Jan. 18, 1944. H. H. HELBUSH 2,339,397

CLAMP APPLYING TOOL

Filed Sept. 22, 1941

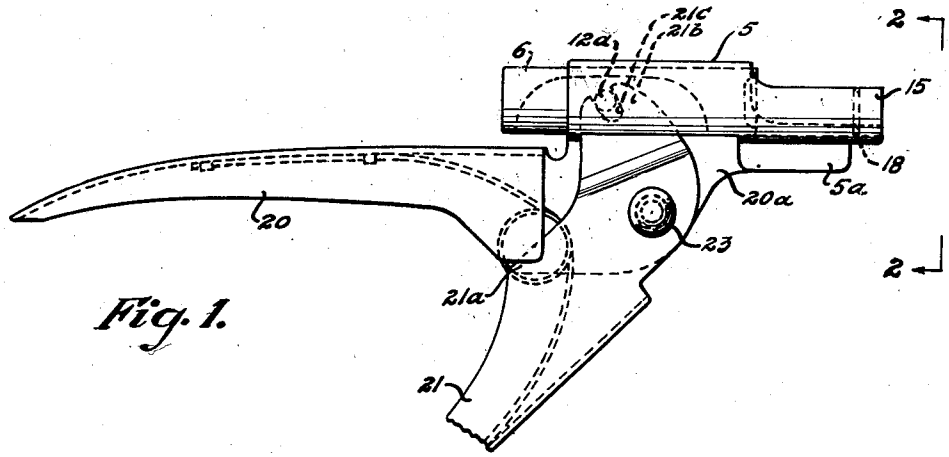

Fig. 1.

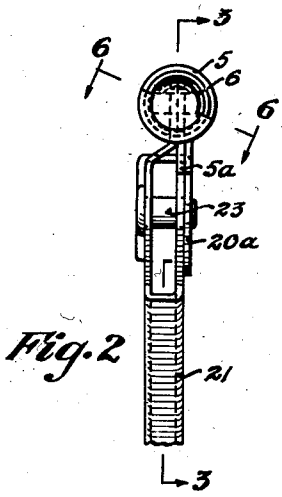

Fig. 2.

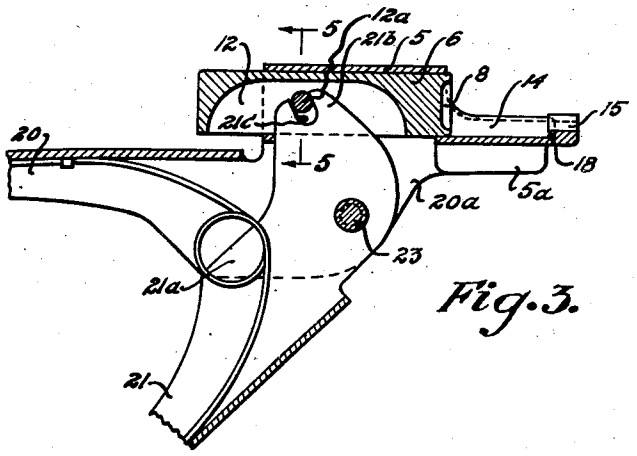

Fig. 3.

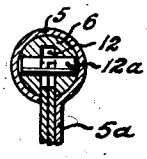

Fig. 5.

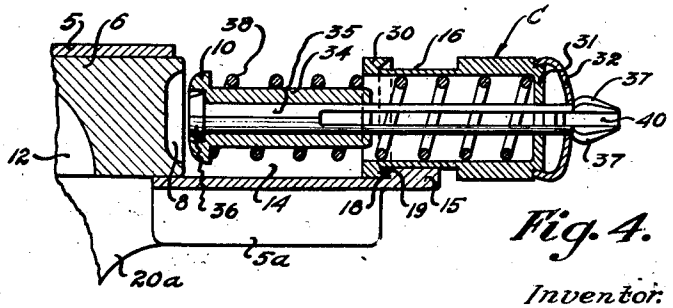

Fig. 4.

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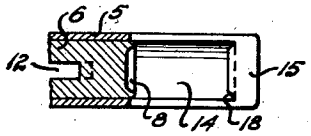

Fig. 6.

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CLAMP APPLYING TOOL

Herman H. Helbush, Los Angeles, Calif.

Application September 22, 1941, Serial No. 411,879

1 Claim. (Cl. 29—84)

This invention relates to devices for applying clamps and the like; and, more particularly, it has to do with applying tools for applying and removing clamp devices commonly employed for holding together in superposed relation perforated sheets for riveting purposes.

Such clamps usually have spring pressed retaining pins adapted to be inserted in aligned perforations in the superposed sheets. The springs used for this purpose are relatively strong and the applying tool must be capable of compressing the spring. Since the applying tool must be operated and manipulated by manual effort, it is important that the tool be of a construction minimizing this effort. The applying tools now being used are of the pliers type having one bifuracted jaw to hold the clamp and another jaw to compress the spring. The arched path followed by such jaws in moving towards each other, however, renders it difficult or impossible to operate them to apply pressure to the spring and retaining pin in a straight line coaxial with those members, thus rendering the device difficult of operation, causing injury to the clamp and often resulting in the clamp flying out of the jaws and injuring a worker.

I have found that the ideal device for the purpose is one which utilizes a plunger moving against the spring pressed retaining pin in a straight line coaxial with the pin and spring, and in a copending application Serial Number 408,100, filed August 23, 1941, there is shown a plunger type clamp applying tool, in which the plunger is operated by a trigger and link mechanism in a pistol-shaped device. This present application is by way of improvements upon that type of device.

An object of this invention is to utilize a plunger movement in conjunction with a pincers type actuating mechanism, thus materially reducing the cost of manufacture, providing a relatively light and durable structure and reducing to a minimum the manual effort required for operation.

Another important object is to provide a clamp applying tool which is particularly adaptable for applying clamps in corners and in overhead places which would otherwise require a cramped position of the user's hand to use the device.

My invention has still further objects and produces still further advantages, and how those, as well as the foregoing, are attained will be made clear by the following detailed description of one preferred form in which the invention may be carried out. For this purpose I shall refer to the accompanying drawing, in which:

Fig. 1 is a side elevation;

Fig. 2 is an end view on line 2—2 of Fig. 1;

Fig. 3 is a section on line 3—3 of Fig. 2;

Fig. 4 is an enlarged fragmentary section showing a clamp mounted in the applying tool;

Fig. 5 is a section on line 5—5 of Fig. 3; and

Fig. 6 is a fragmentary section on line 6—6 of Fig. 2.

Referring now to the drawing, I show at 5 a cylinder in which a plunger 6 slidably fits. The outer end of the plunger is provided with a recess 8 to receive the headed end of the sleeve and spring pressed retaining pin of a clamp C (see Fig. 4) and the under side of the plunger is recessed at 12 to receive the actuating jaw to be later described.

The cylinder terminates in a half round cradle portion 14 having an end portion 15 of reduced inner diameter to fit into the annular groove 16 of the clamp and to provide an inner shoulder undercut at 18. This undercut 18 is provided to receive an oppositely disposed portion 19 of a clamp in the manner more particularly described and claimed in copending application Serial Number 408,100, filed August 23, 1941.

For operating the plunger, I provide channelled arms 20, 21 pivoted together adjacent their upper ends by pin 23. Arm 20 has an extension 20a which is welded or otherwise secured to the cylinder 5 and to the downwardly projecting portion 5a of the cylinder. Arm 21 slidably fits at 21a in the channel of arm 20 as a guideway and has a bifurcated jaw 21b which fits in recess 12 of the plunger to slide the plunger by means of the side walls of the slot 21c engaging the cross pin 12a in the recess 12. As shown in Fig. 4, cradle 14 opens obliquely to the plane of movement of the arms 20, 21 or somewhat to the side, to facilitate inserting and removing the clamp C.

The clamp C which I have illustrated merely to facilitate explanation of the present invention consists of a cylindric housing 30 having an end wall 31 provided with a central hole, and an end cap 32 likewise provided with a central hole. A sleeve 34 is mounted to move longitudinally in the housing and rotatably carries a split retaining pin 35 which has parallel legs slidable through the holes in the end wall 31 and cap 32 for insertion in aligned perforations in superposed sheets. Pin 35 has a head 36 at its inner end which fits in the recess provided in the head 10 of the sleeve 34 and has enlarged portions 37 on the outer ends of the parallel legs. A coil spring 38 is dis-

posed longitudinally of the pin and sleeve, seating at its inner end against housing wall 31 and at its opposite end against head 10 of the sleeve. A T-shaped spreader 40 has its cross-arm rotatably housed between wall 31 and cap 32, extending transversely between the legs of the retaining pin, the central arm projecting outwardly through the hole in the cap, between the legs.

In operation, clamp C is placed in cradle 14, with head 10 towards the plunger. As arms 20, 21 are compressed together, jaw 21b slides plunger 6 to the right in Figs. 1, 3 and 4 to compress spring 38 and slide the retaining pin legs outwardly of the housing.

While I have resorted to considerable detail in explaining this specific adaptation of my invention, I wish it understood that, in its broader aspects as defined by the appended claim, the invention is subject to various modifications.

I claim:

A clamp applying tool comprising a tubular housing, a plunger slidably mounted in the housing, an arm secured at one end to the housing and a second arm pivotally connected to the first-mentioned arm, said arms being capable of pincer-like movement with respect to each other, and a semi-circular clamp holding cradle carried by the housing in the path of movement of the plunger, said cradle opening obliquely to the plane of movement of the arms with respect to each other.

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