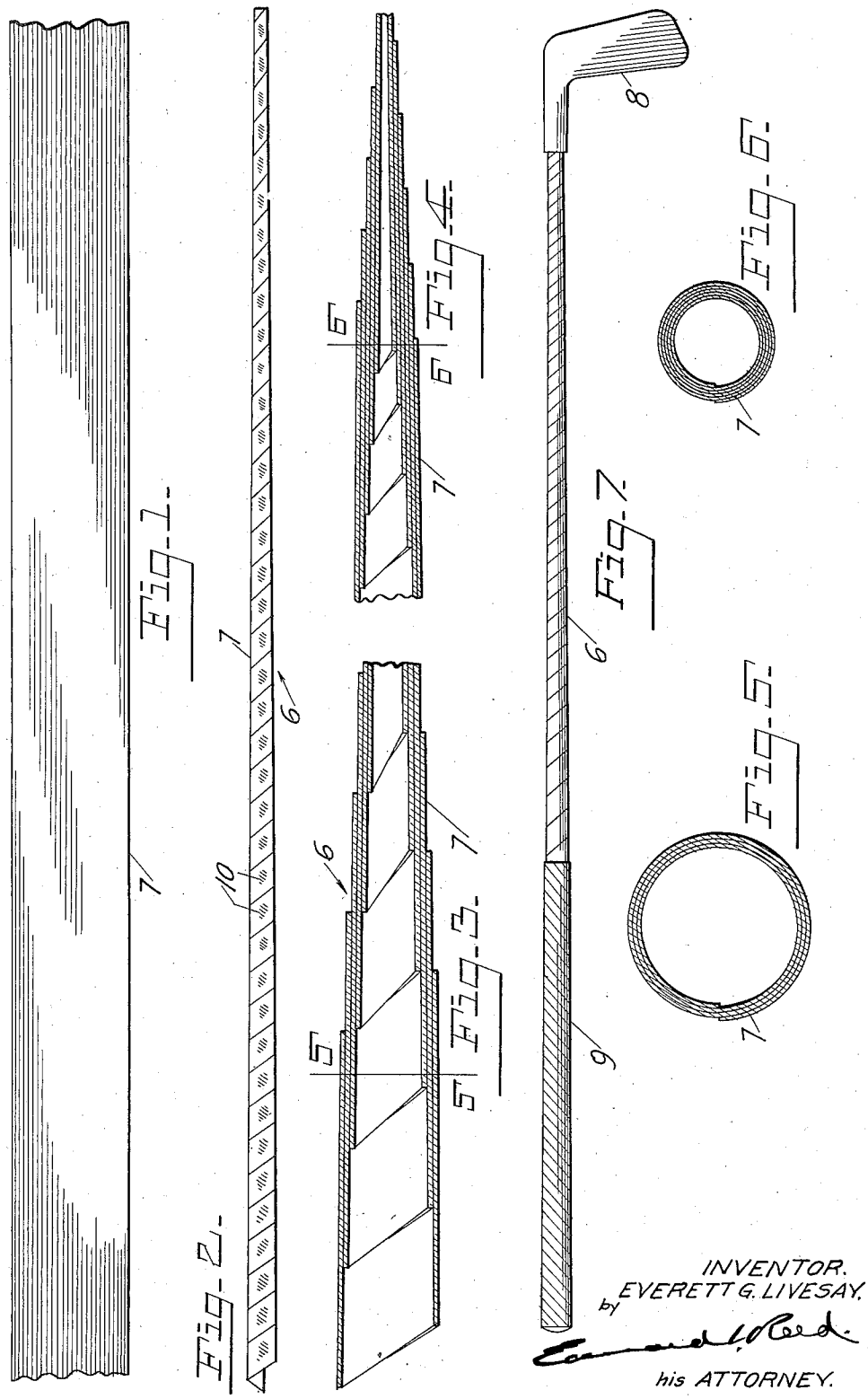
July 16, 1935. E. G. LIVESAY 2,008,077

METAL SHAFT FOR GOLF CLUBS OR THE LIKE

Filed July 27, 1931



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Patented July 16, 1935 2,008,077

UNITED STATES PATENT OFFICE

2,008,077

METAL SHAFT FOR GOLF CLUBS OR THE LIKE

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Application July 27, 1931, Serial No. 553,356

7 Claims. (Cl. 273—80)

This invention relates to a metal shaft for a golf club or the like. Because of the scarcity and high cost of wood suitable for forming shafts for golf clubs metal shafts are being used in increasing numbers. Because of the inherent characteristics of the metal great difficulty has been experienced in producing a metal shaft having the desirable characteristics of the wooden club. So far as I am aware it has been found impossible heretofore to provide a metal shaft which would have the "feel" of the wooden shaft. A club having a metal shaft will almost invariably sting the hands of the player when the club tops the ball or strikes hard ground and, further, the "whip" or resiliency of the shaft cannot be controlled. Variations in the metal from which the shaft is formed will result in different amounts of resiliency in different shafts and the resiliency will be located at different points in the length of the shaft, thus making it practically impossible to produce any given number of clubs having exactly the same feel.

One object of the present invention is to provide a metal shaft for a golf club which will have the feel of the wooden shaft and will not sting the hands of the player.

A further object of the invention is to provide a metallic shaft for a golf club of such a character that the amount of resiliency thereof and the location of that resiliency can be accurately controlled in the manufacture of the club, thereby enabling any desired number of clubs to be manufactured with exactly the same feel.

A further object of the invention is to provide a shaft or golf club having relatively great strength in proportion to its weight.

A further object of the invention is to provide such a shaft which can be produced at a low cost.

Other objects of the invention will appear as the device is described in detail.

In the accompanying drawing Fig. 1 is a plan view of a portion of the metallic ribbon from which the shaft is formed; Fig. 2 is a side elevation of the shaft after it has been fully wound; Fig. 3 is a longitudinal sectional view of a portion of such a shaft; Fig. 4 is a longitudinal section of a portion of a slightly modified form of shaft; Fig. 5 is a transverse section taken on the line 5—5 of Fig. 3; Fig. 6 is a transverse section taken on the line 6—6 of Fig. 4; and Fig. 7 is a side elevation of a golf club embodying the invention.

In the drawing I have illustrated one embodiment of my invention and have shown the same as comprising the shaft for a golf club but it will be understood that this particular embodiment has been chosen for the purposes of illustration only, and that the shaft may take different forms and may be used for various purposes.

The shaft comprises an elongated tubular structure formed of spirally wound metal. Preferably a single thin strip or ribbon 7 of suitable metal, such as steel, is wound in spiral formation to provide an elongated tubular structure and the adjacent windings are mounted in overlapping relation and are held in snug engagement one with the other. If desired, each succeeding winding, after the second, may be caused to overlap at least two preceding windings, thereby providing the structure at all points in its length with three or more thicknesses of metal and enabling a very strong durable structure to be formed from a relatively thin ribbon of metal. As shown in Figs. 3 and 5 each succeeding winding overlaps two preceding windings and the wall of the structure is thus formed of three thicknesses of metal. In Figs. 4 and 6 each succeeding winding overlaps four preceding windings and the wall of the structure consists of five thicknesses of metal.

The overlapping windings may be retained in proper engagement one with the other in any suitable manner but it is not essential that the superimposed windings be connected by any means other than their frictional contact. However, it may be desirable in some shafts to provide positive connections between overlapping windings and this may be accomplished in any suitable manner. By properly arranging such connections I am able to accurately control the resiliency or whip of the shaft. In the shaft here illustrated I have spot welded the windings at intervals, as shown at 10, determined by the characteristics to be imparted to that shaft.

The characteristics which are embodied in a shaft for a golf club depend in part upon the type of club in which the shaft is to be used and in part upon the preference of the individual players. These characteristics may, for the most part, be determined by varying the amount and location of the resiliency of the shaft, and this resiliency may be controlled in several ways. First, by varying the angle at which the ribbon is wound and/or the number of thicknesses of metal in the wall of the structure; second, by varying the spacing of the connections between the overlapping windings, and, third, by trimming the edge of the ribbon to reduce its width at certain points. A shaft in which there are no positive connections between the overlapping windings will have a relatively great resiliency, while

a shaft in which the windings are so connected as to prevent all movements thereof with relation one to the other will be relatively stiff. By varying the number of connections and the arrangement thereof various degrees of resiliency may be obtained. The connections may be spaced uniformly throughout the length of the shaft or the spacing may be varied in those parts of the shaft where more or less resiliency is desired.

While the width of the ribbon and the number of windings may vary, as above explained, I have secured very satisfactory results by using a ribbon of metal approximately three inches in width and so winding the same that each succeeding winding will overlap the next preceding winding approximately two inches, thereby causing it to overlap the second preceding winding approximately one inch, as shown in Fig. 3. In the manufacture of the shaft the ribbon may be wound upon itself in any suitable manner, upon a mandrel or otherwise, and the windings then secured in snug contact one with the other. When such a structure is to be employed as the shaft of a golf club it is tapered from one end to the other and the smaller end thereof is rigidly secured to the head 8 of the club while the outer or larger end of the shaft is provided with a covering 9, of leather or other suitable material, to form a hand grip. Such a golf club has a feel substantially identical with that of a wooden shaft club and the spirally wound shaft will not transmit any appreciable vibration or sting from the head of the club to the hand of the player when the club tops the ball or hits hard ground. Further, the whip or resiliency of the shaft can be very accurately controlled in the manufacture of the shaft by the methods above explained. By trimming or reducing the width of the ribbon at the desired points the amount of resiliency in any given part of the shaft may be increased beyond that provided by the spacing of the connections between the windings. By varying the amount of overlap between adjacent windings the shaft may be provided with a different number of laminations at different points in its length, as shown in Fig. 4. By trimming the smaller end of the tapered shaft, as shown in Fig. 4, or by so winding the shaft that the windings at the smaller end thereof will overlap for substantially their full width this small end may be provided with an increased number of laminations which will impart thereto relatively great strength at the point of connection with the head of the club, at which point the shaft is subjected to the greatest strain. Because of this ability to control the resiliency of the shaft any desired number of shafts may be constructed which will be identical in feel and whip, thus enabling a matched set of clubs to be produced in all of which the feel will be exactly the same. Because of its laminated construction the shaft may be made very strong without increasing its weight above that desired, and the positive connections between the windings prevents these from becoming loose and destroying the initial characteristics of the shaft. Such a shaft can be produced at a cost very much less than that of other shafts now in use. I have also found that a club provided with such a shaft has much greater distance than clubs now in use, that is, a golf ball can be driven much farther with such a club than it can with other clubs.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention what I claim as new and desire to secure by Letters Patent, is:

1. A shaft for a golf club or the like comprising a relatively narrow metallic ribbon wound in spiral form about an axis transverse to its length to form an elongated tubular structure and having its windings arranged in different overlapping relation at different points in the length of said structure to provide a wall of varying thickness.

2. A shaft for a golf club or the like comprising a relatively narrow metallic ribbon wound in spiral form about an axis transverse to its length to provide an elongated tubular structure tapered toward one end and having its windings arranged in such overlapping relation that the smaller end of said structure will have a greater number of laminations than the larger end thereof.

3. In a golf club, a head and a spirally wound tubular shaft secured to said head, said shaft having its windings arranged to provide the same with an increased number of laminations at its point of connection with said head.

4. A shaft for a golf club or the like comprising metallic ribbon wound in generally spiral form with successive convolutions in overlapped relation to form a tube, at least a portion of the length thereof having successive overlying and underlying convolutions radially spaced apart by an intervening convolution.

5. A shaft for a golf club or the like comprising metallic ribbon wound in generally spiral form with successive convolutions in overlapped relation to form a tube, at least a portion of the length thereof having successive overlying and underlying convolutions radially spaced apart by an intervening convolution, at least some contacting portions of said adjacent convolutions being secured together.

6. A shaft for golf clubs comprising a tube of progressively decreased diameter towards one end formed by a generally spiral winding of ribbon material, the width of the material relative to the pitch of successive convolutions being such that said successive convolutions in at least a portion of the length of an intermediate portion of the shaft comprises successive convolutions overlapped to at least the extent that half the widths thereof are in overlapped relation to each other.

7. A shaft for golf clubs comprising a tube of progressively decreased diameter towards one end formed by a generally spiral winding of ribbon material, the width of the material relative to the pitch of successive convolutions being such that said successive convolutions in at least a portion of the length of an intermediate portion of the shaft comprises successive convolutions overlapped to at least the extent that half the widths thereof are in overlapped relation to each other, overlapped contacting surfaces thereof being bonded together to prevent relative sliding of said surfaces at bonded portions thereof during flexing of the shaft during use.

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