

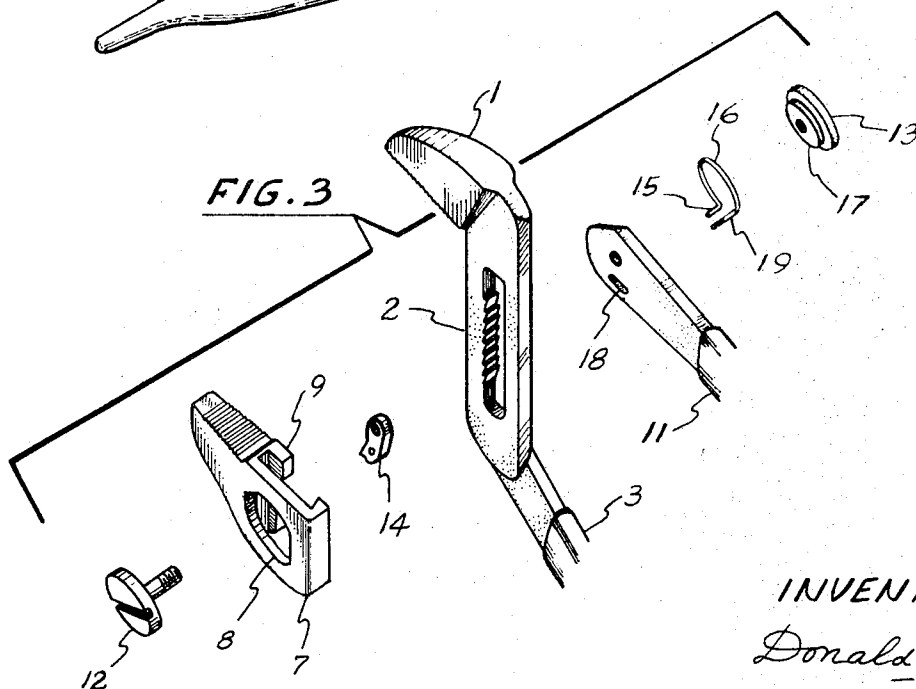
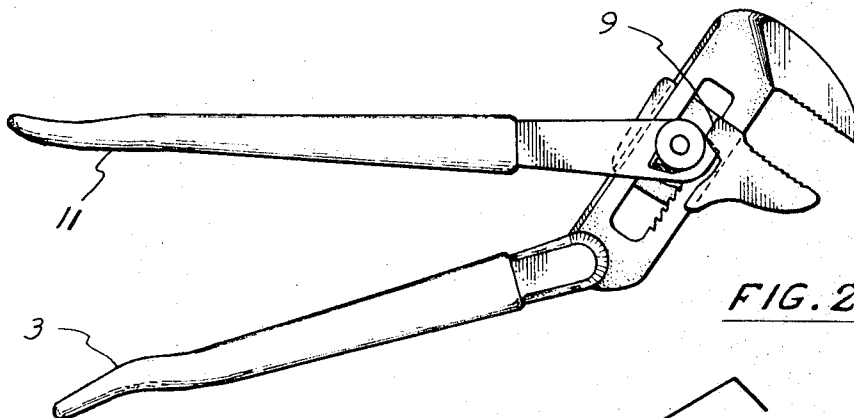
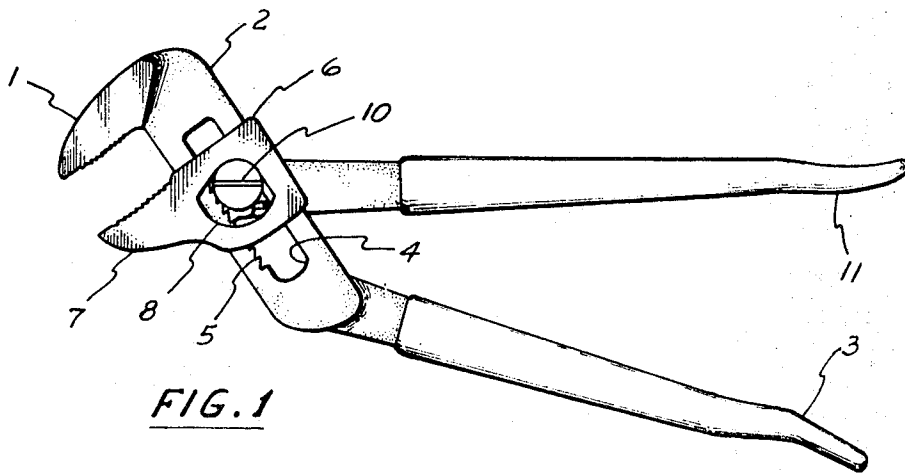
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PLIERS WITH SLIDABLE JAW ACTUATION BY CLAW LEVER MEANS

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**PLIERS WITH SLIDABLE JAW ACTUATION
BY CLAW LEVER MEANS**

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3 Claims

ABSTRACT OF THE DISCLOSURE

Pliers of the adjustable, compound leverage type which are adjustable directly against and over the work by either squeezing the jaws closed or by pulling one handle away from the other handle until the jaws register against the work.

This invention relates to, and it is an object to provide, improved pliers of adjustable, compound leverage type.

Another object of the invention is to provide pliers, which instantly adjust directly against and over the work by simply squeezing the jaws closed or by pulling the upper handle away from the other handle until the jaws register against the object. This important feature eliminates frustrating guess work now present in conventional pliers, which have to be adjusted remote from the work, often resulting in a final inconvenient grip on the handles and on the work piece, and often overloading the structures of those pliers when used in said conditions.

A further object of the invention is to provide pliers, as above, which maintain their adjustment even under on and off and conventional rough handling and which jaws are prevented from accidental moving, until the operator desires readjustment.

A still further object of the invention is to utilize the compound leverage feature in conjunction with the constantly parallel jaws, to firmly grasp flat, as well as round and irregular shapes of objects.

Other objects of this invention will appear most clearly in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In the drawings:

FIG. 1 is a side elevation of the pliers.

FIG. 2 is another side elevation showing the opposite side of FIG. 1.

FIG. 3 is an exploded view in perspective showing all of the individual components.

Referring now to the drawings, the tool consists of a fixed jaw 1 integral and formed at a 90 degree angle to the main body portion 2 of the first handle member 3. Said main body portion is substantially wide and flat and includes a longitudinal slot 4 having on the long edge nearest to said jaw, a rack 5 of upwardly directed saw-profile teeth, while the opposed edge remains to be smooth.

A slidable jaw member 6 is mounted on said main body portion 2 and has a jaw 7 fixed to it. The work engaging surfaces on jaw 1 and jaw 7 run substantially parallel to each other. The slidable jaw further has an opening 8 on one side of the body, FIG. 1, and is substantially more open on the other side thereof, FIG. 2. A broaching operation to form opening 8 may instantly provide the basis for a lug 9, on the far side thereof, FIG. 2, which lower edge may contact with the upper edge of the forward section, past the pivotal joint 10, of a second handle member 11.

Said pivotal joint comprising a bolt 12, having a large head, and placed inside said opening 8, said head diameter being larger than the width of the slot in order to

track and retain the slidable jaw member in the up or down travel; a large circular nut 13 fitted on the outer end of the bolt shank in a sufficiently tight manner to maintain the proper relationship of the parts, without causing frictional binding; a pawl 14, placed inside the slot, and shaped on one side to mesh with the opposed tooth rack in a positive manner, said pawl further having a small transverse hole in it and a larger mounting hole which rotatably receives the shank portion of the bolt, said smaller hole receiving the end portion 15 of a substantially circular retainer spring 16 which is placed over a collar 17 of nut 13, said end of the spring at the same time projecting through a narrow slot 18 in handle 11. The other end 19 of the spring projects through the same narrow slot 18 under initial spring compression, tending to separate the two ends, and bears against the smooth long edge of the slot 4 and the lower edge of the opening 8.

The installation and character of the spring are of vital importance to the claimed actions of the overall device. The spring force always exerts pressure against the pawl in the direction of the tooth rack, causing it to make engagement there when allowed; the same spring force draws handle 11 toward handle 3 and the upper edge of the opening 8 in contact with the head of bolt 10, thereby maintaining a predetermined resilient gap condition between the pivotal joint and the slidable jaw. The width of the gap must be larger than the chosen pitch of the teeth in order to provide for adequate upward breathing ability for handle 11, when the pliers are adjusted over an object to the nearest possible pitch engagement and further pressure is applied on the handles, causing handle 11 to contact the lower edge of lug 9, and in this manner elevating the slidable jaw up and against the work to be firmly held or turned, while the compound leverage feature adds to the gripping power of the jaws.

In order to reopen the jaws over a distance larger than one pitch, the operator must merely rotate handle 11 away from the lower handle, against the will of the spring, and in doing so, will retract the pawl from previous tooth engagement when the end 15 of the spring sees and contacts the end of the slot 18; a further downward push on said handle, and in the above position, will freely move the slidable jaw downward.

From the foregoing description it will be readily seen that there has been produced such a device as substantially fulfills the objects of the invention as set forth herein.

While the specification sets forth in detail the present and preferred construction of the device, still in practice such deviations therefrom may be resorted to as do not form a departure from the spirit of this invention, as defined by the appended claims.

What is claimed is:

1. A pliers substantially as described having a pair of crossed handle members and a slidable jaw member; the first handle member having a fixed jaw which cooperates with a second jaw integral to said slidable jaw member, and work engaging surfaces on the jaws running substantially parallel to each other; a pivotal joint between the handle members comprising a bolt and slot connection preventing lateral shifting of one member relative to the other in a direction crosswise of the slot, but freely permitting movement of one member relative to the other lengthwise of the slot, said pivotal joint carrying a teeth engaging pawl, rotatably mounted on the shank portion of the bolt and placed inside said slot to mesh with awaiting saw-profile cut teeth within said slot at any desired elevation in respect to the given length of the slot; also included in said pivotal joint assembly a rotatably mounted retainer spring, one end of which engages with said pawl and at the same time with a portion

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on the second handle, the latter engagement providing free travel for the second handle member in a further closing of the handles after sufficient pawl and slot engagement has been made; the other end of the spring placed against a smooth portion of the first handle member, under initial spring compression, and there to provide unrestricted up and down travel with said pivotal joint and also bearing against a portion of the slidable jaw member, so as to maintain a predetermined resilient gap between the pivotal joint and said slidable jaw member; said slidable jaw member being carried by said pivotal joint and sliding in a retained manner over the main body portion of said first handle and having an elongated portion or lug projecting over the end section of the second handle and coming in contact therewith and hence being elevated thereby when closing pressure is applied on the handles.

2. The device, according to claim 1, wherein said sec-

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ond handle end portion and said slidable jaw lug have slightly inclined or undercut contacting surfaces to provide for positive engagement when pressure is transmitted and in order to cancel out otherwise uncontrollable side forces on said parts, including the pivotal joint retention hardware.

3. The device, according to claim 1, wherein said first handle member has an inwardly beveled rear edge on its main body portion, there to engage with a similarly inclined surface on the slidable jaw member in order to economically and slidably interlock said parts in assembly.

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