Dec. 27, 1927. 1,654,371

C. B. GOODSTEIN

STAPLE

Filed March 22, 1926

Fig. 1.

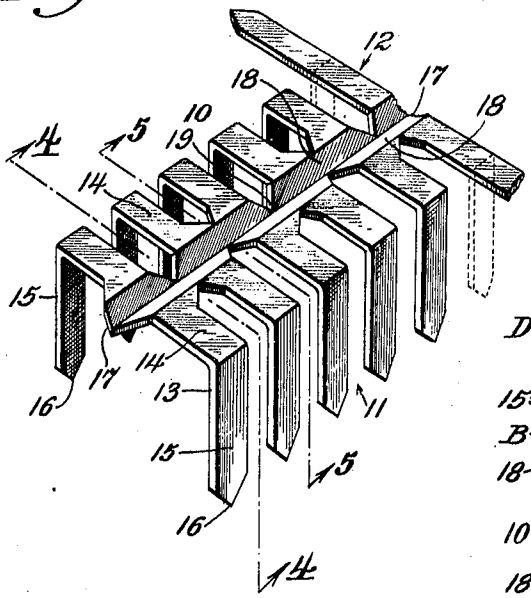



Fig. 6.

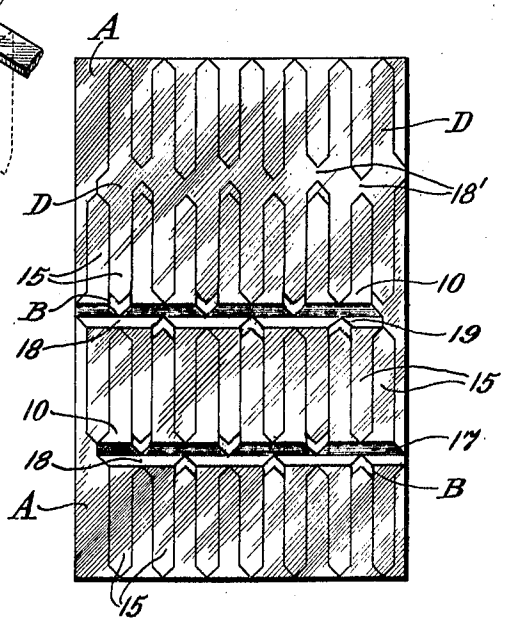



Fig. 4.

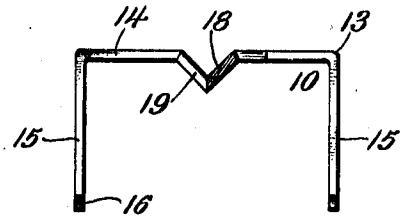



Fig. 2.

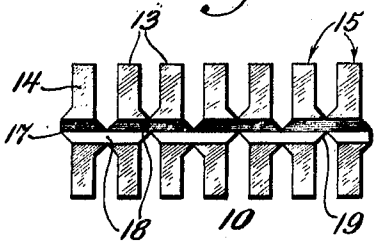



Fig. 5.

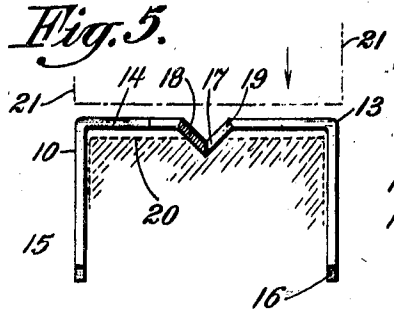
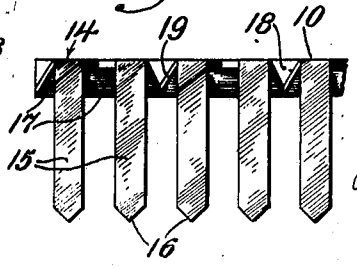



Fig. 3.




INVENTOR

Charles B. Goodstein

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# UNITED STATES PATENT OFFICE.

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## STAPLE.

Application filed March 22, 1926. Serial No. 96,447.

The present invention relates to staples, and more particularly to a type adapted for use in connection with stapling machines.

The primary object of the invention resides in the provision of a staple strip wherein the individual staples are respectively joined by connecting portions positioned at an angle with respect to the body portion thereof for causing the cutter of a stapling machine to separate one staple from the remainder of the strip through the medium of a slicing or shearing action; instead of abruptly chopping them apart in the manner heretofore which consisted in the flat under face of the cutter coacting with the horizontally flat connecting portions of the staple strip.

Another object of the invention resides in providing a staple strip with a longitudinal rib for serving as auxiliary legs, for each individual staple when separated from the remainder of the strip, to afford additional gripping of material to be held by the same.

Another object resides in so constructing my improved staples as to provide a projecting portion to present a minimum bearing surface and consequently reduce the friction while being fed through a stapling machine.

A further object resides in so constructing the staple as to provide means thereon for permitting reasonable distortions and due to its spring-like action, return the staple body to its original condition upon termination of stresses which rise to cause said distortions.

A still further object resides in constructing the staples in substantially flat formation to obviate the possibility of accidental interlocking during shipment; as occurs in the present type of staples which are U-shaped in cross section and this type are distorted when forcibly separated from such interlocked conditions.

Another object in constructing the staples in flat formation is to permit a greater amount of the same to be positioned or boxed in a space heretofore occupied by a lesser amount of the U-shaped type of staple strips.

A further object in constructing the staples in flat formation resides in their ready adaptation to reeling upon a spool whereby a continuous staple strip of one thousand or more may be used within a stapling machine in place of the usual method of inserting a new strip upon the expiration of fifty staples, which is the standard length of the present type of staple strips.

A still further object is to provide the staples with a roughened, knurled or corrugated surface on the under and inner side of the body and leg portions respectively to prevent retrograde slippage after the same has been driven; while the outer faces thereof present a smooth and polished surface to enhance the appearance of the staple.

Still further objects reside in so constructing the staples as to render the same inexpensive of manufacture, sturdy in construction, neat in appearance and highly efficient for the purposes intended.

With these and other objects in view the invention resides in certain new and novel construction, the essential features of which are hereinafter fully described, are particularly pointed out in the appended claims, and are illustrated in the accompanying drawing in which:

Figure 1 is a perspective view of a portion of my improved staple strip illustrating two stages the same assumes during use.

Figure 2 is a plan view of a strip of completely shaped staples.

Figure 3 is an enlarged side elevation of a portion thereof.

Figure 4 is a vertical transverse sectional view taken on line 4—4 of Figure 1.

Figure 5 is a similar view on line 5—5 of Figure 1 and illustrating in dotted lines the manner in which the staple strip is employed within a stapling machine.

Figure 6 illustrates a metallic sheet from which the die of a punch press has stamped a plurality of staple strips in flat and partially shaped condition.

It might be here stated that I am aware of patents granted for staples and staple-strips of the general type for use in stapling machines and it is with such staples in view that the present invention has been designed to overcome their inadequacies.

Referring to the drawing and more particularly to Figure 1, the reference character 10 designates my improved staple strip in its entirety, the portion or section 11 of which illustrates staples completely formed or shaped and ready to be cut and driven by a stapling machine, while the portion 12 (one staple only, being shown) designates the condition of the staples prior to shap-

ing, and in which forms the same are usually constructed; are shipped, and are inserted into the machine.

Taken individually each staple 13 comprises a horizontal body portion 14 which terminates at each end in downwardly projecting legs 15 adapted to penetrate the material to be held by the staple, and the lowermost ends of said legs 15 are provided with points 16 to facilitate their penetration.

At a point intermediate the ends of the horizonal body 14 a portion thereof is bent downwardly to provide a rib 17 which serves as an additional gripping means for material to be held by the staple as the entire leg penetrates the material.

Taken collectively the staple strip 10 is composed of a series of the individual staples 13 which are an integral part of the strip through the medium of their respective connections to each other by bridges 18. As clearly shown, these bridges 18 are alternately offset between first one pair of staples and then another. It will therefore be seen that by providing first the V-shaped rib 17 centrally of the underside of the staple strip it is possible to effect the above alternate bridging by merely alternately notching out the material of the rib as at 19.

Figures 4 and 5 of the drawings clearly illustrate the rib and the angular bridges 18, while Figure 5 more definitely illustrates the objects of the construction described thus far. In this view the base of the anvil 20 of a stapling machine is illustrated in dotted lines and it will be seen that the rib 17 rides in the anvil groove which is of less depth than the depending length of said rib in order to space the under face of the horizontal portion 14 of the staple strip with respect to the upper horizontal face of the anvil to eliminate friction therebetween during the passage of the strip through the stapling machine.

The cutter of a stapling machine is illustrated in dot-and-dash lines as at 21 and for the purpose of clarity to the layman it might be mentioned that the cutter also constitutes the piston driver which is substantially square in bottom plan and flat horizontally and that the same after having severed one staple from the staple from the strip, "follows through" on its stroke to drive the separated staple out of the machine and impale the legs thereof in the material to be secured thereby.

The cutter 21 when driven downwardly from the position shown in Figure 5 will first contact with the uppermost edge of the angular bridge 18 and shear or slice the same to disconnect the staple from the remainder of the strip; from which point the driver delivers same in the usual manner as set forth. It will therefore be seen that the cutter 21 acts only on the edges of the bridge portions 18 throughout the entire cutting action instead of engaging a flat portion of the staples to chop one staple from the strip as is the common practice at present.

In comparison with the present method of a central flat bridge to be chopped by the same portion of the cutter continuously, I position the angular bridges first on one side of the center of the staple strip and then the other in order to alternately co-act with different cutting faces of the cutter, which in itself would consequently allow just double the life of the cutting edge of the cutter even exclusive of my additional improvement of slicing instead of abruptly chopping the staples apart.

The central rib 17 also serves the function of a spring which allows the legs of the staples, while in flattened condition in the machine, to flex in order to freely pass any irregularities while passing therethrough, and return the same to original condition upon reaching the anvil where the leg portions are bent downwardly to form the legs 15 in a manner well known in the art and not deemed necessary to describe. It might be mentioned that the present flat top staples, if distorted in such manner as mentioned will remain so, as a fold or crease is formed which remains in the staple or staples affected and clogs the machine either upon reaching the staple feed mechanism of the machine or the cutter; but if still able to pass said feed a deformed and ineffective staple will be delivered from the machine.

In Figure 6, I have illustrated the metallic sheet A from which my improved staple strips are stamped and such sheet in the stage shown, has received the cutting and shaping die of the punch press to form the staple strips in their flat condition, which is the preferred method of construction prior to use in a stapling machine of the character for which said staples were primarily designed, as such machine converts the flattened staples into U-shape form while passing therethrough prior to cutting and driving the staples.

I desire it to be understood that whether the staples are constructed in flat formation as at 12 or U-shaped as at 11 in Figure 1 for use in different types of machines, the same does not alter the advantages set forth as the spring action of the central depression of rib 17 is identical.

As clearly shown in said Figure 6 two staple strips 10 have been cut therefrom and the central ribs 17 formed simultaneously with said cutting operation and the legs 15 are in flat condition corresponding to the portion 12 illustrated in Figure 1 and as previously specified the staples in this condition are designed for use in machines which form them into U-shape therein. It will be seen that due to the alternate cutting

of the rib portion 17 as previously designated at 19 will necessitate a V-shaped opening B in the metallic sheet A which constitutes the only waste portion of said sheet other than the conventional discard portions which are common in the art.

As shown at D a staple strip of entirely flat condition has also been cut from said sheet A and this type is also adapted to be used in the same type of machine as are the strips 10. This type of staple strip has bridges 18′ alternately depressed in a manner similar to the prefered form of staple.

From the foregoing description, it will be seen that I have provided staples readily adaptable to strip formation and capable of attaining the manifold objects of the invention.

While I have described what I deem to be the most desirable embodiment of my invention, it is obvious that many of the details may be varied without in any way departing from the spirit of my invention, and I therefore do not limit myself to the exact details of construction herein set forth nor to anything less than the whole of my invention limited only by the appended claims.

What is claimed as new is:—

1. A staple strip including joinder portions between the staples of the strip, said portions disposed at an angle with respect to the body and leg portions thereof.

2. A staple strip of the character described comprising a multiplicity of preformed staples each including a V-shaped connecting portion, and joinder portions respectively between the staples positioned at an angle and alternately offset with respect to each other.

3. A staple strip embodying a multiplicity of preformed staples, and integral alternately disposed offset portions for connecting the staples together in strip formation.

4. A staple strip cut and formed from a single piece of material to provide series of spaced stapling legs on each side of a V-shaped rib alternately notched coincident with the space between certain of the stapling legs.

5. A staple strip cut and formed from a single piece of material to provide a multiplicity of preformed staples each comprising stapling legs connected together by relatively angularly disposed connecting portions, the staples connected together by the merging of one of said angularly disposed connecting portions with a similar connecting portion of the adjacent staple.

6. A staple strip cut and formed from a single piece of material to provide series of spaced pointed stapling legs on each side of a V-shaped rib alternately notched coincident with the space between certain of the stapling legs.

In testimony whereof I affix my signature.

CHAS. B. GOODSTEIN.