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M. LEVENDUSKY

2,553,660

STAPLE PULLER

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Fig. 1.

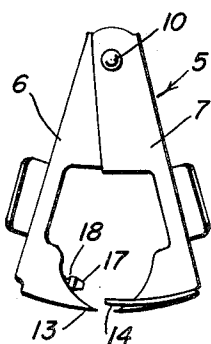


Fig. 2.

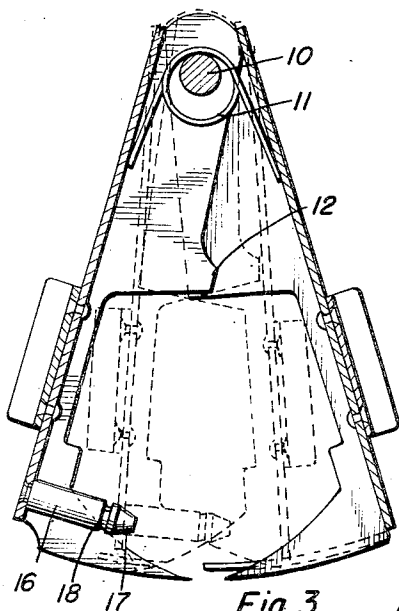


Fig. 3.

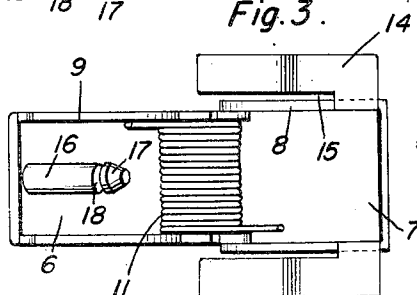


Fig. 4.

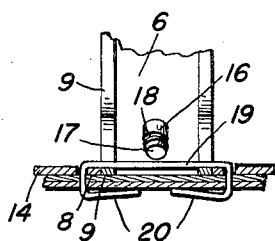


Fig. 5.

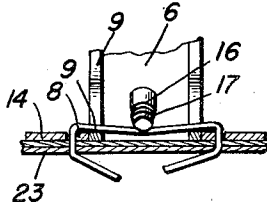


Fig. 6.

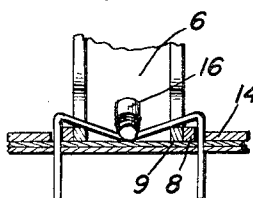


Fig. 7.

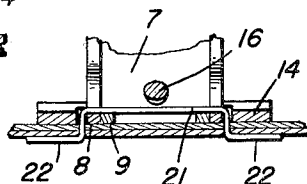


Fig. 8.

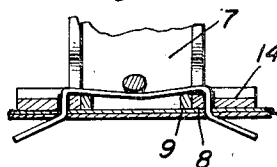
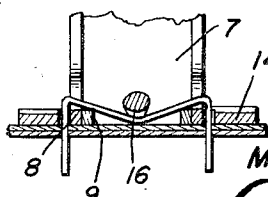


Fig. 9.



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UNITED STATES PATENT OFFICE

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STAPLE PULLER

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Application September 18, 1947, Serial No. 774,697

3 Claims. (Cl. 254—28)

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The present invention relates to new and useful improvements in staple pullers and more particularly to a puller for use with paper staples.

An important object of the present invention is to provide a bending pin carried by the puller and operating to exert a downwardly pressing force on the center of the staple to cause the legs of the staple to straighten to thus enable extracting the legs from the paper without enlarging the holes that were made by the staple when the same was driven into the material.

A further object of the invention is to provide a combined bending pin and staple ejector which includes as its function the ejection of the staple from the staple puller after being removed from the paper.

A still further object of the invention is to provide presser feet or shoes at the sides of the staple puller which press against the upper surface of the paper in the region of the legs of the staple when the legs are temporarily or outwardly clinched to prevent creasing or tearing of the paper during removal of the staple.

A still further object is to provide a device of this character of simple and practical construction which is attractive in appearance, efficient and reliable in operation, relatively inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view;

Figure 2 is an enlarged vertical sectional view;

Figure 3 is a bottom plan view;

Figure 4 is a fragmentary sectional view showing the puller in its initial pulling position with a permanently bent or clinched staple;

Figure 5 is a similar view showing the bending pin in its leg straightening position;

Figure 6 is a similar view showing the legs with the staple straightened for removal from the paper;

Figure 7 is a similar view showing the puller in its initial engaging position with a temporary staple;

Figure 8 is a similar view showing the initial leg straightening action of the puller; and

Figure 9 is a similar view showing the legs of the staple straightened for removal from the paper.

Referring now to the drawing in detail where-

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in, for the purpose of illustration, I have disclosed a preferred embodiment of the invention, the numeral 5 designates the paper staple puller generally and which comprises a pair of jaws 6 and 7 of light weight sheet metal construction, each of the jaws being of channel shape in cross section and with the flanges 8 of the jaw 7 at their upper ends overlapping the flanges 9 of the jaw 6 and pivotally connected to each other by a pin 10. A coil spring 11 is carried by the pin with its ends bearing against the respective jaws to normally hold the lower ends of the jaws in an open position, as shown in Figure 1 of the drawings. The flanges 9 of the jaw 6 are formed with stops 12 to engage the jaws 7 to limit the closing movement of the jaws.

The lower edges of the flanges 8 and 9 are formed with inwardly projecting curved staple lifting points 13 and to the outer surface of the lower ends of the flanges 8, and at the rear of the jaw 7, is a pair of arcuate L-shaped presser feet 14 which have one end welded or otherwise suitably secured to the outer surface of the flanges 8 and with their other ends extending inwardly in spaced relation to the points 13 of the flanges 8 to provide entrance slots 15 at each side of the puller between the pointed ends of the flanges 8 and the presser feet 14 to receive the legs of a staple. The inner ends of the presser feet 14 are curved upwardly slightly above the points 13 of the flanges 8, 9, as shown more clearly in Figure 1 of the drawings. The staple lifting points 13 flare vertically so that when inserted under the staple from opposite directions, said points will cam the staple upwardly.

A bending pin 16 has one end suitably secured to the rear wall of the jaw 6 adjacent its lower end and projects inwardly of the jaw 6 and formed at its inner ends with a tapered or conical head 17. A circumferential groove 18 is formed inwardly of the head 17.

The staple puller may be used for removing either permanently clinched staples 19 having their leg portions 20 bent inwardly, as shown in Figures 4 to 6, inclusive, or in removing temporarily clinched staples 21 having outwardly bent leg portions 22, as shown in Figures 7 to 9, inclusive.

In either type of staple, the lifting points 13 of the jaws 6 and 7 are inserted under the bight or upper portion of the staple in the usual manner, the inward movement of the jaws causing the staple to ride upwardly on the sloping upper edges of the points to exert an upward pulling

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force on the staple. At the same time, the shoes 14 ride on the surface of the paper 23 outwardly at the sides of the lifting points to hold the paper firmly against bending, creasing or tearing.

After the initial engagement of the lifting points with the staple, the head 17 of pin 16 will ride on top of the bight or upper portion of the staple and as the closing of the jaws continues, the central portion of the staple is seated in groove 18. Further continued closing of the jaws exerts a downward pressure on the center of the staple by the pin which forces the outer portions of the staple upwardly, as shown in Figure 6, to straighten the legs of the staple.

As pressure is released on the jaws, the spring 11 will open the jaws, the staple still remaining in groove 18, and when fully opened, the staple drops from the groove and slides off jaw 6.

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

1. A staple puller of the class described comprising a pair of jaws pivoted to each other at one end and having staple lifting points at the outer ends of the jaws and opposed to each other, presser shoes carried by one of the jaws holding down work at the opposite ends of a staple clinched in the work, said presser shoes being spaced outwardly at each side of the jaws to provide a slot for receiving the end portions of a staple, and a staple straightening member carried by one of the jaws and opposing the lifting movement of the central portion of the staple.

2. A staple puller of the class described comprising a pair of jaws pivoted to each other at

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one end and having staple lifting points at the outer ends of the jaws and opposed to each other, and presser shoes carried by one of the jaws holding down work at the opposite ends of a staple clinched in the work, said pressure shoes being spaced outwardly at each side of the jaw to provide a slot for receiving the end portions of a staple.

3. A staple puller of the class described comprising a pair of jaws pivoted together for closing movement, one of said jaws having a terminal pair of opposed laterally spaced tapered points extending toward the other jaw arranged for insertion progressively under the crown of a driven staple by closing movement of the jaws to gradually pull the staple completely from the material, the first-mentioned jaw being provided with a staple straightening pin extending endwise therefrom between said points and toward the second-mentioned jaw and endwise movable with the first-mentioned jaw over the crown of the staple and arranged to engage the same before said points have pulled the staple from the material.

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The following references are of record in the file of this patent:

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