April 10, 1945. E. L. LIPP 2,373,193

SKIN CLAMP-APPLYING TOOL

Filed June 11, 1943 2 Sheets-Sheet 1

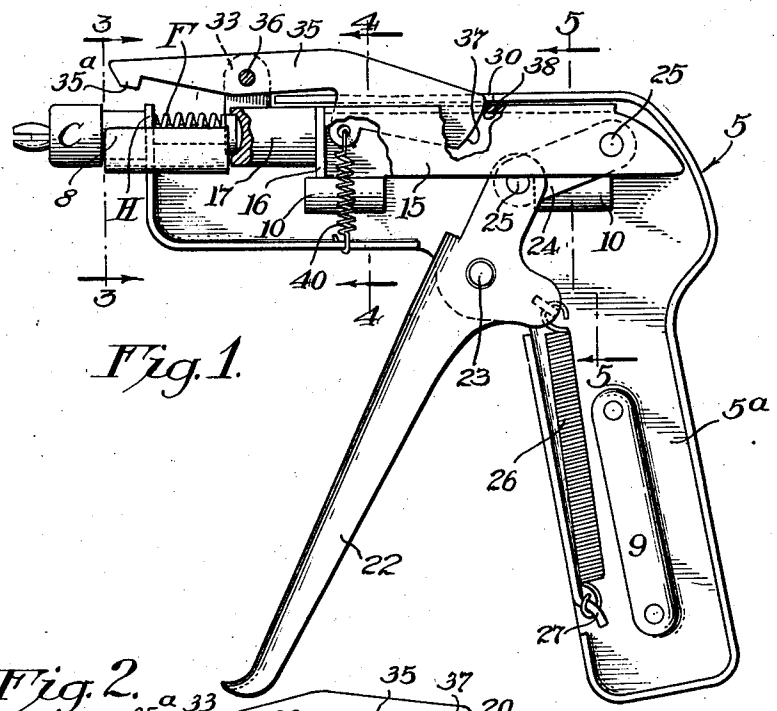


Fig. 1.

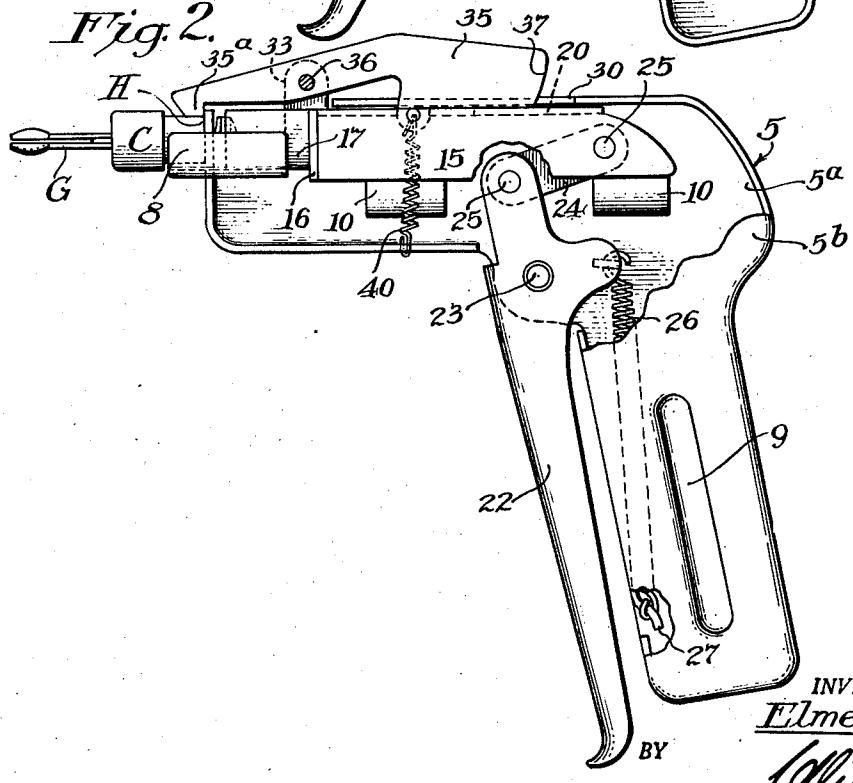


Fig. 2.

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Fig. 3.

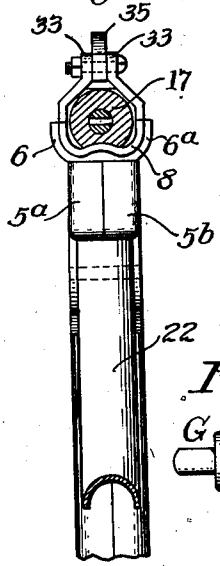


Fig. 4.

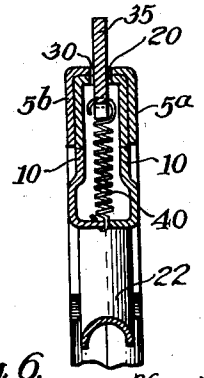


Fig. 5.

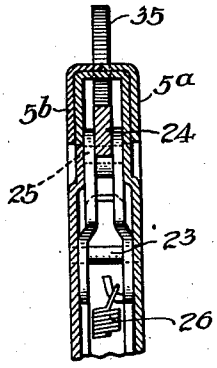


Fig. 6.

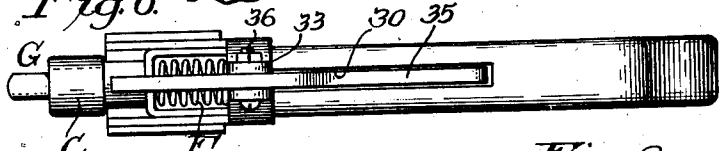


Fig. 7.

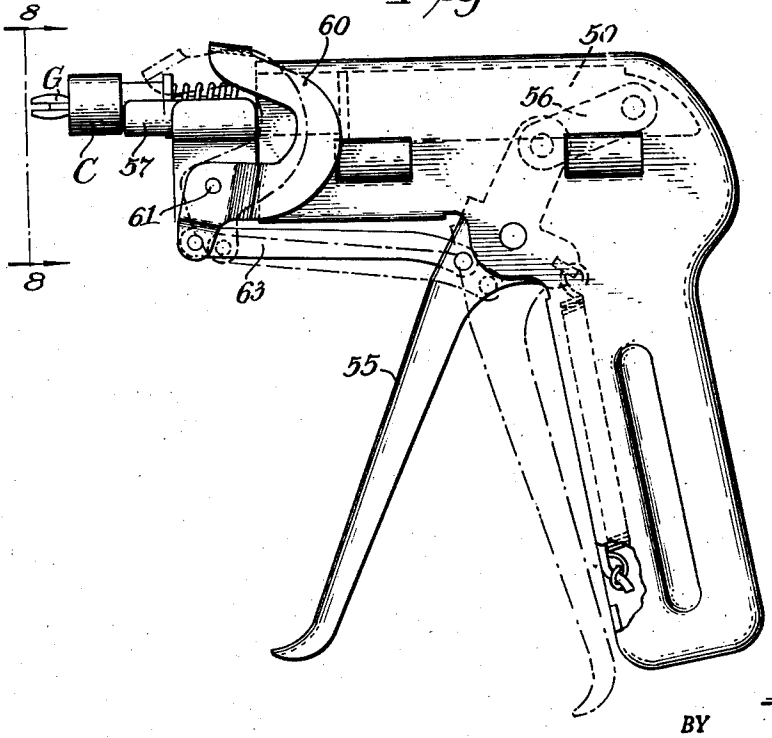
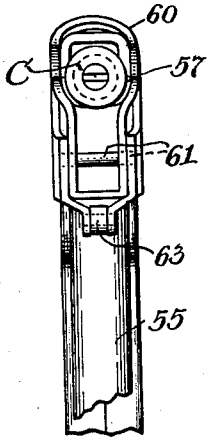


Fig. 8.



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Patented Apr. 10, 1945

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UNITED STATES PATENT OFFICE

2,373,193

SKIN CLAMP-APPLYING TOOL

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Application June 11, 1943, Serial No. 490,446

10 Claims. (Cl. 29—270)

My invention relates to tools for holding and compressing sheet metal clamps.

The metal clamp shown in United States Letters Patent No. 2,266,929 is typical of the skin clamps which this tool is adapted to hold and operate. Such clamps utilize a relatively strong spring normally urging the clamp fingers into retracted or clamping position, and to apply the clamp to the work, it must be held in a tool, which tool also compresses the clamp spring to protract the work-engaging fingers. It is a well-known fact that the use of these clamp-applying tools has constituted a considerable hazard in that as the pressure is applied to compress the clamp spring, the clamp is apt to fly out of the tool with considerable force and injure the user or nearby workmen unless the clamp is meticulously centered in the tool.

It is, therefore, among the primary aims of the present invention to provide a clamp-applying tool which overcomes those difficulties by providing a swingable jaw operable to automatically engage the clamp and hold it in the retaining cradle of the tool while the clamp spring is being compressed, and to automatically release the clamp when the spring is released.

My invention involves additional and subordinate advantages and how those as well as the primary objects hereinabove stated are achieved will be best understood from the following detailed explanation of presently preferred embodiments of the invention, for which purpose I shall refer to the accompanying drawings in which:

Fig. 1 is a side elevation with one of the side walls removed;

Fig. 2 is a view similar to Fig. 1 except that the tool is shown in clamp-retaining and operating position;

Figs. 3, 4 and 5 are views taken on lines 3—3, 4—4 and 5—5, respectively, of Fig. 1;

Fig. 6 is a top plan view;

Fig. 7 is a side elevation showing a variational form; and

Fig. 8 is a fragmentary end view taken on line 8—8 of Fig. 7.

Referring first to Figs. 1 to 6, inclusive, I show a pistol-shaped body 5 comprised of two companion side members 5a, 5b. The outer end of the barrel portion of each side member is upwardly and outwardly flared as shown at 6, 6a, (Fig. 3), to which flared portions a substantially semi-circular clamp-receiving cradle 8 is spot-welded or otherwise suitably secured. The companion body members are held together in opposed relation by the spot-welding of the cradle 8 to the portions 6, 6a and by spot-welding together the depressed portions 9 of the handle portion of the body. A track for the plunger to be described is provided by striking out of each side member and bending inwardly the ears 10.

A plunger 15 formed of channel iron is slidably mounted on the track provided by the ears 10, the plunger having an outer end wall 16 to which a clamp-engaging portion 17 is welded or otherwise suitably secured. The top wall of the plunger is longitudinally slotted at 20 for the purpose to be described.

A plunger-operating lever 22 is pivoted to the sides 5a, 5b by means of pin 23 about which it is fulcrummed, the upper end of the lever being operatively connected to the plunger by link 24 and pivot pins 25. A coil spring 26 secured at its lower end to an ear 27 struck out of the handle portion and secured at its upper end to the lever 22, normally urges the lever into the inoperative position shown in Fig. 1. Each of the companion side plates 5a, 5b is cut away along the top of the barrel portion, as shown at 30, to provide a slot registering with the slot 20 in the plunger. Each of the side plates 5a, 5b adjacent the outer end of the barrel portion is provided with an upright projection 33 between which a swingable lever or jaw member 35 is pivoted by pin 36.

The outer end of the jaw 35 has a depending portion 35a which is engageable against a clamp C behind the shoulder H conventionally provided on such a clamp, and the opposite end of the jaw is provided with a cam surface 37 which is engaged by a cam surface 38 provided by the end wall of the slot 20 in the top of the plunger. A coil spring 40 secured at one end to the lever and at its other end to the body normally urges the inner end of the lever downwardly into the slot 20, which is the inoperative position.

To operate the device a clamp C is placed in the cradle 8 and as the lever 22 is pressed towards the handle of the body, the plunger 15 slides to the left along the track provided by the ears 10 to compress the clamp spring F, the inner end of the clamp being engaged by the outer end 17 of the plunger. As the plunger is thus moved to the left, cam surface 38 engages the cam surface 37 of the lever and further movement of the plunger to the left causes the lever to move from the position of Fig. 1 to the position of Fig. 2 about pin 36 as a fulcrum, to engage the clamp and positively hold it against escaping upwardly from the open topped cradle. In Fig. 2 the

clamp is shown with its clamping fingers G protracted for insertion in work sheets. Release of the lever 22 permits the springs 26 and 40 to return parts to the inoperative position of Fig. 1, in which position the clamp is released from the cradle.

In the form of device shown in Figs. 7 and 8 the plunger 50 is operatively connected to the operating lever 55 by the link 56 in the manner before described and the clamp-receiving cradle 57 is mounted in the manner of cradle 8 previously described. Here, however, instead of the lever 35, I utilize a variational type of swingable jaw 60 which is somewhat U-shaped and fulcrumed by means of pivot pin 61 so as to swing between the full line position and the dot-dash line position of Fig. 7. A link 63 is pivotally connected at one end to the lower end of the jaw 60 and pivotally connected at its other end to the lever 55, so that when the the lever is moved to operate the plunger, the jaw 60 is swung into or out of engagement with a clamp C in the cradle 57.

While, in the foregoing, I have resorted to considerable detail of structure and association of parts in describing a particular example of my invention, I wish it to be understood that I have done so merely to make my invention understood and that I do not limit my invention to such details. On the contrary, my invention is only to be limited as appears in the appended claims.

I claim:

1. A clamp-operating tool comprising a pistol-shaped body having a handle portion and a barrel portion, an upwardly opening clamp-receiving cradle carried by the outer end of the barrel portion, a plunger longitudinally slidably mounted in the body for movement towards and away from the cradle, a lever-like jaw pivotally mounted between its ends atop the barrel portion of the body for swinging movement laterally of the cradle, and inter-engageable cam means on the lever and the plunger operable to swing the jaw by virtue of longitudinal movement of the plunger and means for sliding the plunger.

2. A clamp-operating tool comprising a pistol-shaped body having a handle portion and a barrel portion, an upwardly opening clamp-receiving cradle carried by the outer end of the barrel portion, a plunger longitudinally slidably mounted in the body for movement towards and away from the cradle, a longitudinal upwardly opening slot in the plunger, the end wall of said slot providing a cam surface, a lever-like jaw pivotally mounted between its ends atop the barrel portion of the body whereby its outer end is swingable into and out of lateral engagement with the clamp in the cradle and its inner end is swingable into and out of the slot in the plunger, and a cam surface on the inner end of the jaw, said last-named cam surface being engageable by the cam surface on the plunger upon movement of the plunger towards the cradle whereby to swing the outer end of the jaw towards the cradle.

3. A clamp-operating tool comprising a pistol-shaped body having a handle portion and a barrel portion, an upwardly opening clamp-receiving cradle carried by the outer end of the barrel portion, a plunger longitudinally slidably mounted in the barrel portion for movement towards and away from the cradle, a plunger-operating lever pivotally mounted on the handle portion and operatively connected to the plunger, a clamp-retaining jaw pivotally mounted on the body whereby its outer end may be swung into and out of lateral engagement with the clamp in the cradle, and link means operatively connecting the outer end of the jaw to the plunger-operating lever whereby movement of the lever causes swinging movement of the jaw.

4. A clamp-operating tool comprising a pistol-shaped body having a handle portion and a barrel portion, an upwardly opening clamp-receiving cradle carried by the outer end of the barrel portion, a plunger longitudinally slidably mounted in the barrel portion for movement towards and away from the cradle, a plunger-operating lever pivotally mounted in the handle portion and operatively connected to the plunger, a U-shaped clamp-retaining jaw pivotally mounted on the barrel portion whereby to be swingable into and out of lateral engagement with a clamp in the cradle, and link means operatively connecting the jaw to the plunger-operating lever.

5. A clamp-operating tool comprising a pistol-shaped body having a handle portion and a barrel portion, a laterally opening clamp-receiving cradle carried by the outer end of the barrel portion, a plunger slidably mounted in the body to move longitudinally relative to the cradle, means on the cradle end of the plunger for engaging and operating a clamp while it is held in said cradle, a clamp-retaining jaw, means carried by said body for pivotally mounting said jaw for swinging movement to and from the cradle for holding a clamp in said cradle, means operating the jaw in consonance with movement of the plunger, and means for operating the plunger.

6. A clamp-operating tool comprising a pistol-shaped body having a handle portion and a barrel portion, a laterally opening clamp-receiving cradle carried by the outer end of the barrel portion, a plunger slidably mounted in the body to move longitudinally relative to the cradle, means on the cradle end of the plunger for engaging and operating a clamp while it is held in said cradle, a clamp-receiving jaw, means carried by said body for pivotally mounting said jaw for swinging movement laterally of the cradle to hold a clamp in said cradle, inter-engaging cam means on the jaw and plunger, said cam means being operable to swing the jaw into position engaging a clamp in the cradle by virtue of movement of the plunger towards the cradle, and means for actuating said plunger.

7. A clamp-operating tool comprising a pistol-shaped body having a handle portion and a barrel portion, a laterally opening clamp-receiving cradle carried by the outer end of the barrel portion, a plunger slidably mounted in the body to move longitudinally relative to the cradle, means on the cradle end of the plunger for engaging and operating a clamp while it is held in said cradle, a clamp-retaining jaw, means carried by said body for pivotally mounting said jaw for swinging movement laterally of the cradle to hold a clamp in said cradle, inter-engaging cam means on the jaw and plunger, said cam means being operable to swing the jaw into position engaging a clamp in the cradle by virtue of movement of the plunger towards the cradle, spring means operable to move the jaw out of engagement with the clamp upon movement of the plunger away from the cradle, and means for actuating said plunger.

8. In a clamp-operating tool, the combination of a body having a pair of opposed jaws adapted to hold a clamp therebetween, means carried by the body for mounting one of the jaws for movement relative to the other, a clamp-operating

member movably carried by the body for movement to and from said jaws, means on the jaw side of said member for engaging and operating a clamp while it is held in said jaws, actuating means operatively connected with the clamp-operating member and the movable jaw, and means for actuating said clamp-operating member.

9. In a clamp-operating tool, the combination of a body having a pair of opposed jaws for receiving a clamp therebetween, means carried by the body for mounting one of the jaws for movement relative to the other whereby to releasably retain a clamp, a clamp-operating plunger slidably mounted in the body for movement into and out of the space between the jaws, means on the jaw end of the plunger for engaging and operating a clamp while it is held in said jaws, a lever, means carried by the body for pivotally mounting said lever, and means operatively associating the lever with the plunger and said movable jaw whereby operation of the lever causes simultaneous movement of the plunger and jaw.

10. A tool for applying clamps each having a shank and a movable operating element, the tool including a body having a barrel, a plunger shiftable in the barrel and adapted to engage and move the element of a clamp aligned therewith, jaw members for gripping the shank of a clamp, one of said members being pivotally secured to the forward portion of the barrel and movable between an open position and a closed position where it engages about the shank of the clamp aligned with the plunger, means carried by the body for moving the plunger toward and away from the forward end of the barrel to move said element of the clamp and then retract therefrom and means for pivoting the member between its said two positions simultaneously with said movement of the plunger.

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