

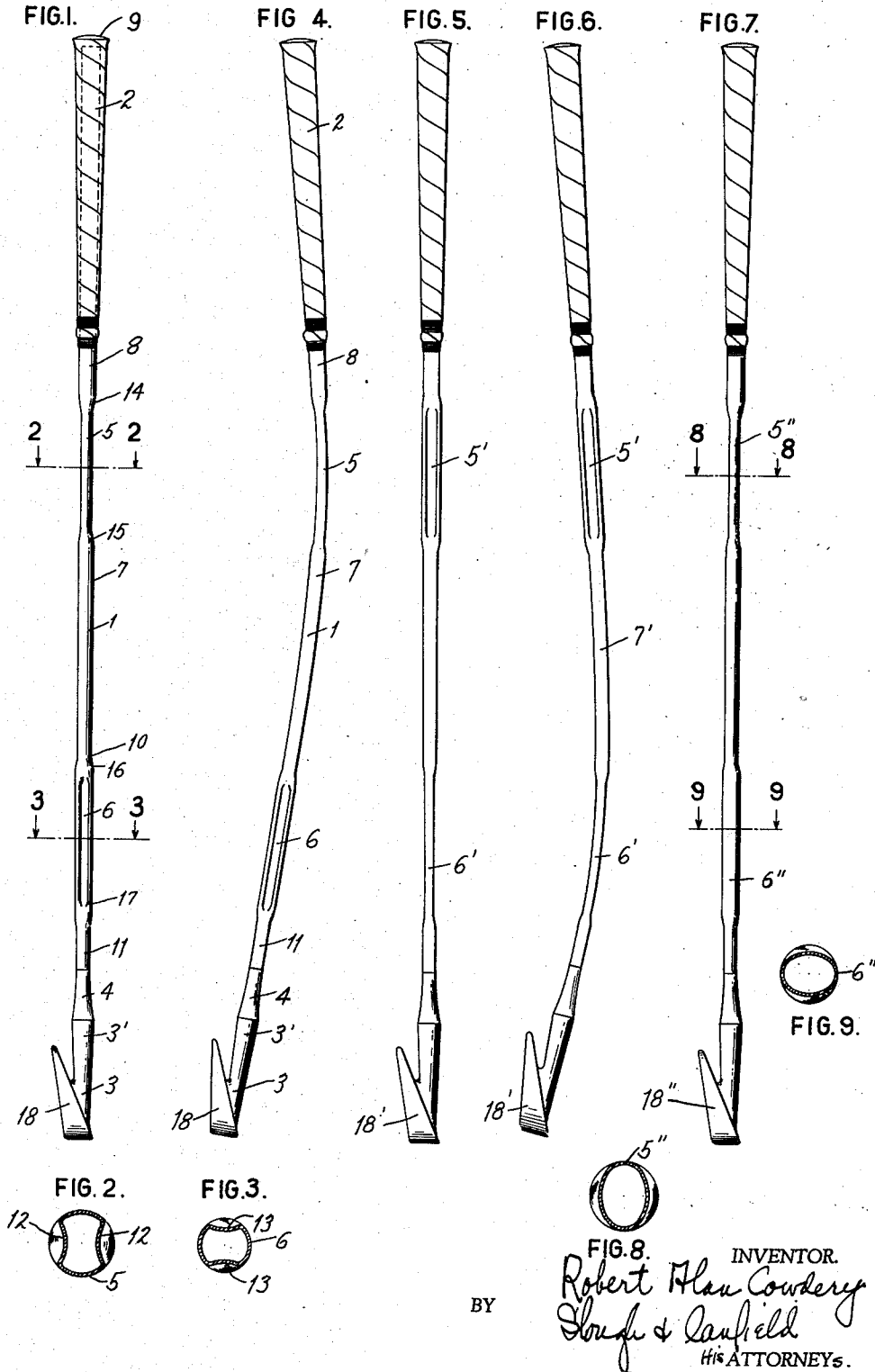
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GOLF SHAFT

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GOLF SHAFT

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My invention relates to improvements in golf clubs, and shafts therefor.

The golf club of my present invention, through a novel shaft construction, achieves a more efficient stroking of a golf ball during play, due to the fact that the shaft is provided with two or more relatively spaced portions of its length, each of two such portions being so constructed as to yield more readily to bending stresses imposed upon the shaft from a given lateral direction than from a substantially different lateral direction, and with said portions differing from each other with respect to the angular direction from which stresses may be applied to most readily bend such shaft portion.

In the making of the usual orthodox golf stroke the shaft is rotated as it moves from a ball "addressing" position towards and to the position assumed at the end of the "backstroke" and the extent of this rotation may be so much as 90°, or one-quarter of a complete rotation. The shaft rotates in the reverse direction during the down stroke movement until striking the ball, also through an approximately corresponding angle of rotation.

Thus the "leading" surface during a part of the swing is a mere lateral surface at another point of the swing, and in my present invention I take advantage of this fact, to selectively effect maximum flexing of the desired portion of the shaft during a selected rotative shaft position, and to selectively effect maximum flexure of the other portion of the shaft at a selected angularly different rotative shaft position, the maximum flexures of the two longitudinally spaced shaft portions being sequentially effected at the most desirable points of the "stroke."

The rotative positioning of the striking head, on the shaft is also of importance, being different for orthodox and for different unorthodox stroking.

Among the objects of my invention are:—

To provide an improved golf club;

To provide an improved golf club shaft;

To provide a golf club comprising a shaft wherein during the making of a stroke, at least two different relatively longitudinally spaced portions of the shaft will be selectively and sequentially moved to rotative positions wherein they most readily respond to accelerating and decelerating shaft movements, and wherein the non-selected portion will least readily respond to flexing stresses during the period of ready response by the selected portion.

Other objects of my invention will be apparent

from the following description of an embodiment thereof, illustrated in the accompanying drawing wherein:

Fig. 1 is an elevational view of a golf club which is an embodiment of my invention,

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

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1,

Fig. 4 is an elevational view of the shaft of the foregoing figures showing the same resiliently bent as when a golf ball is being struck, the bending being exaggerated for ordinary shafts of this kind,

Fig. 5 is an elevational view of another golf club which is an embodiment of my invention,

Fig. 6 is an elevational view of the golf club of Fig. 5, but with the shaft bent as when making a golf stroke, the degree of bending being similarly exaggerated in the manner of Fig. 4,

Fig. 7 is an elevational view corresponding to that of Fig. 1, but of another embodiment of my invention similar in type to that illustrated in Figs. 1—4 inclusive,

Fig. 8 is a transverse section through the shaft of the club of Fig. 7, the section being taken on the line 8—8 of Fig. 7, and,

Fig. 9 is a transverse section taken on the line 9—9 of Fig. 7.

Referring now first to the figures of drawing illustrating the said first embodiment of my invention and comprising Figs. 1 to 4 inclusive, said figures illustrate an improved golf club comprising a resilient tubular metallic shaft 1, which carries at its upper end the usual hand grip 2 and at its lower end the usual club head 3. The shaft is flattened at two longitudinally separated portions of its length, at 5 and 6, these portions being preferably of limited length, although the length of said portions may vary considerably in practice as hereinafter set forth. The portions 5 and 6 are relatively spaced and separated by an intermediate portion 7 which is of the usual tapered tubular form although, as hereinafter set forth, this form may be cylindrical.

The hand grip supporting end of the shaft 8 above the flattened portion 5 is preferably of the usual tapered form and preferably the rate of taper in the portions 8 and 7 is the same, and except for the flattening of the intermediate portion 5 the shaft, from its extreme upper end 9 to the extreme lower end of the said intermediate spacing portion 7, at 10, would comprise one continual taper in a preferred embodiment.

The same is preferably true relative to the

intermediate portion 7 and the lower club head supporting portion 11, where, except for the flattening of the intervening portion 8, the shaft portions 7, 8, and 11 would preferably form one continuously tapered shaft portion throughout its length.

The nature of the flattening of the portions 5 and 6 is best illustrated in Figs. 2 and 3, and in connection with the flattening it will be understood that the opposite flattened lateral surfaces 12 and 13, Figs. 2 and 3, are preferably joined to the adjacent shaft portions 8, 7, and 11 by curvilinear merging shoulders at 14, 15, 16, and 17.

By reference more particularly to Figs. 2 and 3 it will be seen that in the embodiment of Figs. 1 to 4 inclusive I preferably depress the longitudinal middle portion of the flattened sides 12 and 13 toward the center or axis of the shaft, so that these flattened sides are slightly trough-shaped.

At 4 I may provide a tubular ferrule intermediate the upper end of the club head hosel 3' and the shaft 11, thereby contributing to the strength of the shaft adjacent to the end of the hosel 3' and to cause the shaft in such portion to achieve a smooth symmetrical "stream-line" appearance. The provision of the ferrule 4 forms no essential part of the present invention, however.

In the embodiment illustrated in Figs. 1 and 4, it will be noted that the striking head portion 18 extends laterally from the supporting lower end of the shaft and generally preferably in the laterally extending plane of the upper flattened portion 5 and conversely at right angles to the general plane of the flattened portion 6.

Figs. 5 and 6 illustrate another embodiment of my invention wherein the relative general planes of the upper flattened portions herein shown at 5' extend at right angles to the plane of the flattened portions 5 of the foregoing embodiment, with respect to the plane of the club head 18' and correspondingly the flattened portion 6' in the embodiment of Figs. 5 and 6 normally extend in a plane parallel to the plane of the club head 18' as distinguished from the general plane of the lower flattened portions 6 of Figs. 1 to 4 inclusive which extend at right angles to the general plane of the club head striking portions 18.

Fig. 7 illustrates another embodiment of my invention wherein the method of flattening opposite sides of the shaft for the portions 5'' and 6'' is somewhat different from that previously illustrated. In Fig. 7, both the portions 5'' and 6'' are of preferably elliptical cross-section, whereby a cross-section will have a major axis and a minor axis in the manner of any ellipse, the major axis of the portion 5'' being parallel to the general plane of the club head 18'', whereas the major axis of the portion 6'' extends transversely to the general plane of the club head 18''.

I contemplate also transposing the planes of the major axes of the portion 5'' and 6'' in another embodiment of my invention, which, however, I have not illustrated for the reason that from reference to Figs. 5 and 6 the manner of such transposition will be readily understood from the foregoing.

The shaft of my invention may be, as previously described, more particularly with respect to Figs. 1 to 4 inclusive, made from a previously tapered tube, the degree and rate of taper being substantially the same throughout the length of the shaft, or the degree of taper may be varied in different portions of the shaft in accordance with well-known present day practice, in order to supply different degrees of rigidity, or con-

versely, readiness to respond to bending stresses in the different portions of the shaft.

I may, however, make my improved shaft without taper whatsoever in any one or all of said portions, the drawing illustrating, however, the preferred forms where each of the shaft sections corresponding to those shown at 8, 7, and 11 are tapered or, in other words, gradually reduced in diameter from their upper end portions toward their lower end portions.

In my preferred method of making these shafts, I preferably first make the shaft of circular cross-section in all portions of its length, and then apply pressure to the two sides of the shaft in the portions 5 and 6 for the first embodiment, 5' and 6' for the second embodiment, and 5'' and 6'' for the third embodiment, so as to produce in these portions the flattened contour shown and previously described. In this manner of making the shaft, the circumference of the shaft even in the flattened portions is the same as such circumference would be in the usual type of shaft without such flattening, and as shown in the drawing, wherever such flattening occurs the shaft is wider in the flattened portions proceeding laterally in one direction through the longitudinal axis of the shaft than it is through a minor axis extending at right angles thereto.

From the foregoing it will be understood that as illustrated in Fig. 4, the upper flattened surface portion 5 will bend responsive to the making of a stroke when the club head 18 engages a golf ball in a plane parallel to the ensuing direction of flight of said golf ball and bends very little in the flattened portion 6, the plane of the flats of which are parallel to such ensuing flight of the golf ball.

As shown in Figs. 5 and 6, and particularly at 6', in Fig. 6, the flattened portion 6' is more susceptible to bending than the intermediate portion 7' of said shaft, which is of circular cross-sectional form, and still more readily bendable during the striking of a golf ball than the upper-most flattened portion 5' which has its major axis extending in the direction of the ensuing flight of the ball.

The mode of operation of the shaft shown in Fig. 7 corresponds closely to the mode of operation of the shaft illustrated in Figs. 1 and 4, and the proposed modification of the shaft of Fig. 7 would operate in the manner of that shown in Figs. 5 and 6.

In the use of golf clubs, with respect to the present invention, golf players may be loosely divided into two groups; those of the first group being the more skillful players whose stroke is smoother throughout than the stroke of the ordinary players and players of still lesser skill who may be beginners or players who have taken up the game of golf so late in life that they are unable to acquire a smooth rhythmical swing.

For players of the first or more highly skilled class, it will be found that they pass from the back stroke, at the end of which the golf club extends from the hands to the rear of the player's head and nearly over the adjacent shoulder of the player, to the down or striking stroke during which the golf club head descends until it meets the ball and then continues forwardly, inwardly, and upwardly, until the shaft extends approximately over the other shoulder of the player and which is disposed generally in the direction of the flight of the ball. The stroke of such players, being smoother and more rhythmical, can often advantageously employ more flexibility in the shaft nearer the hand grip than can the players of the less skilled variety, and for such

players the flats 5' and 5'' may be as illustrated in Figs. 5 and 6, particularly with the short irons clubs.

Players of the less skilled variety, however, have difficulty with shafts having ready response to bending stresses at the top of the back stroke, since they ordinarily change from the back stroke to the down striking stroke abruptly and without the smoothness of the more skilled player, and for such players it is found that when the upper portion of the shaft is stiffer, as it would be in the case of the shafts of Figs. 1, 4, and 5, they get a better stroke, since there is less interference with their stroke by the bending of the shaft at the top of the back swing.

The above observations are, however, merely general, because some very good players achieve best results with the upper portion of the shaft nearest the grip made stiffer and with the more flexible portion disposed near the club head and at the time of striking the ball. Conversely, some relatively unskilled players pause so long at the end of the back stroke that they have little or no difficulty with flexure of the shaft at that time, but the ensuing striking movement is so abrupt that unless the upper portion of the shaft is relatively stiffened during the down striking movement of the shaft, this will cause their shots to be less efficiently made than were the case otherwise.

In the shafts of my invention, I provide two longitudinally spaced portions separated by an intermediate portion which preferably is equally responsive to bending stresses applied in any diametrical direction, but with such portions flattened in different directions each at right angles to the other, I find that with the flats extending for the two portions relatively in the one or the other direction relative to the direction in which the head extends from the shaft, most any player can find a shaft which suits his stroke better than the present day type of shaft which is merely flexible indifferently in all lateral directions, or in some cases where the shaft is flattened on two opposite sides at one or more portions of its length.

The secret of the success of shafts embodying my present invention resides in the fact that in the making of the back stroke and the downward striking stroke, the shaft is rotated relative to the direction of movement of the shaft, thereby disposing the club head in different directions throughout the stroke relative to the direction of movement of the shaft as a whole.

Having described my invention as illustrated in different embodiments and as explained for still further embodiments, I am aware that my invention may be practiced in still other embodiments which will be readily apparent from the foregoing description and without departing from the spirit of my invention.

I claim:

1. A golf club shaft having substantially flattened side walls on two opposite sides in two longitudinally spaced regions intermediate the club head and grip supporting shaft end portions, and said shaft having its walls substantially unflattened intermediate said regions, the flattened sides in one of said regions extending generally at right angles to the flattened sides in the other of said regions.

2. A golf club shaft having two longitudinally spaced portions of its length flattened on opposite sides, the intermediate shaft region being of substantially circular cross-section and the flat

sides in one of said portions extending generally at a substantial angle to the flat sides in the other flat portions.

3. A golf club comprising a head and a supporting shaft, said head extending laterally from an end of the shaft, said shaft being of flattened cross-sectional form in two longitudinally spaced portions of its length the flattening of one of said portions extending in the same general direction as the face of said head, and that of the other portions extending at a substantial angle thereto.

4. A golf club shaft having opposite sides flattened in two longitudinally spaced portions of its length, one of said portions being disposed below the hand grip supporting shaft portion and the other disposed substantially near the club head supporting end of the shaft, the flattened sides of one of said portions extending substantially at right angles to the flattened sides of the other said portion.

5. A golf club comprising a tubular shaft and a club head extending laterally from an end thereof, said shaft having two longitudinally spaced portions of its length flattened on opposite sides, the flattened sides of one of said portions extending substantially at right angles to the flattened sides of the other of said portions, the intermediate portion of the shaft between said flattened portions being substantially unflattened whereby said shaft is so formed in two longitudinally spaced portions as to be more readily bendable in two opposite lateral directions than in directions at right angles thereto, the one portion being more readily laterally bendable in the lateral direction wherein the other portion is least readily bendable.

6. A golf club shaft having two longitudinally spaced portions of its length flattened on opposite sides, the intermediate shaft region being of substantially circular cross-section and the flat sides of one of said portions extending generally at a substantial angle to the flat sides of the other flat portion, and the diameter of said shaft intermediate said reduced sides being greater than any diameter of the immediately adjacent portions of the said intermediate region.

7. A golf club comprising a shaft having substantially flattened side walls on two opposite sides in two longitudinally spaced regions intermediate the club head and grip supporting shaft end portions, and said shaft having its walls substantially unflattened intermediate said regions, the flattened sides in one of said regions extending generally at right angles to the flattened sides of the other of said regions, and a golf club head extending laterally from an end of said shaft and the flattened sides in the region nearest the golf club head extending in substantially the same direction as the face of said head.

8. A golf club comprising a shaft having two longitudinally spaced portions of its length flattened on opposite sides, the intermediate shaft region being of substantially circular cross-section and the flat sides in one of said portions extending generally at a substantial angle to the flat sides in the other flat portions, and a golf club head extending laterally from an end of said shaft and the flattened sides of the portion nearest the golf club head extending in substantially the same direction as the face of said head.

9. A golf club shaft having two longitudinally

spaced zones of its length flattened on opposite sides, the shaft being substantially unflattened intermediate said zones, the flattened sides in one of said zones extending approximately at right angles to those in the other zone thereby effecting sequential increased flexure in the respective zones when the shaft is swung in play sequentially in different directions substantially

at right angles to each other whereby when the club is in use the shaft portion in one of said zones is relatively increasingly flexed during the rearmost portions of a conventional stroke and later the shaft portion in the other zone is increasingly flexed during the ball-striking portion of such stroke. 5

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