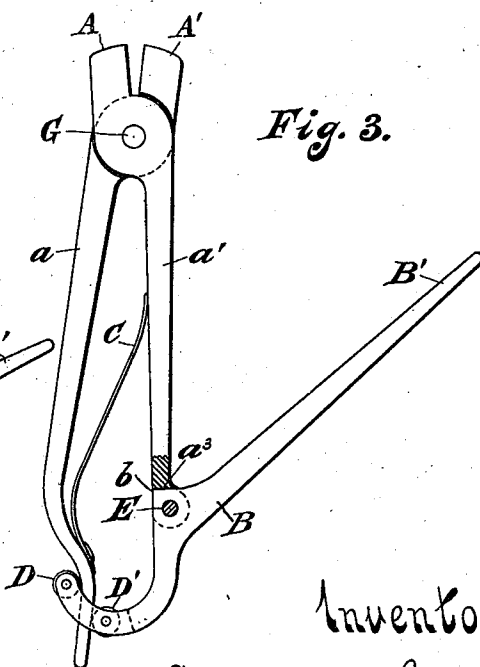
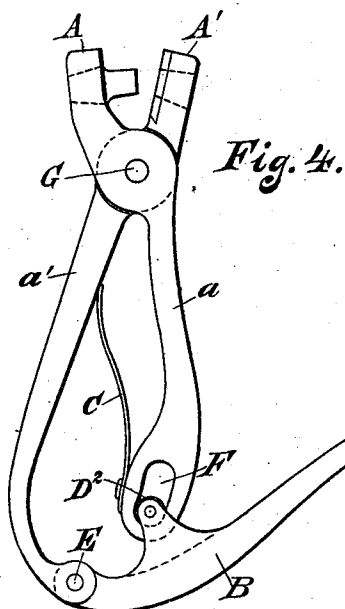
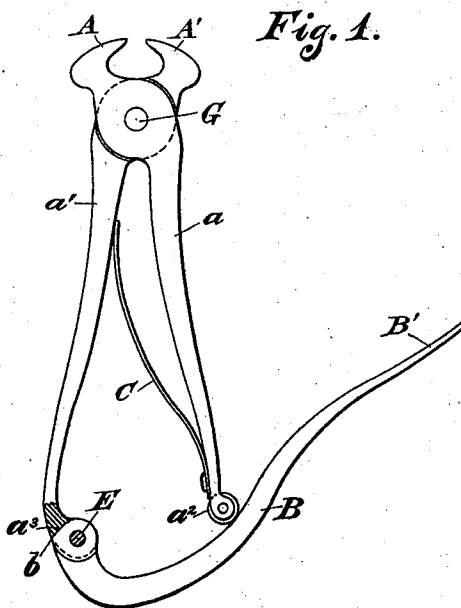
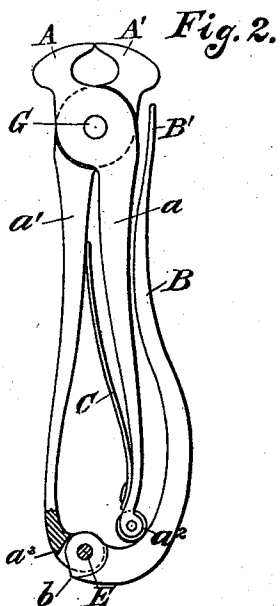


(No Model.)

C. FORD & F. MAHLER.
TOOL.

No. 577,948.

Patented Mar. 2, 1897.



Witnesses:

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UNITED STATES PATENT OFFICE.

CAMPBELL FORD AND FRANK MAHLER, OF SAN FRANCISCO, CALIFORNIA.

TOOL.

SPECIFICATION forming part of Letters Patent No. 577,948, dated March 2, 1897.

Application filed July 6, 1896. Serial No. 598,229. (No model.)

To all whom it may concern:

Be it known that we, CAMPBELL FORD and FRANK MAHLER, citizens of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented an Improved Tool, of which the following is a specification.

Our invention relates to an improvement in such tools, devices, or instruments ordinarily used and manipulated by power or pressure, such as are used for clamping, cutting, shearing, or punching purposes, &c.

The object of our device or improvement is to multiply ordinary or initial power or pressure upon such tools, devices, or instruments in a convenient and expedient way, thereby not rendering them clumsy or less handy of use. We attain this object by means of the device and devices shown in the accompanying drawings, in which—

Figure 1 is a view in elevation of our device on an ordinary hand-tool (shown for illustration as a pair of pincers) and showing the relative position of its different members or parts when said hand-tool is not in use or operation, portions being broken away to more clearly illustrate. Fig. 2 is a view in elevation of our device on the same hand-tool, showing the relative position of its different members or parts when said hand-tool is in use or operation, portions being broken away to more clearly illustrate. Fig. 3 is a view in elevation of a modification, showing the device connected to a pair of hand-pliers and in similar position as Fig. 1, portions being broken away to more clearly illustrate. Fig. 4 is a view in elevation of another modification of our device connected to a hand-punch and in similar position as Figs. 1 and 3.

Similar letters refer to similar parts in the different views.

A and A' are jaws of nippers, pliers, or punch; *a* and *a'*, projecting arms or extensions for operating the jaws A and A' of tool or instrument; *a*², roller at lower extremity of arm *a*, Fig. 1; *a*³, flattened projecting face of hinged end of arm *a'*; B, hinged supplemental lever or extension of arm *a'*; B', upper extreme end of lever B; *b*, projecting lug of hinged end of lever B; C, spring attached to arm *a*; D D' D², rollers attached to and pivoted in arm *a* and lever B, roller D being

pivoted in arm *a*, as shown in Figs. 1 and 2, and rollers D' and D² being pivoted in lever B, as shown, respectively, in Figs. 3 and 4; E, hinge forming pivotal joint between arm *a'* and lever B and serving as a fulcrum for said lever B; F, slot in arm *a* at its lower extreme end, (shown in Fig. 4;) G, pivot or fulcrum of tool between jaws A A' and arms *a a'*.

The operation of our device is as follows: The tool, a hand-tool, as here represented for convenience, instead of being grasped at its projecting arms or extensions *a a'* and operated as ordinarily is the case, that is, as far as convenient from its fulcrum or pivot G, to secure the requisite power or pressure for its successful operation, is in our device manipulated just in the reverse position; that is, as close to the fulcrum or pivot G as is convenient, the operator thus manipulating the tool by grasping the upper extreme portion of arm *a'* at the most convenient position nearest the fulcrum G and the upper extreme end of the hinged lever B at B' between his fingers, drawing or swinging said arm *a'* and hinged lever B, through their hinged connection at E, closer together. The hinged lever B by its contact with the arm *a*, through the intervention of the roller *a*², as shown in Figs. 1 and 2, or its more rigid connection therewith, as shown in Figs. 3 and 4, causes the arm *a*, through the aforesaid motion of the hinged lever B and through the pivotal connection at the fulcrum G with the arm *a'*, to swing on said pivot G close up to the said arm *a'*, thereby operating and closing the jaws A A' at the opposite end of the fulcrum or pivot G, as shown in Fig. 2, representing this position in our first-named device. The supplemental hinged lever B, operating in the manner just described, affords additional leverage, thus multiplying and increasing the initial power or pressure exerted considerably above that gained on the ordinary tools or instruments at present in use. The arrangement as shown makes it convenient in successfully doing this and yet not marring the utility of the tool or instrument in effectiveness and dexterity in its manipulation.

The contact or connection between the hinged lever B and arm *a* is made as close to the hinge or fulcrum E and as far away from the fulcrum or pivot G as is necessary in ob-

taining the desired motion for the operation of the tool or instrument and at the same time insuring the greatest amount of power or pressure for thus operating or manipulating the tool or instrument effectively.

In Fig. 3, instead of having the roller a^2 attached to the arm a , as shown in Figs. 1 and 2, as a contact-point against which the face or edge of hinged lever B is made to operate, we use the two rollers $D D'$, attached, as shown, on the hinged lever B, for operating against the opposite sides of the arm a to communicate the motion and pressure applied to the hinged lever B to said arm a , the operation undergone being otherwise similar to that before explained.

In Fig. 4, which, like Fig. 3, is a modification of our device as shown in Figs. 1 and 2, we have shown another combination, using the roller D^2 , attached on the hinged lever B, said roller D^2 operating in the slot F at the lower extremity of the arm a , thus serving as a connection to communicate the motion and pressure applied to the hinged lever B to said arm a , the operation undergone being likewise similar to that at first explained. The flattened projecting portion of the hinge E shown at b and a^3 in Figs. 1, 2, and 3 serves to limit the motion of hinged lever B in one of its two directions, that is, from its closed position, as shown in Fig. 2, to its open position, as shown in Fig. 1. In Fig. 4 the extent or length of the slot F at the lower extremity of the arm a is made to serve for a similar purpose. It is not absolutely essential to limit this motion or opening of the arms $a a'$ and jaws $A A'$ of the tool, it being more of a convenience in adding to its handiness of manipulation.

The spring C, fastened to the arm a and operating against the arm a' , as shown, causes the opening of the jaws and arms $A A' a a'$ of the tool or instrument when they are relieved by the power or pressure exerted during the operation or manipulation.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a tool or instrument, having arms or extensions $a a'$ projecting from a pivot or fulcrum G for operating said tool or instrument, the lower end of arm or extension a' farthest from said pivot or fulcrum G having a hinged joint or additional fulcrum E, a portion of said hinge being flattened and projecting as shown at a^3 ; a lever B pivoted at and forming at b said hinge, flattening and projection; a roller a^2 journaled at the lower end of arm a farthest from said pivot or fulcrum G and a spring C attached to the arm a ; all operating substantially as and for the purpose herein described.

2. In a tool or instrument, having arms or extensions $a a'$ projecting from a pivot or fulcrum G for operating said tool or instrument, the lower end of arm or extension a' farthest from said pivot or fulcrum G having a hinged joint or additional fulcrum E, a portion of said hinge being flattened and projecting as shown at a^3 ; a lever B pivoted at and forming at b said hinge, flattening and projection; pins or rollers D, D' fastened or journaled at one end of lever B, and spring C attached to arm a ; all operating substantially as and for the purpose herein described.

3. In a tool or instrument, having arms or extensions a, a' projecting from a pivot or fulcrum G for operating said tool or instrument, the lower end of arm or extension a' farthest from said pivot or fulcrum G having a hinged joint or additional fulcrum E, a portion of said hinge being flattened and projecting as shown at a^3 ; a lever B pivoted at and forming at b said hinge, flattening and projection; pin or roller D^2 fastened or journaled on lever B; slot F at the lower end of the arm a farthest from said pivot or fulcrum G, and the spring C attached to the arm a ; all operating substantially as and for the purpose herein described.

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