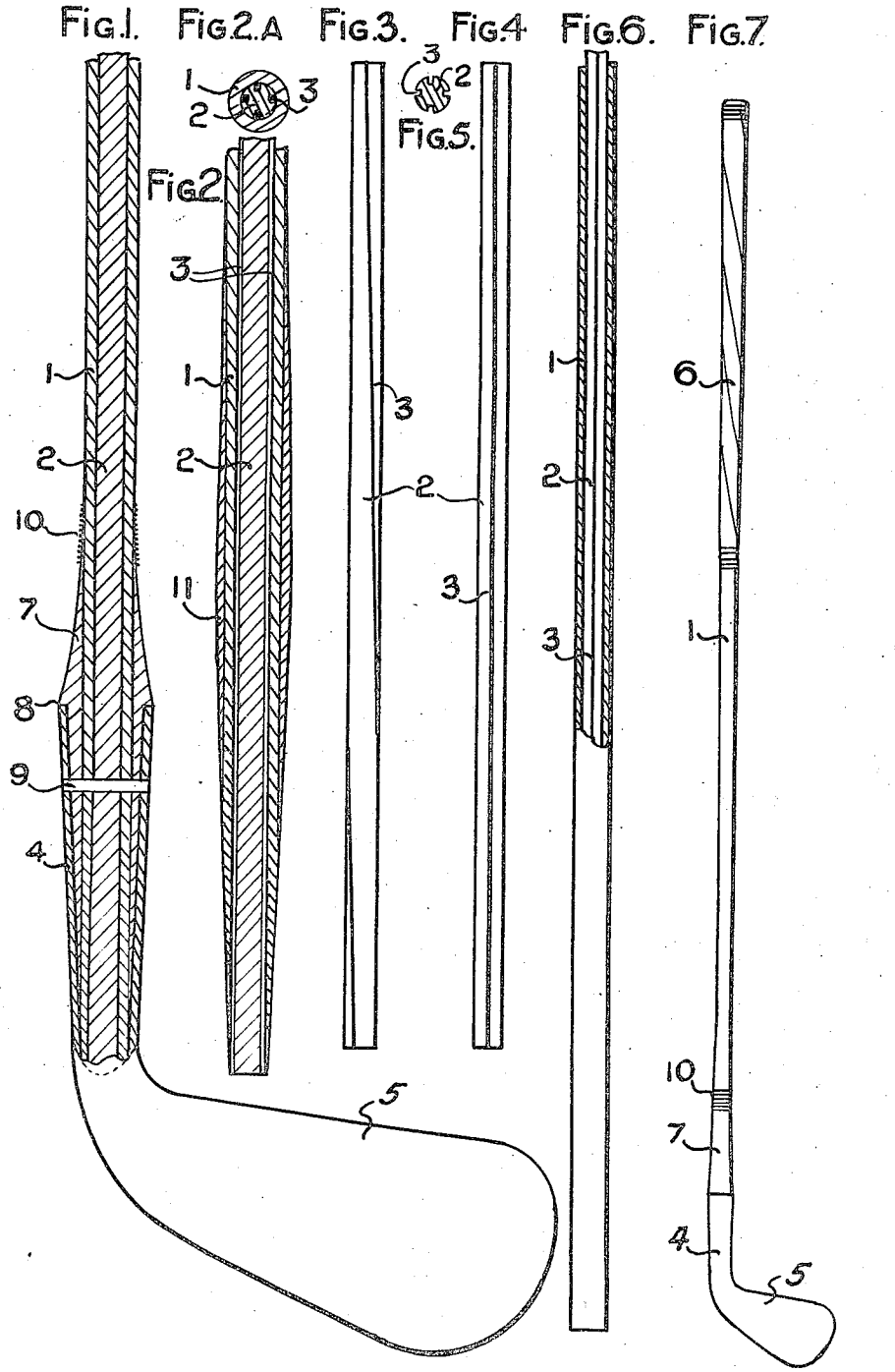
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GOLF CLUB SHAFT

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GOLF CLUB SHAFT

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This invention relates to golf clubs and is particularly concerned with improvements in the shafts of golf clubs.

It is quite common to use as a substitute for hickory shafts, tubular metal shafts, and in some cases such shafts have had reinforcing sleeves of non-metallic material shrunk on to them to form an outside covering providing increased strength and a better "feel".

Alternatively, in the endeavour to obtain the whippiness and "feel" of hickory shafts, composite wood shafts built up in sections have been introduced some of which have comprised bamboo or cane strips glued or otherwise cemented together about a wood core which itself has consisted of a number of these strips suitably united.

The majority of these composite shafts suffer from the defect that they disintegrate after considerable use and although they may provide in the initial stages, the required whippiness or resilience and the necessary bending strength, there is a definite tendency for the shafts to twist when swinging through the air so as to create a feeling of lag of the head during the swing or when the ball is struck, in other words such shafts owing to their light and sectionalized construction have not had the torsional strength to withstand without appreciable twisting, the turning movement applied by the air resistance to the head of a club when swung, or the hard impact of the head with the ball at the moment of striking.

The main object of the present invention is to provide an improved golf club shaft, of composite form which will have the "feel" of hickory without the harshness or twang of an all metal shaft or the encased metal shaft previously referred to, and is of such a construction as to ensure that disintegration of the parts is unlikely to take place during use, which will stand up under the torsional strain imposed upon it without appreciable twisting whilst having the necessary bending strength and whippiness, and which is cheap and simple to make and practically impervious to the effects of weather and general atmospheric conditions and changes.

In an endeavour to find material that would satisfy these conditions, it was found that a certain type of Chinese water reed, namely, *Arundinaria amabilis*, known as a Tsinglee bamboo, by the reason of the consolidation of the natural fibrous structure and a smooth hard outer covering or shell would give the required torsional strength and whippiness, and also the resistance to the fluctuating atmospheric conditions to which a golf shaft is subjected, if the reed is constituted as the main body of the shaft with an internal core of resilient material, preferably a rod of lancewood securely cemented within the reed to give the necessary bending strength, and further that such a composite shaft would have the inherent quality of definitely not coming to pieces during use, as is often the case with the sectionalized bamboo and cane shafts previously suggested.

According to the invention therefore, a golf club shaft consists of an *Arundinaria amabilis* or other similar natural reed and a lancewood or such like resilient core extending throughout the effective length of and securely consolidated within the reed to form an integral part thereof, whereby a composite structure having the necessary "feel", whippiness, and high torsional and bending strength is provided.

The advantage of employing a resilient wood core particularly a lancewood rod, is that a perfect marrying of the reed and the core can be obtained which not only insures proper cementing of the parts but also enables them to be of like strength so as to result in a structure of substantially uniform resilience and strength throughout and of the necessary light construction to give a proper balance.

In order to cement the two parts of the shaft securely together, the lancewood rod core preferably is grooved longitudinally from end to end around its periphery so as to avoid the formation of air pockets between the core and inner surface of the reed as the cement, such as glue, is applied, and thus allow the cement to flow evenly between the core and the reed.

The invention will now be described with reference to the accompanying drawing, wherein Fig. 1 is a sectional elevation of the improved shaft mounted by means of an adaptor in the hosel of an iron head. Fig. 2 is a sectional elevation of the head and of the improved shaft adapted primarily for fitting to the head of a "wood" club and showing also an alternative form of adaptor. Fig. 2A is a cross section of Fig. 2. Fig. 3 and Fig. 4 are elevations of grooved lancewood rod cores embodied in the improved shaft. Fig. 5 is a cross section of Fig. 3 or Fig. 4. Fig. 6 is an outside elevation of a shaft partly broken away at the top to show the fitted core, and Fig. 7 shows a complete golf club fitted with the improved shaft.

In the drawing the reference numerals denote like or similar parts.

The preferred form of composite shaft shown consists of a Tsinglee reed 1 within and throughout the effective length of which is cemented a lancewood rod 2 having longitudinal grooves 3 of spiral form as shown in Fig. 3 or straight as shown in Fig. 4 made round the periphery from end to end. The effective length above referred to of the reed is to be taken as that portion which has to take the strain and load imposed on the club during play and which extends essentially from the end which fits into the hosel 4 of the club head 5 to or near the extremity of the opposite end of the shaft around which the usual grip 6 is fitted in the complete club of Fig. 7. In Fig. 1 the hosel end of the composite shaft has a sleeve like adapter 7 cemented around it, the adapter having a circumferential ridge 8 which abuts the top of the hosel when the adapter is cemented into the hosel after being tapered to fit snugly in the internal bore thereof. The shaft is finally secured by the usual transverse pin 9 and the portion of the adapter above the ridge may be tapered off and bound with suitable binding 10 as shown in Figs. 1 and 7 to secure a tight fit and rigid joint. Alternatively, when the invention is applied to a "wood" club, the adapter may be omitted and the head end of the shaft tapered to fit and be secured in the head of the "wood" as illustrated in Fig. 2. Or this form of the shaft without the adapter may be employed for an iron head by binding or sleeving over the tapered end a resilient rubber or leather sleeve or tape 11 which will absorb the vibration and insure a tight joint. For this purpose also the adapter, when used may be bound or sleeved in this manner.

It will be understood that any other suitable form of adapter may be employed as long as it secures a rigid joint as between the shaft and the head of the club, the adapter above described, preferably being constructed from hardened moulded material such as celluloid or a composition thereof, or from a hard wood that is not likely to split due to the impact or force applied to the head of the club during play.

Obviously, as long as the strength of the reed is not materially affected, the shaft may be tapered slightly towards the head both for appearance and to obtain more whippiness and reduce wind resistance, particularly in the case of the woods; and if necessary or desirable the shafts may be covered by a sheath which may be made of cellulose or rubber material, providing an additional water proof protection to the shaft as well as enhancing the appearance thereof.

A golf club constructed with the improved shaft of the invention, apart from the inherent strength and resistance to twisting, is light and easy to swing with a minimum of wind resistance and by having a true balance enables the required force and direction to be imparted to the ball.

Although it is preferable to make the core continuous it may be desirable especially where it will facilitate manufacturing operations, to divide the core transversely into several parts which will be cemented within the reed in abutting relation from end to end.

The present invention provides a shaft embodying the advantages of both hickory and steel, in other words, the improved shaft has the feel and responsiveness of hickory, plus strength and control comparable to steel, and its self contained power makes it less tiring to play with.

This shaft differs from all other attempts made to obtain this effect—in that it consists of the two natural substances which in combination furnish the necessary characteristics to obtain the desired result—these substances namely, cultivated water reed and lancewood, being combined—not in a laminated—or built up form, having surface joints, but as a solid outer covering of reed with a centre or core of lancewood, so that the shaft can without harm, be scraped or sandpapered to give the desired "whip" or "balance" required.

One of the reasons why the golf shaft of the present invention has the necessary feel and strength, is the incorporation of the lancewood core, which is a straight grained, tough, light and elastic wood, and accordingly only such resilient cores which give similar results to the lancewood are within the scope of the appended claims, hence where fishing rods have hitherto been made of cane with a greenheart core, such composite rods have been found not to fulfill the requirements of the invention as they have to meet an entirely different set of conditions, the employment of wood cores such as greenheart, whilst perhaps giving the necessary strength for a fishing rod, would inter alia be too heavy and too brittle to be able to withstand the hard impacts which the shaft of the invention has to meet in play.

The term resilient core wherever used in the appended claims is to be interpreted to mean thereof, only cores e. g. hickory which give effects equivalent to those of lancewood.

A further feature of the present shaft which ensures absolute consolidation of the reed to the lancewood core is the provision of a resilient cushion between the core and the reed. This preferably is obtained by leaving, when drilling out the reed, a layer of the soft interior of the reed.

I claim:—

1. A golf club shaft comprising a section of a natural reed in its natural, one-piece, approximately cylindrical form in cross section, having its pith removed, a resilient reinforcing core within and closely fitting said reed, and means uniting said core with said reed.

2. A golf club shaft comprising a section of a natural reed in its natural, one-piece, approximately cylindrical form in cross section, having its pith removed, a resilient reinforcing core within and closely fitting said reed, said core having longitudinally extending grooves, and cement within said grooves and between said reed and core firmly uniting said core with said reed.

3. A golf club shaft comprising a section of a natural reed in its natural, one-piece, approximately cylindrical form in cross section, having its pith removed to an extent to leave a relatively soft resilient layer on the inner face of the reed, and a resilient reinforcing core closely fitted within said reed and firmly united therewith.

4. A golf club shaft comprising a section of the natural reed Arundinaria amabilis in its natural, one-piece, approximately circular form in cross section, having its pith removed, and a resilient reinforcing core within and closely fitting said reed and united therewith.

5. A golf club shaft comprising a section of the natural reed Arundinaria amabilis in its natural, one-piece, approximately circular form in cross section, having its pith removed, and a resilient reinforcing core of lancewood within and closely fitting said reed and united therewith.

6. A shaft of the character described compris-

ing a section of a natural reed in its natural, one-piece, approximately cylindrical form in cross section, having its pith removed, and a resilient reinforcing core within and snugly fitting said reed.

7. A shaft of the character described comprising a section of a natural reed in its natural, one-piece, approximately cylindrical form in cross section, having its pith removed, and a resilient reinforcing wood core within and snugly fitting said reed.

CLAUDE WILLIAM HISCOCKS.