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CAM-ACTUATED PLIER WRENCH WITH WEDGE ADJUSTMENT

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Fig. 1.

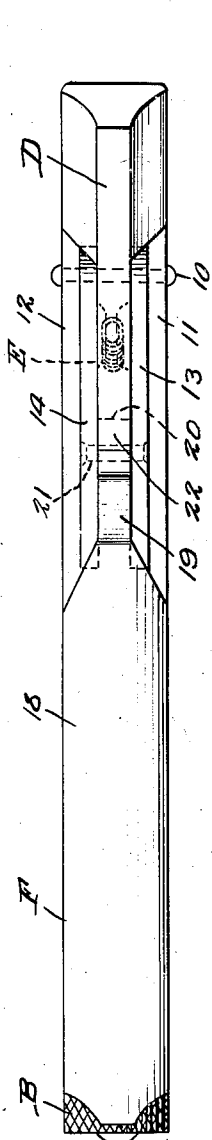


Fig. 2.

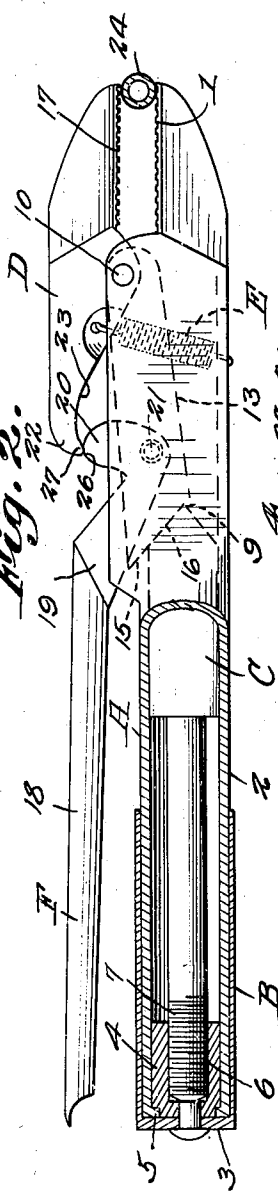


Fig. 3.

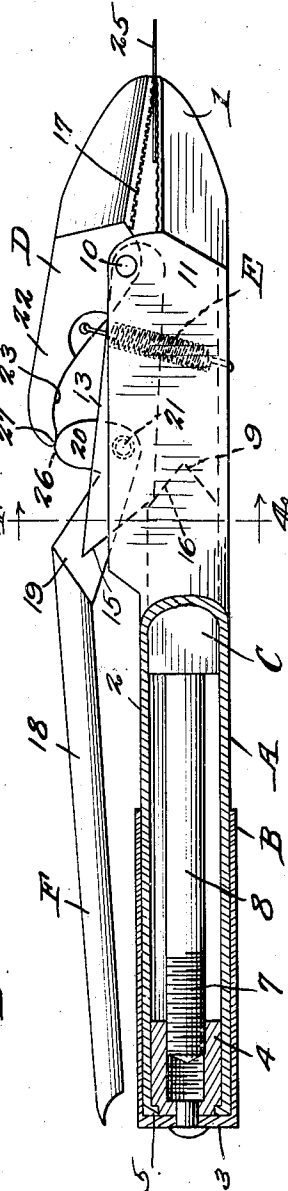
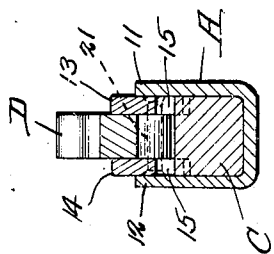


Fig. 4.



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CAM-ACTUATED PLIER WRENCH WITH
WEDGE ADJUSTMENT

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3 Claims. (Cl. 81-44)

1

This invention pertains to a tool which partakes of the nature of both a wrench and pinchers or pliers and as a consequence can well be referred to as a plier-wrench.

The primary object of the invention is the provision of a tool closely similar to a pair of pliers or pinchers but which operates in a manner to clamp an article more tightly and rigidly than the article could be normally clamped by a conventional pair of pliers.

Another object of the invention is the provision of such a tool the construction and operation of which is simple, which can be manufactured comparatively cheap, and yet is highly efficient in operation and is durable in normal usage.

A still further object of the invention is the provision of means for adjusting the tool to clamp articles of different sizes and diameters.

Other objects, novel features of construction and improved results of the invention will appear from the following description when read in the light of the accompanying drawings.

In the drawings:

Fig. 1 is a top view of the tool.

Fig. 2 is a view in side elevation a portion of the figure being broken away and being shown in vertical section.

Fig. 3 is a view similar to Fig. 2 with the tool being adjusted to clamp an article of small size or thickness.

Fig. 4 is a vertical sectional view on the line 4-4 of Fig. 3 looking in the direction indicated by arrow.

Referring now to the drawings which illustrate one embodiment of the inventive concept and utilizing like characters and reference numerals to designate similar parts throughout the description, A designates the main handle of the tool and at its outer end is provided with a serrated jaw 1 which is similar in construction to one of the jaws of a conventional pair of pliers. The inner end 2 of the handle is hollow and terminates in an inner open end which is closed by a sleeve B which telescopically receives the inner handle end and is freely rotatable thereon. The end 3 of the sleeve carries or has rigidly attached thereto a plug 4 which is disposed interiorly of the handle and is prevented from outward movement by the intumed ends 5 of the inner end of the handle. This plug is provided with a central interiorly threaded bore 6 which threadedly receives the threaded end 7 of the rod-like portion 8 of the plunger C the inner end of which is V-shaped as at 9.

2

Intermediate its length the handle A is of a U-shape in cross section, as clearly appears in Fig. 4.

The upper jaw D of the tool is pivoted as at 10 intermediate its length between the upstanding side walls 11 and 12 of the U-shaped portion of the handle. A pair of rearwardly extending arms 13 and 14 one each of which is disposed at the sides of the jaw D and within the handle have their forward ends pivotally supported on the pivot 15 of the jaw D while their rear ends are rearwardly and upwardly tapered at at 15 and bear upon the upper tapered face 16 of the inner V-shaped end 9 of the plunger C. A coil spring E connected to the upper jaw D rearwardly of its pivotal support and to the main handle tends normally to separate the serrated jaw portion 17 of the upper jaw from the like portion of the lower jaw. The secondary handle F of the tool has an elongated rearwardly extending hand engaging portion 18 and a forwardly and downwardly extending portion 19 terminating in an upwardly extending cam shaped end 20. This handle is pivoted as at 21 between the arms 13 and 14 at a point adjacent but inboard of the rear tapered ends 15 of said arms.

The upper jaw D has a rearwardly extending end 22 the under surface of which is curved to form a cam face 23 which is normally held in engagement with the cam end 20 of the secondary handle by the tension of the coil spring E.

In operation the tool works similarly to a pair of pliers or pinchers. By moving the main and secondary handles toward one another the jaws of the tool are forced towards one another to clamp between them an article or object such as a small pipe or hollow pin 24 as illustrated in Fig. 2. This article can be very rigidly clamped, similarly to the manner in which it could be clamped by a wrench, due to the heavy clamping action which can be imparted by reason of the co-acting cam 20 and the cam surface 23 of the pivoted jaw D of the tool.

To provide for adjustability similar to that obtainable in a wrench for clamping articles of various sizes or dimensions adjustability is provided. This is obtained by rotation of the sleeve B in proper direction. When a small or thin article or object such as a sheet 25, see Fig. 3, is to be clamped the sleeve is rotated to move the plunger C inwardly or forwardly as illustrated in Fig. 3. This inward movement of the plunger by reason of the engagement of its inclined face with the inclined inner ends of the arms lift the inner ends of the arms as the arms swing about the pivot 10. Elevation of the arms elevate the

3

pivot point 21 of the secondary cam carrying handle F with the result that the cam action between the handle F and the jaw D is now sufficient to move the jaw D downwardly towards the jaw I a sufficient distance to clamp and lock a small or thin article between the jaws.

The adjustment is always made such that the final clamping action is obtained when the top-most portion 26 of the cam is on the end 27 of the camway 23 with the result that when the upper secondary handle is brought down to or approximately against the lower main handle the jaws are locked in clamped relationship upon the article between them.

I claim:

1. In a tool, a rigid main handle having a fixed jaw at one end thereof, an opposed jaw pivotally mounted on the main handle, a pair of rearwardly extending arms pivotally mounted on the pivot of said pivoted jaw, a secondary handle pivotally mounted between the free ends of said arms and provided with a cam, a cam surface on the pivoted jaw, resilient means holding said cam surface in engagement with the cam, a reciprocable plunger interior of the main handle and provided with means to engage said arms to elevate the same, and rotatable means exterior of the main handle for reciprocating said plunger to raise said arms and the pivot point of the secondary handle.

2. In a tool, a rigid main handle having a fixed jaw, said handle having upwardly extending spaced side walls, a pivot pin extending through said side walls, a movable jaw supported on said pivot pin cooperating with the fixed jaw in gripping an article, and provided at the under side of its rear end with a cam surface, a pair of rearwardly extending spaced arms pivotally supported on said pivot pin, a secondary handle pivotally supported between the rear ends of said arms and provided with a cam, resilient means holding the cam surface of the pivoted jaw in engagement with the cam, the rear ends

4

of said arms provided with a beveled surface, a longitudinally reciprocable plunger interior of the rigid arm and provided with a beveled end adapted to engage the beveled ends of said arms, and rotatable means exterior of the main arm for reciprocating said plunger to elevate said arms.

3. In a tool, a rigid main handle having a rigid jaw, said handle having oppositely disposed side walls, a pivot pin extending between said side walls and pivotally supporting a movable jaw cooperating with the fixed jaw in gripping an article, said movable jaw having a rearwardly extending end the under face of which is provided with a cam surface, said rigid handle being hollow, a pair of spaced rearwardly extending arms pivotally supported at their front ends on said pivot pin and having beveled rear ends normally disposed within the hollow portion of the rigid handle, a secondary handle pivotally supported between the free ends of said arms and provided with a cam, resilient means holding the cam surface of the movable jaw in engagement with said cam, a reciprocable plunger within the hollow rigid handle provided with a beveled end adapted to engage the beveled ends of said arms, a sleeve exterior of the main handle and rotatable thereon and provided interiorly of the handle with a rotatable interiorly threaded nut, said plunger provided with an exteriorly threaded end threadedly engaging said nut, and rotation of said sleeve and nut acting to reciprocate the said plunger.

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