Sept. 5, 1950 R. A. PERCOCO 2,521,019

STAPLE

Filed Jan. 17, 1948

Fig. 1

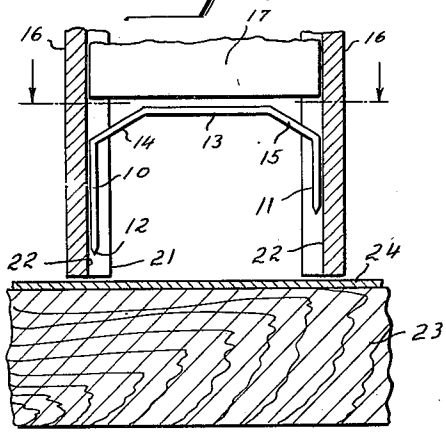


Fig. 2

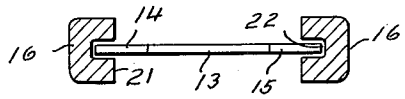


Fig. 3

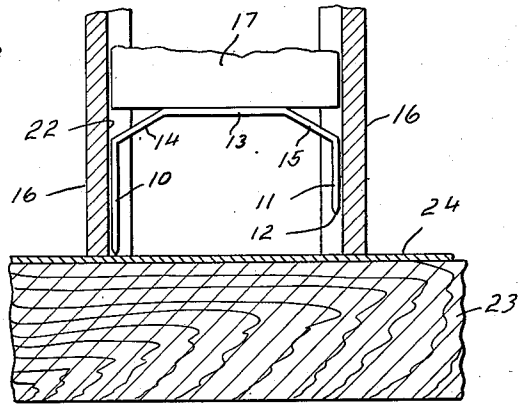


Fig. 4

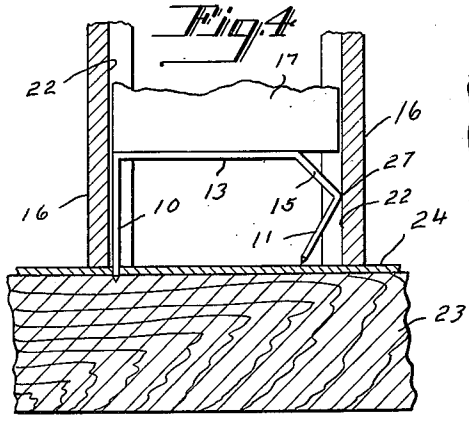


Fig. 5

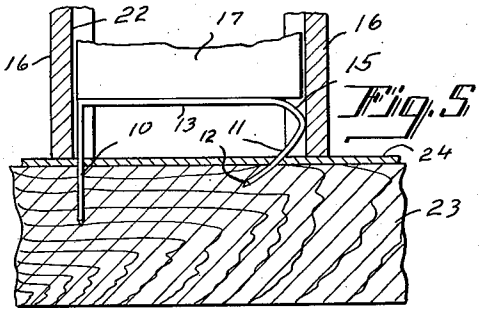


Fig. 7

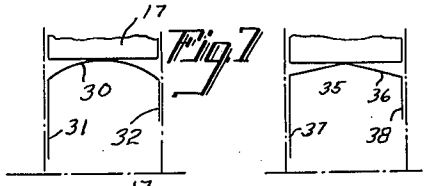


Fig. 8

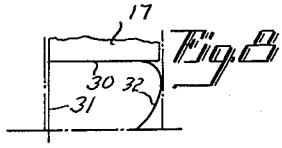


Fig. 10

Fig. 9

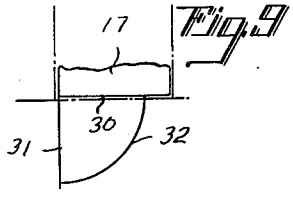
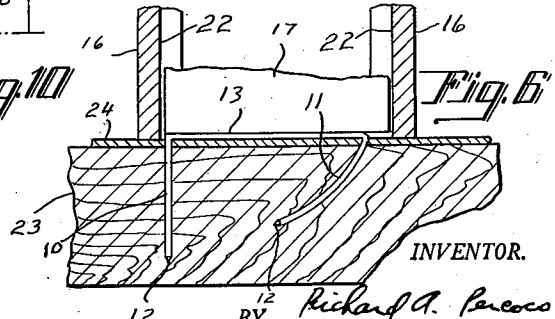


Fig. 6



INVENTOR.

BY Richard A. Percoco

John P. Chandler

his Attorney

Patented Sept. 5, 1950 2,521,019

UNITED STATES PATENT OFFICE

2,521,019

STAPLE

Richard A. Percoco, Mamaroneck, N. Y.

Application January 17, 1948, Serial No. 2,841

3 Claims. (Cl. 85—49)

1

This invention relates to staples which are adapted to be driven into an article by the use of a stapling machine or driver, and relates more particularly to a novel staple designed especially for driving into wood, composition board, and other relatively thick articles wherein the legs of the staple do not normally pass completely through the material. The invention further relates to a novel method of causing one of the two legs of a staple to move towards the other as it is driven into the work.

In common stapling machines for office use, a staple is driven through a number of sheets of paper, and the legs of the staple are then directed inwardly by a suitable anvil mounted on the base of the machine. If sufficient pressure has been applied to the hammer, the several sheets of paper are firmly clamped between the inturned legs and the bridge of the staple. The staple of the present invention is adapted primarily, although not exclusively, for driving into a member of greater thickness than the length of the legs so there is no opportunity for an anvil to direct the legs inwardly.

The principal object of the present invention is to provide a novel staple wherein one of the legs turns inwardly toward the other during the act of driving. A common use for a staple of this character is in applying insulation to wood beams and rafters during building construction. If both legs of the staple maintain their initial, generally parallel relation as they are driven into the wood, they are easily pulled out under a slight load. In the improved staple of the present invention, one leg moves inwardly toward the other leg, and the result is almost a triangular relationship between the legs and the interconnecting bridge. As a result, the staple will support from two to four times the load of a conventional staple.

Another object of the invention is to provide a novel staple wherein one of the legs moves in the direction of the other as it is driven into solid material, without the necessity of providing supplemental jaws on the driver which penetrate the wood or other material.

Still another object of the invention is to provide a novel staple which requires less driving pressure to drive the staple home.

In the drawings:

Fig. 1 shows a front elevation of a staple embodying the present invention, the view further showing certain parts of a conventional stapling machine, partly in section, and also the work to be stapled.

2

Fig. 2 is a section taken on line 2—2 of Fig. 1.

Fig. 3 shows the position of the staple and the driver as the staple is about to enter the work.

Fig. 4 shows the position of the parts as the longer leg of the staple has begun to penetrate the work.

Fig. 5 shows the relation of the parts when the staple has been partly driven into the work.

Fig. 6 is a section through the work showing the position of the staple after it has been driven home.

Fig. 7 is a schematic view of a modified form of staple.

Fig. 8 shows the staple of Fig. 7 as one leg enters the work.

Fig. 9 shows the staple driven home.

Fig. 10 shows a second modified form of staple.

Referring now more particularly to the drawings, a staple embodying the present invention is shown in Fig. 1, the staple including spaced-apart leg portions 10 and 11, the lower terminals of which are pointed, as shown at 12. Leg portion 11 is shown as being of lesser length than leg portion 10. A bridge portion connects leg portions 10 and 11, such bridge portion comprising a central section 13 which is generally perpendicular to the leg portions, and downwardly-inclined terminal sections 14 and 15.

Staples which are adapted to be applied by stapling machines are generally made from a length of wire of square or other appropriate cross-sectional contour which is fed to a staple-forming machine. In this machine the wire is cut to short lengths, and then formed by suitable dies into individual staples. The staples are thereafter secured together by adhesive, and the stapling machine then shears off one staple from the gang and drives it into the work. The staple of the present invention may be formed in this fashion.

Portions of a conventional stapling machine are shown in Figs. 1 and 2, such including spaced channel members 16 and a hammer 17 having a generally flat, lower edge which engages the bridge portion of the staple. The spaced flanges 21 which form the trackways retain the staple in a position generally parallel with the driving edge of the hammer during the driving operation. The inner walls 22 of the trackways are spaced apart a distance substantially equal to the overall length of the staple. Accordingly, when the hammer 17 descends, one staple is severed from the gang of staples and is moved downwardly in the direction of the work. In this instance, the work is shown as comprising a relatively thick

board 23 and a sheet 24 which may comprise paper, sheet metal, or the like.

Fig. 1 shows the general position of the staple with respect to the work at the time at which it is sheared from the gang of staples. In Fig. 3, the hammer has moved the single staple downwardly in the direction of the work to a point wherein the lower pointed terminal 12 of leg 10, being the longer leg, has contacted the upper surface of the work.

Up to this point the hammer has not deformed the initial contour of the bridge. As the hammer continues to descend, leg 10 penetrates the work, and in doing so terminal section 14 of the bridge is bent to a position in axial alignment with central section 13, as shown in Fig. 4. This action somewhat lengthens the bridge and tightens the relation between the leg portions and the inner walls 22 of the trackways, causing a shifting of the bridge to the right by a distance roughly equal to the increase in the length of the bridge caused by the bending of section 14. Continued downward movement of the hammer causes leg 10 to move into the work in a direction generally perpendicular to the surface of such work. At all times during the penetration of leg 10 into the work, the entire length of the leg is in firm engagement with the inner wall 22 of the channel, and, as a result, the leg penetrates the work in a direction generally perpendicular to the surface of such work.

As a result of the shifting to the right of the bridge, the point 27 of intersection between section 15 and the shorter leg 11 moves rather forcibly against the inner wall 22 of the other channel with a bending of the parts in the general manner shown in Fig. 4. The angle between sections 15 and 13 of the bridge decreases, and the leg 11 assumes a smaller angle relative to the central section 13 of the bridge. Sections 15 and 11 then appear to assume a more curved contour, as shown in Fig. 5, and the point 12 of the leg commences travel in an arcuate path toward leg 10. The final result is as shown in Fig. 6. It will be appreciated that the two points of the legs will more closely approximate each other if the bridge is made relatively shorter.

This arrangement is shown in the modified embodiment of Fig. 7. The bridge 30 is shown as having a continuous curve and joins leg portions 31 and 32, the latter being shorter. As the hammer 17 descends, the left-hand section assumes a right-angular configuration, thus shifting the bridge to the right, as shown in Fig. 8. Further downward movement of the hammer causes the shorter leg 32 and the adjoining terminal section of the bridge to assume a curved contour, and the final result is shown in Fig. 9.

In Fig. 10 the staple has a bridge composed of two sections 35 and 36 of substantially equal length, and which bear an angular relationship to each other. Legs 37 and 38 are disposed at the ends of the sections, the latter being the shorter. When this staple is driven into the work, the results are substantially the same as that shown in Fig. 9.

While three forms or embodiments of the invention have been shown and described herein for illustrative purposes, and the construction and arrangement incidental to three specific applications thereof have been disclosed and discussed in detail, it is to be understood that the invention is limited neither to the mere details or relative arrangement of parts, nor to its specific embodiments shown herein, but that extensive deviations from the illustrated forms or embodiments of the invention may be made without departing from the principles thereof.

What I claim is:

1. A staple formed from a length of metal of generally uniform cross-sectional contour and comprising a pair of spaced leg portions which are generally parallel with each other and an interconnecting bridge portion provided with a generally straight central section and downwardly-inclined terminal portions which connect with the leg portions, the length of the central section being substantially similar to that of one of said leg portions, the length of the other leg portion being lesser relative thereto.

2. A staple formed from a length of metal of generally uniform cross-sectional contour and comprising a pair of spaced leg portions which are generally parallel with each other, and an interconnecting bridge portion provided with a generally straight central section and downwardly-inclined terminal sections which connect with the leg portions, each terminal section being substantially one-half the length of the central section one of said leg portions being substantially the length of said central section and the other of said leg portions being of a lesser length relative thereto.

3. A staple formed from a length of metal of generally uniform cross-sectional contour and comprising a pair of spaced leg portions which are generally parallel with each other, and an interconnecting bridge portion provided with a generally straight central section and downwardly-inclined terminal portions which connect with the leg portions, the terminals of such leg portions being pointed to facilitate entry into material one of said leg portions being substantially the length of said central section and the other of said leg portions being of a lesser length relative thereto.

RICHARD A. PERCOCO.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,142,782	Gillette	Jan. 3, 1939
2,150,127	Passek	Mar. 7, 1939
2,380,655	Lang	July 31, 1945
2,380,786	Percoco	July 31, 1945