Oct. 21, 1924. 1,512,040

J. H. REED

STAPLE

Filed Feb. 2, 1923

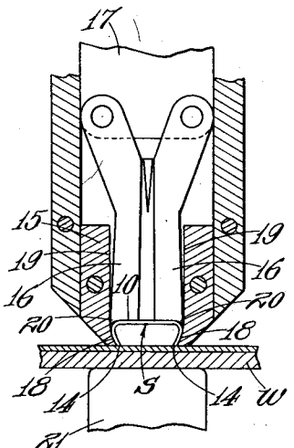


Fig. 2.

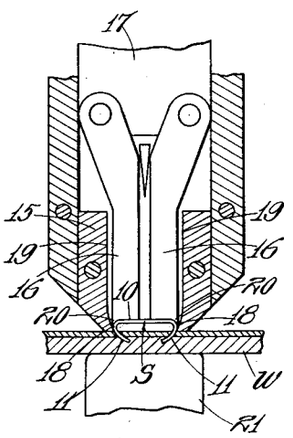


Fig. 3.

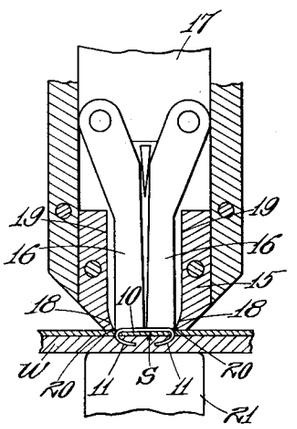


Fig. 4.

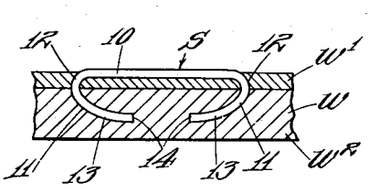


Fig. 5.

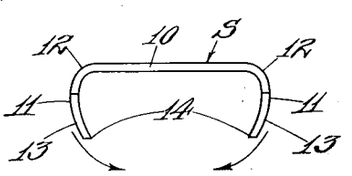


Fig. 1.

INVENTORS

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Patented Oct. 21, 1924. 1,512,040

UNITED STATES PATENT OFFICE.

JAMES H. REED, OF SWAMPSCOTT, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

STAPLE.

Application filed February 2, 1923. Serial No. 616,622.

To all whom it may concern:

Be it known that I, JAMES H. REED, a citizen of the United States, residing at Swampscott, county of Essex, State of Massachusetts, have invented a certain new and useful Improvement in Staples, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has for its general object to provide a staple or other fastener of similar type which may be driven in such a manner as to be clinched within the body of the work, so as to be securely retained therein without completely passing through the same, thus making a "blind" fastening, or a fastening which shows on only one side of the work.

The more particular objects of the invention, together with means whereby the same may be carried into effect, will best be understood from the following description of one form or embodiment thereof and means for driving the same as illustrated in the accompanying drawings. It will be understood, however, that the particular constructions and operations described and shown have been chosen for illustrative purposes merely, and that the invention, as defined by the claims hereunto appended, may be otherwise practised without departure from its spirit and scope.

In said drawings:

Fig. 1 is an enlarged detail side view of a staple embodying the invention.

Figs. 2, 3 and 4 are diagrammatic views illustrating the manner of driving the staple shown in Fig. 1.

Fig. 5 is a view similar to Fig. 1 showing the staple driven and clinched in the work, the latter being shown in section.

The staple S, shown in Fig. 1, comprises a substantially straight wire body 10 having at each end an inwardly extending pointed prong. These prongs are preferably curved so that portions 12 of the shanks of said prongs extend outwardly away from each other a short distance at their parts adjacent said body and said shanks at their parts 11 and 12 curve inwardly so that their pointed ends 14 are directed towards each other. The prongs of the staple shown in Fig. 1 are somewhat sidepointed, as denoted by the cross lines adjacent the reference numerals 11, owing to the fact that the wire for each staple is cut off diagonally.

The staple above described may be driven into the work W, herein shown as comprising two superposed layers of leather w^1 and w^2, in accordance with the method and by means of the mechanism disclosed and claimed in applications Serial Nos. 616,621 and 648,935 filed by me February 2, 1923, and July 2, 1923, respectively. In accordance with the method referred to, said staple is driven through a throat 15 by means of a driver comprising a pair of driving members 16 pivoted or otherwise mounted for lateral movement upon a plunger 17 which is reciprocated by any suitable means, not shown. The throat 15 has an open end of a width substantially equal to the width of the body 10 of the staple, and consequently less than the maximum width of the staple measured across the shanks, and adjacent said open end said throat is formed with oppositely disposed walls 18 which converge toward said open end and are preferably so curved as substantially to conform to the shape of the portions 13 of the staple shanks, said curved concave portions 18 merging into straight parallel portions 19 spaced substantially to correspond to the maximum width of the staple and adapted to guide the same into driving position. The driving members 16 are provided at the outer sides of their lower ends with projections 20 which engage said shank portions 12 laterally as the staple is driven.

In Fig. 2, a staple is shown in the throat 15 in position to be driven by the driving members 16 into a piece of work W resting upon a suitable support 21. As the driving members 16 descend, the pointed ends 14 of the staple are caused to enter the work, being, however, simultaneously deflected laterally toward one another by the curved converging portions 18 of the walls of the throat 15. As the operation continues, as illustrated in Fig. 3, causing the converging shank portions 13 of the prongs, adjacent the ends 14, to be forced into the work, said prongs being also progressively deflected inwardly toward one another as they enter the work. The arrangement is such as to cause the point-

ed ends 14 and adjacent portions of the prongs to pass into the work along or parallel to the curved lines generally indicated by the arrows on Fig. 1, the portions 12 of the shanks adjacent the body 10 being gradually bent to come closer to the body as this movement continues. The desired movement and bending of the shanks along the curved lines indicated is insured, and buckling prevented, by the portions 20 of the driving members 16, which portions, after the points of the staple have entered the work, engage the curved portions 18 of the walls of the throat so as to give to said driving members a progressively increasing movement in a lateral direction toward one another and thus contract the driver as a whole. This operation causes the staple to be compressed laterally, the prongs being forced toward one another so as to enable the staple to pass through the contracted open end of the throat, and supplying a progressively increased lateral component to the driving force, which is thereby applied to the shanks in a direction substantially parallel to the direction of movement of the pointed ends 14 during their penetration of the work. As the driver reaches the forward limit of its movement, the body 10 of the staple passes through the open end of the throat, the portions 13 of the shanks 11 thereof having been brought into a position substantially parrallel with said body 10, being therefore clinched in the work although spaced from the side thereof opposite that from which the staple was driven, and the portions 12 of said prongs having been brought into positions of substantial parallelism to the body 10.

It will therefore be seen that the staple herein shown may be driven, in the manner and by the means described, part way only through the work but nevertheless be securely clinched within the latter by means of a clinching member (namely, the portions 18 of the throat 15) located on the same side of the work as the driver. The necessity of a clinching anvil at the opposite side of the work from the driver is therefore obviated, and said last named side of the work left unmarred by the anvil and unbroken by the points of the staples which are thoroughly sheathed within the body of the material, so as to be incapable of doing damage. It will also be seen that the staple described is further capable of advantageous use in connection with work of greater thickness than the length of the prongs, or with work whose side opposite that from which the staples are driven is inaccessible, so as to prevent the clinching of the latter by ordinary clinching means, the prongs of the present staple being securely clinched within the body of the work from the side thereof from which they are driven.

Having thus described my invention, I claim:

1. A staple comprising a substantially straight wire body provided at each end with a prong, said prongs curving toward one another and the free ends thereof converging in the direction away from said body.

2. A staple consisting of a wire body having a pointed prong at each end, said prongs curving outwardly away from each other at their parts adjacent said body and then curving inwardly so that their pointed ends are directed toward each other.

In testimony whereof I affix my signature.

JAMES H. REED.