H. M. HIGGINS.

FASTENER.

APPLICATION FILED MAR. 15, 1917.

1,281,958. Patented Oct. 15, 1918.

Fig. 1.

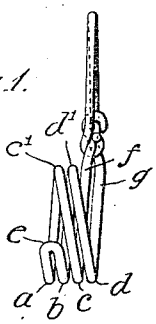


Fig. 2.

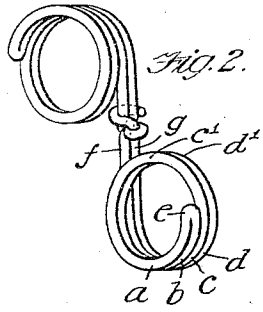


Fig. 3.

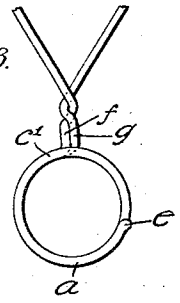


Fig. 4.

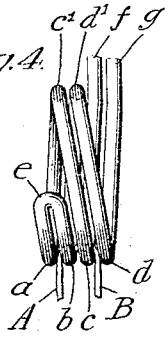


Fig. 5.

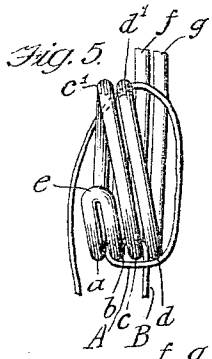


Fig. 6.

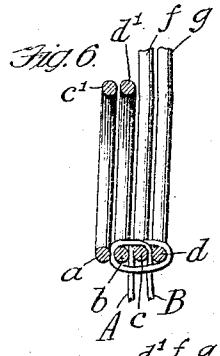


Fig. 7.

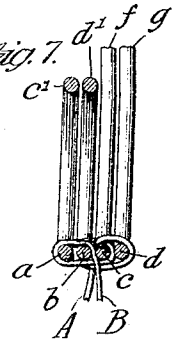


Fig. 8.

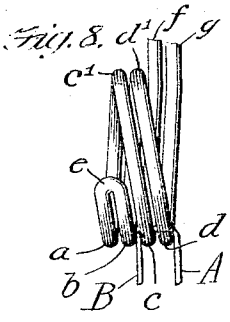


Fig. 9.

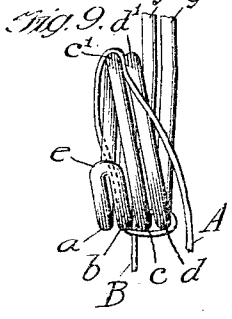


Fig. 10.

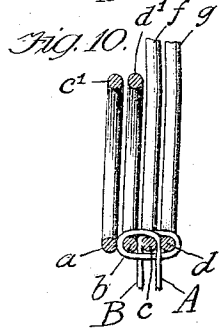


Fig. 11.

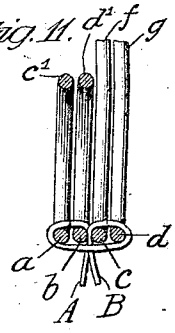


Fig. 12.

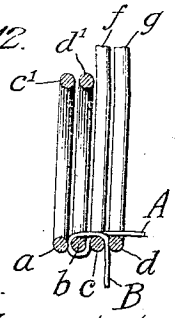


Fig. 13.

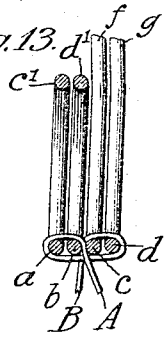
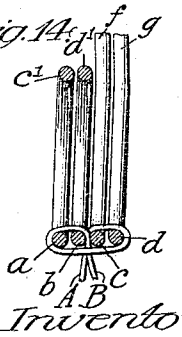


Fig. 14.



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FASTENER.

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Application filed March 15, 1917. Serial No. 154,995.

To all whom it may concern:

Be it known that I, HORACE M. HIGGINS, a citizen of the United States, residing at Regina, Province of Saskatchewan, Canada, have invented certain new and useful Improvements in Fasteners, of which the following is a specification.

My invention relates to fasteners for securing the end of lines of any size, as strings, cords or ropes. In large sizes my new fastener may be used for holding fast tent ropes, clothes lines, and the like, while in medium and small sizes it may be used for fastening shoe laces, leggings, corsets, gloves, envelops, mailing packages, and in fact any article the closure of which is fastened by a cord or string, and may also be used for tying up packages, bundles or parcels of any sort for shipment or delivery. The object of my invention is the provision of a simple and secure device for use on articles such as those mentioned which shall take the place of the ordinary tied knot or other fastening, and which can be very quickly and easily fastened, and as quickly and easily loosened or unfastened. To this end I have devised the novel fastener which is illustrated in the drawings and which will hereinafter be described in detail. My invention consists in the novel form and construction of this fastener, in the relation of its parts to each other and to the cord with which it is used, and the structure of the knots which are formed with and upon the fastener, as more particularly pointed out in the appended claims.

In the drawings Figure 1 is a front view of a single-ended fastener embodying my invention, or with which my invention may be practised; Fig. 2 is a perspective of a double fastener, that is, one having two oppositely arranged sets of fastening coils; Fig. 3 a face view of a single ended fastener having the fastening strands spread apart in a manner suitable for attachment to a flap of sheet material of any sort; and Figs. 4 to 14, inclusive, views illustrative of the formation of various knots which may be made upon and by means of my device.

The same letters of reference indicate the same parts in all the figures of the drawing.

My fastener is formed of wire of proper size for the particular purpose for which it is designed, coiled into the shape illustrated, and having preferably considerable resiliency or spring. The fastener may be described as consisting of a wire bent back on itself to form a double strand or loop, and with the loop coiled spirally about one and one-half turns of the double strand or loop, so that at the bottom of the fastener, using the word "bottom" with reference to the position of the fastener, shown in Fig. 1, there will be four single strands, *a*, *b*, *c*, and *d*, two of which, *a* and *b*, upon one side of the fastener extend forwardly and unite at the front of the coil, form the bend *e*, at the end of the double strand or loop, from which the device is coiled, and the other two of which, *c* and *d*, extend rearwardly and merge into the fastening strands *f* and *g*, approximately diametrically opposite the bend *e*. The portions *f* and *g*, which constitute the shank of the coil, may be extended and given such shape as to enable them to be anchored in any desired manner to one of the parts which it is desired to secure together, as in Figs. 1 and 3; or may be coiled to form a second fastening member, as in Fig. 2. The last mentioned form of my invention is particularly suitable for tying up packages, bundles, or parcels of any sort, where it is desired to carry a cord around an article and secure the ends together. The single end forms of my device, on the other hand, are adapted to situations in which the fastener is secured to one element and the fastening cord is attached to another member, as in the case of cover flaps or closures for any sort of containers, or for use on articles of any sort where it is desired to secure a cord to a fastener carried by the article.

At the top of the fastener (again referring to the position of parts shown in Fig. 1) the coil forms but two strands, designated as *c'* and *d'*. The fastener may therefore be said to consist of a double coil, the parts *a*, *c'*, *c* and *f* being continuous turns on one side of the bend *e*, and the parts *b*, *d'*, *d* and *g* being continuous on the other.

In Figs. 4 to 14 I have illustrated my fastener in connection with a cord to show the formation of a typical or preferred form of knot and several variations or modifications thereof. Describing first the knot shown in Figs. 4, 5 and 6, it is evident that if the cord be drawn from above downwardly between the top strands *c'* and *d'*

to the bottom of the coils, one end, marked A, will pass between the strands *a* and *b* and the other end, marked B, between the strands *c* and *d*, and the loop will of course pass upwardly on the interior of the coils around the strands *b* and *c*. If the end A be now carried across the coil underneath the strands *b*, *c* and *d* and then rearwardly or toward the strand *f* and between such strand and the strand *d'* and then pulled taut downwardly it is evident that it will form a loop extending over the top of the strands *c* and *d*, and that the more tightly it is pulled the more tightly it will pull the strands together to grip the end B of the cord.

Assuming the coils of the fastener to be presented as in Fig. 3, and the end B to be anchored or to extend around the parcel, this knot may be very speedily formed by carrying the loose end A with a counter-clockwise rotary movement between the strands *c'* and *d'*, drawing the cord taut to the position shown in Fig. 4, carrying the cord again, with a resumption of the same counter-clockwise movement between the strands *d'* and *f*; and finally drawing the knot tight by a downward pull to the position shown in Fig. 6.

A modified form of this knot, illustrated in Figs. 8, 9 and 10, can be as quickly formed by carrying the loose end (assuming the end B to be held taut as before) in a clockwise direction, again viewing the coils as in Fig. 3, downwardly between the strands *d'* and *f* to the taut position shown in Fig. 8, then swinging the end A around in the same direction, but between the strands *c'* and *d'*, to complete the knot, as shown in Fig. 10. It will be noted that this knot differs from the knot shown in Fig. 6 in that it is the anchored end B which lies between the strands *b* and *c*, instead of the free end A, and the free end lies in front of the loop underlying the strands *b*, *c* and *d* instead of behind it. The knot shown in Fig. 10 may also be formed upon the strands *a*, *b* and *c* in the manner already described, excepting that the operation is begun by drawing the end A of the cord between the strands *c'* and *b'*, and then looping such end downwardly over the end *e* of the fastener, into final position between the strands *b* and *c*.

In Fig. 12 I have shown a form of knot which may be formed by drawing the free end A of the cord in counter-clockwise direction between the strands *c'* and *d'*, drawing the knot taut as in Fig. 4, and then reversing the movement by carrying a loop backwardly, thence up and forwardly between the strands *d'* and *f* and drawing the cord downward to form a loop around the strand *b*. Manifestly, as in the forms of knot previously described, stress on the secured portion B of the cord will grip the strands *b* and *c* together to prevent the cord from slipping.

In cases where the application of the cord and fastener is such as to permit manipulation of the end B of the knots above described, the knot shown in Fig. 6 may be modified by carrying the end B across underneath the strands *a*, *b* and *c*, and looped over the end *e* of the fastener coil and drawn down taut between the coils *b* and *c* to the position shown in Fig. 7. In a similar manner the knot shown in Fig. 10 may be modified by carrying the end B of the cord underneath the strands *a* and *b*, and looping it over the end *e* of the fastener, then drawing it taut between the strands *b* and *c*.

Another form of knot is illustrated in Fig. 13, which is formed in the same manner as that shown in Fig. 10, but differs therefrom in that the free end A of the cord is looped from the position shown in Fig. 8 underneath the strands *a*, *b*, *c* and *d* over the end *e* of the fastener downwardly between the strands *b* and *c*. A similar knot, shown in Fig. 14, may be formed by swinging the free end A of the cord in a counter-clockwise direction to loop the cord first over the end *e* of the fastener, then across under all the strands and to the left between the strands *d'* and *f* and then downward to knotted position between the strands *b* and *c*. While the two forms of knots last described, shown in Figs. 13 and 14, are sufficiently secure to answer some purposes and are very readily formed, I do not regard them as possessing the degree of security afforded by the forms of knot previously described.

All of the knots above described may of course be untied as readily as formed, by a reverse operation.

While the manipulations above described are those by which a knot may be very readily formed with my fastener, it will be understood that many variations are possible, and that the portions A and B of the cord may be on opposite sides, or the same side, of the loop underneath the coil strands, and that the top loop of the free end A may cross or lie parallel with the top loop of the end B, and that supplementary looping may be employed in addition to those employed in the knots above described. The formation of the coil out of a double strand causes a loop formed by looping the cord between the members of the double strand, *c'* and *d'*, and drawing it down to one side of the coil to embrace the strands *b* and *c*, and the knot being completed by carrying a loop between the turns of the double strand, that is, over the end *e* of the coil or downwardly between the shank and the coil and drawn taut between the strands *b* and *c* adjacent the first

mentioned loop, stress on the other end will tend to grip the strands *b* and *c* together to grip and hold the portion of the cord lying between them. This gripping construction results from looping the cord in succession between the turns of the double strand and between the members of such double strand, whether in the order mentioned or vice versa.

I claim:

1. A device of the character described, consisting of two parallel adjacent strands united at one end to form a double strand and provided at their other end with attaching means, said double strand being coiled helically in excess of a complete turn.

2. A device of the character described consisting of a wire bent upon itself to form a double strand, said double strand being bent to form a shank adjacent the ends of the wire and a double strand coil of a plurality of turns, said shank and the end of said coil being approximately opposite each other diametrically of the coil.

3. A device of the character described consisting of a wire bent upon itself to form a double strand, said double strand being bent to form a shank adjacent the ends of the wire and a double strand coil, said shank and the doubled end of said coil being approximately one and one-half turns apart.

4. The combination of a double-strand helically-coiled wire fastener and a fastening cord engaging the fastener, said cord being looped from a part thereof lying without the coil inwardly around two adjacent strands of the coil, and a portion of said cord being passed between said adjacent strands.

5. The combination of a double-strand helically-coiled wire fastener and a fastening cord engaging the fastener, said cord being looped from a part thereof lying without the coil inwardly around two adjacent strands and winding on the outside of the coil around said two strands and an adjacent third strand, and further winding on the inside of the coil around said third strand and the contiguous one of the first mentioned two strands and passing between said last mentioned strands to the outside of the coil.

6. The method of forming a knot in a cord which consists in looping the cord in succession between the turns of a double-strand helically-coiled wire fastener and also between the members of said double-strand.

HORACE M. HIGGINS.

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