

Feb. 25, 1941.

S. S. BERNSTEIN

2,232,994

FASTENING MEANS

Filed April 2, 1940

2 Sheets-Sheet 1

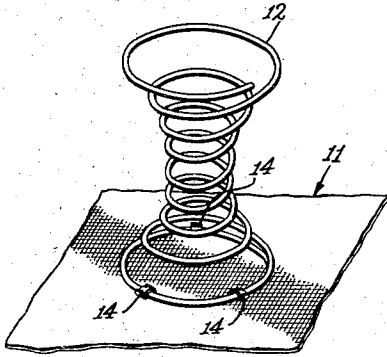


Fig. 1.

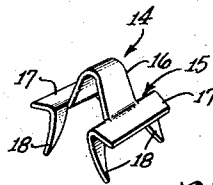


Fig. 2.

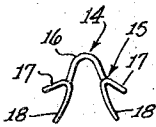


Fig. 3.

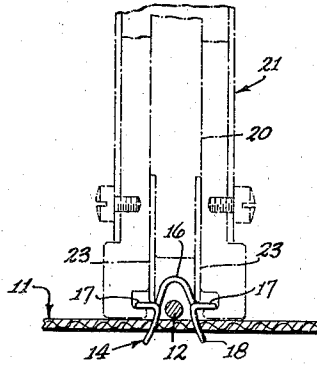


Fig. 4.

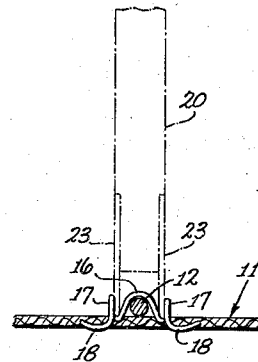


Fig. 5.

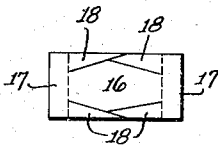


Fig. 6.

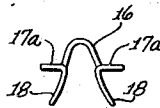


Fig. 7.

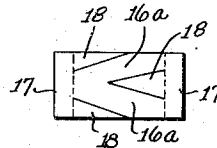


Fig. 8.

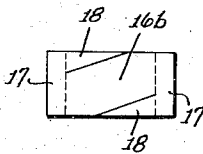


Fig. 9.

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FASTENING MEANS

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2 Sheets-Sheet 2

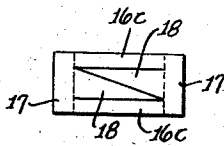


Fig. 10.

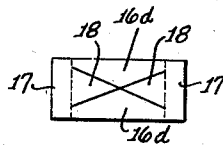


Fig. 11.

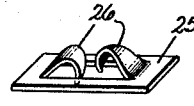


Fig. 12.

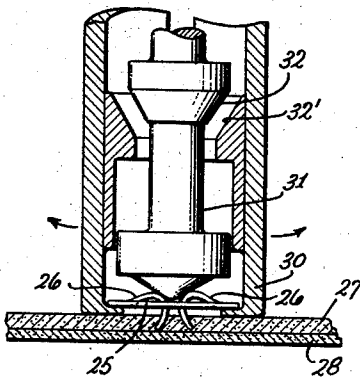


Fig. 13.

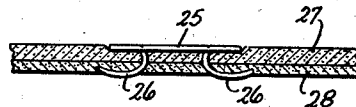


Fig. 14.

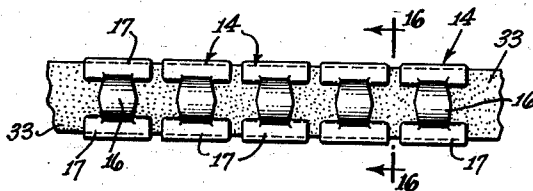


Fig. 15.

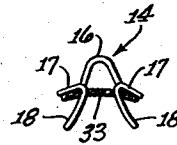


Fig. 16.

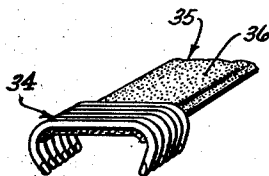


Fig. 17.

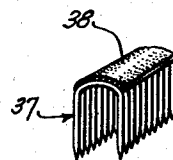


Fig. 18.

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UNITED STATES PATENT OFFICE

2,232,994

FASTENING MEANS

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Application April 2, 1940, Serial No. 327,440

12 Claims. (Cl. 85—49)

This invention relates generally to fastening means such as wire staples or the like. More particularly, the invention relates to means for attaching or fastening coil springs, such as are commonly used in upholstery construction, to the spring supporting fabric or webbing.

This application is a continuation in part of my application for Stapling mechanism, Serial No. 304,634, filed November 15, 1939, which in turn is a continuation in part of my application which resulted in Patent No. 2,180,500, of November 21, 1939.

The fastening means of this invention is particularly designed for use in upholstery construction as a means of securing the coil springs in place on a spring supporting means. However, it is contemplated that the fastening means has several other uses and although in the description particular reference will be made to the fastening of coil springs to a spring supporting fabric, this is done for the purpose of clearly disclosing the invention and it is not intended by this to limit the invention.

The disadvantages of the common practice of securing coil springs to a supporting fabric by means of stitching twine, have been pointed out in my Patent No. 2,180,500. It is a primary object of this invention to provide a new and improved fastening means for securely attaching coil springs to a fabric without the attendant disadvantages of stitching twine securing means or the like as commonly used. In this connection it is also an object of this invention to provide a fastening means of neat appearance and in which no points or projections are left on the under-surface of a spring supporting fabric when the fastening means has been installed.

The various forms of fastening means disclosed herein will be referred to as staples. Ordinary metal staples, such as are commonly in use, must be driven against an anvil or the like on order to deform the staple to the holding position. This is a disadvantage since it limits the use of the staples to objects where it is possible or convenient to position an anvil or the like behind the objects to be stapled. In view of this, it is a particular object of this invention to provide a staple which can be installed without the use of an anvil by a tool operating from only one side of the fabric or the like to which an object is to be secured. To accomplish this, it is an object to provide a staple having portions which are designed to be bent upon a central portion of the staple to cause prongs on the staple to move out-

wardly and upwardly and firmly engage in a holding position.

It is also an object of this invention to provide a staple which may be installed by a variety of tools and which is capable for use for various purposes where it is desired to secure one object to another.

It is a further object to provide a relatively inexpensive staple of the general type indicated having a minimum amount of material and capable of being readily and economically manufactured.

Heretofore it has been the practice to secure a plurality of staples together by a rigid means so that the staples may be used in the magazine of a stapling machine. The disadvantage of this has been that the staples were only usable in machines which had a straight magazine since if the magazine were curved, the fastening means connecting the staples would break. As a result, it has been impossible to design certain special types of stapling machines for handling particularly difficult stapling operations in cramped quarters. It therefore is an object of this invention to provide a means of securing a plurality of staples together so that the staples may be used in a magazine which is curved or has a curved part and the staples will remain flexibly secured to each other while passing through the magazine until such time as the stapling operation itself may sever the staples from the flexible attaching means one at a time.

These and other objects will be apparent from the drawings and the following description thereof. Referring to the drawings which are for illustrative purposes only;

Fig. 1 is a perspective view of a fragmentary portion of a spring supporting fabric to which there is shown attached an upholstery spring by means of the fastening means of this invention;

Fig. 2 is a perspective view of one form of staple of this invention;

Fig. 3 is an end elevation of the staple of Fig. 2;

Fig. 4 is an end elevation of the staple of Fig. 2, shown deformed to an intermediate position and being installed to hold a coil of a spring on a supporting fabric, the latter two elements being shown in section;

Fig. 5 is a view similar to Fig. 4 except that the staple is shown in holding or securing position;

Fig. 6 is a plan view of a blank used in forming the staple of Fig. 2;

Fig. 7 is an end elevation of a modified form of staple;

Fig. 8 is a plan view of a blank used in forming a three-pronged staple;

Fig. 9 is a plan view of a blank used in forming a 2-pronged staple;

Fig. 10 is a plan view of a blank used in forming another form of a 2-pronged staple;

Fig. 11 is a plan view of a blank used in forming still another form of a 2-pronged staple;

Fig. 12 is a perspective view of another form of staple;

Fig. 13 is an end elevation of the staple of Fig. 12 shown with relation to two sheets to be secured together and with relation to apparatus for installing the staple;

Fig. 14 is an end elevation of the staple of Fig. 12 in holding position, shown with relation to two sheets of material which it is securing together, the sheets being in section;

Fig. 15 is a plan view of a plurality of staples of the type shown in Fig. 2 secured together by means of a tape;

Fig. 16 is a cross section on line 16—16 of Fig. 15;

Fig. 17 is a perspective view of a plurality of hog rings secured together by means of a tape; and

Fig. 18 is a perspective view of a plurality of ordinary wire staples secured to each other by a flexible means.

More particularly describing the invention, reference numeral 11 generally indicates a fragmentary portion of a spring supporting fabric such as is commonly used in upholstery construction. Upon this is mounted a spring 12 by means of the staples 14 of this invention. Fig. 1 thus illustrates the manner in which the springs may be secured to a spring supporting fabric.

The staple 14 (see Figs. 2 to 5) is the same staple disclosed in my co-pending application, Serial No. 304,634 above referred to. This staple comprises a top or major portion 15 which consists of a central arch or bridge portion 16 which serves to connect two laterally extending wings 17. Extending downwardly or away from the wings on the side of the staple opposite to the arched bridge 16, are four prongs 18. These prongs are divergent and opposed and with reference to the top or major portion of the staple they may be said to extend downwardly and outwardly. The wings 17 form an acute angle with the prongs as best illustrated in Fig. 3. Preferably the wings 17 are inclined or may be said to extend downwardly assuming that the staple is so positioned that the so-called top portion 15 is actually at the top. However, this is not essential and in the form of the invention shown in Fig. 7 the wings, there indicated by reference numeral 17a, are disposed in the same plane. As will hereinafter become apparent, the purpose in having the wings inclined as in Fig. 3 is to accomplish a maximum movement of the prongs 18 outwardly and upwardly when the staple is bent to holding position.

Referring to Figs. 4 and 5, the staple of Fig. 2 is shown partially deformed to an intermediate position by means of a driver 20 of a stapling mechanism part of which is shown in broken lines and indicated by reference numeral 21. This stapling mechanism includes two spaced plates 23 which engage the staple at the respective junctions of the bridge portion 16 with the wing portions 17, the wings being supported on ledges. Downward movement of the plunger 20 serves to bend the wings 17 back upon the central arched bridge portion of the staple to the ultimate

holding position shown in Fig. 5. A portion of the lower coil of a spring is shown secured to the spring supporting fabric.

Although particular apparatus has been shown for the purpose of installing the staple it is obvious that other apparatus could be used to bend the staple to the holding position. In this connection if the staple is formed to have the wings extend up slightly, that is, form an acute angle with adjacent portions of the bridge portion, the staple could be installed with an ordinary pair of pliers.

It is apparent that with this construction the staple may be installed entirely from one side of the fabric and that the prongs of the staples are caused to move outwardly and upwardly as the two wing portions are bent upon the central arched portion of the staple. This movement of the prongs causes the prongs to reenter the fabric from the lower side so that the points of the prongs are disposed above the lower surface as shown in Fig. 5, thereby leaving no objectionable points or projections. The prongs are first caused to enter the fabric by pressure there-against prior to the deformation of the staple itself.

In Fig. 6 there is shown a plan view of the blank used in forming the staple of Fig. 2. The broken lines on the blank indicate the margins of the wings and the point at which the bridge is bent upwardly and the prongs bent downwardly. The diagonal lines on the blank indicate the boundaries of the prongs 18 and central bridge portion 16.

In Fig. 8 there is shown in plan view a blank such as is used in forming a three-pronged staple. This blank and the blanks of Figs. 9, 10 and 11 subsequently to be described are lined as heretofore described in connection with Fig. 6, that is, the broken lines indicate the inner margins of the wings and the solid lines indicate the division between the prongs and the bridge portions. In this particular staple, there are two prongs 18 on one side and a single centrally disposed prong on the other. This results in the formation of a substantially V shaped bridging portion which is indicated by reference numeral 16a.

In Fig. 9 the blank for forming a two-pronged staple having a diagonally disposed bridge portion 16b is shown. In Fig. 10 there is shown a blank for forming another form of two-pronged staple having two bridging portions indicated at 16c. In this form of the invention the prongs 18 are relatively longer than in the forms heretofore shown and described. In this connection it is pointed out, however, that in the form of the invention shown in Figs. 2 and 6 the prongs 18 have been arbitrarily overlapped a slight distance on the blank to give what has been found to be a desirable sized prong. It is apparent that this overlapping might be reduced or increased to vary the length of the prong without departing from the scope of the invention.

In Fig. 11 there is shown a two-pronged staple having extremely short prongs 18 and two-part bridging portions 16d.

In all of the staples shown in Figs. 8 to 11, it is contemplated that the metal of the blank will be cut along the solid lines and bent to the shape of the staples shown in either Fig. 3 or Fig. 7. All of the staples are of the same general type and operate on the same principle, differing only in details of construction and in the size

and shape and number of prongs and bridging portions.

In Figs. 12 to 14, there is shown a modified form of the invention for use in attaching two sheets of fabric or paper together. This staple is particularly useful for securing parts of paper boxes together or for securing corrugated paper sheets to each other. This form of staple comprises a flat plate-like metal member 25 from which is cut and bent two prongs 26. The staple may be formed from a blank of material as shown in Fig. 10 or as shown in Fig. 11. However, in the particular embodiment of the invention illustrated in Figs. 12 to 14, the prongs 26 have been formed by cutting the material along the lines of the blank shown in Fig. 10.

In this form of staple the prongs are bent into a general U-shape form and extend upwardly above the plate portion 25. The ends or points of the prongs are divergent so that when a driver or hammer is brought into contact with the upper portions of the prongs, the prongs will move downwardly, outwardly and finally upwardly to the position in which they are shown in Fig. 14. In order to drive the prongs of the staple into two or more thicknesses of material, such as the sheets 27 and 28 shown in Figs. 13 and 14, a mechanism may be provided having thin ledges upon which the ends of the staple may rest, such as the ledge forming means 30 of Fig. 13, and having a central plunger, driver, or hammer member 31 to engage the prongs as indicated in order to drive them into the position shown in Fig. 14. Preferably, the driver 31 and means 30 work in timed coordination so that the means 30 is withdrawn from under the staple just prior to the staple being fully driven. A cam means 32—32' could be used for this purpose.

The staple of Fig. 12 when installed has outwardly and upwardly extending prongs as shown in Fig. 14, the points of the prongs being embedded in the material, thereby leaving no objectionable projections on the under-surface or upper-surface of the sheets attached.

In order to provide means for utilizing the staples in a stapling machine embodying a magazine and in order that the staples may be secured together in such a manner that they need not be maintained in the same plane in their passage through the machine, there has been shown in Fig. 15 a plurality of the staples 14 secured together by means of an easily tearable tape 33. Preferably this tape is made of paper although other material might be used. The tape 33 is positioned adjacent the under-surface of the wings 17 during manufacture of the staples as shown in Fig. 16 and is thereby in a region above or inwardly of the divergent portion of the prongs insuring that the individual staples will remain held in position next to each other so long as the tape is not torn.

In Fig. 17 there is shown a plurality of what are termed hog rings 34 secured together by means of a strip or tape 35 which has been coated with an adhesive of any type 36 at its upper surface for the purpose of attaching the hog rings 34. In Fig. 18, a plurality of ordinary staples 37 are shown held together by a coating of flexible material such as a rubber latex coating 38. It is apparent that with either the mechanical fastening of the staples to the tape as in Fig. 15 or

with the adhesive securing means of Figs. 17 and 18 that the staples are individually flexibly mounted so that they may round corners, curves and the like when being fed through a stapling machine or the like.

Although the invention has been shown and described as taking particular forms, it is contemplated that various changes and modifications might be made without departing from the scope of the invention and it is intended to cover such changes as come within the scope of the claims.

I claim as my invention:

1. A staple comprising a top portion having outwardly extending wing portions connected by a bridge portion, and divergent opposed prongs extending from said wing portions.

2. A staple comprising outwardly extending wing portions connected by an arched bridge portion, and divergent opposed prongs extending from said wing portions on the side of the staple opposite said bridge portion.

3. A staple as defined in claim 2 in which there are two prongs extending from each wing portion.

4. A staple as defined in claim 2 in which there are two prongs extending from one wing portion and one prong from the other.

5. A staple as defined in claim 2 in which there are only two prongs.

6. A staple formed of sheet metal comprising a top portion including a central arched bridge portion and laterally extending wings at each end thereof, and opposed prongs extending downwardly and outwardly from said wings, said prongs being adapted to move outwardly and upwardly when said wings are bent upwardly toward said bridge portion.

7. A staple as defined in claim 6 in which the wings are in the same plane.

8. A staple as defined in claim 6 in which the wings are disposed at an obtuse angle.

9. A staple comprising a top portion including a central arched bridge portion and laterally extending wings, and prongs extending from said wings on the side of said staple opposite the convex side of said bridge portion, the individual prongs being generally disposed to form an acute angle with their respective wings, a prong on one wing being divergent with relation to a prong on the other wing.

10. A staple comprising a top portion having a central bridge portion and a laterally extending wing at each end thereof, and opposed prongs extending downwardly and outwardly from the inner edge portions of the respective wings.

11. A staple comprising a flat plate and opposed prongs formed therefrom and attached thereto at one end, said prongs being curved with the major portion of the prongs extending beyond one side of said plate and the free ends of said prongs extending in an opposite direction and being divergent.

12. A staple comprising a flat plate and opposed prongs formed therefrom and attached thereto in regions spaced inwardly from the ends of the plate, said prongs being generally U-shaped and positioned with their major portions on one side of said plate with their free ends pointing in an opposite direction and being divergent.

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