

July 22, 1941.

N. P. VICKERY

2,250,429

GOLF CLUB

Filed June 6, 1933

2 Sheets-Sheet 1

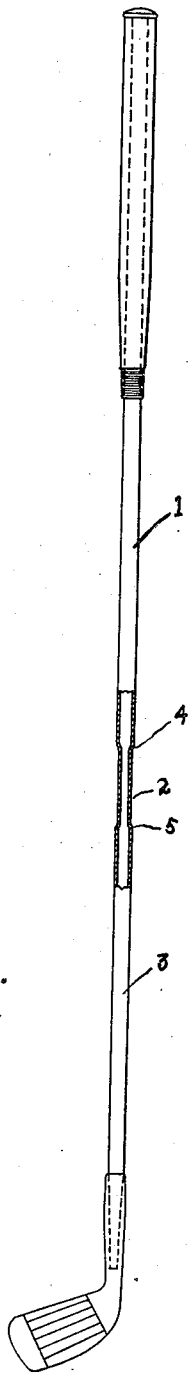


FIG. 1.

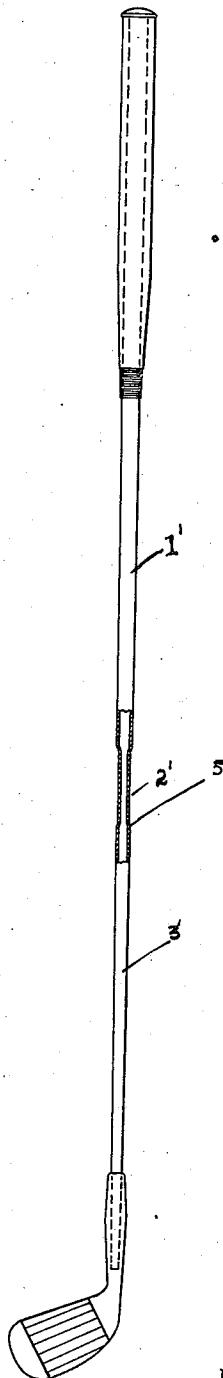


FIG. 3.

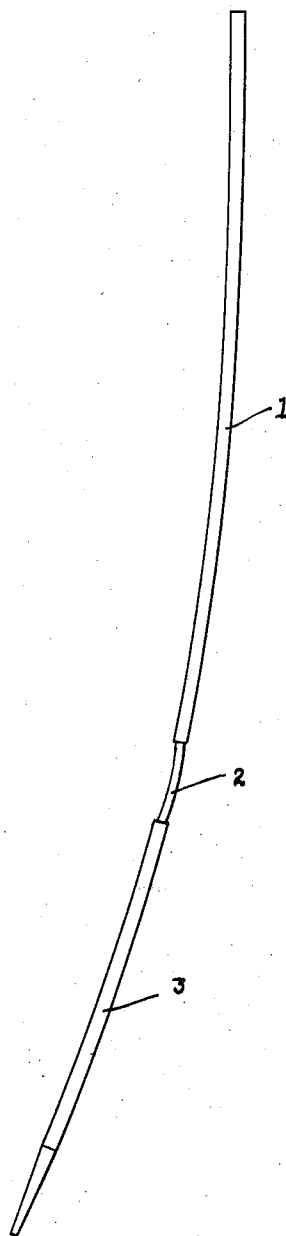


FIG. 2.

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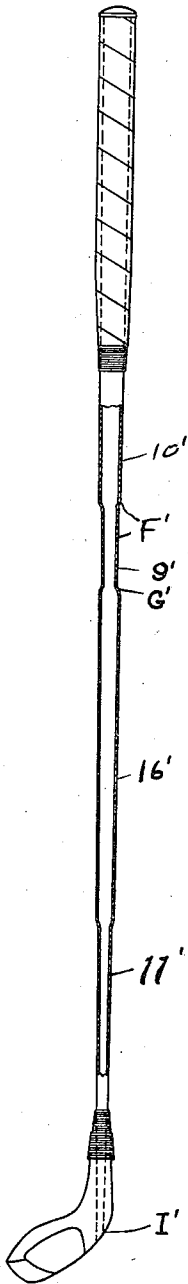
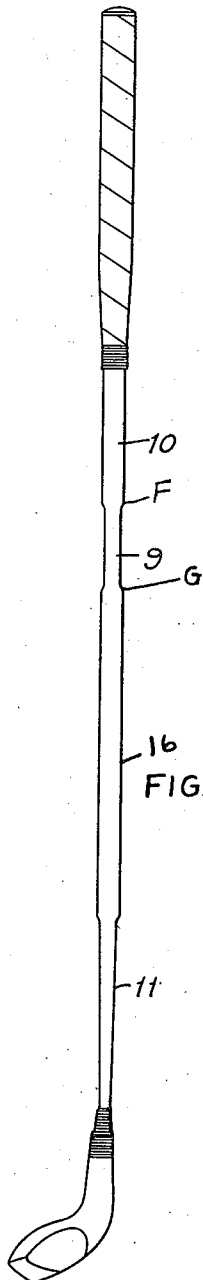
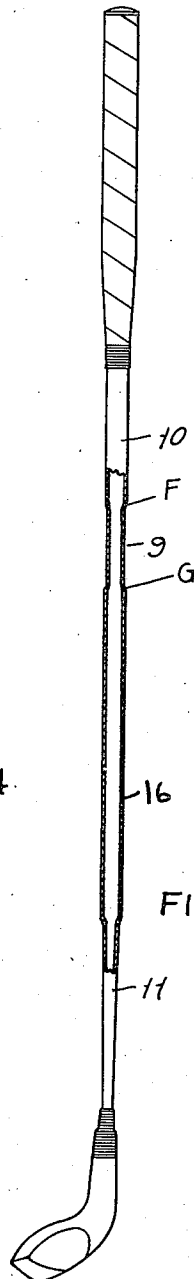
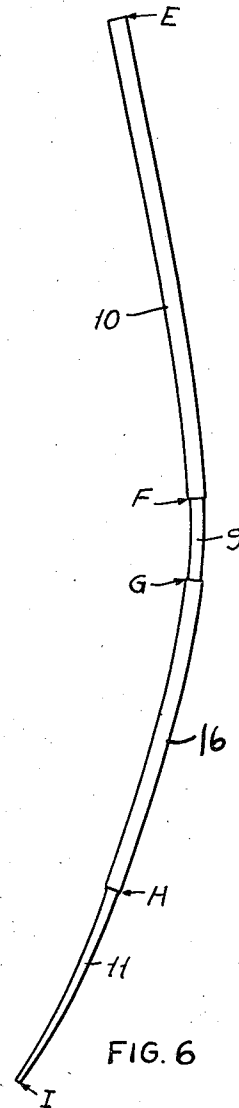
N. P. VICKERY

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GOLF CLUB

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2 Sheets-Sheet 2



Norman P. Vickery INVENTOR.

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## UNITED STATES PATENT OFFICE

2,250,429

## GOLF CLUB

Norman P. Vickery, Brockton, Mass., assignor to  
The American Fork & Hoe Company, Cleveland,  
Ohio, a corporation of Ohio

Application June 6, 1933, Serial No. 674,530

15 Claims. (Cl. 273—80)

My present invention relates to golf clubs, and is primarily directed to that type or class of golf clubs provided with flexible tubular metallic shafts.

A golf club may be likened, for comparison, to a baseball pitcher's arm. If the pitcher did not have flex in his elbow, he would be unable to throw a ball with satisfactory speed, and the flexibility of the pitcher's wrist also contributes to the accuracy and speed of the thrown ball.

Golf club shafts with which I have, in the past, been quite familiar commonly have a flexible lower region, thus corresponding to the flexible wrist of the baseball player's arm. Heretofore, it has been the common belief that the medial region of the length of a golf club shaft should be equally or more non-responsive to bending forces than the portion of the shaft immediately below such region. I have found that better results are obtained by so constructing the shaft that such medial region is made comparatively substantially more flexible than the next adjacent lower portion.

An object of the present invention, therefore, resides in so constructing a golf club shaft as to simulate the flexible articulation of the human arm, which flexes both at the elbow and wrist.

Another object of my invention is to provide an improved shaft for golf clubs, wherein the shaft is so formed as to be more susceptible to bending in the generally middle portion of the shaft length, than in the portion thereof which is disposed adjacent thereto and proceeding for a substantial distance towards the tip end of the shaft.

Another object of my invention is to provide an improved golf club shaft of the character of that of the preceding object and wherein the shaft is so formed in the region of its golf club supporting end or tip, as to make the relatively lower region of the shaft length more flexible than the substantial portion of the shaft length which is disposed above it, and the above referred to medial region, which, likewise, is more flexible.

Another object of my invention is to provide an improved golf club shaft, wherein the shaft is provided with two longitudinally spaced relatively more flexible portions than a substantial portion of the length of the shaft, disposed between them, and in which the lowermost flexible region of the shaft length, disposed closely adjacent the golf club end of the shaft, is the more flexible of the two flexible regions.

Other objects of my invention reside in the

particular construction and arrangement of my novel clubs and shafts, and other objects of the invention, and the invention itself, will more readily be understood by reference to the following description of certain embodiments thereof, reference being had therein to the drawings, illustrating preferred embodiments of my invention, wherein:

In Fig. 1, I show partly in longitudinal medial section a golf club shaft with the club head and hand grip affixed to the lower and upper ends, respectively, said shaft being formed of a single piece of steel tubing and being of circular cross-sectional form throughout and provided in its medial region with a section of reduced diameter;

In Fig. 2 is illustrated the shaft only, otherwise like that of Fig. 1, but shown in exaggerated resiliently bent form to indicate the nature and relative amounts of bending in different portions of the length of the shaft;

Fig. 3 illustrates a shaft otherwise like that of Fig. 1, which, however, is provided with all main portions of its length of substantial cylindrical form, being distinguished therefrom, however, in that all main and medial reduced sections of the shaft of Fig. 1, are in the embodiment of Fig. 2 made of tapered form;

Figs. 4, 5 and 6 illustrate a shaft which is another embodiment of my invention; Fig. 4 being in side elevational view, Fig. 5 being partly in longitudinally medial section, and Fig. 6 showing the shaft in exaggerated bent form after the manner of Fig. 2. The shafts of Figs. 4 and 5, are shown as having upper hand grip wrappings, and a lowermost club head affixed thereto;

Fig. 7 is a view in longitudinal medial section of a shaft otherwise like the shaft illustrated in Figs. 4, 5 and 6, which illustrate portions of the shaft length as being of generally cylindrical form, Fig. 7 being distinguished therefrom in that all portions of the shaft length, in the embodiment of Fig. 7, are shown as being made tapered. In Fig. 7, by dotted lines, a hand grip and a club head are indicated on the upper and lower ends of the shaft.

Referring now to the drawings, the shafts of Figs. 1 and 2, which are one embodiment of my invention, comprise joined substantially cylindrical portions 1, 2 and 3, of abruptly changing diameters, and are illustrated as being constructed of a single piece of steel tubing. At a medial point in said shaft, intermediate the grip and the head, there is provided a step-down or decreased-diameter portion 2, relative to shaft

portions disposed above and below it, thus permitting greater resilient compression and stretching of the metal of the shaft when subjected to bending stresses in this medial region of the shaft length.

The shaft of Figs. 1 and 2, having the medially disposed section 2 of substantially reduced diameter, causes the shaft to be provided with shoulders 4 and 5, at the two extremities of said diametrically reduced region where the said shaft is more susceptible to bending than elsewhere throughout the length of the shaft.

In Fig. 2 the extreme lower end of the shaft of Fig. 1 is illustrated as provided with the usual slight taper, this being for the purpose of fitting in the commonly tapered bore of the hosel or shank of the club head 6.

Fig. 3 illustrates a shaft which is a second embodiment of my invention which is quite similar to that of Fig. 1, except that all sections of the shaft of Fig. 3 are tapered, whereby the flexing of the shaft, per unit of length, is somewhat more distributed, being accentuated wherever the diameters are less, and being greatest in the region 2' in the lower region of the shaft length.

The shaft of Fig. 3, having all sections 1', 2' and 3' tapered, is progressively reduced in diameter from the extreme hand grip shaft end to the junction of the portions 2' and 3', where an abrupt increase in diameter is effected to produce shoulder 5'. The shoulders 5 and 5' of the shafts of Figs. 1 and 3, respectively, represent, what I call, the extreme upper end or terminus of the lower shaft portions 3 and 3' respectively.

The shafts of Figs. 1 to 3, inclusive, are of types which I personally prefer to use in play, when employing the golf clubs commonly called "irons," the shafts of which are commonly shorter in length than are the shafts for the clubs commonly called "woods." "Woods" and "irons" are commonly so called because of the use of wood or iron heads in such clubs. The shafts in "irons" commonly vary from 35 inches to 39 inches in length, and the shaft for "woods" commonly vary from 40 inches to 43 inches in length in golf clubs for adults.

The shaft of Figs. 4, 5 and 6 comprises a medially disposed section 9 of relatively reduced diameter as compared to the large diameter of the shaft portions 10 and 11, disposed above and below said portion 9, and with the lowermost length of the shaft also of reduced diameter and tapering downwardly to its tip end I, where the shaft is of least diameter, said shaft also being of lesser diameter in the region immediately above the club head than in any other part of the shaft disposed upwardly thereof.

In this embodiment of the invention, which reduced sections 9 correspond, with reference to the previously recited analogy, to the elbow of a baseball pitcher's arm, and the reduced lower portion of the section 11 corresponds to the wrist of such arm, the placement of the club heads at the end of such shaft corresponding generally to the positioning of the baseball in the player's hand supported by the relatively flexible wrist of the player.

In this embodiment I have shown the shaft portions 10, 9 and 11, as being made substantially cylindrical, whereby the hand grip may be lengthened in diameter, and the portion 10 may be stiffer over a longer length than would be the case were the portions 10 and 11 made tapered. The accentuated bending in the portions 9 and 11, is illustrated in somewhat exaggerated form

in Fig. 6, which also shows that, in play, there is very little bend to the hand grip supporting portion 10, which, quite commonly, is held intermediate its ends, and that, the portion 11 is less susceptible to bending than the portion 9 disposed above, and the portion 11, disposed below said intermediate portion 10.

In the embodiment of my invention, illustrated in Fig. 7, I show a shaft otherwise like that of Figs. 4, 5 and 6, except that I have shown the portions 10, 9 and 11 as being tapered more in accordance with the common practice in the making of golf clubs, which commonly taper from their extreme upper end to their lower end portions. In Fig. 7, reference numerals and letters similar to those of Fig. 4 indicate corresponding portions of the shaft.

Of course, in such a shaft, the progressive reduction in diameter toward the lower ends, of said tapered portions, makes such portions near their lower ends somewhat more flexible than the diametrically larger upper end portions, and thus effects a somewhat greater distribution of bending of the shaft than is the case in the embodiments of Figs. 4, 5 and 6.

Having thus described my invention in different embodiments, I have herein shown that in each instance in the present application, where I have illustrated a cylindrical main portion of the shaft, it will be appreciated that this may be tapered if desired, or any degree desired, together with corresponding tapered reduced portions, within the scope of my present invention.

It will be apparent, however, that, as the player swings a golf club of the present invention, the head of the club will swing in to meet the ball with a tremendous impact and driving power. Furthermore, the tendency of the shaft to assume the opposite flex or bend to that diagrammatically shown in Figs. 2 and 7, on the follow-through, will impart still further initial driving power and velocity to the ball. As a matter of fact, this latter feature is an important characteristic of each and every one of the clubs illustrated and described in this application.

While I have herein illustrated tubular golf club shafts as made by the drawing of a single piece of tubing, I am aware that the shaft of my invention may be otherwise manufactured, and I, therefore, also claim my invention in certain aspects broadly.

While I have necessarily described my present invention somewhat in detail, it will be appreciated that I may vary the size, shape and arrangement, ratios, proportions and distances within wide limits without departing from the spirit of the invention.

I claim:

1. A tubular metallic golf club shaft having a grip portion at its upper end and a tip at its lower end, said shaft being of circular cross section throughout and comprising an upper portion and a lower portion, said upper and lower portions being interconnected by a shoulder outwardly protruding from the upper portion and affording the upper terminus for the lower portion, and the lower portion immediately below the shoulder tapering therefrom to a minimum diameter in the tip region, and the minimum diameter of the lower portion being less than the minimum diameter of the upper portion in the region adjacent the shoulder.

2. A tubular metallic golf club shaft of uniform cross sectional shape throughout its length, comprising an upper portion carrying the handle or

grip and tapering downwardly to a medial region at which the metal of the shaft wall is abruptly bulged outwardly in symmetrical relation to the axis of the shaft, thereby forming an annular stiffening shoulder; and a lower portion tapering downwardly from a maximum diameter at said shoulder toward its opposite or tip end.

3. A tubular metallic golf club shaft having a grip portion at its upper end and a tip at its lower end, said shaft having contiguous upper and lower portions of circular cross section throughout, and said upper and lower portions being connected in the medial region of the shaft by a portion which outwardly protrudes from the upper portion and merges with the upper terminus of the lower portion, said lower portion tapering to a minimum diameter in the tip region.

4. A tubular metallic golf club shaft having a grip portion at its upper end and a tip at its lower end, said shaft being of circular cross section throughout and comprising an upper portion and a lower portion, both of said portions being tapered in the same general direction, said upper and lower portions being interconnected by a shoulder outwardly protruding from the upper portion and affording the upper terminus for the lower portion, the lower portion being of maximum diameter at the crest of the shoulder and tapering to lesser diameter toward its tip end, and the minimum diameter of the lower portion being less than the minimum diameter of the upper portion in the region adjacent the shoulder.

5. A tubular metallic golf club shaft of uniform cross sectional shape throughout its length, comprising an upper portion carrying the handle or grip and progressively downwardly decreasing in diameter to the medial region at which the diameter of the shaft is substantially so abruptly increased as to provide an annular shoulder of the shaft in said region with the shoulder being disposed in symmetrical relation to the axis of the shaft, and a lower portion progressively decreasing in diameter from a maximum diameter at said shoulder downwardly toward its opposite or tip end, and a substantial length of the upper part of said lower portion, including said shoulder, being of greater diameter and relatively stiffer than corresponding lengths of the shaft disposed both immediately above and immediately below it.

6. A tubular metallic golf club shaft having a grip supporting portion at its upper end and a club head supporting tip at its lower end, said shaft having contiguous upper and lower portions of circular cross section throughout and said shaft being substantially abruptly increased in diameter at the junction of said upper and lower portions in the medial region of the shaft length to provide a shoulder of the shaft thereat, said shoulder providing the upper terminus of the lower portion, said lower portion tapering to a minimum diameter in the region comprising said tip.

7. A tubular metallic golf club shaft having a grip supporting portion at its upper end and a club head supporting tip at its lower end, said shaft having contiguous upper and lower portions of circular cross section throughout, said upper and lower portions being joined in the medial region of the shaft and being tapered in the same general direction and said shaft being substantially abruptly increased in diameter at the junction of said portions whereby said lower portion is provided with an upper terminal region

of substantial length and of increased diameter relative to the diameter of the shaft regions disposed adjacent thereto both above and below said region.

8. A tubular metallic golf club shaft having a grip supporting portion at its upper end and a tip at its lower end, said shaft having contiguous club head supporting upper and lower portions of circular cross section throughout, and said upper and lower portions being connected in the medial region of the shaft, the upper terminal of the uppermost region of said lower portion being of substantially greater diameter than that of the adjoining lower region of said upper portion, said lower portion tapering to a minimum diameter in the tip region and said uppermost region comprising a relatively stiffened substantial portion of the length of said lower portion and being of greater diameter than the portion of the length of said lower portion disposed immediately below said uppermost region thereof.

9. A tubular metallic golf club shaft having a grip portion at its upper end and a tip at its lower end, said shaft being of circular cross section throughout and consisting of an upper portion and a lower portion, said upper and lower portions being interconnected generally medially of the length of the shaft, said shaft being substantially abruptly increased in diameter at the junction of said upper and lower portions relative to the diameter of the shaft in the region above said junction, said increase in diameter providing the shaft with a shoulder affording the upper terminus for the lower portion, and the lower portion immediately below the shoulder tapering therefrom to a minimum diameter in the general region of its lower end, and the diameter of a substantial portion of the length of said lower portion proceeding downwardly from its said upper terminus being greater than the diameters of the adjacent lower regions of said upper portion and the adjacent region of said lower portion proceeding toward the tip.

10. A shaft for golf clubs having two substantially localized relatively short portions of its length which are relatively spaced from each other, the first being provided in the portion of the shaft length between the hand grip supporting portion and the longitudinal middle portion of the shaft and the second being positioned between said middle portion and the club head supporting end substantially close to the club head supporting end, both of said portions being constructed to be more readily resiliently bent than the next adjacent portion of the shaft disposed towards the hand grip supporting end thereof from such short portion, the portion of the shaft disposed intermediately of said short portions being substantially free of localized portions of similarly increased resiliency.

11. A shaft for golf clubs comprising distinct "elbow" and "wrist" resilient hinge portions positioned generally, respectively, in the middle longitudinal portion of the length of the club, and adjacent to but substantially spaced from the club head supporting end portion thereof, and being elsewhere substantially free of distinct resilient hinge portions.

12. A tubular metallic golf club shaft of generally tapered construction throughout but having a pair of relatively spaced portions of short length one positioned substantially close to but spaced from the grip supporting end portion, the other positioned substantially close to but spaced from the club head supporting end portion, said

short portions constructed so as to respond more readily to flexing stresses than the other portions of the shaft which are relatively disposed more toward the handle end of the shaft, and also between said short portions.

13. A tubular shaft for golf clubs adapted for the placement of a hand grip and a club head respectively on its two end portions, having a distinct circumferentially reduced resilient hinge portion of relatively short length and disposed substantially nearest said hand grip supporting portion, said shaft being additionally weakened to laterally flexing stresses in that portion of its length disposed closely adjacent its club head supporting end.

14. A tubular shaft for golf clubs adapted for the placement of a hand grip and a club head respectively on its two end portions, having a distinct resilient hinge portion of relatively short length provided by weakening the walls of the shaft to laterally directed bending stresses exerted upon said portion relative to longitudinally disposed adjacent portions, said hinge portion being disposed substantially nearest said hand grip supporting portion, said shaft being formed to be substantially less responsive to bending stresses in the other portions of its length intermediate said hand grip supporting portion and

that portion of its length disposed mid-way of said supporting portions, said shaft being additionally weakened to laterally flexing stresses in that portion of its length disposed closely adjacent its club head supporting end.

15. A tubular shaft for golf clubs adapted for the placement of a hand grip and a club head respectively on its two end portions, having a distinct resilient hinge portion of relatively short length provided by weakening the walls of the shaft to laterally directed bending stresses exerted upon said portion relative to longitudinally disposed adjacent portions, said hinge portion being disposed substantially nearest said hand grip supporting portion, said shaft being formed to be substantially less responsive to bending stresses in the other portions of its length intermediate said hand grip supporting portion and that portion of its length disposed mid-way of said supporting portions, said shaft comprising a portion extending from said hinge portion in the direction of the club head of substantially greater length and extending substantially beyond said mid-way portion, said shaft being additionally weakened to laterally flexing stresses in that portion of its length disposed closely adjacent its club head supporting end.

NORMAN P. VICKERY.