

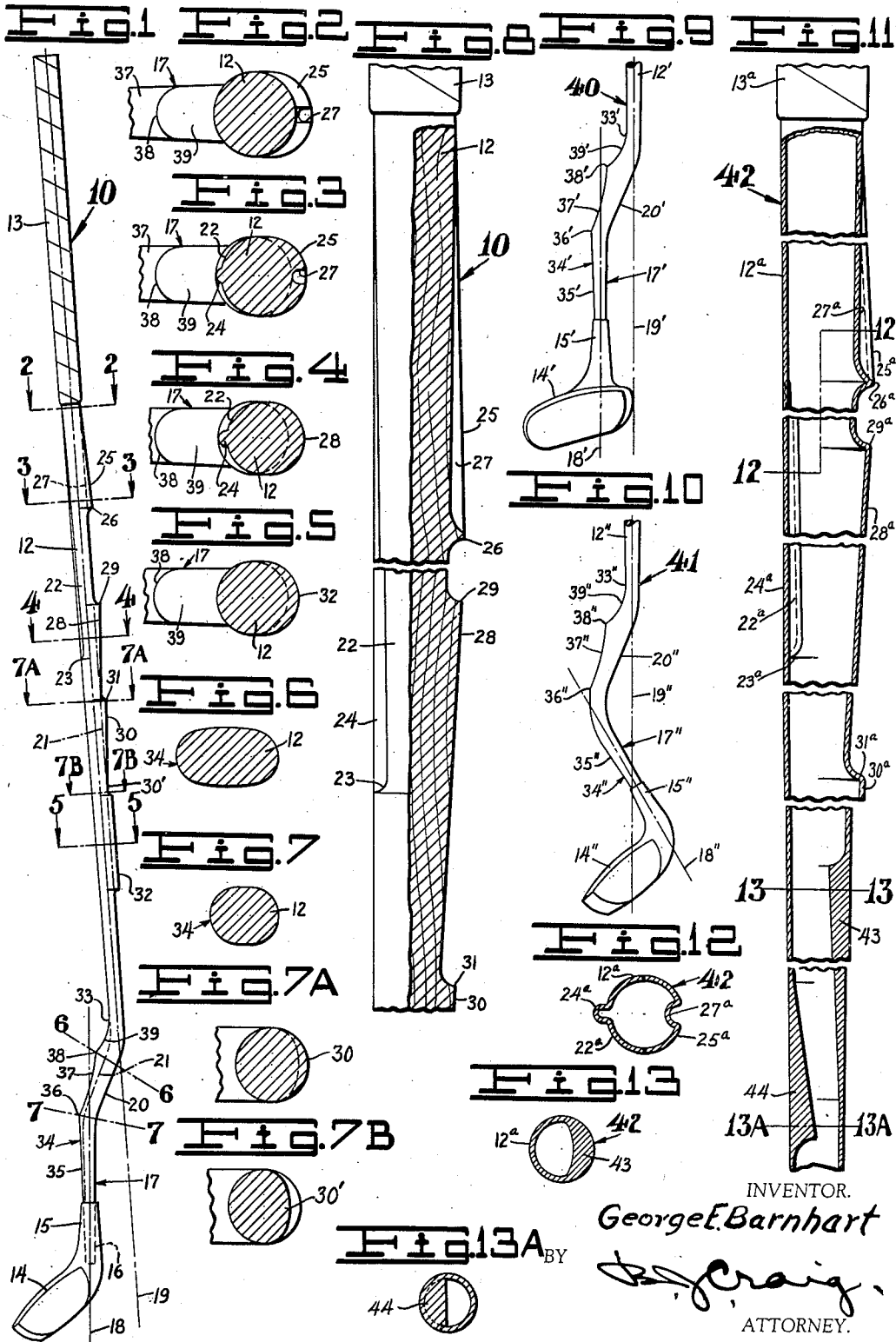
Feb. 7, 1939.

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2,146,048

GOLF CLUB

Filed June 5, 1935



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2,146,048

GOLF CLUB

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Application June 5, 1935, Serial No. 25,024

9 Claims. (Cl. 273-80)

This invention relates to improvements in golf clubs.

The general object of the invention is to provide a golf club including novel means to control the shock imparted to the shaft thereof when the club head strikes a golf ball.

A further object of the invention is to provide a golf club shaft which includes means for changing the direction of vibration of the shaft.

Another object of the invention is to provide means increasing the torsional stresses of a golf club shaft.

An additional object of the invention is to provide means for increasing the stiffness of one side of the shaft and also provide control of the flexure of the shaft at desired points.

Another object of the invention is to provide a golf club shaft having means for changing the direction of the vibration forces.

Other objects and the advantages of this invention will be apparent from the following description taken in connection with the accompanying drawing wherein:

Fig. 1 is a side view of a golf club embodying the features of my invention;

Fig. 2 is an enlarged section taken on line 2-2 of Fig. 1;

Fig. 3 is an enlarged section taken on line 3-3 of Fig. 1;

Fig. 4 is an enlarged section taken on line 4-4 of Fig. 1;

Fig. 5 is an enlarged section taken on line 5-5 of Fig. 1;

Fig. 6 is an enlarged section taken on line 6-6 of Fig. 1;

Fig. 7 is an enlarged section taken on line 7-7 of Fig. 1;

Fig. 7A is a section taken on line 7A-7A of Fig. 1;

Fig. 7B is a section taken on line 7B-7B of Fig. 1;

Fig. 8 is a fragmentary enlarged view similar to Fig. 1 with portions thereof in section;

Fig. 9 is a fragmentary view similar to Fig. 1 showing the offset portion at a different angle from that shown in Fig. 1;

Fig. 10 is a view similar to Fig. 9 showing the offset portion at a different angle from that shown in Fig. 1 or Fig. 9;

Fig. 11 is a fragmentary longitudinal sectional view of a hollow metal golf club shaft embodying the features of my invention;

Fig. 12 is a section taken on line 12-12 of Fig. 11;

Fig. 13 is a section taken on line 13-13 of Fig. 11, and

Fig. 13A is a cross section taken on line 13A-13A of Fig. 11.

Referring to the drawing by reference characters I have indicated a golf club embodying the features of my invention generally at 10. As shown the golf club 10 comprises a shaft portion 12 having a gripping portion 13 at one end and a head member 14 at the opposite end. The head 14 includes the usual hosel portion 15 into which the lower end of the shaft 12 is fitted as indicated at 16. Although in the accompanying drawing I have shown the club head 14 as being a driving head it will be understood that the head may be an "iron" head or another type of wooden head.

As shown, the shaft 12 is made of wood and includes a portion 17 adjacent its lower end which is offset from the remainder of the shaft. The axis 18 of the offset portion 17 is forward of the axis 19 of the shaft and is arranged at an angle to the shaft axis 19 being inclined forward and downward. The offset portion 17 where it merges with the remainder of the shaft includes a forward and downwardly inclined portion 20.

In general the shaft 12 is shown as convergently tapered from the gripping portion 13 to its lower end as indicated by the broken lines 21 in Fig. 1. Adjacent its upper end the shaft 12 includes a reduced portion 22 which extends from adjacent the grip 13 downward a predetermined distance to a location as indicated at 23. The reduced portion 22 is formed in the front half of the shaft (see Fig. 3) and from the lower end 23 thereof enlarges upward until it is the full diameter of the shaft. Throughout the length of the reduced portion 22 the shaft includes an integral longitudinal rib portion 23 (see Figs. 3 and 4) which is located on the front of the shaft.

Adjacent its upper end the shaft 12 further includes an enlarged portion 25 which extends from adjacent the grip 13 downward to a location indicated at 26. The enlarged portion 25 is formed in the rear half of the shaft and is of less length than the front reduced portion 22. At the lower end 26 the enlarged portion 25 has the greatest protrudence from the original surface of the shaft and diminishes upward until it is the full diameter of the shaft. Throughout the length of the enlarged portion 25 the shaft has a longitudinal groove 27 in the rear face thereof (see Figs. 2, 3, and 8).

Spaced below the enlarged portion 25 the shaft includes another enlarged portion 28 which is

formed on the rear half of the shaft and extends from a point 29 downward to a predetermined location. At its upper end 29 the enlarged portion 28 has the greatest protrudence from the original surface of the shaft and diminishes downward until it is the original diameter of the shaft.

Below the enlarged portion 28 the shaft 12 includes another similar enlarged portion 30 which is formed on the rear half of the shaft and extends from a point 31 downward a predetermined distance. At its upper end 31 the enlarged portion 30 is preferably circular in cross section and diminishes in cross section to an elliptical form 30' as shown in Fig. 7B.

Below the enlarged portion 30 the shaft 12 includes a further enlarged portion 32 which is formed on the rear half of the shaft. The enlarged portion 32, unlike the previously described enlarged portions, is coaxial with the shaft throughout its length.

Although I have shown and described a particular arrangement of the reduced and enlarged portions of the shaft, it will be understood they may be positioned in varying relationships to each other and at different positions on the shaft.

From the lower end of the shaft upward to a point 33 where the offset portion merges with the remainder of the shaft, I have shown an enlarged portion 34 on the front half of the shaft. As shown, this enlarged portion 34 diverges upwardly from the lower end of the shaft as indicated at 35 to a point 36 and on the inclined portion 20 is formed concave as at 37 from the point 36 to a point 38 where it curves into the original diameter of the shaft as indicated at 39.

By providing the enlarged and reduced portion on the shaft at predetermined positions rigidity is provided at certain places which controls the flexure of the shaft and at the same time greater torsional strength is provided.

Furthermore, by providing a shaft of varying diameters such as the shaft 12 vibrations set up in the shaft by the club head striking an object are expanded and contracted as they travel upward toward the grip until they are practically damped to a degree where they have very little effect upon the grip portion 13.

In Fig. 9 I have indicated a golf club generally at 40 which is similar to the golf club 10 and like portions thereof are indicated by similarly primed reference numerals. The difference between the golf club 40 and the golf club 10 is that the axis 18' of the offset portion 17' of the golf club 40 is parallel to the axis 19' of the main portion of the shaft 12' and that the head 14' has the hosel springing from the body thereof and not from one end.

In Fig. 10 I have indicated a golf club generally at 41 which is similar to the golf club 10 and like portions thereof are indicated by similarly double primed reference numerals. In the golf club 41 the axis 18'' of the offset portion 17'' intersects the axis 19'' of the shaft and also a plane passing through the axis 19'' intersects the center of the striking face of the club head 14''.

In Figs. 11, 12, and 13, I have indicated a golf club shaft generally at 42. The shaft 42 is made of metal and is hollow and is shaped similar to the golf club shaft with similar portions thereof indicated by a primed reference numerals. In addition to the various formations previously described in connection with the shaft 12 the shaft 42 includes thickened portions 43 and 44

formed on the inner surface of the shaft. The portion 43 tapers downwardly while the portion 44 tapers upwardly and this construction damps the vibrations created in the shaft when the head thereof strikes an object.

From the foregoing description it will be apparent that I have provided a novel golf club which is simple in construction and highly efficient in use.

Having thus described my invention, I claim:

1. A golf club shaft comprising a tubular metallic member including a plurality of portions, said portions having a single neutral axis, one of said portions having a wall thickness which provides a preponderance of the weight of said one portion on one side of the neutral axis and another portion having a wall thickness which provides a preponderance of the weight of said other portion on another side of the neutral axis.

2. A golf club, said golf club comprising a hollow metal shaft having a gripping portion at one end, said shaft including an intermediate longitudinally tapered portion the wall thickness of which is of varying cross section, said longitudinal tapered portion having a single longitudinally extending groove therein.

3. A golf club shaft comprising a tubular metallic member including continuous connected portions, the neutral axis of one of said portions being disposed parallel to and at one side of the neutral axis of another portion.

4. A golf club shaft, said shaft at one end including a longitudinally extending portion which is reduced in cross section, said shaft also including a plurality of longitudinally extending portions which are enlarged in cross section, said portion which is reduced in cross section being connected to the end one of said longitudinal portions which are enlarged in cross section, certain of said enlarged portions diverging upwardly from the normal diameter of said shaft to their greatest diameter and others of said enlarged portions diverging downwardly from the normal diameter of the shaft to their greatest diameter and another of said enlarged portions being cylindrical throughout its length and coaxial with the main axis of the shaft.

5. A golf club shaft, said shaft at one end including a longitudinally extending portion which is reduced in cross section, said shaft also including a plurality of longitudinally extending portions which are enlarged in cross section, said portion which is reduced in cross section being connected to the end one of said longitudinal portions which are enlarged in cross section, certain of said enlarged portions diverging upwardly from the normal diameter of said shaft to their greatest diameter and others of said enlarged portions diverging downwardly from the normal diameter of the shaft to their greatest diameter and another of said enlarged portions being cylindrical throughout its length and coaxial with the main axis of the shaft, said shaft including a longitudinally extending rib in said portion of reduced cross section and said shaft of certain of said enlarged portions having a single longitudinally extending rib therein.

6. A golf club shaft comprising a tubular metallic member including a plurality of portions, each portion having the thickness of the wall, along one side only thereof, increasing longitudinally of the shaft, the portion of increased wall thickness abruptly terminating at one end.

7. A golf club shaft having in the upper part thereof elongated protuberant portions extending

longitudinally thereof, said elongated protuberant portions each being of increasing cross sectional area in one direction along the length of the shaft, each of said elongated protuberant portions throughout its length being confined to one side of said shaft, the protuberant portion abruptly terminating at one end.

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10 8. A golf club shaft comprising a tubular metallic member which includes a portion the outer surface of which is defined by a surface of revolutions, the wall thickness along one side only of said portion increasing longitudinally of the

shaft, the portion of increased wall thickness abruptly terminating at one end.

9. A golf club shaft made of metal and including a portion the outer surface of which is of uniform shape throughout its length, said portion having a wall of increased thickness along one side only, the thickness of said wall along the one side increasing lengthwise of the shaft, the portion of increased wall thickness abruptly terminating at one end.

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