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GOLF CLUB

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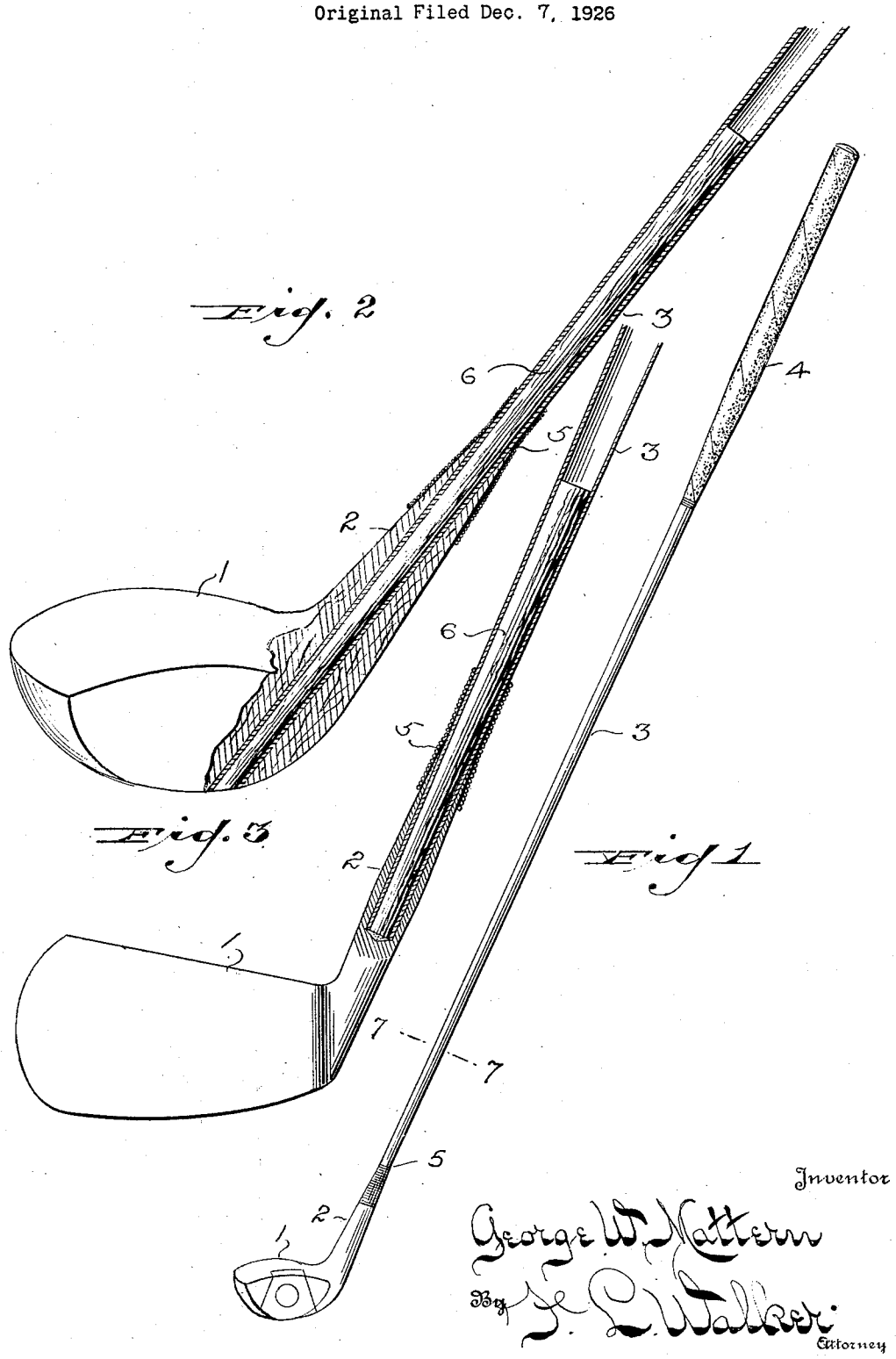

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UNITED STATES PATENT OFFICE

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GOLF CLUB

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My invention relates to golf clubs and more particularly to the reinforcement of a hollow metallic handle shaft therefor.

At the present time tubular metallic handle shafts for golf clubs are quite popular. Such handle shafts are secured to the head of the club by being inserted within a corresponding bore in the hosel or neck of the club head. It has been found, however, that many such clubs have been returned for repairs or for replacement of the tubular metallic shaft due to the bending or breaking of the handle shaft at a point in close proximity to the end of the hosel. It is believed that this breakage and bending of the hollowed shaft at this point is due to the abrupt change from the rigid support and reinforcement of the portion of the shaft within the hosel or club head to the unsupported and unreinforced portion there beyond.

The present invention contemplates the reinforcement of the tubular metallic handle shaft throughout that portion contiguous to the club head for the purpose of distributing the strain and affording a more or less graduated resistance from the rigid unyielding resistance or support of the club head and hosel to the inherent yielding flexibility of the handle shaft at a point removed somewhat from the club head. To this end there is inserted within the bore of the hollow metallic handle shaft an elongated core of flexible, but more or less resistant material, such as hickory wood which completely fills the portion of the handle shaft enclosed within the head and hosel and extends some distance there beyond. While not affording the unyielding rigidity of the club head hosel or neck such inserted reinforcement core tends to yieldingly resist the bending of the handle shaft to undue degree in proximity to the club head and prevents the collapse or kinking of the wall of the tubular shaft under undue strain. Such inserted core has the further effect of giving a feeling of solidity to the club at the moment of impact with the ball and it is believed increases the effectiveness of the player's stroke and achieves greater distance flight of the struck ball.

The object of the invention is to improve the construction as well as the means and mode of assembly of golf clubs whereby they will not only be cheap in construction but will be more efficient in use of increased strength and durability, and unlikely to get out of repair.

A further object of the invention is to reinforce the present popular tubular metallic handle shaft to prevent breakage and bending and to distribute the flexure of "whip" of the handle shaft, preventing concentration of the bending action at a point in close proximity to the head of the club and bringing into action the flexibility and resiliency of the entire handle shaft.

A further object of the invention is to afford solidity to the club head, and to improve the driving power of a golf club.

With the above primary and other incidental objects in view as will more fully appear in the specification the invention consists of the features of construction the parts and combinations thereof and the mode of operation, or their equivalent, as hereinafter set forth and described in the claims.

Referring to the drawings wherein is shown the preferred but obviously not necessarily the only form of the embodiment of the invention, Fig. 1 is a perspective view of an assembled golf club in which the present invention has been embodied. Fig. 2 is a perspective view partly in section of the club head and adjacent portion of the handle shaft showing the reinforcement core inserted within the tubular shaft and indicating its approximate extent beyond the end of the hosel. Fig. 3 is an elevational view of the head and cross sectional view of the joint between the shaft and head of a modification of the invention.

Like parts are indicated by similar characters of reference, throughout the several views.

In the preferred embodiment of invention illustrated in the accompanying drawing, 1 is the head of the club having a hosel or neck 2 provided with a longitudinal tapered bore in which is inserted the tubular metallic shaft 3. The upper end of the shaft

3 carries the usual handle grip wrapping 4. Experience has shown that the weak point of such metallic shafted golf club is in close proximity to the upper end of the hosel as at 5. The hollow metallic handle shaft 3 is securely seated and cemented or otherwise secured within the correspondingly tapered bore within the hosel 2 of the head. The hosel 2 thus supports and reinforces the portion of the shaft within the club head holding it rigidly against bending or flexure. The tubular shaft 3 possesses a reasonable degree of inherent flexibility and resiliency. The change of conditions at the point 5 is therefore one abruptly from a state of rigidity and repression of bending tendency to a degree of maximum flexibility of the shaft. As a result more or less breakage and bending of the shaft occurs at this point 5.

In order to overcome the difficulty and to distribute the strain and to afford a more gradual change of the yielding capability of the shaft from the rigid non-yielding portion within the hosel 2 to the maximum flexibility of which the shaft is capable there is provided a reinforcement core 6 which is preferably, though not necessarily of hickory wood. This reinforcement core 6 is driven tightly within the bore of the shaft 3 completely filling the portion of the hollow shaft within the head 1 and extending a considerable distance there beyond. The extent of the insert core 6 may vary according to the conditions of use, the character and degree of flexibility or "whip" of the shaft 3 and the particular desires and requirements of the player. The approximate limit of the core in relation with the length of the shaft is indicated by the line 7—7 in Fig. 1. While hickory wood is, at the present time, the preferred material for the insert core 6, obviously cores of other material, such as fiber, rubber, composition or other species of wood may be substituted.

The insert core 6 possesses a reasonable degree of flexibility and without rendering the enclosing portion of the shaft 3 rigid and unyielding it nevertheless reinforces such shaft portion and prevents abrupt bends occurring in proximity to the head of the club. By preventing abrupt bends and graduating the yielding resistance of the shaft this insert core brings into play substantially the full length of the handle shaft 3 causing the yielding flexure to be extended over an increased range instead of being concentrated within a short range close to the club head. By utilizing the resiliency of a greater length of the shaft 3 a more harmonious action of the club as a whole is achieved and greater distance and accuracy in the flight of the ball is insured.

In addition to distributing the strain of impact and graduating the yielding resistance of the shaft 3 the insert core 6 gives to the head of the club a sense of solidity and eliminates the feeling of striking the ball with a hollow implement. So long as the bore of the shaft is open there are certain vibrations set up at the moment of impact which are damped by the presence of the insert core 6 and a feeling of increased force and resistance at the moment of impact is transmitted to the hands of the player.

In the manufacture of golf clubs as perhaps in no other art, it is small differences of mechanical construction and slight variations of weight, resistance and flexibility which makes for great success or failure of the player's stroke and determines in greatly magnified degree the efficiency and merit of the golf club itself. In the present instance, while the addition of the insert core 6 of yieldingly resistant material may seem a comparatively simple addition it is nevertheless found to afford a maximum beneficial effect in the action of the club and in resisting bending and breaking, while at the same time inducing the "whip" action throughout a greater extent of the shaft and greatly improves the accuracy and power of the player's stroke.

Because of difficulties in the manufacture and the expense of production of hollow tubular shafts of varying diameter the commercial tubular golf shaft of the present time is tapered substantially uniformly throughout its length. For this reason the point of smallest diameter of the exposed portion of the shaft is at the point 5 close to the end of the hosel 2. It may be recalled that when the traditional hickory shaft was generally used, the shaft after converging to a reduced diameter some distance from the hosel or the club head then gradually increasing in diameter towards the head so that the point of smallest diameter and least resistance was not closely contiguous to the end of the hosel as is the case with an unreinforced tubular metallic shaft but to the contrary was located some distance from the head of the club. This gradual increase of diameter of the hickory shaft toward the club head as well as toward the hand grip portion 4 afforded a graduated yielding resistance and avoided an abrupt change from a degree of comparative rigidity to one of maximum flexibility. The insert core 6 of the present construction enclosed within the reduced portion of the tubular shaft adjacent to the club head affords a similar increase of resistance and graduation of flexibility and distribution of strains and stresses as was effected by the increase of diameter of the hickory shaft formerly used as such shaft approached the head of the club. In other words the present construction is designed to give in a metal shafted club a close simulation of the response and action of the standard traditional hickory shaft.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific details shown, but that the means and construction herein disclosed comprises the preferred form of several modes of putting the invention into effect and the invention is, therefore, claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. A golf club, including a head portion, a tubular metallic handle shaft portion extending within a bore in said head portion and a flexible wooden reinforcement core enclosed in that portion of the tubular shaft extending within the head portion and extending beyond the head within the tubular shaft a distance less than a third of the length of the shaft.

2. A golf club, including a head, a hollow tubular handle shaft, and a flexible reinforcement core of materially less length than the handle shaft, fitted within that portion of the tubular shaft contiguous to the head.

3. A golf club, including a head, a tubular metallic handle shaft projecting within the head, a flexible wooden core fitted in that portion of the tubular handle projecting within the head and terminating at midlength point of the shaft, serving to yieldingly increase the resistance of the shaft contiguous to the head.

4. A golf club, including a head, having a hosel bored for the reception of a tubular handle shaft, and a core of yieldingly resistant material of less than half the length of the shaft, enclosed within that portion of the shaft engaged in the club head and extending beyond the hosel.

5. A golf club, including a head, having a hosel bored for the reception of a tubular handle shaft, and a flexible reinforcement core of wood of less than half the length of the shaft, fitting within that portion of the tubular shaft extending within the hosel and extending beyond the termination of the hosel, said core coacting with the shaft whereby the point of maximum flexure of the combined shaft and core is located differently from the inherent point of maximum flexure of the tubular shaft alone.

6. A golf club, including a head portion and a tubular metallic handle shaft connected with the head portion, and a flexible resilient reinforcement core of less length than the shaft, enclosed within the half length of the shaft contiguous to the head portion, said core and shaft having their points of greatest flexure differently located in spaced relation whereby each member tends to resist the flexing movement of the other for increasing the resistance of the shaft to bending moment adjacent to the club head, the combined action of the shaft and core serving to locate the point of bending moment of the combined core and shaft at a point spaced from the club head and located differently from the inherent point of maximum flexure of the tubular shaft alone from which point the resistance of the shaft to bending strain gradually increases toward the club head.

7. Means for minimizing bending and breakage of tubular metallic shafts for golf clubs, wherein the shaft is engaged in a bore in the club head including a yielding resilient core, of less length than that of the shaft, within the tubular shaft adjacent the head by which the abrupt bending of the shaft is resisted and the strain distributed.

In testimony whereof, I have hereunto set my hand this 27th day of November A. D. 1926.

GEORGE W. MATTERN.