March 18, 1947. J. C. LANG 2,417,423

DOUBLE ENDED STAPLE

Filed Sept. 29, 1943

Fig. 1.

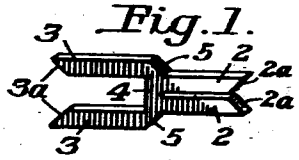


Fig. 4.

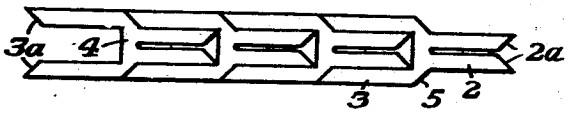


Fig. 2.

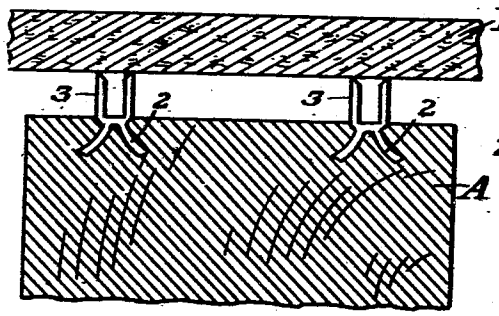


Fig. 3.

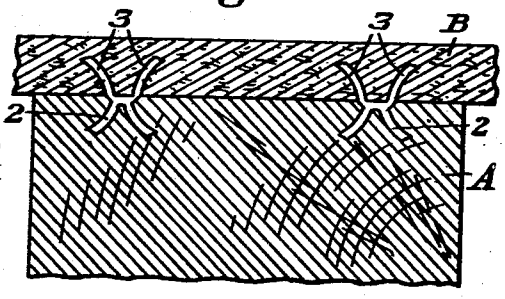


Fig. 5.



Fig. 6.

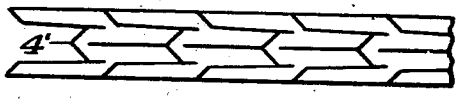


Fig. 7.

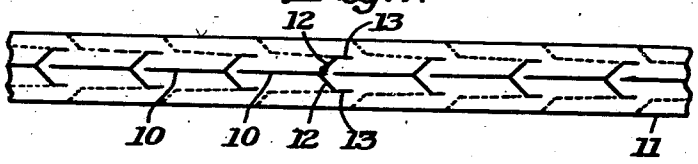


Fig. 8.

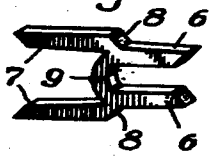
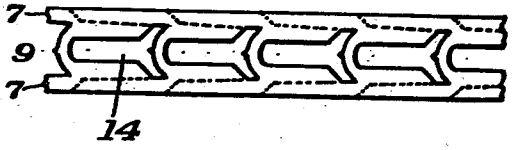


Fig. 9.



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DOUBLE ENDED STAPLE

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Application September 29, 1943, Serial No. 504,256

6 Claims. (Cl. 85—49)

1

This invention pertains to the art of stapling and is for an improved staple construction and for a method of making same.

Conventional staples normally have a bridge portion with deep ending substantially parallel legs. According to the present invention, there is provided a staple having a bridge portion with two pairs of legs, one extending upwardly from the bridge, and one extending downwardly from the bridge. These staples are designed for use in fields where conventional staples are entirely inadequate. For example, in the building industry it is frequently desirable to unite sheets of wall board or plaster board to studding by fasteners which are completely concealed. A staple made in accordance with the present invention can be used for this purpose. It is first driven into the studding in such manner that one pair of legs enters the studding, while the other pair of legs projects perpendicularly from the face of the studding. When a sheet of plaster board is forced against the studding, the upstanding legs enter the plaster board. Both pairs of legs are preferably so constructed that when they penetrate the material into which they are driven, they will diverge or spread, to increase the holding power of the staple.

While I have mentioned that the staple of the present invention is adapted for use in the building field, this is only typical of one use, and it will be understood that the staple may be used elsewhere where it is desired to connect two pieces together with a fastener of the staple type, and particularly to have a completely concealed staple.

According to the present invention, it is further contemplated that the staple will preferably be cut from sheet metal. Conventional methods of forming cut sheet metal staples would result, in the present instance, in a considerable waste of metal. My invention contemplates a method of forming the staples from a narrow strip of metal in succession, without substantial loss of any material. This is effected by slitting and expanding the metal from which the staple is formed and constitutes improvement on my copending application, Serial No. 498,627 filed August 14, 1943.

My invention may be more fully understood by reference to the accompanying drawings, in which;

Figure 1 is a perspective view of a single staple embodying my invention;

Figure 2 is a more or less schematic view illustrating the manner of using the staple of Figure 1, with the staples being shown completely driven into one of two parts to be joined, and with the other of the two parts to be joined brought into position for stapling;

2

Figure 3 is a view similar to Figure 2 showing the staples completely driven into both parts;

Figure 4 is a plan view and shows the manner in which the staples of Figure 1 may be nested to save space in packing, or for use in a magazine type of driver;

Figure 5 is a view similar to Figure 1, illustrating the manner of developing a single staple;

Figure 6 shows the method of slitting a strip of metal to produce the staples of Figure 5;

Figure 7 is a view similar to Figure 6 showing the steps in the development of a staple such as that illustrated in Figure 8;

Figure 8 is a perspective view of the modified staple; and,

Figure 9 is a view similar to Figure 7 showing a further step in the development of the staple shown in Figure 8.

Referring first to Figure 1, the staple, which is preferably blanked from sheet metal, has a primary set of legs designated 2, and a secondary set of legs designated 3, these legs extending in opposite directions from a bridge portion 4. The primary legs 2 are preferably closer together than the legs 3 so that, at the outside of the staple, there is formed a bevelled shoulder 5. The overall width of the pair of legs 2 is preferably such that they will nest or fit between the two legs 3 of a correspondingly formed staple. The primary legs 2 have outwardly bevelled or chiseled pointed ends 2*a*, such that when these ends are entered into material into which the staple is driven, the material tends to spread the legs apart. Likewise, the legs are similarly shaped at 3*a* so that when they penetrate the material, they will tend to spread apart.

By forming the legs at one end of the staple closer together than the legs at the other end, the staples may be blanked from a narrow ribbon or strip of metal as shown in Figure 4, with very little waste of material. Practically the only material which is wasted is that which is punched out in forming the bevelled surfaces 2*a* on the legs 2. Also, because of this manner of forming the staples, they may be very compactly nested one over the other with the legs 3 of one staple embracing the legs 2 of the next. This has definite advantages in packaging the staples, in housing them in the driver, and in feeding them.

In driving the staple shown in Figure 1, either end of the staple may first be driven. For simplicity in the design of the driver, however, it is

preferred that the staples be driven as shown in Figure 2 so that the legs 2 are first driven into the material designated A. In this operation the top of the cross head or bridge 4 which is flat, may be engaged by a staple driver of any known or preferred construction, suitably modified to provide clearance for the legs 3. When the staple is driven, the bevelled ends tend to cause the legs to spread apart as clearly shown in Figure 2.

There is another advantage in driving the small end of the staple first. This arises from the fact that in many instances one end of the staple will be driven in relatively firm material, such as the wood studding of a building. In Figure 2, A designates such studding. The other end of the staple in many cases, will be driven into softer material, such as composition board or wall board. In Figures 2 and 3. B designates a panel of such composition material.

Within certain limits, the holding power of the staple is increased by increasing the spread between the legs. For example, if the two legs coincided, the staple would have no more holding power than a nail of corresponding section. Consequently, as the spread between the legs increases, the holding power of the staple also increases up to a certain point. Consequently, because the legs of the staple can exert less holding power in the composition board B than they will in the solid wood A, it is desired to have those legs 3 which are widely spaced enter the softer material, and to have the more closely spaced legs 2 which have less holding power in the stronger material.

In using these staples, large numbers of them are driven into the stud A and into adjacent studs in a building operation. Then the panel B is forced against the studding. This causes the legs 3 of the staples to penetrate the panel B and in penetrating the panel they also tend to spread apart. The length of the legs 3 is calculated to be insufficient to completely penetrate the panel B. However, in instances where holding power, without respect to appearance is to be taken into consideration, it is feasible to have the legs 3 longer and have them completely penetrate panel B, and be clinched over on the outer surface of the panel B.

While I have described the staple used in an operation where there is a wood stud and a composition panel to be connected, this is purely by way of illustration, and it will be obvious that the invention is applicable to various other securing operations where wood is fastened to wood, or where panel boards are connected as elsewhere.

Instead of cutting the staples as shown in Figure 1, the method of cutting illustrated in Figures 5 and 6 may be used. In this case, the legs 2 are separated only by a slit and the bridge of the staple between the legs 3 is pointed instead of flat as shown in Figure 1. The application of driving pressure to the point 4' of the bridge of the staple in Figure 5 tends, when the staple is entering hard material, to spread the legs 2 apart, and this also tends to further expand the distance between the legs 3. Figure 6 shows how these staples may be blanked from a narrow strip, and how they may be nested for the purposes herein above mentioned.

A somewhat more effective way of making the staples is illustrated in Figures 7, 8 and 9. Referring first to Figure 8, the staple has two pairs of legs, the legs of one pair being designated 6, and the legs of the other pair being designated 7. These legs have bevelled or chiseled ends as

described in connection with Figure 1, and the pair 6 is separated less widely than the pair 7. There is a shoulder at 8 on each outer edge of the staple, the legs 6 being offset inwardly from the legs 7 a distance equal to the cross section of the width of the legs 7. This is for the purpose explained in connection with Figures 1 and 4 of blanking the staples from a continuous strip with a minimum waste of material, and for allowing the staples to be nested in packaging and in use. However, the staples have a bridge portion 9 which is bowed in such manner that it presents a convex surface between the legs 7 and a concave surface between the legs 6. This form of staple is produced as shown in Figures 7 and 9 by forming a straight slit 10 at regular intervals along the center line of the strip of the metal 11. At one end the slit is forked to provide two divergent arms 12, and extending longitudinally of the strip toward the next slit is a short slit 13 forming a continuation of the slit 12. When the strip has been slit in this manner, it is then progressively spread in a lateral direction, as more fully explained in my copending application, Serial No. 498,627 filed August 14, 1943, above referred to, by forcing progressively larger punches into the slits 10 and 12. Eventually each slit is expanded into a Y-shaped opening shown in Figure 9, the Y-shaped opening being designated 14. The staples are then severed on the dotted lines shown in Figure 9 to produce individual staples shown in Figure 8. Thus by starting with the narrow strip of material, the resulting staple has a width substantially greater than the width of the original strip. This is a desirable condition because a wide staple is cut and formed from narrow strip metal without any waste of material. Because the holding power of the legs 6, being spaced from each other, is greater than the holding power of the corresponding legs 2 of the staple shown in Figure 1, the form of staple shown in Figure 8 is to be preferred in many operations where considerable holding power is required. Also the arched driving surface 9 which result from the expanding of the Y-shaped slit may be engaged by flat driving surface in the operation of driving the staple. The application of driving pressure to this curved surface will, as previously explained in connection with Figure 5, tend to cause the legs 6 to spread apart as they enter the material.

The advantages of my invention recite in the fact that a new form of fastener is provided in the form of a double ended staple and that this staple is adapted for use in many operations where staples could not heretofore be used. In fact, it provides a fastener for use in a manner which is unique.

While I have illustrated and described certain preferred embodiments of my invention and the method of producing the staples, it will be understood that this is by way of illustration, and that various changes and modifications may be made within the contemplation of my invention and under the scope of the following claims, and instead of being cut from sheet metal the staple may be formed from wire stock.

I claim:

1. A staple having two legs and a bridge portion and having a second pair of legs extending from the bridge portion in a direction opposite the first pair, the bridge portion of the staple being arched in one direction, both pairs of legs and the bridge being in a common plane.

2. A staple having two legs and a bridge por-

tion and having a second pair of legs extending from the bridge portion in a direction opposite the first pair, the bridge portion being arched toward the points of the first mentioned legs, the second mentioned pair of legs being spaced closer together and having less over-all width than the first pair.

3. A double ended staple having two sets of points, the points of one set extending in a direction opposite the points of another and a common bridge portion connecting the points on one side of the staple with the points on the other, said bridge portion being arched whereby the application of driving force to the bridge tends to separate one set of legs.

4. A double ended staple having two sets of legs, one set extending in a direction opposite the other, the staple having a common bridge portion between the legs of one side and the legs of the other, both sets of legs having outwardly divergent chisel-like terminal portions, one set of legs being spaced more widely apart than the other set of legs and having beveled shoulders at their inner ends against which the points of a similar staple may set when the staples are nested.

5. A staple having a bridge portion with a pair of legs extending in opposite directions from each side of the bridge portion, the legs and bridge being in a plane, the axes of the legs of one pair being closer together than the axes of the legs of the other pair, the space between the legs of each pair being open.

6. A staple having a bridge portion with a pair of legs extending in opposite directions from each side of the bridge portion, the legs and bridge being in a plane, the axes of the legs of one pair being closer together than the axes of the legs of the other pair, the space between the legs of each pair being open, and at least one pair of said legs having outwarly divergent chisel-like terminal portions.

JOSEPH C. LANG.

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