

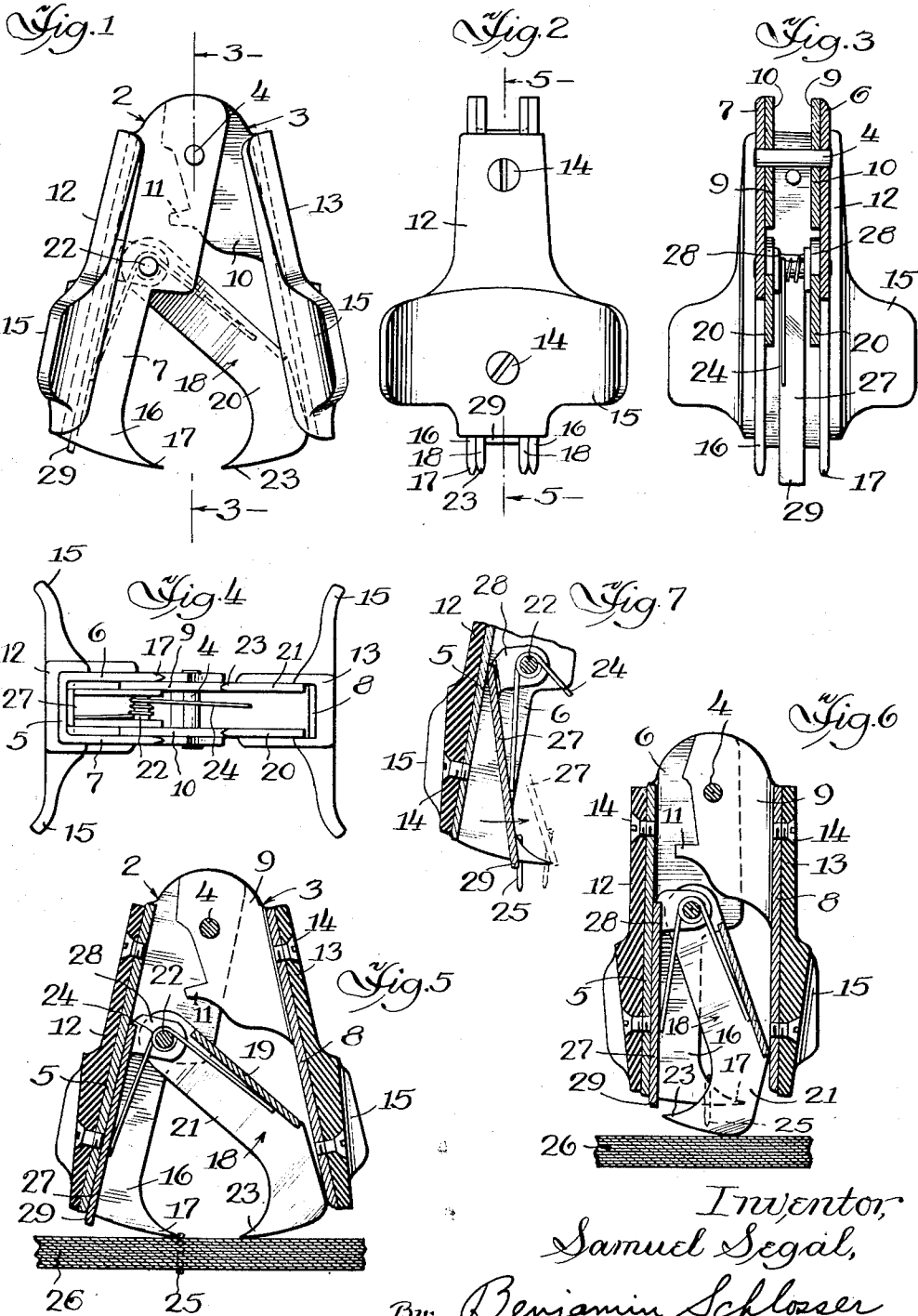
Jan. 1, 1957

S. SEGAL
STAPLE REMOVER

2,776,109

Filed April 7, 1953

4 Sheets-Sheet 1



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4 Sheets-Sheet 2

Fig. 8

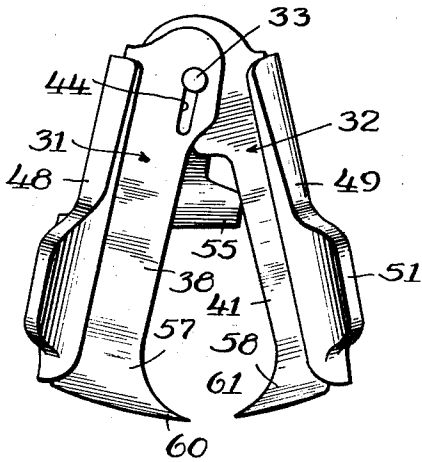


Fig. 9

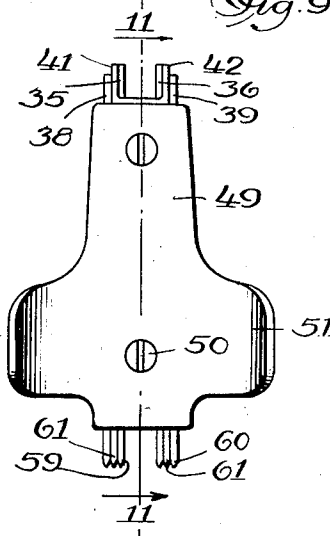


Fig. 10

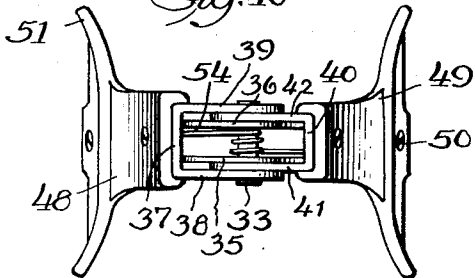


Fig. 12

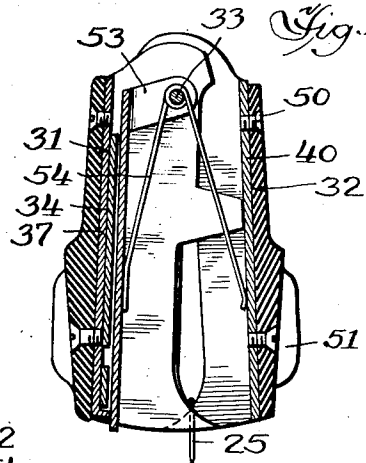


Fig. 13

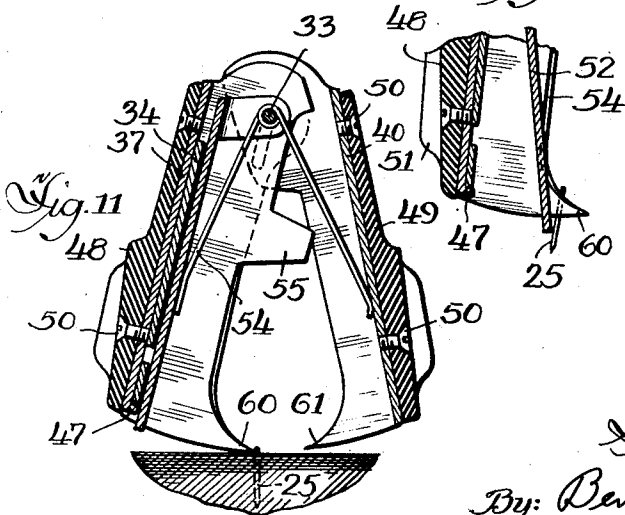


Fig. 11

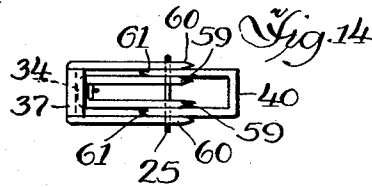


Fig. 14

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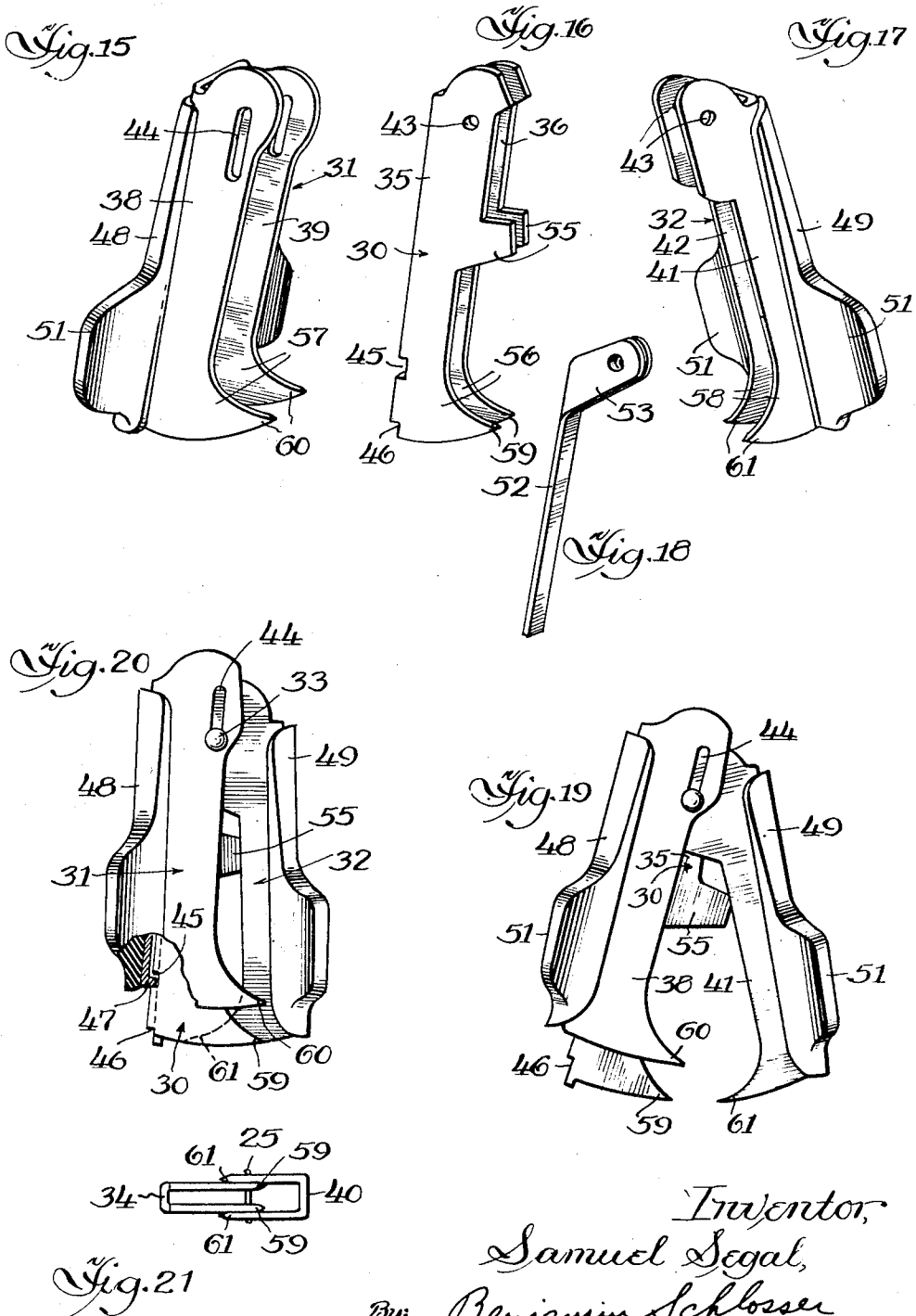
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2,776,109

STAPLE REMOVER

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4 Sheets-Sheet 3



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STAPLE REMOVER

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4 Sheets-Sheet 4

Fig. 22

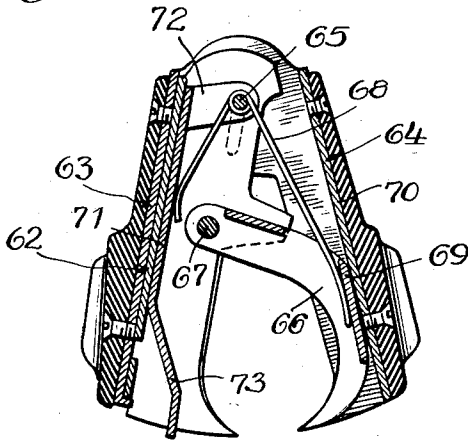


Fig. 23

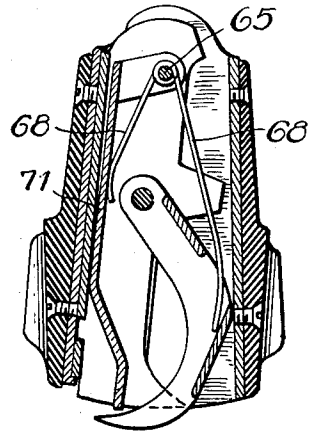


Fig. 24

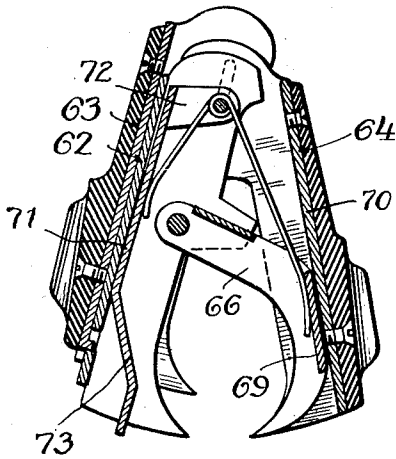
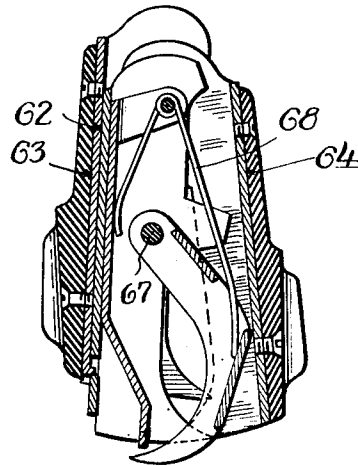


Fig. 25



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2,776,109

STAPLE REMOVER

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5 Claims. (Cl. 254—28)

This invention relates to a staple remover particularly adapted to remove staples that are clinched through a plurality of sheets of paper or similar material or embedded in a wood surface such as a counter, shelf, or drawing board.

It is an object of this invention to provide a staple remover that can efficiently remove staples clinched through a plurality of sheets of paper without tearing or mutilating the sheets.

Another object is to provide a staple remover that works efficiently with staples of different widths.

It is a further object to provide a staple remover that may be operated very fast without requiring excess caution.

A further object is to provide a staple remover with means for quickly and easily removing any staples that may be caught on either jaw of the remover after a staple removing operation.

Other advantages and objects of the invention will become apparent upon reading the following description, taken in conjunction with the accompanying drawings illustrating a few preferred embodiments of the invention, and in which:

Fig. 1 is a side elevational view of one embodiment of the invention;

Fig. 2 is a front elevational view of the structure shown in Fig. 1;

Fig. 3 is a cross sectional view, taken along the line 3—3 of Fig. 1;

Fig. 4 is a bottom elevational view of the structure shown in Fig. 1;

Fig. 5 is a cross sectional view, taken along the line 5—5 of Fig. 2;

Fig. 6 is a cross sectional view, similar to Fig. 5, showing the staple removing jaws in closed position immediately after the staple removing operation;

Fig. 7 is a fragmentary cross sectional view illustrating the operation of the finger for removing staples from the jaw of the device;

Fig. 8 is a side elevational view, similar to Fig. 1, showing another embodiment of the staple remover;

Fig. 9 is a front elevational view of the staple remover shown in Fig. 8;

Fig. 10 is a top elevational view of the staple remover shown in Fig. 8;

Fig. 11 is a cross sectional view, taken along the line 11—11 of Fig. 9;

Fig. 12 is a cross sectional view, similar to Fig. 11, showing the jaws of the remover in closed position;

Fig. 13 is a fragmentary cross sectional view showing the means for holding two relatively movable jaw members in fixed position and the finger for removing staples from one jaw of the staple remover;

Fig. 14 is a bottom plan view showing the interengagement of the jaws of the staple remover of Figs. 8 to 13 with a staple of standard width;

Fig. 15 is a detail perspective view of one jaw member of the staple remover of Figs. 8 to 13;

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Fig. 16 is a detail perspective view of a second jaw member adapted to fit within the first jaw;

Fig. 17 is a detail perspective view of a third jaw member adapted to cooperate with either of the first or second jaws to remove a staple;

Fig. 18 is a detail perspective view of the finger for removing staples from the jaws of the device;

Fig. 19 is a side elevational view, similar to Fig. 8, showing one of the jaw members held in inoperative position;

Fig. 20 is a side elevational view, similar to Fig. 19, showing the jaws in closed position;

Fig. 21 is a bottom plan view, similar to Fig. 14, showing the interengagement of two of the jaws of the staple remover of Figs. 8 to 20 with a staple of less than standard width;

Fig. 22 is a cross sectional view of another embodiment of the staple remover;

Fig. 23 is a cross sectional view, similar to Fig. 22, showing the jaws of the staple remover in closed position;

Fig. 24 is a cross sectional view, similar to Fig. 22, showing one jaw held in inoperative position; and

Fig. 25 is a cross sectional view, similar to Fig. 23, with one jaw held in inoperative position.

Referring to Figs. 1 to 7 of the drawings, the staple remover comprises a pair of jaw members 2 and 3, pivoted together adjacent one end by a hinge pin 4. The jaw 2 is channel shaped and has a back wall 5 and two side walls 6 and 7 which extend inwardly towards the jaw 3. The jaw 3 has a back wall 8 and side walls 9 and 10 extending inwardly towards the jaw 2. The hinge pin 4 extends through the side walls 6, 7, 9 and 10. The side walls 9 and 10 are spaced to fit between the side walls 6 and 7. Stop members 11, integral with the side walls 9 and 10, project inwardly so as to engage the back wall 5 of the jaw 2 when the jaws are pressed inwardly, to limit the relative inward movement of the jaws. Outer frame members 12 and 13 are secured to the jaw members 2 and 3 respectively by a pair of screws 14 which are threaded into the back walls 5 and 8. The frame members 12 and 13 are each provided with a pair of laterally projecting wing portions 15 adjacent the free end of the jaws to facilitate manipulation of the jaws. The frame members 12 and 13 are preferably formed of plastic, but may be of any other suitable material.

The side walls 6 and 7 of the jaw member 2 each terminates at its free end in a claw 16 having an inwardly extending pointed staple engaging end 17. An oppositely disposed claw 18, provided with a back wall 19 and a pair of inwardly extending side walls 20 and 21, is pivoted to the jaw member 2 about midway of its length by a hinge pin 22 which extends through the side walls 6, 7, 20, and 21. The side walls 20 and 21 of the claw 18 are in the same planes as the side walls 9 and 10, which terminate approximately midway of the length of jaw member 3, to provide clearance for the claw 18. The side walls 20 and 21 each terminate in an inwardly extending pointed staple engaging end 23. A spring 24, coiled around the hinge pin 22, has one end bearing against the back wall 19 of claw 18 to urge the claw 18 outwardly so that its back edge is normally held against the back wall 8 of the jaw member 3.

The method of operating the staple remover to remove a staple from a plurality of sheets of paper or similar material is illustrated in Figs. 5 and 6. The pointed ends 17 are positioned in engagement with one edge of a staple 25 clinched through a plurality of sheets 26 with the bottom edge of the claw 16 engaging the top surface of the uppermost sheet. The frame members 12 and 13 are grasped between the thumb and forefinger, which are positioned at the wing portions 15, and are pressed together against the action of the spring 24.

The pointed ends 23 are moved into engagement with the opposite edge of the staple, and continued inward pressure against the jaws 2 and 3 causes the pointed ends of the claws 16 and 18 to pass each other, thereby forcing the staple to ride upwardly along the curved upper edges of the claws. The distance from the pivot 22 to the free end of claw 18 is greater than the distance from 22 to the free end of claw 16. This difference in the length of the claws causes the ends 17 of claw 16 to move longitudinally relative to the ends 23 of claw 18, the claw 16 moving upwardly above the sheets 26 while the claw 18 remains in engagement with the sheets. This relative movement of claw 16 tends to straighten out the legs of the staple 25 while the sheets are held down, thereby preventing tearing or mutilation of the sheets during the staple removing operation.

The staples removed from the sheets sometimes bind against the outer surfaces of the claw 16, and the presence of a plurality of such staples will interfere with the normally rapid operation of the staple remover. The staples may be pushed off the claw with a fingernail, pencil, or similar implement, but I have provided a mechanical finger which facilitates such removal without interfering with the efficient use of the staple remover. A finger 27 formed of a strip of metal fitting between the side walls 6 and 7 is provided with a pair of ears 28 bent at right angles thereto by means of which it is pivotally mounted on the hinge pin 22. The finger 27 is positioned between the end of spring 24 and the back wall 5 so that it is normally held against the wall 5 by the spring. The free end 29 of the finger projects beyond the adjacent end of the jaw 2 so that it may be moved inwardly by finger pressure against the action of spring 24. The finger 27 moves between the side walls 6 and 7 past the pointed ends 17 to sweep any staples from the claw 16. As soon as the end 29 is released the spring 24 forces it outwardly against the back wall 5. Instead of using a flat metal strip for the finger it is possible to extend the end of spring 24 to make it project beyond the end of the jaw. To overcome the inconvenience that would be caused by the single length of wire it would preferably be bent to provide a loop so that the portion engaged by the user's finger would present a smooth end.

In the embodiment of the invention illustrated in Figs. 8 to 21, three cooperating jaw members 30, 31 and 32 are pivotally secured adjacent one end by a hinge pin 33. The jaw 30 comprises a back wall 34 and two inwardly extending side walls 35 and 36. The jaw 31 has a back wall 37 and two side walls 38 and 39. Side walls 35 and 36 are spaced apart less than the distance between walls 38 and 39, so that jaw 30 may be positioned within jaw 31 with side walls 35 and 36 spaced from side walls 38 and 39. The jaw 32 has a back wall 40 and two side walls 41 and 42 spaced to fit between walls 35 and 38 and walls 36 and 39, respectively. The side walls of jaws 30 and 32 are each provided with a round aperture 43 to receive the hinge pin 33, but the side walls of jaw 31 are each provided with an elongated aperture 44 for the hinge pin, so that the jaws 30 and 31 are slidable longitudinally relative to each other. The back wall 34 is provided with two longitudinally spaced notches 45 and 46, and the back wall 37 is provided with a projection 47 adapted to be selectively engaged with either notch 45 or 46, to hold the jaw 31 in either inoperative or operative position. Although the projection 47 is illustrated as being bent inwardly from the free end of the back wall 37 it may be positioned in any desired position, and the notches 45 and 46 similarly changed to engage the projection. A pin may be secured to the back wall 37, and suitably positioned holes provided in back wall 34 to cooperate with the pin.

The jaw members 31 and 32 are provided with outer frame members 48 and 49, respectively, which are similar to the frame members 12 and 13. These frame mem-

bers are secured to the back walls 37 and 40, respectively, by screws 50, and are each provided with laterally extending wing portions 51, similar to the wing portions 15. A staple removing finger 52 is pivotally mounted on the hinge pin 33 by means of ears 53. The finger 52 comprises a flat metal strip which fits between the side walls 35 and 36 of the jaw 30 and is normally held against the back wall 34 by a spring 54 which is coiled around the hinge pin 33. The spring 54 urges the jaws 30 and 32 outwardly, thereby normally holding the jaw 30 in engagement with the jaw 31. When it is desired to move jaw 31 longitudinally relative to jaw 30 it is pulled outwardly to release the projection 47 from the notch 45 or 46 with which it is engaged. The side walls 35 and 36 are provided with integral inwardly extending stop members 55 which limit the inward pivotal movement of the jaws.

The free ends of the side walls of each of the jaws 30, 31 and 32, each terminate in an inwardly extending claw, designated by numerals 56, 57 and 58 respectively. The claws have pointed, staple engaging ends 59, 60 and 61, respectively. When a staple 25 of standard width is to be removed, the jaw 31 is held in its operative position, wherein the ends 59 and 60 are in the same plane, and the claws 59 and 60 are positioned against one edge of the staple to be removed. The jaws 31 and 32 are then pressed together, causing the claw 61 to engage the opposite edge of the staple. Continued inward pressure on the jaws moves the side walls 41 and 42 between the side walls 35 and 38, and the side walls 36 and 39, respectively. As the claw 58 moves into cooperative relationship with the claws 56 and 57 the staple is forced to ride upwardly on the curved upper surfaces of the claws and the legs of the staple are straightened out as the staple is lifted upwardly from the paper or other material in which it has been clinched. If the staple to be removed is less than standard width the jaw 31 is moved to its inoperative position, and the claws 56 and 58 cooperate in the same manner to remove the staple. The different arrangement of the claws in removing staples of different width is shown in Figs. 14 and 21. The finger 52 operates in the same manner as the finger 27 described in the previous embodiment.

In the embodiment illustrated in Figs. 22 to 25, three jaw members 62, 63 and 64 are pivotally secured together by a hinge pin 65. The jaws 62 and 63 are similar to jaws 30 and 31 and require no further description. The jaw 64 is similar to jaw 3 in the first embodiment. A claw 66 is pivoted to the side walls of the jaw 62 by a hinge pin 67. The hinge pin 67 does not pass through the side walls of the jaw 63 because the jaws 62 and 63 must be left free to slide longitudinally relative to each other. A spring 68 is coiled around the hinge pin 65 and has one end bearing against the back wall 69 of the claw 66 to hold it normally in engagement with the back wall 70 of jaw 64. The distance from the pivot 67 to the end of claw 66 is greater than the distance from this same pivot to the free end of jaw 62, as in the first embodiment, so that when the jaws are pressed together to remove a staple the claw 66 moves longitudinally relative to the claw of jaws 62 or 63. A staple removing finger 71 is pivotally secured to hinge pin 65 by ears 72 and is offset, as indicated at 73, so that only a very short movement is required to remove staples from the jaw if they become stuck thereon. The claw 66 cooperates with the claws integral with jaw members 62 and 63 in the same manner as described in the first embodiment.

Although I have described a few preferred embodiments of my invention in detail, it will be understood that the description thereof is intended to be illustrative, rather than restrictive, as many details of the structure may be modified or changed without departing from the spirit or scope of the invention. Accordingly, I do not desire to be restricted to the exact construction described, except as limited by the appended claims.

I claim:

1. A staple remover comprising first, second and third channel shaped jaw members pivotally secured together adjacent one end thereof, each of said jaw members having a back wall and a pair of side walls, said side walls each terminating at its free end in an inwardly directed pointed staple engaging claw, the first of said jaw members being positioned within said second jaw member with each of its side walls spaced from the side walls of the second jaw member a distance greater than the thickness of the side walls of said third jaw member whereby the claws of said third jaw member may enter the space between the claws of said first and second jaw members when said jaw members are pressed together, said second jaw member being slidable longitudinally relative to said first jaw member whereby the claws of said third jaw member may cooperate with the claws of both other jaw members or with the claws of only said first jaw member to remove a staple clinched through a plurality of sheets of paper or similar material.

2. A staple remover comprising first, second and third channel shaped jaw members pivotally secured together adjacent one end thereof, each of said jaw members having a back wall and a pair of side walls, said side walls each terminating at its free end in an inwardly directed pointed staple engaging claw, the first of said jaw members being positioned within said second jaw member with each of its side walls spaced from the side walls of the second jaw member a distance greater than the thickness of the side walls of said third jaw member whereby the claws of said third jaw member may enter the space between the claws of said first and second jaw members when said jaw members are pressed together, stop means integral with one of said jaw members engageable with an oppositely disposed jaw member to limit the relative inward movement of said oppositely disposed jaw members, said second jaw member being slidable longitudinally relative to said first jaw member and cooperating means on said first and second jaw members to hold said second jaw member in either operative or inoperative position, whereby the claws of said third jaw member may cooperate with the claws of both other jaw members or with the claws of only said first jaw member to remove a staple clinched through a plurality of sheets of paper or similar material.

3. A staple remover comprising first, second and third channel shaped jaw members pivotally secured together adjacent one end thereof, each of said jaw members having a back wall and a pair of side walls, said side walls each terminating at its free end in an inwardly directed pointed staple engaging claw, the first of said jaw members being positioned within said second jaw member with each of its side walls spaced from the side walls of the second jaw member a distance greater than the thickness of the side walls of said third jaw member

whereby the claws of said third jaw member may enter the space between the claws of said first and second jaw members when said jaw members are pressed together, said second jaw member being slidable longitudinally relative to said first jaw member, a pair of longitudinally spaced recesses in the back wall of said first mentioned jaw member, and a projection extending inwardly from the back wall of said second mentioned jaw member, said projection being engageable with either of said recesses to hold said second jaw member in either operative or inoperative position, whereby the claws of said third jaw member may cooperate with the claws of both other jaw members or with the claws of only said first jaw member to remove a staple clinched through a plurality of sheets of paper or similar material.

4. A staple remover comprising a pair of jaw members the first of which is positioned within the second, said jaw members each having a staple engaging claw pointed in the same direction, a third jaw member having a staple engaging claw pointed in the opposite direction, each of said jaw members having a pair of side walls, the side walls of each of said jaw members being apertured adjacent one end, a pin extending through all of said apertures to pivot said jaw members together, the apertures of said second jaw member being elongated in a longitudinal direction to permit said second jaw member to move longitudinally relative to said first jaw member, and means to hold said second jaw member in either operative or inoperative position, whereby the claw of said third jaw member may cooperate selectively with the claw of said first or second jaw member to remove a staple clinched through a plurality of sheets of paper or similar material.

5. A staple remover comprising a pair of jaw members the first of which is positioned within the second, and a third jaw member oppositely disposed to said pair of jaw members, all of said jaw members being pivotally secured together adjacent one end, each of said jaw members having a pair of staple engaging claws at its free end, the second jaw member of said pair of jaw members being movable to inoperative position, means for holding the second jaw member in inoperative position, the claws of said third jaw member cooperating selectively with the claws of either said first jaw member or said first and second jaw members to remove staples of different widths when said jaw members are pressed together with the cooperating claws engaging opposite sides of a staple clinched through a plurality of sheets of paper or similar material.

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