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E. D. BALL

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TOGGLE ACTUATED TOOL AND RELEASE THEREFOR

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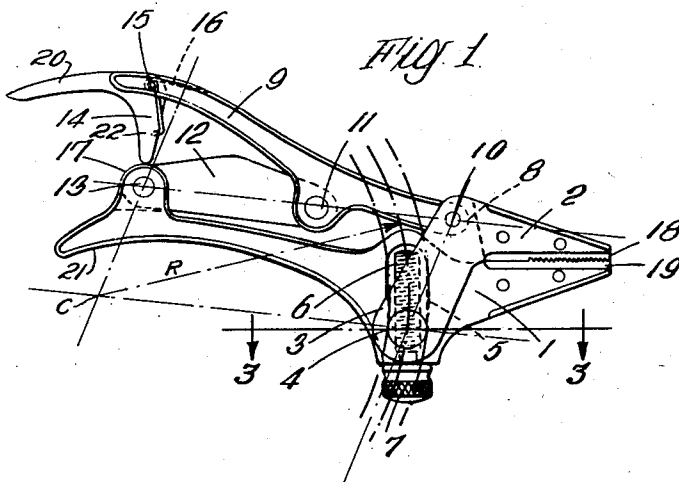


FIG. 2.

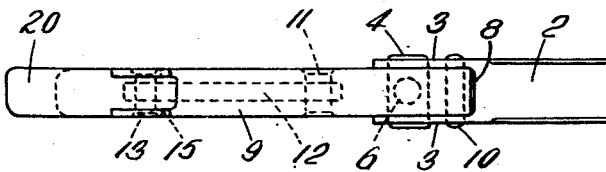
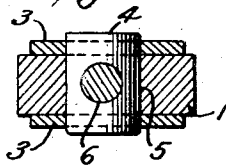


FIG. 3.



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TOGGLE ACTUATED TOOL AND RELEASE THEREFOR

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3 Claims. (Cl. 81-84)

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This invention relates to toggle actuated appliances suitable for use, for example, as welding clips, pliers, punches, cutters, embossing tools or hand vices.

One of the objects of the present invention is to provide a toggle actuated appliance of which the jaws are relatively adjustable whilst still being capable of engaging with a work piece or the like located between them with substantially parallel surfaces.

According to the present invention a toggle actuated appliance is provided with a pivoted jaw and a stationary jaw connected together by a hinge pin, an actuating member being hingedly engaged at one end with the pivoted jaw, whilst a link connects the actuating member to the stationary jaw, the hinge pin of the pivoted jaw is adjustably mounted in the stationary jaw so that the jaws can be set in a substantially parallel relationship for various sizes of work. The hinge pin preferably engages with a curved slot in the stationary jaw, the position of the hinge pin being adjusted by an adjusting screw which is passed through the hinge pin and engages with the stationary jaw.

The invention will now be described by way of example with reference to the accompanying drawing, wherein:

Figure 1 shows a side view of a toggle actuated appliance;

Figure 2 shows a plan of Figure 1; and

Figure 3 is a cross-sectional view taken on line 3-3 of Figure 1.

As shown in the drawing a toggle actuated appliance is provided with a pair of jaws 1, 2 of which the jaw 2 is substantially of L-shape. One limb 3 of the L-shaped jaw 2 is bifurcated and straddles the sides of the jaw 1, the free ends of the limb 3 being engaged with a hinge pin 4 mounted in the jaw 1.

The hinge pin 4 engages with a curved slot 5 in the jaw 1. Through the hinge pin 4 passes an adjusting screw 6 which enters the bottom of the jaw 1 in which it is free to turn. The screw 6 engages with a screw-threaded hole in the hinge pin 4 and at its outer end it is provided with a suitably shaped head 7 for its manipulation. For this purpose the head 7 may be milled or knurled.

In the angle formed by the two limbs of the L-shaped jaw 2 is provided a recess 8 for receiving the rounded end of an actuating member 9, which is preferably held in the recess 8 by a hinge pin 10 passing therethrough and through the L-shaped jaw 2.

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To a point 11 intermediate the ends of the actuating member 9 is hinged one end of a link 12 of which the other end is hinged at 13 to the free end of the jaw 1.

The hinge points 10, 11, 13 are preferably so located and the slots 5 in the sides of the jaw 1 are preferably so curved that when the jaws 1, 2 are adjacent the operative position the jaw faces are substantially parallel to each other and remain in this relationship, whilst the actuating member 9 passes the dead centre position so as to lock the appliance in the operative position.

By means of the arrangement as above described, the jaws 1, 2 are always substantially parallel to one another in all positions of adjustment when in the operative position.

The appliance is moved into the operative position by pressing the actuating member 9, near its free end, and the jaw 1 towards one another in the same manner as when closing a pair of pliers. For releasing the appliance a substantially L-shaped member 14 is pivoted at 15 in the end of the actuating member 9, whilst a spring 16 acting on the part 22 of the member 14 in a clockwise direction holds the latter in such a position that one limb 20 of the member 14 forms a continuation of the actuating member 9, whilst the other limb 22 engages with a hump 17 on the jaw 1 when the toggle mechanism is just over the dead centre position. When the projecting limb 20 of the member 14 and the end 21 of the jaw 1 are gripped and thus forced towards one another, the other limb 22 of the member 14 moves over the hump 17, in a counter-clockwise direction, so as to allow the toggle links to pass considerably beyond the dead centre position so as to open the jaws, whereby a work piece between the jaws is released and the appliance can be removed. The appliance can then be opened easily when the limb 22 of the member 14 passes in a clockwise direction, over the hump 17, and the appliance is ready for a further operation.

As will be readily appreciated from the foregoing description, the pressure of the toggle mechanism formed by the link 12 and actuating member 9, is applied directly to the L-shaped jaw 2.

The jaws have flat engaging surfaces which, in the operative position of the jaws, are parallel to each other.

The jaws of the appliance may be made of any suitable width, according to the operation to be performed thereby.

By the provision of the means as above de-

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scribed, for adjusting the jaws 1, 2, relatively to one another, a wide range of parallel adjustment of the jaws can be obtained.

The actual jaws 18, 19 are preferably interchangeable and for this purpose may be of T-shape and are secured removably in the L-shaped member 2 and in the jaw member 1.

What I claim is:

1. A toggle actuated appliance comprising a pair of jaws, one of said jaws being L-shaped and having one of its limbs bifurcated, said bifurcated end straddling the other of said jaws, said other jaw having a slot therein, a hinge pin mounted in said slot, the ends of said bifurcated limb being secured to said hinge pin, an actuating member hingedly engaging at one end thereof the L-shaped jaw at the junction point of the two limbs of said L-shaped jaw, a link connected at its opposite ends to a point intermediate the ends of said actuating member and to the other said jaw, and an adjusting screw engaging with said other jaw and said hinge pin.

2. A toggle actuated appliance according to claim 1, including an L-shaped member pivoted at its apex to the end of the actuating member remote from the first jaw, a spring operatively associated with said L-shaped member, a hump on said second jaw, said hump being engaged by the second limb of said L-shaped member when the toggle mechanism is just beyond its dead center position, the first limb of the L-shaped member and the free end of said other jaw when gripped and moved towards one another causing the toggle mechanism to move a greater distance beyond the dead center position so as to open the jaws.

3. A toggle actuated appliance comprising a first jaw, an extension member on said jaw, a hump at the other end of said member, said jaw having a curved slot therein, a pivot pin engaging

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said slot, an adjusting screw engaging said jaw, said adjusting screw screwing through said pivot pin, an L-shaped jaw, one limb of said L-shaped jaw being bifurcated, said bifurcated end straddling said first jaw and near its ends engaging said pivot pin, a hinge pin at the junction point of the two limbs of the L-shaped jaw, an actuating member hinged at one end to said hinge pin, said L-shaped jaw having a recess therein adjacent the hinge pin therein, said recess being engaged by the end of the actuating member, a link hinged at one end to a point intermediate the ends of the actuating member and at the other end to the hump, an L-shaped member hinged at the junction of its two limbs to the end of the actuating member remote from the L-shaped jaw, and a spring operatively associated with said L-shaped member, said extension member having a portion thereof extending beyond said hump.

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