March 14, 1939. C. Y. CHITTICK 2,150,737

GOLF CLUB

Filed Sept. 6, 1930

FIG. 4




FIG. 5

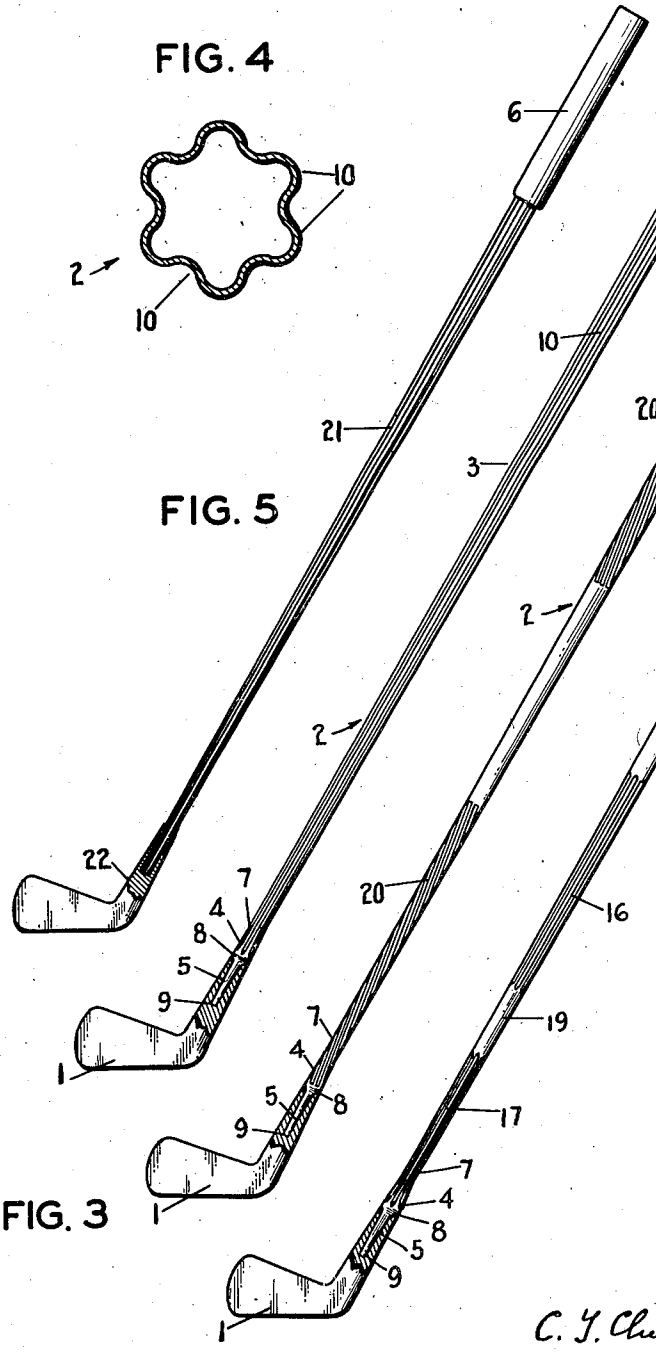


FIG. 3

FIG. 1

FIG. 2

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## GOLF CLUB

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8 Claims. (Cl. 273—80)

This invention relates to the shafts of golf clubs. Such shafts when made of tubular metal, as for instance steel, often do not have the desired "feel". They frequently are not yielding or elastic at required points especially torsionally.

It is the main object of the present invention to provide tubular metal golf shafts which shall be free from the objections noted.

This is accomplished by fluting the tube forming the shaft, such fluting extending for only a portion of the length of the shaft, and at one or more desired points, or the fluting may extend the whole length of the shaft; also the fluting may be of any suitable depth and may be of different depths at different points of the shaft, to produce the desired characteristics.

Other and ancillary objects of the invention will appear hereinafter.

In the accompanying drawing, which illustrates the invention;

Fig. 1 is a side elevation of a golf club embodying the invention, wherein the flutings extend substantially the whole length of the shaft;

Fig. 2 is a similar view of a modified form of shaft wherein the flutings are at separated points upon the shaft;

Fig. 3 is a similar view of a further modification wherein the flutings are not parallel to the axis of the shaft but extend about it to some extent;

Fig. 4 is a cross section on an enlarged scale of the fluted shaft showing both the exterior and interior of the shaft as being fluted; and

Fig. 5 is a side elevation of a golf club having a modified form of shaft, i. e. one having a taper in but one direction (a "straight" taper) and the flutings extending within the head.

Referring to the drawing, and first to Fig. 1, the golf stick therein shown comprises the iron head 1 (but the invention is equally applicable to golf clubs with wooden heads) in which is secured in any suitable manner, the metal (preferably steel) tubular shaft 2. This shaft is integrally formed but has the parts or sections 3, 4 and 5, the section 3 tapering from the end upon which the handle 6 is placed, from a larger diameter to a smaller diameter at 7. From the point or waist 7, the tube section 4 tapers upwardly (increases in diameter) to the point 8 adjacent to the place of entry of the shaft into the head, and from the point 8 the section 5 is reversely tapered (grows smaller in diameter) to its end 9 within the head. Substantially the whole length of the tubular metal shaft 2 is provided with fluting 10 as clearly appears by the cross section of the shaft shown in Fig. 4 which also shows the tube as being seamless. The portion of the shaft within the handle 6 and the section 5 within the head will not ordinarily be fluted but if more convenient or desirable for any reason these parts may be fluted also. It will be observed from Figs. 1 and 4 that the flutings are straight having no angular deviation about the axis of the tube; that both the outside and inside of the shaft is fluted, that the wall of the tube is of substantially uniform thickness and that the flutings are uniform and equally spaced both exteriorly and interiorly of the tube or shaft. It will further be observed that in cross section the fluted tube is sinuous, that is, is a smooth curve without sharp angles.

Instead of the flutings extending substantially the whole length of the shaft as in the shaft shown in Fig. 1, the flutings may be confined to separated parts on sections selected to produce the desired results. Thus in Fig. 2 is shown a shaft wherein the flutings are confined to the section 15 near the handle end of the shaft, another fluted section 16 lower down on the shaft and a fluted section 17 which includes the waist portion (portion of small diameter), these fluted portions being separated by plain, cylindrical unfluted portions 18 and 19.

In the construction as shown in Fig. 3, the flutings instead of being straight along the axis of the shaft as in the forms shown in Figs. 1 and 2, the flutings 20 are shown as being twisted to some extent about the axis of the shaft or tube, that is, each flute extends to some extent circumferentially (as well as longitudinally) about the axis i. e. longitudinally successive portions of a flute are angularly displaced about the tube axis.

In the construction of shaft shown in Fig. 5, instead of having a plurality of tapers as shown in Figs. 1, 2 and 3, the shaft 21 has a taper in one direction throughout its length, such taper being a "straight" (uniform) taper; and it will also be noted that the flutings extend within the head 22.

The fluting as described produces the desired "feel" which may be readily varied to suit individual preferences by suitably locating and forming the fluting on the shaft to suit the various circumstances, and especially does the fluting provide in a simple and inexpensive manner a shaft having a torsional "give" or spring which relieves against the shock to the hands of the player which is ordinarily experienced upon striking the ball improperly with a club having

a plain or unfluted metal shaft to which the head is connected in the usual way.

While the invention has been illustrated in what are considered its best applications, it may have other embodiments without departing from its spirit and is not therefore limited to the structures shown in the drawing.

What I claim is:

1. In a golf club, the combination with a head, of a fluted tubular metal shaft secured thereto comprising flutes each extending both longitudinally and circumferentially of the tube.

2. In a golf club, the combination with a head, of a tubular metal shaft secured thereto having fluted portions separated longitudinally of the shaft with the flutes thereof extending longitudinally of the shaft and a smooth portion interposed between said fluted portions.

3. In a golf club, the combination with a head, of a seamless fluted tubular metal shaft secured thereto comprising flutes each extending both longitudinally and circumferentially of the tube.

4. In a golf club, the combination with a head, of a tubular metal shaft secured thereto, said shaft having a groove extending both longitudinally and circumferentially of the shaft.

5. A golf club comprising a shaft and a head secured to the lower end of said shaft and extending laterally therefrom, said shaft being formed of thin sheet metal and of tubular form with a plurality of exterior ribs and grooves spacing said ribs apart, said ribs and grooves extending spirally around said shaft and of a height and depth varying longitudinally of the shaft to provide a shaft varying in cross sectional area throughout the length of said grooves and ribs and to provide a yielding torsional movement of said shaft when said head is brought into contact with a ball in play, said exterior open grooves between said ribs of said tubular shaft providing a yield in the side walls of the ribs when the shaft is subjected to torsional strains.

6. In a golf club, the combination with a head, of a tubular metal shaft secured thereto having grooved portions separated longitudinally of the shaft by interposed smooth portions, and having the grooves extending both longitudinally and circumferentially of the shaft.

7. A shaft for golf clubs of tubular steel material comprising opposite hand grip and head supporting end portions, said shaft provided with longitudinally spaced relatively stiffened portions formed by longitudinally extending ribs, one of said portions extending from the hand grip end portion of the shaft and another portion extending from the club head end portion of the shaft, and an intermediate stiffened portion, said portions being relatively spaced by intervening shaft portions of relatively non-ribbed surface construction.

8. A shaft for golf clubs of tubular steel material comprising opposite hand grip and head supporting end portions, said shaft having a portion longitudinally ribbed to stiffen said portion against lateral bending stresses extending from the hand grip end portion toward the head supporting end portion, and a flexing portion adjacent thereto extending toward the head supporting end portion of the shaft and of relatively smooth surface construction, the juncture of said ribbed and smooth shaft portions being disposed closer to the hand grip end portion of the shaft than the head supporting end portion.

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