

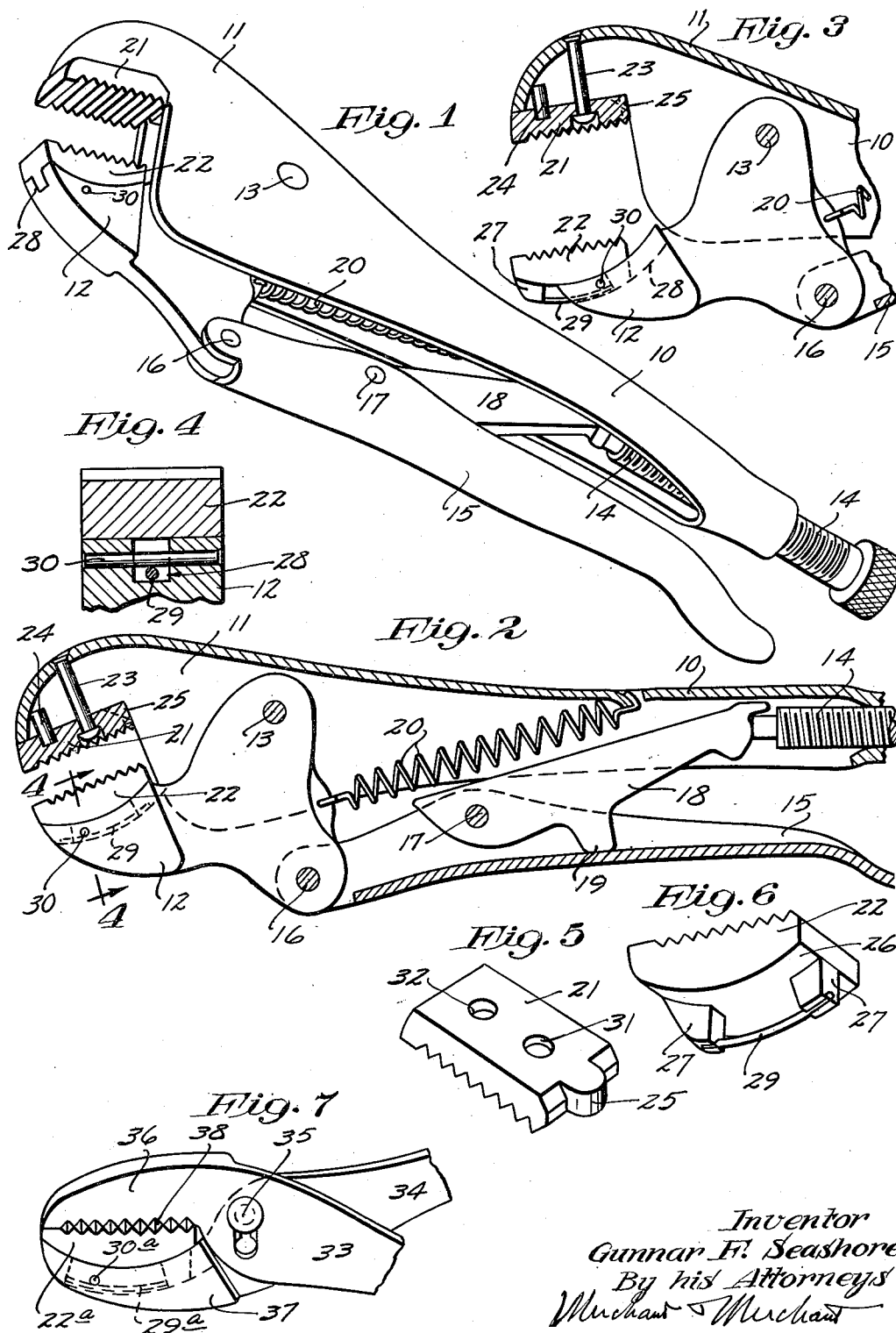
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PLIERS

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2,285,683

PLIERS

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1 Claim. (Cl. 81-179)

My present invention relates particularly to pliers of the type equipped with jaw plates, one of which is shiftable in respect to the other so that the plates will adapt themselves to the engaged surfaces of an object regardless of whether the engaged surfaces are parallel or flaring; and the invention is directed to an improved means for detachably applying the jaw plates to the co-operating jaws.

Generally stated, the invention consists of the novel devices, combinations of devices, and arrangement of parts hereinafter described and defined in the claim.

The invention is illustrated in the accompanying drawing wherein like characters indicate like parts throughout the several views.

Referring to the drawing:

Fig. 1 is a view in perspective showing my invention applied to the jaws of a pair of pliers of the type disclosed in Letters Patent No. 1,489,458 entitled "Wrench" granted to William Petersen of date April 8, 1924;

Fig. 2 is a side elevation, with some parts sectioned and some parts broken away, showing the same device that is illustrated in Fig. 1;

Fig. 3 is a fragmentary side elevation of the device shown in Figs. 1 and 2 with the jaws opened up;

Fig. 4 is a detail in section taken on the line 4-4 of Fig. 2;

Fig. 5 is a view in perspective showing the relatively fixed jaw plate of the device shown in Figs. 1 to 4, inclusive;

Fig. 6 is a view in perspective showing the relatively movable jaw plate of the structure illustrated in Figs. 1 to 4, inclusive; and

Fig. 7 is a view in side elevation, with parts broken away, showing the invention as applied to an ordinary pair of pliers consisting of two pivotally connected levers.

Describing first the structure illustrated in Figs. 1 to 6, inclusive, the numeral 10 indicates a lever involving a handle and a jaw 11. The body of the lever 10 is shown in the form of a folded or channel-shaped sheet metal structure but might take various forms. The numeral 12 indicates the fixed jaw which is pivotally connected to the jaw 11 at 13. An adjustable abutment screw 14 works through the internally threaded end of the lever 10. A second lever or handle 15, at one end, is pivotally connected to the flange of the jaw 12 at 16 and is intermediately pivoted at 17 to a thrust-acting link 18, the free end of which is subject to the inner end of the abutment screw 14. Link 18 has a lug 19

that is engaged by the inner intermediate portion of the handle 15. A coiled spring 20 is anchored to the handle 10 at one end and at its other end is anchored to the flange of jaw 12 between the pivots 13 and 16.

The peculiar action of pliers of the type just above outlined is well known to the trade and, except for the novel jaw plates hereinafter described, is not here claimed. Briefly, however, it may be stated that by adjustments of the abutment screw 14 the jaws can be set for proper gripping action on objects of different thickness; and that when this proper adjustment has been made and the gripping action produced moves the pivot 17 inward beyond a dead center, the jaws will be locked onto the gripped object and there held until handle 15 is forcibly moved away from handle 10, whereupon spring 20 will automatically complete the separation of the jaws.

In applying my invention to a pliers or wrench of the type just above discussed, I employ two jaw plates 21 and 22, both of which are preferably provided with serrated gripping faces. Jaw plate 21 is rigidly secured to the jaw 11 by means of a rivet 23 and a dowel pin 24. Plate 21 is preferably formed at one end with a projecting lug 25 that is seated in a notch or seat formed in the jaw 11. Dowel pin 24 is preferably anchored in jaw 11 and rivet 23 is passed through said plate 21 with its inner end countersunk into the plate below the serrated surface thereof.

The movable or self-adjustable jaw plate 22, on its bottom or seated surface 26, is made cylindrical to fit a correspondingly cylindrical surface formed on the jaw 12. The bottom surface of plate 22 is formed with spaced lugs 27 that work in a groove 28 formed in jaw 12 and depressed below the cylindrical surface of the latter. The extremities of the lugs 27 of jaw 22 are connected by a curved rod or segment 29, the ends of which are inserted in grooves formed in the extreme ends of said lugs and are there securely anchored, preferably by pounding or pressing together the extreme slotted ends of the said lugs. The curved rod or member 29 is spaced from the cylindrical surface 26 and works close to the bottom of the cylindrical surface of the jaw 12. By the simple expedient of a retaining pin or rivet 30 driven through holes in the grooved face of the jaw 12 just above the segmental or curved rod 29, the self-adjusting jaw plate 22 is held in working position. The lugs 27 closely fit the groove 28 and hold the jaw plate 22 against lateral movements but free for oscillating or self-adjusting movements.

In Fig. 5 the fixed jaw plate 21 is shown as provided with a rivet hole or passage 31 for the rivet 23 and with a dowel seat 32 for the end of the dowel 24.

Obviously, the means for adjustably applying the jaw plate 22 to the jaw 12 is extremely simple, highly efficient, and capable of being made and assembled at small cost.

With this arrangement it is evident that if the jaw plates are caused to grip a bar, plate, or the like, that has parallel surfaces, the movable jaw plate 22 will assume a position parallel to the relatively fixed jaw plate 21, but if the said jaws are clamped against diverging or flaring surfaces, they will adapt themselves to complete contact therewith, thereby giving in all cases a complete gripping action.

In Fig. 7 the pliers involve a pair of levers 33 and 34 pivotally connected at 35 and respectively having jaws 36 and 37. With this arrangement the serrated or gripping surface of the jaw 36 is formed directly thereon. The movable or self-adjusting jaw plate 22a, however, is shown as of the same structure illustrated in Fig. 6 and is applied to the jaw 37 by the same structure illustrated in the views first described; and

hence, corresponding elements of the connection between said jaw plate 22a and jaw 37 are indicated by the same characters used in the first described structure with the exponent "a" added thereto.

What I claim is:

A tool of the kind described involving pivotally connected jaws and handles for operating the same to produce clamping actions, one of said jaws having a concave surface, and a co-operating jaw plate having a convex surface engaged with the concave surface of said last noted jaw and therein mounted for oscillatory movements under clamping pressure, the concave surface of said last noted jaw having a depressed groove and said jaw plate having spaced lugs fitted to and working in said groove, a curved tie-rod rigidly connected to the ends of said lugs but spaced from said concave bearing surfaces, said curved tie-rod being of small cross section as compared with that of said groove, and a retaining pin extended through the walls of said jaw and through the space between said tie-rod and said engaged concave surfaces.

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