

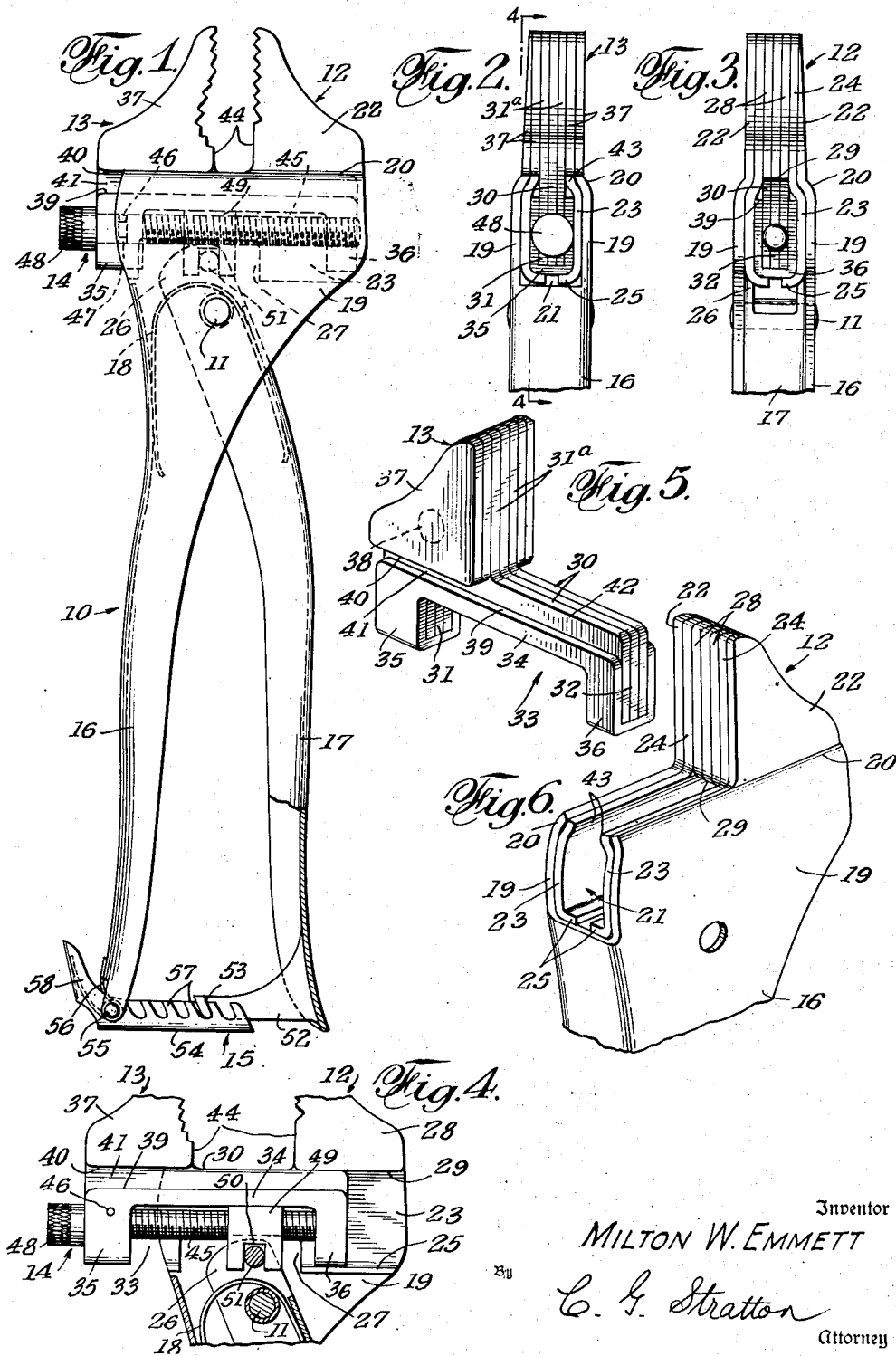
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ADJUSTING MEANS FOR SLIDABLE SIDE JAW WRENCHES

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ADJUSTING MEANS FOR SLIDABLE SIDE
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This invention relates to gripping tools and deals more particularly with adjustable-jaw pliers.

An object of the present invention is to provide pliers, more particularly for article-gripping purposes, that embodies a jaw fixed with one of the handles of the tool, and a jaw that is adjustable with respect to both the fixed jaw and the other handle, to provide a tool that has universal application within the range of its adjustment.

Another object of the invention is to provide adjustable-jaw pliers which have handles that are resilient to a limited degree whereby compression on the handles results in tight gripping of the jaws, said handles being adapted to automatically interlock to retain grip of an article between the jaws after manual release of the handles.

Another object of the invention is to provide novel handle-interlocking means that optionally may be arranged to lock the handles, or not as desired.

A further object of the invention is to provide pliers that embody novel means effecting adjustment of one jaw relative to the other.

A still further object of the invention is to provide pliers that have novel gripping jaws which, rather than comprising expensive machined forgings, are comprised of stamped laminae that are so mutually interconnected as to be strong and durable elements that do not require those machining operations that are required by forgings.

A yet further object of the invention is to provide, in pliers of the character indicated, a combined jaw and handle element that is completely formed of stampings which are so inter-fused that said element is substantially integral.

The invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawings merely show and the following description merely described one embodiment of the present invention, which is given by way of illustration or example only.

In the drawings, like reference characters designate similar parts in the several views.

Fig. 1 is a side elevational view of adjustable jaw pliers according to the present invention.

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Fig. 2 is an edge view of the gripping end of the pliers as seen from the left of Fig. 1.

Fig. 3 is a similar view as seen from the right of Fig. 1.

Fig. 4 is a longitudinal sectional view as taken on line 4-4 of Fig. 2.

Fig. 5 is a perspective view of the adjustable jaw of the pliers.

Fig. 6 is a similar view of the other jaw, the connected handle being broken away.

The pliers that is illustrated in the drawing comprises, generally, a pair of handles 10, a pivot 11 connecting the handles, a jaw 12 fixed with one of the handles, a cooperating jaw 13, means 14 for adjusting jaw 13 relative to jaw 12 and also relative to the other handle, and means 15 for releasably interlocking the handles to hold the jaws in work-gripping position.

The handles 16 and 17 of the pair of handles 10 are each formed to have a U-shaped cross-section and are advantageously stamped from sheet stock of a suitable gauge. From the point of connection of handles 16 and 17 at the pivot 11, the same are reducingly gradually tapered toward their free ends. Consequently, while the handles are, in the main, rigid, they yet have limited resilience. Thus, hand pressure on the handles is capable of flexing them toward each other. A suitable spring 18 is provided for urging the handles apart, the same being shown as a bowed leaf spring trained around pivot 11.

The handle 16 on the other side of the pivot, is considerably widened to provide opposed plate parts 19 which, at their upper edges, are intumed as at 20. There is thus provided a through space or passage 21 between plate parts 19. On one side, each plate part 19 is provided with an upper extension 22 that comprises the outer laminae of the jaw 12. To reinforce the walls 19 so that the shape of space 21 is accurately maintained, each wall is lined with a plate part 23 which has an upper extension 24 that is similar in size and shape to extension 22. Along the lower edge of each plate part 23 there is provided an intumed lip or flange 25, the same thereby defining the bottom of passage 21. In order to accommodate the upper end 26 of handle 17, said plate parts 23 and their intumed flanges 25 are interrupted to form elongated recesses 27 as best seen in Fig. 4.

The above partially formed fixed jaw 12 includes a plurality of laminae 28 that fill the space between extensions 24, the bottom edges 29 of said laminae defining, at one end, the top of passage 21. In practice, the above-described elements of the combined handle 16 and jaw struc-

ture 12—said elements all comprising metal stampings of substantially the same thickness—are copper brazed or otherwise similarly joined. The braze-jointed formation of the jaw and handle renders the elements thereof relatively integral. The same is, therefore, strong for the purpose intended.

The movable jaw 13 is similarly fabricated. In practice, several stamped elements 30, of a length commensurate to the width of plate parts 19 and 23, are arranged in superposed relation. Each of said elements 30, at one end, is provided with an upper extension 31a that has a shape similar to that of the elements comprising jaw 12. The lower portion of the superposed elements 30 is cut away to provide spaced end portions 31 and 32 that define a space 33 therebetween. Said superposed elements 30 are inserted into a U-shaped stamped member 34 that, when flat, is a hollow rectangle and, when formed to shape, comprises a channel receptive of elements 30. The hollow of member 34, when said member is bent as in Fig. 5 provides said member with spaced end portions 35 and 36 that respectively confine portions 31 and 32 of the superposed elements 30.

In order to build up jaw 13 to the thickness of jaw 12, stamped elements 37, similar in size and shape to extensions 31a, are applied to the outer faces of the outer of said extensions. While, during fabrication, the elements 30 are held in superposed relation by member 34, it is necessary to initially spot weld as at 38 to temporarily hold elements 37 in place with relation to extensions 31a. A copper-brazing operation will then effect an integral union of the components of jaw 13.

It will be noted that the laminated jaw 13, thus provided, is substantially complete and does not require finishing-machining operations that are necessary for forged jaws. The upper edges 39 of member 34 and the opposed lower edges 40 of elements 37 define a way 41. Accordingly, the spaced ends of said jaw and the connecting portion thereof, comprises a body 42 that slidably fits in passage 21, said body being retained in the passage by engagement of the inturned edges 43 of plate parts 23 in the ways 40. In addition to guide afforded by edges 43, the jaw 13 is held against canting or tilting by flanges 25, at the bottom, the edges 29 of elements 28, at the top on one end, and by engagement of edges 40 of elements 37 with inturned edges 20 on the other end.

It is evident that the cooperating faces 44 of the two jaws 12 and 13 may be treated according to the use for which the pliers are intended. Said jaw faces may be plane, knurled or serrated, as shown. In any event, said faces move relatively parallel, both during adjustment and under movement by manipulation of the handles 16 and 17.

The jaw adjusting means 14 comprises an adjusting screw 45 that has bearing in the spaced ends of jaw body 42 to extend between said ends. Said screw is held against endwise movement by a pin 46 extending transversely through a groove 47 provided in the screw where it has bearing in one of the mentioned body ends. A knurled knob 48 is provided on the end of the screw to rotate the same.

A nut in the form of a block 49 is threadedly engaged with said screw, said block being adapted to be adjustably moved between the spaced ends of jaw body 42, said block being held against

rotation by engagement with the bridging portion of said body. A notch 50, open in the direction of pivot 11, is formed in the block, the same being receptive of a transverse pin 51, carried by arm end 26 above pivot 11. Said notch is of sufficient depth to accommodate arcuate movement of pin 50 without interference, said arcuate movement resulting in straight-line movement of jaw 13 relative to jaw 12.

The means 14 can be manipulated to adjust jaws 12 and 13 to grip relatively thin objects or relatively thick ones while the handles 16 and 17 remain in the same relative position, it being evident that block 49 remains immovable as screw 45 is rotated during adjustment of jaw 13.

As herein contemplated, handles 16 and 17 are designed to have limited flexibility so that when pressed together, with the jaws gripping a work-piece, they will flex toward each other. The jaws, thereby, resiliently engage the work and grip the same firmly.

The means 15 is provided to interlock the handles so that hand pressure may be released with assurance that the jaws will retain work-gripping position. As shown, said means comprises an extension 52 that is affixed to the end of handle 17 as by welding, said extension being directed toward handle 16 and terminating in an offset lug or tooth 53; and a ratchet bar 54 that is carried on a pivot 55 on the end of handle 16 and urged by a spring 56 to seek a retracted position in the hollow of said handle. The teeth 57 on said bar 54 are inter-engageable with lug 53 substantially as shown. A finger-piece 58 on said bar is employed for moving the latter from retracted to the operative position of Fig. 1. The bar 54 is preferably of channel form so that the same serves as a guide for extension 52 to insure engagement of lug 53 and teeth 57.

The pliers are usable in the ordinary manner when bar 54 is retracted, the jaws closing over the work by hand pressure on the handles and opening under the force of spring 18 when hand pressure is released. The means 15 is employed when manual release of the handles is desired. Said means is first inter-engaged by hooking lug 53 and one of the teeth 57. The jaw 13 is then adjusted to engage against the work, the handles retaining their relative position. Now hand pressure is applied to squeeze the handles, cause them to flex and thereby ratchet lug 53 past one or more of the next successive teeth 57. Holding pressure is thus imparted to jaws 12 and 13. The handles may now be manually released. By pressing on the finger-piece 58, the means 15 is released so that spring 18 becomes effective to separate the jaws for removal of work between them.

While the invention that has been illustrated and described is now regarded as the preferred embodiment, the construction is, of course, subject to modifications without departing from the spirit and scope of the invention. It is therefore not desired to restrict the invention to the particular form of construction illustrated and described, but to cover all modifications that may fall within the scope of the appended claim.

Having thus described my invention, what I claim and desire to be secured by Letters Patent is:

Adjusting means for a slidable side jaw wrench comprising: a first handle member having a transversely channeled head and a fixed jaw thereon, a second handle member hinged to said first handle member at a point near said head,

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said fixed jaw having a channeled shank held in the channel of said head, a movable jaw having a shank slidable on the shank of said fixed jaw to and from work holding position relative to said fixed jaw, an adjusting screw rotatable in the shank of the movable jaw, a bifurcated nut borne by said screw and adjustable between spaced portions of the movable jaw, and a connector borne by said second handle member and seated between the furcations of said nut, whereby the rotation of said screw will effect axial adjustment of said nut, limit movement of the movable jaw to a predetermined position relative to the fixed jaw and thereby accommodate the wrench to work of different dimensions.

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