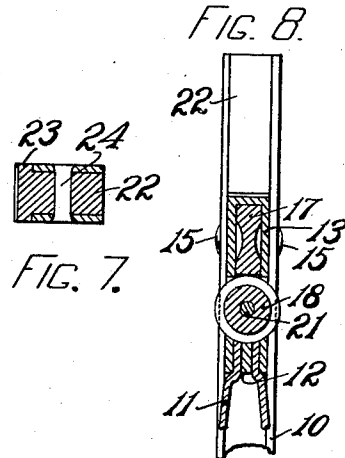
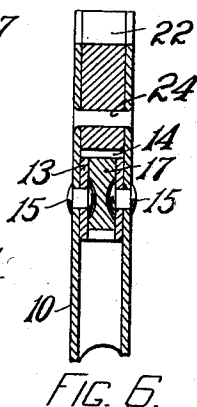
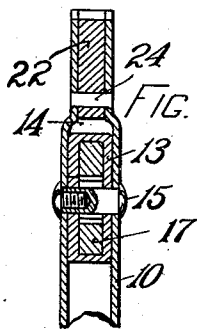
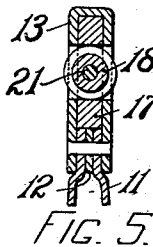
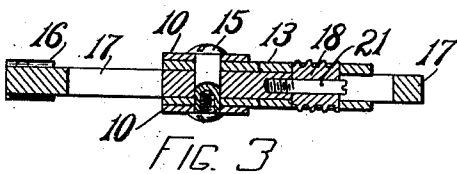
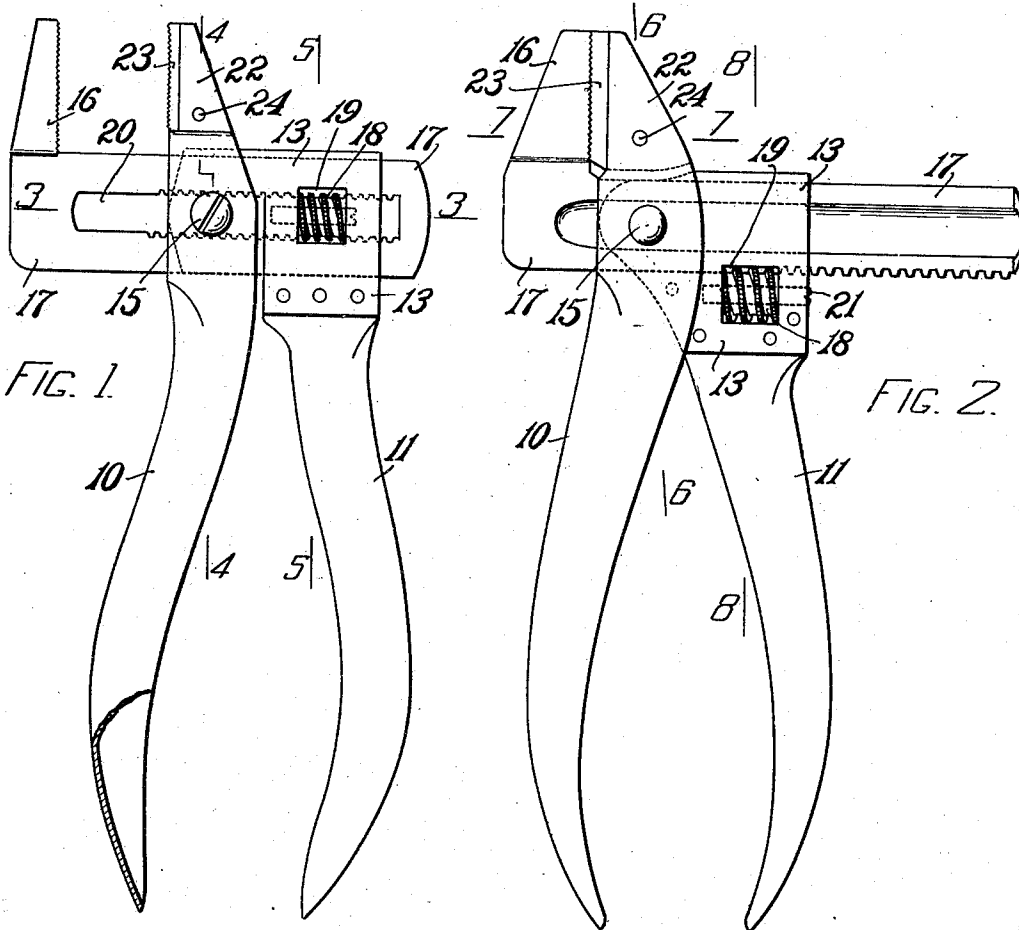


L. S. STARRETT.
EXPANSION PLIERS.
APPLICATION FILED MAR. 27, 1909.

980,361.

Patented Jan. 3, 1911.



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EXPANSION-PLIERS.

980,361.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed March 27, 1909. Serial No. 486,273.

To all whom it may concern:

Be it known that I, LAROCY S. STARRETT, of Athol, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Expansion-Pliers, of which the following is a specification.

This invention provides a powerful expansion pliers and wrench having pivoted handles, gripping jaws adjustable to wide variations in distance, with their faces parallel or inclined to each other, speedy adjustment being effected preferably by a male or peripherally threaded screw having a rotary movement only and engaging the teeth of a rack-bar or arm having a sliding movement, bodily, through a handle head which entirely surrounds said arm.

The principal parts may be drop-forged if desired, but in the preferred construction herein illustrated, the handles are of pressed steel shaped to the desired form, and one of them has, secured to it, a hollow, loop-like head or guide portion, of like material, part of which extends into a recess through the other handle to receive the connecting pivot. One of the jaws is formed at the tip of this recessed handle, the other being integral with a transverse rack-arm reciprocating through said head and recess.

In the drawing forming part of this specification, Figure 1 is a side view of one form of my improved tool. Fig. 2 shows another form, which I consider preferable, as it has a wider range of adjustment and other advantages. Figs. 3, 4 and 5 are sectional details, taken respectively on the lines 3—3, 4—4 and 5—5 of Fig. 1. Figs. 6, 7 and 8 are like sections on the corresponding lines of Fig. 2, only jaw 22 being shown in Fig. 7.

The handles 10 and 11, as here shown, are externally convex and otherwise shaped to fit the hand. Handle 11, at its upper end, has its side walls flattened together or collapsed on a flat, interposed piece of metal 12, see Figs. 5 and 8. Upon this flattened end portion the hollow head 13 is secured by riveting or otherwise, part of it being prolonged and extending edgewise into a recess 14 in handle 10, see Fig. 4. Pivot 15, through this extension and the recessed walls of handle 10, unites the parts for operation.

Gripping jaw 16 is preferably formed integral with the transverse rack-arm 17

which passes through recess 14 in handle 10, see Figs. 4 and 6, and has a sliding movement through the broad hollow head 13, said arm having an edgewise bearing the full width of such head and an equally substantial support therein whatever the distance between the jaws may be. This movement is effected, to adjust the distance of the jaws, by means of the peripherally threaded milled screw 18 engaging the teeth of rack-arm 17 and held, for rotation only, in a recess 19 in said head, see Fig. 2. The rack teeth may be formed in each edge of a lengthwise slot 20, as in Fig. 1, pivot 15 passing through such slot and arm. In the former case there are or may be two short pivots each uniting one wall of handle 10 to the adjacent wall of head 13, the pivot tips being upset and adapted to traverse shallow concave grooves in the sides of said arm, see Figs. 2 and 6.

In Figs. 2 and 8 the hollow screw 18 rotates about the stem of a screw 21 which is threaded at the tip into the flattened portion of handle 11 and the interposed plate 12. In Figs. 1 and 3 the center of rotation is the cylindrical portion of a corresponding screw, threaded into a thicker piece of metal through which pivot 15 passes. With this hollow or shell-like, pressed-steel construction, I form the jaw 22 at the tip or handle 10, by welding or riveting between the side walls, a similarly tapering steel piece, the working face of which has marginal flanges 23 flush with the outer sides of the handle, see Fig. 7. The drawings show a rivet 24 to unite the parts. The working faces of both jaws are preferably somewhat roughened to improve their grip. These pliers are of large scope and great utility. The form shown in Fig. 2 is simpler and has the greater compass, and the parts are more readily assembled than those of Fig. 1. In either form the hinged jaw, having a short fulcrum, will hold with a powerful grip at the desired angle, making the tool a very effective pipe wrench.

The new tool, combining the valuable features of pivoted handles, a hollow head, and separating or closing sliding jaws, one having an arm inclosed by such head and actuated by means of the knurled screw, to adjust the jaws to fit a straight or taper piece of moderate size, while the grip handles are moved together and retained in the right

position to grip by the hand, is a great improvement that will be appreciated by all who have use for such a tool.

What I therefore claim and desire to secure by Letters Patent is:—

1. In adjustable jaw pliers, two gripping handles, one being rigidly secured to a hollow, loop-like head and the other pivoted to and recessed to receive part of said head and having, above such recess, a terminal jaw, in combination with a sliding jaw perpendicular to and formed integral with a rack-bar movable through such recess and hollow head, and means for reciprocating said bar and its jaw.

2. An adjustable jaw plier, comprising a pair of handles, a head on one handle, a jaw on the end of the other handle, said second handle being pivoted to said head, a second jaw, an arm on said jaw and passing through said head substantially at the point of said pivot and means for moving said arm to adjust the jaws.

3. In a pliers and wrench, two pivoted handles, one having a broad loop-like hollow head flattened and extended into a recess through the other handle to receive the pivot which unites them, such recessed handle having one of the gripping jaws formed at its tip portion, in combination with a gripping jaw having an elongated transverse rack-arm reciprocating through said recess in an edgewise bearing in such hollow head and means for actuating said arm and jaw.

4. In a pliers and wrench, two gripping jaws, one having an integral arm at right angles to the jaw face and formed with a rack for reciprocating it and the other having an integral handle recessed for passage of the rack arm, in combination with the

opposite handle having a loop-like head or body portion to which the first handle is pivoted, such head loosely surrounding said rack-arm, and a peripherally threaded screw mounted in a recess in said head to actuate the rack-arm and its jaw.

5. An adjustable jaw plier, comprising a pair of handles, a head on one handle, a jaw on the end of the other handle, said second handle being pivoted to said head, a second jaw, an arm on said jaw and passing through said head substantially at the point of said pivot and means for moving said arm located in said head on the opposite side thereof from said movable jaw.

6. An adjustable jaw plier, comprising a pair of handles, a head on one handle, a jaw on the end of the other handle, said second handle being pivoted to said head, a second jaw, a rack arm on said jaw and passing through said head substantially at the point of said pivot and a screw for moving said rack arm located in said head on the opposite side thereof from said movable jaw.

7. An adjustable jaw plier, comprising a pair of handles, a head on one handle, a jaw on the end of the other handle, said second handle being pivoted to said head, a second jaw, a grooved rack arm on said jaw and passing through said head substantially at the point of said pivot and means for moving said rack arm located in said head on the opposite side thereof from said movable jaw.

In testimony whereof I have affixed my signature, in presence of two witnesses.

LAROY S. STARRETT.

Witnesses:

FLORENCE E. BOYCE,
FRANK E. WING.