March 10, 1936. S. A. CROSBY 2,033,613

STAPLE

Filed June 8, 1934

Fig. 1.

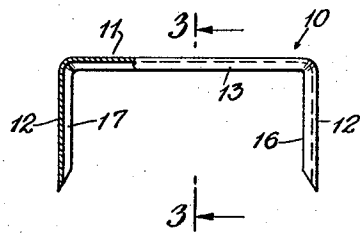


Fig. 2.

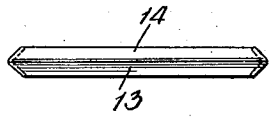


Fig. 3.

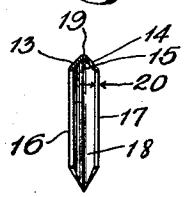


Fig. 4.

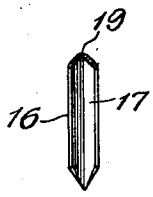


Fig. 5.

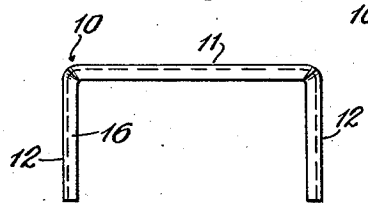


Fig. 6.

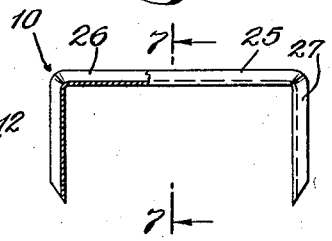


Fig. 7.

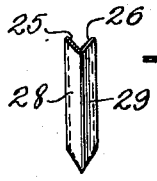


Fig. 8.



Fig. 9.

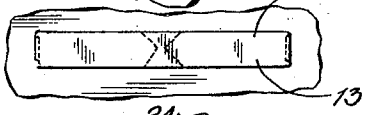


Fig. 10.

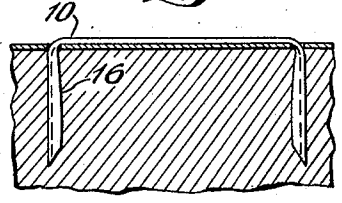
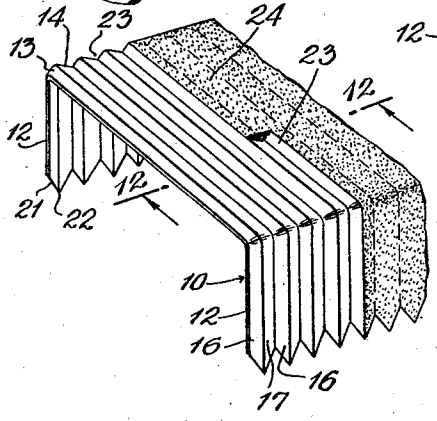


Fig. 11.



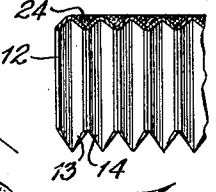
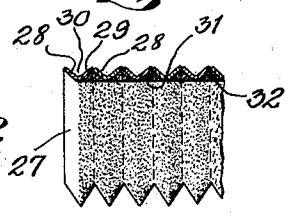


Fig. 12

Fig. 13.



Stephen A. Crosby
INVENTOR

BY
ATTORNEY

Patented Mar. 10, 1936 2,033,613

UNITED STATES PATENT OFFICE

2,033,613

STAPLE

Stephen A. Crosby, New York, N. Y., assignor to Parrot Speed Fastener Corporation, New York, N. Y., a corporation of New York

Application June 8, 1934, Serial No. 729,545

3 Claims. (Cl. 1—56)

The present invention is generally concerned with staples and more particularly relates to a functionally and structurally improved unitary staple clip or gang comprising a plurality of appropriately secured and juxtapositioned staple elements. In certain aspects, the invention comprehends a one piece staple having means presenting a relatively large gripping and holding surface after driven into the parts to be secured and deformed by cooperative action of the hammer and anvil of a stapling machine. In other certain aspects, the invention comprises a clip or series of severally disconnectable staple elements so formed as to constitute means having inclined anchoring surfaces between adjacent elements and forming channels each having a depth progressively varying in width for the reception of an appropriate adhesive or the like. In other aspects, the stack or clip according to the invention, comprises a series of similar and disconnectably secured staples each embodying a crown and spaced depending legs having a width appreciably less than the original width of the flat material processed subsequently to form a channeled staple, the crown and depending legs each having a substantially V shaped cross section so arranged according to one embodiment that the channel of the crown normally faces downwardly while the channel of the legs face inwardly and according to another embodiment the channel of the crown normally faces upwardly, while the channel of the legs faces outwardly. In a further aspect of the invention each staple is characterized by a crown and depending legs each having complementary or companion rectilinear integrally connected sloping sections adapted to spread apart and be arranged in unitary planes pursuant to the operation of the stapling machine. Another aspect of the invention has to do with a clip or stack of staples normally occupying less space in the stack for a predetermined gripper power.

Other aspects, objects, advantages and features of the invention are in part obvious and in part pointed out hereinafter.

The invention is exemplified in the combination and arrangement of parts shown in the accompanying drawing and described in the following specification and it is more particularly pointed out in the appended claims.

The present invention will be best understood from the following discussion of several typical structural embodiments, reference being had to the accompanying drawing in which:—

Fig. 1 is a front elevation of the staple according to the invention, shown partly in section.

Fig. 2 is a plan view of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Fig. 4 is a slightly modified view of Fig. 3.

Fig. 5 is a front elevational view of a staple similar to that shown in Fig. 1 but having squared ends.

Fig. 6 is a view similar to Fig. 1 illustrating another form of staple.

Fig. 7 is a section taken on the line 7—7 of Fig. 6.

Fig. 8 illustrates a staple of the type shown in Fig. 1 attached to sheets of paper or cardboard.

Fig. 9 is a plan view of Fig. 8.

Fig. 10 is an elevational view of a staple according to the invention, shown driven into a block of wood or the like.

Fig. 11 is a fragmentary view of a unitary gang or stack of staples, shown in perspective.

Fig. 12 is a sectional view taken along the line 12—12 of Fig. 11 and

Fig. 13 is a fragmentary view, in elevation of a gang of staples each of which is of the type shown in Fig. 6.

In the drawing, the staple is a one piece member and is generally designated 10. Each staple comprises a web or crown portion 11 having integrally depending spaced legs 12—12.

The staple of the type shown in Fig. 1 has its crown 11 formed with tapering integrally connected rectilinear sections or wings 13 and 14, the inner faces thereof form a longitudinal channel or trough 15 facing downwardly and having a depth progressively varying in width.

Each staple leg as 12 integrally depends from its crown 11 and embodies tapering rectilinear sections 16 and 17 defining an inwardly facing and vertically disposed channel or groove 18 having a depth progressively varying in width, it being noted that companion sections of a leg diverge transversely relative to the longitudinal axis of its staple.

The outer surface of companion or complementary sections 13 and 14; 16 and 17 of a staple are interconnected by a curved surface 19 having a radius equal to the thickness 20 of the body of the staple. The inner surfaces of the sections are interconnected by a curved surface, which is concentric to the curved surface 19.

According to the form shown in Figs. 1, 6, 11 and 13, the terminals of a staple are provided with beveled edges 21 to form a relatively sharp pointed end 22. In the form according to Fig. 5,

the free edge of the terminals are at right angles to the body of a respective leg.

With the form shown in Fig. 4, the outer tapering faces of the sections of the staple are interconnected by the curved surface 19 as in the case of the form shown in Fig. 3 while their inner surfaces terminate in an appropriately defined line or rectilinear path.

In the case of the form shown in Figs. 1, 5 and 11, the staple may be defined as consisting of a ribbed body having a width considerably less than the width of the previously unbent material out of which a channeled staple as shown is formed or fabricated so formed as to constitute means conveniently utilized to fasten several instrumentalities such as, paper cardboard and/or wood together by the aid of a cooperative hammer and anvil associated with a stapling machine.

In Fig. 11, a plurality of staples of the type shown in Fig. 1 are juxtapositioned to constitute a strip or clip of staples. It will be noted that contiguous rectilinear sections of adjacent staples form an outwardly facing substantially triangular shaped trough or channel as 23 in which a suitable adhesive coating 24 is applied to anchor the several staples of the gang or series together. So secured, the unitary stack of staples is appropriately arranged in a storage compartment of a stapling machine where they may be severally and progressively disconnected from the stack.

In the process of detaching a staple from a stack, the hammer of the stapling machine, strikes the apex 19 of the crown, causing the terminals of the legs of the staple to penetrate the sheets of paper or the like to be attached. Further application of a downwardly directed force by the hammer causes the legs of the staple to fold inwardly and against the under surface of the lowermost sheet of paper, the anvil and hammer are so formed that they displace the medial parts of the crown and legs of the staple downwardly and upwardly respectively such that at the conclusion of the down stroke of the hammer, the adjacent sections of the crown hitherto substantially at right angles to each other, are now spaced apart and in the same plane (see Fig. 9) thus gripping the upper surface of the upper sheet, and likewise the adjacent sections of the legs also formerly at right angles are spread apart and arranged in the same plane concomitantly abutting the under surface of the lowermost sheet. In other words, after having been anchored or deformed upon the application of pressure, a staple assumes the form of a conventional staple of the type having a normally flat crown and legs. Thus, it is apparent, that with the staple according to the invention, a greater number of staples may be arranged in a stack for a predetermined gripping power.

Although, a staple may be readily severed from its stack by a cutter of the stapling machine, increased anchorage between adjacent sections of contiguous staples is provided by reason of the formation of the triangular adhesive receiving channels. This is an important feature of the invention.

The staple of the type shown in Figs. 6, 7 and 13 is a one piece member comprising a crown and depending spaced legs 27, the crown constituting a triangularly shaped trough or channel 30, the companion rectilinear sections 25 and 26 of a staple having a V shaped cross section, that is, diverged upwardly and outwardly and the depending legs 27 each include complementary rectilinear sections 28 and 29 defining a V shaped cross section, and forming an outwardly disposed channel of progressively varying widths.

As shown in Fig. 13, a plurality of staples of the type shown in Fig. 6, are arranged side by side, such that the adjacent sections of contiguous staples form an inwardly disposed trough or channel 31 adapted to receive an appropriate adhesive, or the like 32 to anchor adjacent staples of the plurality in the formation of a unitary clip or gang. As in the case of the outwardly disposed adhesive receiving channels formed by adjacent staples, shown in Fig. 11, the inwardly arranged adhesive receiving channels of Fig. 13 provide means whereby increased anchorage may be attained.

By placing the gang of staples of the type according to Fig. 13 in a stapling machine, each staple thereof may be severally detached from the gang for fastening several sheets of paper or the like together as is well understood, the hammer and anvil of the stapling machine being such that the companion sections 25 and 26 of the crown of a staple spread apart and are disposed in the same plane, hence forming an increased gripping surface and similarly the companion sections 28 and 29 of the legs are spread apart and lie in the same plane for a similar purpose.

In Fig. 10, a staple of the form shown in Fig. 1 has been driven into a block of wood or the like. As shown the legs are not folded inwardly but by reason of their angular or channeled shaped cross section they enter the body of the block vertically and without buckling.

As illustrated in Figs. 8 and 9, it will be noted that a formerly channeled staple has been flattened and the crown and legs thereof now have a width substantially corresponding to the original width of the material or body out of which the channeled staples according to the invention were formed. In other words, the width of the material of a staple before the material has been processed and the width of a staple after it has been applied to a stapling machine and deformed thereby is considerably greater than the width of channeled staple of the types illustrated in Figs. 1, 6, 11 and 13. Hence it is apparent that the method of applying a staple according to the invention is realized by providing a staple strip of juxtapositioned and adhesively secured staples each fabricated or formed of flat material and each bent into channeled shape having a width less than the original width of the flat material bent into a channeled staple and then driving a severed staple into a body, for example, into a plurality of sheets of cardboard or papers, by the application of pressure to restore the crown and spaced legs of a severed staple substantially to the original flat width of the material, thereby providing gripping surfaces substantially greater than that possessed by a channeled staple when a part of the staple strip.

While I have described my invention in detail and have referred to specific applications thereof, I do not intend that the invention herein disclosed shall be limited to such specific applications but intend that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. The method of driving a staple which comprises, providing a staple strip formed of staple elements fabricated of flat material bent into

angular channel shape having less width between their front and rear edges than the width of the flat material, severing a staple from the strip and driving the severed staple into a body by the application of pressure sufficient to restore portions thereof substantially to the original width of the flat material, thereby providing fastenings of a width greater than that present while in original strip form.

2. The method of driving staples which comprises providing a staple strip formed of juxtapositioned adhesively secured staples each fabricated of flat material and each bent into channel shape having less width than the width of the flat material, severing a staple from said strip and driving the severed staple into a body by the application of sufficient pressure to restore portions of the severed staple substantially to the original width of the flat material, thereby providing fastenings of a width greater than that possessed by a staple when a part of said strip.

3. The method of driving staples which comprises, providing a staple strip formed of juxtapositioned secured staples each fabricated of flat material and each bent into channel shape having a width less than the width of the flat material, severing a staple from said strip and driving the severed staple into a body by the application of pressure to restore the crown and spaced legs of the severed staple substantially to the original width of the flat material, thereby providing gripping surfaces greater than that possessed by a staple when a part of said strip.

STEPHEN A. CROSBY.