TOGGLE LEVER OPERATED PLIERS WITH
PIVOTED JAW PIECE

Louis E. Isele, Watertown, Conn., assignor to Sey-
mour Smith & Son, Oakville, Conn., a corpora-
tion of Connecticut

Application August 23, 1944, Serial No. 550,723.

1. Claim. (Cl. 81—84)

This invention relates to improvements in a
tool comprising a pair of handles pivoted to-
gether, and more particularly to a toggle pliers
which may also be used as a lock grip wrench.

One object of this invention is to provide a lock
grip pliers of the above nature, which is adapted
to serve as a clamp or vise to permit the tool and
the article clamped thereby to be laid down while
performing some other operation.

A further object is to provide a lock grip pliers
which will serve as a third hand to take the place
of an additional helper.

A further object is to provide a device of the
above nature in which the lock grip mechanism
avoids the necessity of exerting the muscles of the
fingers for holding the jaws in closed position
when used as a wrench or as a clamp for holding
one or more parts together for drilling, welding,
or grinding.

A further object is to provide a lock grip pliers
of the above nature having a rockable work-engag-
ing jaw carried by an intermediate lever mem-
ber which in turn is connected by a handle-op-
erated toggle linkage to the stationary handle of
the pliers.

A further object is to provide a lock grip pliers
of the above nature in which the rockable jaw
and the intermediate lever are provided with co-
operating cam surfaces which serve to prevent
stresses from being imparted to the pivot pin 3
which connects said work-engaging jaw to said
lever.

A further object is to provide a lock grip pliers
of the above nature which will be simple in con-
struction, inexpensive to manufacture, easy to in-
stall and manipulate, compact, ornamental in
appearance, and very efficient and durable in use.

With these and other objects in view, there has
been illustrated on the accompanying drawing
one form in which the invention may conveniently
be embodied in practice.

In the drawing,

Fig. 1 represents a side view of the lock grip
pliers showing in full lines the closed position of
the movable handle when clamped upon an ar-
ticle, and in dotted lines, the open position of
said movable handle.

Fig. 2 is a similar view of a forward portion of
the lock grip pliers, showing its appearance when
clamped upon an irregular-shaped work piece.

Fig. 3 is a front end view of the lock grip pliers.

Fig. 4 is a side view of the rear portion of the
pliers, taken along the line 4—4 of Fig. 1, and
showing the rear portion of the stationary handle
in section.

Referring now to the drawing in which like re-
ference numerals denote corresponding parts
throughout the several views, the numeral 10 in-
dicates a stationary handle having a ribbed work-
engaging jaw 11 rigidly secured to the end of said
handle 10 by means of a screw member 11a. The
jaw 11 is adapted to cooperate with a swiveled
work-engaging jaw or anvil 12 having a ribbed
face 13 formed on coplanar flanges thereof, said
swiveled jaw 12 comprising a depending reduced
central wing section 12a which is adapted to be
rockably received in a slot formed between the
upper portions of a pair of abutting convex strips
15a, 15b on an intermediate movable lever
15 which is pivotally secured to the stationary
handle 10 by a pin 16. The wing section 12a is
secured to the swiveled jaw or anvil 12 by means
of a pivot pin 14 having a cross-shaped slot 14a
on its head for convenience in the manipulation
thereof.

The abutting strips 15a, 15b are provided with
circular convex bearing surfaces hereinafter
called "trunnions" 17, 17 on their upper portions
for cooperating with a pair of circular bearing
recesses 18, 18 formed on the bottoms of the two
overhanging flanges of the jaw 12 above the wing
12a.

By means of this construction it will be seen
that the movable work-engaging jaw 12 may
swivel with respect to the pivot pin 14 without
causing any stresses to be transmitted to said
pin—all stresses and wear being taken up by the
engagement of the trunnions 17 with the recesses
18.

It will also be understood from this construc-
tion that the angular motion of the swiveled jaw
12 in opposite directions will be limited by the en-
gagement of the extremities of said swiveled jaw
12 with the shoulders 18a, 18b formed on a front
extension of the intermediate lever 15.

In order to operate the lock grip pliers, pro-
vision is made of a movable handle 19, pivoted on
a pin 20 which passes through the intermediate
movable lever 15.

For the purpose of maintaining the pliers nor-
manly in open position, provision is also made of a
strong coiled spring 21 having a front hook mem-
ber 22 which is adapted to engage in a circular
aperture 23 in the intermediate lever 15 formed
substantially midway between the pivot pins 16
and 20. The spring 21 is also provided with a rear
hook 24 which passes through a circular aperture
25 located about half way between the ends of the
stationary handle 10, said hook being forwardly
directed so as to form a secure anchorage in said aperture (see Fig. 3).

In order to produce a strong gripping action of the movable swivel jaw 12 against the stationary jaw 11, provision is made of a toggle link 26 connected by a pivot pin 27 to the handle lever 19. The toggle link 26 is provided with a rear coneave socket 28 having an upper over-hanging lip 29 extending rearwardly therefrom for engagement with a reduced convex pin 31 formed on the front end of a screw bolt 30. The screw bolt 30 is also provided with a knurled rear handle knob 32 to facilitate manual adjustment thereof.

In order to enhance the frictional grip of the user's hand upon the stationary handle 10 and the movable handle 19, provision is made of a plurality of transverse grooves 33, 34 formed on the upper and lower surfaces of said handles, respectively, as clearly shown in Fig. 1.

**Operation**

In operation, when the handle member 19 is moved upwardly against the stationary handle 10, the toggle action of the link 26 connected with the movable intermediate lever 15 will force the swiveled jaw 12 to engage the work piece W with a strong gripping vise-like action. If the screw bolt 30 has previously been properly adjusted to the correct position, the pivot pin 27 will then pass upwardly beyond the dead center position shown in full lines in Fig. 1 and under the force of the spring 21 will snap into locked position above the same and produce a powerful locking grip action.

One advantage of the present invention is that the stationary jaw 11 and the swiveled jaw 12 will always lie in flat engagement with the upper and lower surfaces of the work piece W, whether or not said surfaces are in parallelism. A further advantage is that the trunnions 17 and the concave recesses 18 will absorb the stresses so that the swiveled jaw 12 will be prevented from exerting force on the pivot pin 14.

Another advantage is that the improved lock grips piers are adapted to be used as a pipe wrench for gripping round pieces, or as a vise for holding small or large pieces during drilling, welding, forging, or other operations. It will be understood, of course, that the improved tool may be used as a simple piers or as a simple wrench without employing the toggle locking feature, but that when said feature is used, a gripping force of one ton or more may be easily exerted on the work piece without any undue exertion on the part of the operator.

A further advantage is that by the use of the swiveled jaw, a more uniform grip on the work will be obtained, thus eliminating any tendency for the edges of the work- engaging jaws to dig into the opposite surfaces of the work piece.

The work will also be prevented from rotating in the plane of the work faces.

While there has been disclosed in this specification one form in which this invention may be embodied, it is to be understood that this form is shown for the purpose of illustration only, and that the invention is not to be limited to the specific disclosure, but may be modified and embodied in various other forms without departing from its spirit. In short, the invention includes all the modifications and embodiments coming within the scope of the following claim.

Having thus fully described the invention, what is claimed as new, and for which it is desired to secure Letters Patent is:

In a tool of the piler-wrench type, employing a relatively fixed tool handle having a jaw at one end, an L-shaped jaw-carrying lever pivoted to the fixed handle at said end and actuated by a toggle, comprising a movable handle pivoted to said lever and a toggle link pivoted at one end to said movable handle and at its other end to said fixed handle adjacent the free end thereof, said L-shaped jaw-carrying lever comprising a pair of coextensive strips secured in face-to-face contact, said lever having a substantially triangular upper leg adapted to be pivoted upon said fixed handle, and a relatively narrow lower leg, portions of said strips being separated to form a slot in said lower leg, said portions having arcuate trunnions projecting upwardly from opposite sides of said slot, the edges of said strips being inclined downwardly from each side of the trunnions, a gripping anvil member comprising a wing section received in said slot, and opposite coplanar flanges at the top of said wing section, the underside of each flange having an arcuate bearing recess receiving one of said trunnions, and a pivot pin disposed in apertures in said trunnions and said wing section for retaining said wing section in said slot.

LOUIS E. ISELE.

**REFERENCES CITED**

The following references are of record in the file of this patent:

**UNITED STATES PATENTS**

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>449,930</td>
<td>Vandegrift</td>
<td>Mar. 31, 1921</td>
</tr>
<tr>
<td>1,489,588</td>
<td>Petersen</td>
<td>Apr. 8, 1924</td>
</tr>
<tr>
<td>1,561,833</td>
<td>Cruikshank</td>
<td>Nov. 17, 1925</td>
</tr>
<tr>
<td>1,680,456</td>
<td>Simonsen</td>
<td>Aug. 14, 1928</td>
</tr>
<tr>
<td>2,211,507</td>
<td>Lilleberg</td>
<td>Aug. 13, 1940</td>
</tr>
<tr>
<td>2,299,454</td>
<td>Borchers</td>
<td>Oct. 20, 1942</td>
</tr>
<tr>
<td>2,341,489</td>
<td>Tornborg</td>
<td>Feb. 8, 1944</td>
</tr>
<tr>
<td>2,385,654</td>
<td>Seashore</td>
<td>Sept. 29, 1945</td>
</tr>
</tbody>
</table>

**FOREIGN PATENTS**

<table>
<thead>
<tr>
<th>Number</th>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>154</td>
<td>Great Britain</td>
<td>Jan. 2, 1905</td>
</tr>
</tbody>
</table>