Dec. 18, 1951 A. R. RALSTON 2,579,272

JAW ACTUATING MEANS FOR TOOLS

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Fig. 1.

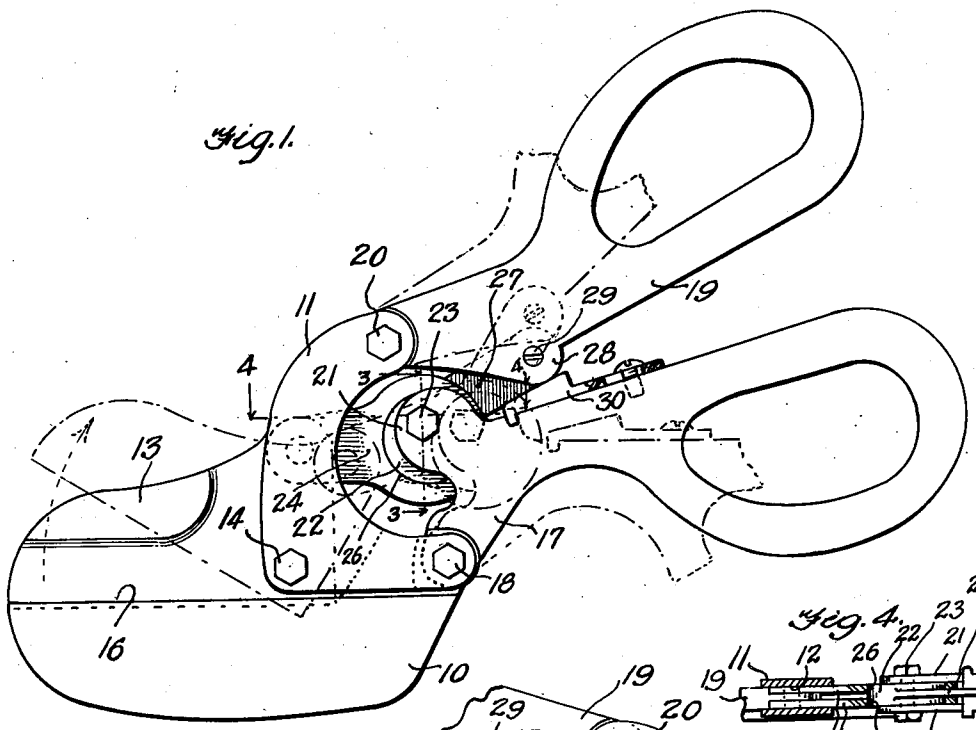


Fig. 4.

Fig. 2.

Fig. 3.

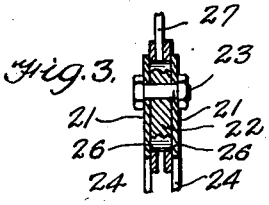


Fig. 5.

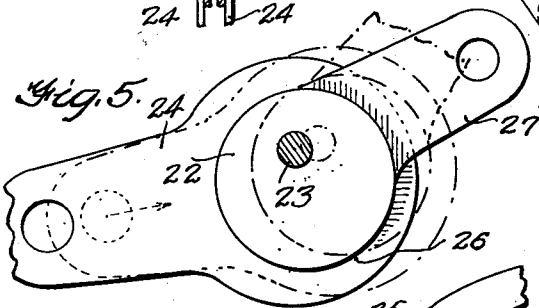
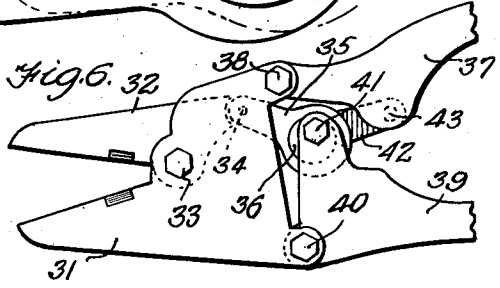


Fig. 6.



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JAW ACTUATING MEANS FOR TOOLS

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4 Claims. (Cl. 74—1)

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This invention relates to a jaw actuating means for metal shears, pliers, and the like, and has for one of its objects the production of a simple and efficient means for actuating the jaws of a tool in a manner to apply maximum pressure upon the jaws and to facilitate quick and efficient release of the jaws.

A further object of this invention is the production of a simple and efficient eccentrically mounted actuating disc which is carried by one handle and is bodily moved in one direction and is also rotated by means of movement of the other handle when the handles are opened to open the jaws of the tool, the closing of the handles reversing this movement to close the jaws.

Other objects and advantages of the present invention will appear throughout the following specification and claims.

In the drawing—

Figure 1 is a side elevational view of a tool in the nature of a pair of metal shears, showing the actuating mechanism applied thereto;

Figure 2 is a side elevational view of the reverse side of the blade or jaw portion of the tool shown in Figure 1, the bifurcated portion which connects the upper handle to the lower jaw being broken away to show the connection of the upper jaw with the operating eccentric linkage;

Figure 3 is a fragmentary vertical sectional view taken on line 3—3 of Figure 1;

Figure 4 is a fragmentary longitudinal sectional view taken on line 4—4 of Figure 1;

Figure 5 is an enlarged fragmentary side elevational view of the actuating eccentric and connecting link, the pivot bolt being shown in section;

Figure 6 is a side elevational view of a modified form showing the actuating link leverage means applied to a tool of a pliers type.

By referring to the drawing, it will be seen that 10 designates the lower jaw or blade of the tool which is provided near its rear end with an upstanding bifurcated portion 11 defining a socket 12. An upper jaw or blade 13 is pivotally secured within the lower end of the socket 12 by means of a suitable pivot bolt or pin 14. In the form shown in Figures 1 and 2 the upper jaw 13 is provided with a cutting edge 15 and the lower jaw is provided with a cutting or shearing edge 16.

An actuating handle 17 is pivotally secured to the rear end of the lower jaw 10 by means of a pivot bolt or pin 18. A companion actuating handle 19 is pivoted within the upper end of the

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bifurcated portion 11 of the jaw 10 by means of a pivot bolt or pin 20. The handle 17 is provided with a pair of spaced forwardly and upwardly protruding circular extensions 21. A disc 22 is eccentrically pivoted between the extensions 21 upon a journal bolt or pin 23, thereby defining an actuating eccentric.

A pair of jaw actuating links 24 are pivotally connected at their forward ends to the upper end of the upper jaw 13 by means of a pivot bolt or pin 25, and the actuating eccentric or disc 22 is journalled in matching or transversely aligned apertures 26 in the rear portions of the links 24. The eccentric or disc 22 carries an integral arm 27 which is pivotally connected at its rear end to the portion 28 of the handle 19 by means of a pivot pin 29, rearwardly of the pivot bolt 20.

A stop wedge 30 is slidably and adjustably mounted upon the handle 17 adjacent the handle 19 for abutting engagement with the portion 28 of the handle 19 and arm 27 to limit the closing of the handles toward each other.

It should be noted that as the handles 17 and 19 are moved apart or opened, the downward swing of the handle 17 will move the pivot pin 23 bodily moving the eccentric 22 rearwardly as shown in dotted lines in Figure 1. The upward swing of the handle 19 at the same time will swing the arm 27 upwardly thereby rotating the eccentric disc 22 to pull the links 24 rearwardly and to thereby open the upper jaw relative to the lower jaw of the tool. By means of this structure, a double or two-fold movement is obtained, first the rearward bodily movement of the pivot bolt 23 rearwardly, and second the rotary movement of the eccentric disc 22. A maximum rearward pull upon the links 24 to swing the jaw 13 is obtained within a minimum amount of space and a positive and forcible leverage action is thereby produced.

As is shown in Figure 6, the same leverage may be employed in connection with a pair of pliers, as that shown in Figures 1 and 2, wherein a pair of shears is shown. In Figure 6, the numeral 31 designates one jaw of a pair of pliers, and a companion jaw 32 is pivotally connected thereto by a pivot bolt 33. The jaw 32 is pivotally connected at its rear end at 34 to a link means 35, which is in turn engaged by means of an eccentric disc 36 similar to the disc 22 referred to in Figures 1 and 2. One handle 37 is pivotally connected by a pivot bolt or pin 38 to the top of the jaw 31, and a companion handle 39 is pivotally connected to the bottom of the jaw 31, by a pivot bolt 40. The handle 39 is

in turn pivotally connected to the disc **36** by means of an eccentrically mounted journal bolt or pin **41** similar to the bolt **23** shown in Figures 1 and 2. An arm **42** is formed integral with the disc **36** and is pivotally connected to the handle **37** by means of a pivot pin **43**. The operation of the above described leverage is the same as that described with respect to Figures 1 and 2.

It should be understood that the leverage herein described may be employed in any tool of the general type illustrated within the spirit of the invention, whether the tool be a pair of shears or pliers, and it should be further understood that certain detail changes in the mechanical structure and arrangement of parts may be employed without departing from the spirit of the invention, so long as such changes fall within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A tool comprising a primary jaw and a companion jaw, means pivotally connecting the jaws, a handle pivotally connected to the primary jaw and a companion handle also connected to the primary jaw in spaced relation to the pivot connection of the first mentioned handle, a link connection connecting the companion jaw with the first mentioned handle, said link connection including an eccentric member pivotally secured to the first mentioned handle, and a rigid arm carried by said eccentric member and pivotally connected to said companion handle to move the jaws toward and away from each other as the handles are opened and closed.

2. A tool comprising a primary jaw and a companion jaw, means pivotally connecting the jaws, a handle pivotally connected to the primary jaw and a companion handle also connected to the primary jaw in spaced relation to the pivot connection of the first mentioned handle, a link connection connecting the companion jaw with the first mentioned handle, said link connection including an eccentric disc pivotally secured to the first mentioned handle in inwardly spaced relation with respect to the pivot connection of the first mentioned handle and the primary jaw, and a rigid arm carried by said eccentric disc and pivotally connected to said companion handle to move the jaws toward and away from each other as the handles are opened and closed.

3. A tool comprising a primary jaw and a companion jaw, means pivotaly connecting the jaws, a handle pivotally connected to the primary jaw and a companion handle also connected to the primary jaw in spaced relation to the pivot connection of the first mentioned handle, a link connection connecting the companion jaw with the first mentioned handle, said link connection including an eccentric disc pivotally secured to the first mentioned handle in inwardly spaced relation with respect to the pivot connection of the first mentioned handle and the primary jaw, a rigid arm carried by said eccentric disc and pivotally connected to said companion handle to move the jaws toward and away from each other as the handles are opened and closed, and the eccentric disc being bodily movable toward the handles and also being rotatable toward the handles as the handles are opened to provide a two-fold leverage action to open said jaws.

4. A tool comprising a primary jaw and a companion jaw, means pivotally connecting the jaws, a handle pivotally connected to the primary jaw and a companion handle also connected to the primary jaw in spaced relation to the pivot connection of the first mentioned handle, a link connection connecting the companion jaw with the first mentioned handle, said link connection including an eccentric member pivotally secured to the first mentioned handle, a rigid arm carried by said eccentric member and pivotally connected to said companion handle to move the jaws toward and away from each other as the handles are opened and closed, and a longitudinally adjustable stop wedge carried by one handle and engageable by the companion handle to adjustably limit the closing of the handles relative to each other.

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No references cited.