This invention relates to tools and more specifically to pliers of the vise type comprising a pair of pivotally connected handles carrying toothed jaws, together with means for locking the jaws into forcible engagement with an object to be gripped, held, turned or otherwise manipulated. Thus the gripping action is maintained even after the handles have been released from manual actuation.

It is the primary object of the invention to provide a device of the character indicated which will comprise a minimum number of parts and those of a very rugged and long lived construction. The several parts are so correlated and combined that the leverages exerted under manual actuation of the tool are of such order that but slight effort is required upon the part of the user to effect a very powerful gripping action by the jaws upon the object to be held.

The tool, if secured to a work bench is also adapted to serve as a small bench vise.

The advantages of the tool will be best appreciated after consideration of the accompanying drawing, wherein:

Fig. 1 is a plan view;
Fig. 2 is a side elevation, partly in section, of a tool constructed in accordance with the invention;
Fig. 3 is a transverse section on line 3—3 of Fig. 2; and
Fig. 4 is a transverse section upon line 4—4 of Fig. 2.

Referring to the drawing, wherein like numerals designate corresponding parts throughout the several views, 5 and 6 designate a pair of elongated handles which are pivotally connected adjacent their rear ends by a pivot 7. At their forward ends these handles carry jaws 8 and 9 and the confronting faces of which carry teeth 10.

Handle 5 is of channel formation in cross section with the top of the channel being open. Handle 6 is disposed within the channel of handle 5 and is biased to open position (that is in a direction to move the jaws 8 and 9 apart) by a leaf spring 11, which spring is disposed between handle 6 and the bottom of the channel of handle 5. A yoke-like abutment of inverted U-shape comprising the side walls 12 and a connecting head 13 upstands from the side walls of the channelled handle 5. A vertical screw 14, threaded through head 13 carries a manipulating projection 15. The lower end of screw 14 is reduced to form a stem 14a which has rotative engagement in a transverse circular pivot block 16. The outer ends of this pivot block travel in vertical slots 17 of the walls 12 of the yoke and thus the pivot block is held against turning bodily about the axis of screw 14. The head 18 of a lock lever 19 is pivoted upon pivot block 16. This lock lever comprises the elongated handle 19 and its head 18 and a cam heel 20, said heel consisting of a protuberant portion of head 18. This cam heel bears upon and acts against the upper face of handle 6 and thus serves to move the jaw 9 forcibly toward jaw 8 as the lock lever is swung to the full line position of Fig. 1. At the termination of the movement of the outer or free end of the lock lever toward handle 5 the cam heel will have been moved to past center position to wit, to a position where the tendency for the jaws to move apart will, through cam heel 20, cause lock lever 19 to move toward handle 6, as in full lines, in Fig. 2. Thus the grip of the teeth 10 upon an object gripped, as indicated at A, will be maintained indefinitely and after manual actuation of the jaws toward each other, has ceased. The length of the lock lever, in conjunction with the direction of movement of the head 18 and upper face or edge of handle 6, is such that very slight pressure upon the lever by the user will exert very great pressure upon the jaws in their gripping and holding action.

If desired, handle 5 may be provided with perforated ears E by which the tool may be rigidly affixed to a work bench for use as a small bench vise.

It will be seen that the general elongated shape of the tool is plier-like. For very light work the rear portion of the handles may be grasped in the palm of the hand and squeezed together to bring the jaws into engagement with an object A, without use of the lock lever, but when greater resistance is to be overcome the lock lever may be brought into play as described. Vertical adjustment of the pivot block 16 by manipulation of screw 14 renders it possible to adjust the movement of the jaws to grip objects of different sizes.

It is to be noted that the handles 5 and 6 themselves constitute the basic frame of the tool and because of their length and size the tool as a whole is rendered very strong and rugged. Further, it is to be noted that the handles are long and of almost equal length and that their point of pivoting to each other is near their rear ends. In addition the handle 6 is of such width that it lies and is housed completely within housing 5, throughout all of its length which lies rearwardly of cam heel 19 or within the plane of action of lock lever 19. Thus it will be seen that the width of what has to be gripped in the palm of the user comprises only the combined width of handle 5 and lock lever 19 and not the combined widths of handles 5 and 6 and lock lever 19, as would be the case if handle 6 were not housed in handle 5, as described.

When used as a small bench vise the tool is secured to the upper front wall of a work bench by screws passed through ear E and with the tool properly projecting upwardly of the top of the work bench. In other words, the tool then lies in the position of Fig. 2 with the lock lever in position to be swung in a vertical plane and away from the work or part held. This part A then projects horizontally beyond the plane of the tool and in a convenient position to be acted upon by a threading die, hack saw, file or other tool.

It is to be understood that the invention is not limited to the precise construction set forth but that it includes within its purview whatever changes fairly fall within either the terms or the spirit of the appended claims.

I claim:

1. A tool of the character described comprising a pair of elongated handles pivotally connected to each other adjacent their rear ends and each carrying a work engaging jaw at its forward end, a fixed abutment carried by one of said handles, an adjusting screw having threaded engagement with said abutment, a pivot block movable bodily under the action of said screw, a lock lever pivoted upon said pivot block and comprising an elongated rearwardly extending handle and a cam heel, said cam heel engaging and imparting movement to the other of said handles.

2. A tool of the character described comprising a pair of elongated handles pivotally connected to each other adjacent their rear ends and each carrying a work engaging jaw at its forward end, a fixed abutment carried...
by one of said handles, an adjusting screw having threaded
engagement with said abutment, a pivot block movable
bodily under the action of said screw, a lock lever pivoted
upon said pivot block and comprising an elongated rear-
wardly extending handle and a cam heel, said cam heel
lying in the lateral plane of and directly engaging and
acting upon the upper edge of the other of said handles.
3. A tool of the character described comprising a pair
of elongated handles each having a toothed jaw at one
end, a first one of said handles being of channel formation
with an open top and the second and other of said han-
dles lying within said channel with its upper edge exposed
at the top of said channel, a pivot extending laterally
through and pivotally uniting said handles adjacent their
rear ends, spring means acting between said handles in a
direction tending to move their jaw portions away from
each other, a circular pivot block movable bodily toward
and from the first handle and projecting transversely of
the said handle, a cam lever comprising a head pivotally
engaged with the pivot block, an elongated lever portion
extending rearwardly from said head and a cam heel bear-
ing upon the upper edge of the second handle.
4. A tool of the character described comprising a pair
of elongated handles each having a toothed jaw at one
end, a first one of said handles being of channel forma-
tion with an open top and the second and other of said
handles lying throughout the major portion of its length,
wholly within said channel with its upper edge exposed
adjacent the top of said channel, a pivot extending lat-
erally through and pivotally uniting said handles adjacent
their rear ends, spring means acting between said handles
in a direction tending to move their jaw portions away
from each other, cam means carried by the first and channeled
handle and acting upon the top edge of the second
handle for forcibly moving said jaws toward each other
and against the tension of said spring, a shiftable pivot
block for the cam means, an adjusting screw engaging
and bodily shifting said pivot block, an abutment carried
by the first handle and interengaging means between the
pivot block and abutment constructed to hold the block
against bodily turning with the screw.
5. A tool of the character described comprising a pair
of elongated handles each having a toothed jaw at one
end, a first one of said handles being of channel forma-
tion with an open top and the second and other of said
handles lying throughout the major portion of its length,
wholly within said channel with its upper edge exposed
adjacent the top of said channel, a pivot extending lat-
erally through and pivotally uniting said handles adjacent
their rear ends, spring means acting between said handles
in a direction to move their jaw portions away from each
other, cam means carried by the first and channeled han-
dle and acting upon the top edge of the second handle for
forcibly moving said jaws toward each other and against
the tension of said jaws, a shiftable pivot block for the
cam means, an adjusting screw engaging and bodily shifting
said pivot block, an abutment carried by the first
handle and interengaging means between the pivot block
and abutment constructed to hold the block against bodily
turning with the screw.

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