March 14, 1944. C. E. NYBERG 2,343,921

STAPLE REMOVER

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Fig. 1.

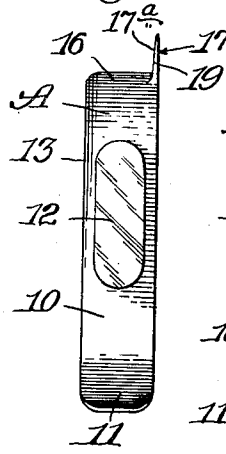



Fig. 2.

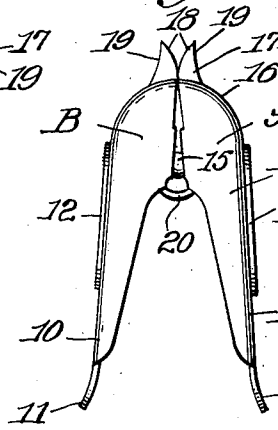



Fig. 3.

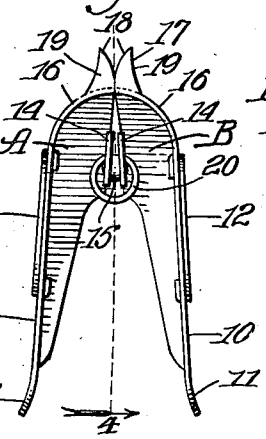



Fig. 4.

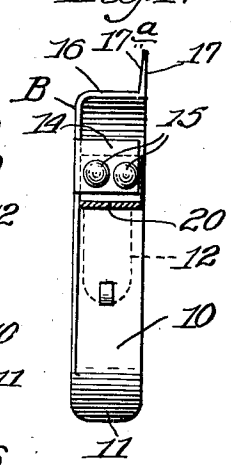



Fig. 5.

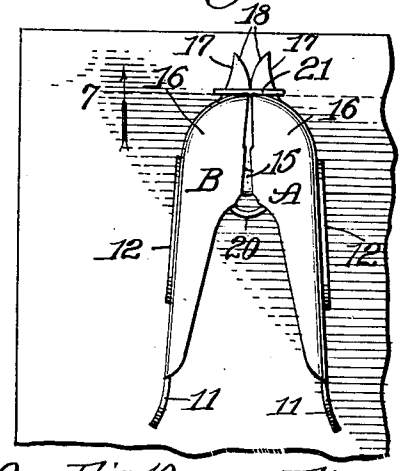



Fig. 6.

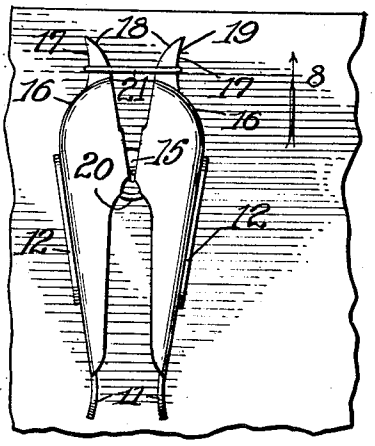



Fig. 9.

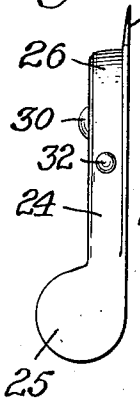



Fig. 10.

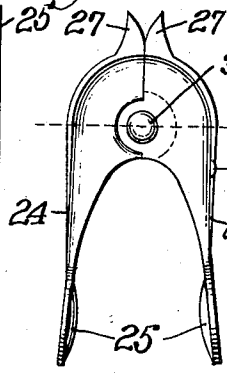



Fig. 11.

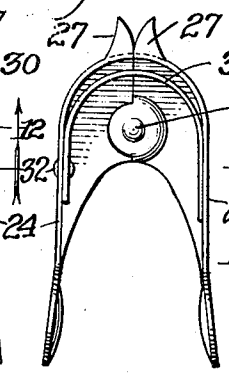



Fig. 12.

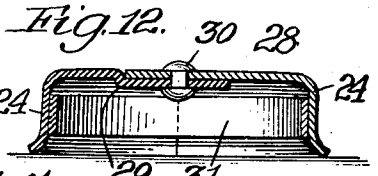
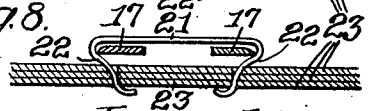



Fig. 7.




Fig. 8.




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Fig. 13. Fig. 14. Fig. 15. Fig. 16.

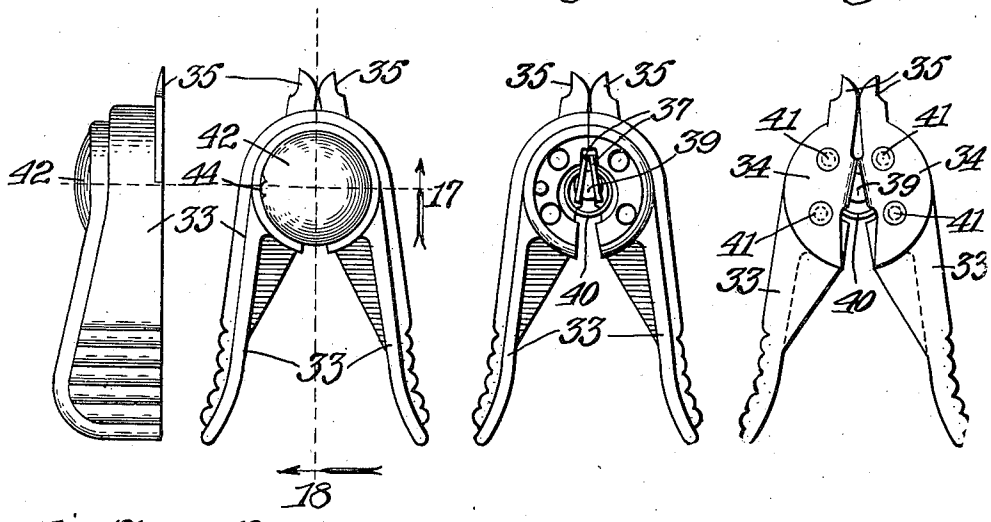



Fig. 17.

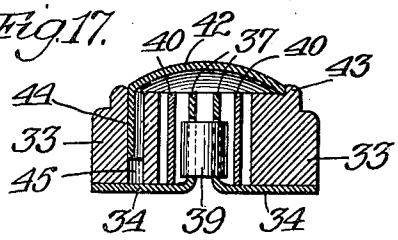



Fig. 18.

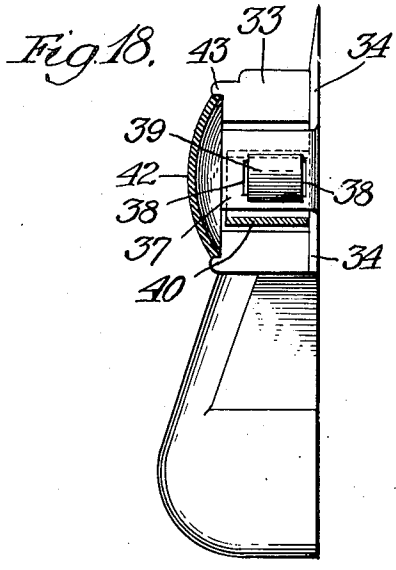
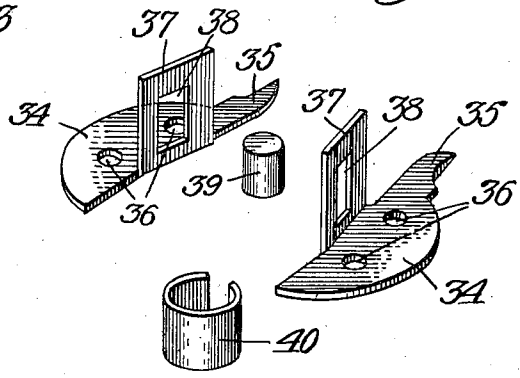



Fig. 19.




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# UNITED STATES PATENT OFFICE

2,343,921

## STAPLE REMOVER

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Application March 8, 1941, Serial No. 382,313

14 Claims. (Cl. 254—28)

This invention relates to a staple remover.

An object of the invention is to provide a staple remover operating on a different principle from those heretofore used and producing extremely advantageous results. A further object is to provide staple removing apparatus of extremely simple and inexpensive construction which will effectively remove staples from paper or other objects, enabling the staples to be torn quickly away from the paper, or, if desired, to be removed one by one while in engagement with the jaws of the remover. Another object is to provide a staple-remover having spreader jaws adapted to engage and remove any size staple. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated, in preferred embodiments, by the accompanying drawings, in which—

Figure 1 is a side view in elevation of a staple remover embodying my invention; Fig. 2, a top plan view; Fig. 3, a bottom plan view; Fig. 4, a longitudinal sectional view, the section being taken as indicated at line 4 of Fig. 3; Fig. 5, a top plan view showing the jaws of the remover brought into engagement with the bridge of a staple, the legs of which have been passed through paper and clenched; Fig. 6, a view similar to Fig. 5 but showing the spreading action of the jaws in removing the staple; Fig. 7, a transverse sectional view, the section being taken as indicated at line 7 of Fig. 5; Fig. 8, a transverse sectional view, the section being taken as indicated at line 8 of Fig. 6; Fig. 9, a view similar to Fig. 1 but showing a modified form of the invention; Fig. 10, a top plan view of the modified form of staple remover; Fig. 11, a bottom plan view of the structure shown in Fig. 10; Fig. 12, a transverse sectional view, the section being taken as indicated at line 12 of Fig. 10; Fig. 13, a side elevational view of a modified form of staple remover; Fig. 14, a plan view of the structure shown in Fig. 13; Fig. 15, a view similar to Fig. 14 but showing the plate or cover removed; Fig. 16, a bottom plan view of the structure shown in Fig. 14; Fig. 17, a transverse sectional view, the section being taken as indicated at line 17 of Fig. 14; Fig. 18, a longitudinal sectional view, the section being taken as indicated at line 18 of Fig. 14; and Fig. 19, a perspective view of the part forming the pivot structure employed in the modification shown in Fig. 14.

In the illustration given in Figs. 1 to 8 inclusive, A designates one of the main operating members; and B, the other. Each of the operating members is provided with a side wall 10 which at the rear is curved slightly outwardly to form a handle 11. In the illustration given, each of the side walls 10 is provided with slots through which the ends of a name plate or other decorative device 12 are inserted and clenched. Formed integrally with each of the side walls 10 is a top plate member 13 which toward the forward end of each device extends inwardly and is provided with a downwardly-turned hinge plate 14. Each of the hinge plates is provided with a pair of vertically-spaced openings, each adapted to receive a portion of a hinge ball 15.

The side walls 10 of each member are curved at their forward ends 16 and form together substantially a semi-circle. Each of the members has integrally formed with the forward portion 16, a spreader jaw or lever 17. Each of the levers 17 has a convex inner surface 18 and a concave outer edge 19. If desired, the jaws 17 may be tapered along their top surface downwardly toward the point, as indicated by the numeral 17a, thus facilitating the insertion of the jaws below the bridge of the staple. The convex surfaces formed by cutting away the inner portion of each jaw produces a horn-like point adapted to be easily inserted below the bridge of a staple while the concave side 19 enables the jaw, when spread, to grip the bridge and prevent it from slipping off the forward end of the jaw.

The two balls 15 are held in close engagement with the hinge plates 14 by means of a substantially circular split spring 20, the free ends of which extend beyond the forward portion of the balls 15.

It will be noted that the jaws 17 are extremely thin in the vertical plane and thus may be readily inserted below the bridge of the staple. It will also be noted that the bottom of each jaw 17 is in alignment with the bottom of the side wall 10, thus enabling the jaw to be accurately positioned below the bridge and brought under the bridge without digging into the paper or other object to which the staple is attached.

In the operation of the device, the remover is placed upon the paper or other device to which the staple is attached, with the lower edge of the side walls 10 resting thereon. The device is then moved forwardly to bring the jaws 17 under the bridge 21 of the staple. In the illustration given, particularly in Figs. 5 to 8 inclusive, the staple has its legs 22 thrust through three sheets of paper 23, the legs being clenched on the bottom side. The jaws 17 are normally held in contigu-

ous position through the force of the spring 20, as shown in Figs. 2, 3, 5 and 7. After the jaws have been brought under the bridge of the staple, as illustrated in Fig. 5, the handle members 11 are pressed inwardly, as shown in Fig. 6, thus spreading the jaws 17 laterally. The lateral or outward movement of the jaws 17 engages the legs of the staple and tends to pull them outwardly, as illustrated more clearly in Figs. 6 and 8. Continued outward movement of the jaws tends further to straighten the legs and to pull them through the openings in the paper without any substantial tearing of the paper. If desired, the spreading movement of the jaws may be operated quickly so as to spring the fastener or staple into the air, thus quickly freeing the paper of the staple. If it is desired to operate the device very slowly, the staple may be removed while still in engagement with the jaws and lifted by means of the jaws to a depository for the staples. When the device is operated quickly, the staples fly in the air immediately upon the operation of the handles.

Referring to the modification shown in Figs. 9, 10, 11 and 12, it will be noted that the side walls 24 are relatively low and are provided at their rear ends with forwardly-turned and enlarged thumb and finger handles 25. These handles are preferably inwardly-dished for convenience in operating them with the thumb and index finger of the hand. The forward ends of the side walls 24 are concave, as indicated at 26, and each is provided with a jaw 27 substantially identical with the jaws 17 already described. Each of the side walls 24 has integrally formed therewith a top wall 28, the top wall of one of the members being turned downwardly at 29 and brought into overlapping relation with the top wall of the other member. A hinge rivet 30 secures the two members in pivotal relation. A semicircular spring 31 is housed within the side walls of the members and has one end secured to one of the side members by means of a rivet 32.

The operation of the modified structure shown in Figs. 9 to 12 inclusive is substantially the same as that of the structure shown in Figs. 1 to 8 inclusive. The side walls 24 are laid flat upon the paper strip and the thumb and index finger brought into engagement with the opposite handles 25. The device is moved forwardly to bring the jaws 17 under the bridge 21 of the staple and then are spread laterally by inward movement of the handles, thus straightening the legs and pulling them through the opening in the paper or other material to which they are attached.

The apparatus is extremely simple and is quick and effective in operation. Staples are removed readily without any substantial tearing of the paper and, if desired, may be removed slowly while still held upon the jaws of the stapler. Because of the lateral movement, the stapler is adapted to remove all sizes of staples.

In the modified form of structure shown in Figs. 13 to 19 inclusive, I employ two handle members 33 formed of molded composition material or other suitable material. To privotally connect the handle members 33, I preferably equip each of them with a plate structure 34 such as is illustrated more clearly in Fig. 19. Each plate 34 is provided with a forwardly extending jaw member 35 of the type already described and with rivet openings 36. Each plate 34 is also provided with an integral upwardly extending flange 37 provided with a rectangular slot 38. The slot is adapted to receive a portion of the collar pivot member 39. A spring collar 40 is employed to lock the collar 39 within the pivot openings 38.

The plates 34 are secured upon the handle members 33 by means of rivets 41 which extend through the plates 34 and through aligned opening handle members 33.

A cover 42 is mounted within a circular rim 43 by the two members 34, and on one side, the cover is provided with a downwardly extending integral post 44 which is received within a socket or opening 45 in one of the members 33. By this means, the cover is locked securely to one of the members 33 and moves therewith.

In the operation of the modification shown in Figs. 13 to 19 inclusive, the parts are readily assembled with the roller 39 confined within the openings 38 by the spring collar 40. The spring urges the jaw members 35 toward each other, as illustrated in Figs. 15 and 16. When the handles 33 are pressed toward each other, the plates 34 swing upon the pivot roller 39 and cause the jaws 35 to widen or separate abruptly. Even by the time that the handle members 33 become substantially parallel with each other, the jaw members 35 are quite widely separated. The expanding operation of the jaws caused by pressing the handles toward each other result in removing the staple from its clenched position within paper sheets, etc.

The cover 42 may be readily removed to expose the working parts by merely inserting a sharp instrument thereunder and lifting the cover vertically. The cover may be inserted in place by merely inserting the post within the socket 45 and bringing the cover edges within the rim 43 of the members 33. The roller pivot 39 provides a rigid connecting member securely holding the plates 34 in alignment.

The plates 34 are shown secured to the members 33 by rivets 41. It will be understood, of course, that the plates may have extensions received within socket portions provided by the members 33 to increase the interlocking engagement therewith, if desired.

The parts may be readily separated by removing the cover plate 42 and the spring collar 40. After repair, the parts may be again assembled as heretofore described.

While I have described in detail three modifications illustrating the invention, it will be understood that the invention may be incorporated in a great variety of modifications which will be obvious to those skilled in the art after the present invention is disclosed. It will be understood that such modifications may be employed and that wide variations may be made in the details described without departing from the spirit of my invention.

I claim:

1. A staple remover comprising a pair of members having side walls and inwardly-extending top walls, said top walls being extended downwardly on their inner sides to form hinged flanges, said hinged flanges being provided with openings adapted to receive at least one ball, spring means holding said flanges together, said members having their forward portions extended to form spreader jaws, and portions extending rearwardly of said ball to form handles.

2. A staple remover comprising a pair of members having depending side flanges curved at their forward ends and depending inner flanges provided with a pair of vertically-spaced apertures, balls in said apertures, and a split spring

ring maintaining said flanges in confining relation about said balls, the rear portion of said members providing handles and the free portions of said members being provided with thin forwardly-extending jaws aligned with the bottom of said members and being adapted to be spread apart as said handles are pressed inwardly.

3. A staple remover comprising a pair of members having rearwardly diverging handle portions, a pair of plates secured, one to each of said members, and having forwardly extending jaw members, each of said plates being provided with an upwardly extending flange having a slot therein, a roller member received within a slot of each plate, and a spring collar inclosing said roller and confining said flanges about said roller so as to urge said jaw members toward each other.

4. A staple remover comprising a pair of members having diverging handle portions, plates carried by said members, and providing forwardly extending jaw portions, said plates having integral upwardly extending portions provided with a roller receiving socket, a roller within said socket provided by said plates, and spring means confining said roller within said socket and urging said jaw members toward each other.

5. A staple remover comprising a pair of molded handle members having pivot portions secured together in pivotal relation, plates secured to said pivot portions and having integrally formed and forwardly extending jaws, said plates also having upwardly extending flanges provided with opposite rectangular sockets, a roller member snugly received within said sockets and providing pivot for said handle members, a split collar confining said roller within said socket and urging said jaws together, and a cover member releasably secured to at least one of said members and housing said pivot.

6. A staple remover comprising a pair of members having handle portions and pivot portions, plates carried by said pivot portions and providing vertically slotted flanges, pivot means carried within said slots, a spring member confining said pivot means within said slot, at least one of said members being provided with a socket, and a cover member extending over said pivot means and provided with a post member releasably received within said socket.

7. A staple remover comprising a pair of composition molded members, plates secured to the bottoms of said members and fixed thereto, each of said plates being provided with a forwardly extending jaw, said plates and vertically extending adjacent flanges provided with roller slots, at least one roller received within said slots, and spring means urging said flanges together and confining said roller within said slots.

8. A staple remover comprising a pair of members pivotally connected at an intermediate portion thereof and providing rearwardly-extending handles and forwardly-extending spreader jaws, and spring means normally urging said spreader jaws together, said spreader jaws having thin portions adapted to extend below the bridge of a staple, each of the jaws having an arcuate concave surface on the outer side thereof extending rearwardly from the forward end of the jaw for a distance materially greater than the diameter of the staple and adapted to engage the legs of the staple when the handles are pressed inwardly whereby the jaws, when urged outwardly against the staple legs, move forwardly with respect to the staple.

9. A staple remover comprising a pair of members pivotally connected at an intermediate portion, the rear portion of said members providing handles, and the forwardly-extending front portions providing spreader jaws, each of the jaws having an arcuate concave surface on the outer side thereof extending rearwardly from the forward end of the jaw for a distance materially greater than the diameter of the staple and adapted to engage the legs of a staple when the jaws are inserted beneath the bridge of the staple and the handles are pressed inwardly whereby the jaws, when urged outwardly against the staple legs, move forwardly with respect to the staple.

10. A staple remover comprising a pair of members pivotally connected at an intermediate portion, the rear portion of said members providing handles, and the forwardly-extending front portions providing spreader jaws adapted to be inserted beneath the bridge of a staple, each of the jaws having an arcuate concave surface extending rearwardly from the forward end thereof along a substantial portion of the outer side of the jaw, said surface being adapted to engage the legs of the staple when the jaws are inserted beneath the bridge of the staple and the jaws are spread outwardly whereby the jaws, when urged outwardly against the staple legs, move forwardly with respect to the staple.

11. A staple remover comprising a pair of operating members pivotally connected at an intermediate portion thereof, the rear portion of said members providing handles, spreader jaws on said members extending forwardly from the pivotal connection and adapted to be inserted beneath the bridge of a staple, the outer sides of the jaws being adapted to engage the legs of the staple when the jaws are spread outwardly, said outer sides of the jaws extending rearwardly and inwardly from the forward end thereof when the jaws are spread outwardly and in position engaging the legs of the staple whereby in operation the jaws, when urged outwardly against the staple legs, move forwardly with respect to the staple.

12. A staple remover comprising a pair of operating members pivotally connected at an intermediate portion thereof, the rear portion of said members providing handles, spreader jaws on said members extending forwardly from the pivotal connection and adapted to be inserted beneath the bridge of a staple, and spring means normally urging said spreader jaws toward each other, the outer sides of the jaws being adapted to engage the legs of the staple when the handles are pressed inwardly to spread the jaws outwardly, each of the jaws having an arcuate concave surface extending rearwardly and inwardly along a substantial portion of the outer sides of the jaw from the forward end thereof when the jaws are in position engaging the legs of the staple, whereby in operation the jaws, when urged outwardly against the staple legs, move forwardly with respect to the staple.

13. A staple remover comprising a pair of members pivotally connected at an intermediate portion thereof and having rearwardly-extending handles and forwardly-extending pointed spreader jaws, spring means normally urging said spreader jaws toward each other, said jaws having thin portions at the forward end thereof adapted to extend beneath the bridge of a staple in a flat supporting surface, a flat surface on the

bottom of each of said jaws, and a flat surface on the bottom of each of said handles at the rear portion thereof, said surfaces being in substantial alignment, each of said handles also having a wall extending upwardly from the bottom surface thereof a sufficient distance to provide a finger grip when said flat jaw and handle surfaces are in engagement with said supporting surfaces.

14. A staple remover comprising a pair of members having top overlapping walls and side walls substantially right angularly-disposed with respect to said top walls, a pivot extending through said overlapping top walls at an intermediate portion of each of the members and connecting the same, the side walls being spaced outwardly of said pivot on opposite sides thereof and extending rearwardly to provide handles and forwardly to provide spreader jaws, said jaws having thin pointed portions at the forward ends thereof adapted to extend beneath the bridge of a staple in a flat supporting surface, a flat surface on the bottom of the forward end of the thin portion of each of said jaws, and flat surfaces on the bottom of the rear of the handle portion of each of said side walls, said flat surfaces being in substantial alignment.

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