May 9, 1967 RICHARD R. KUNIHISA 3,318,602

GOLF CLUB HAVING A HANDLE WITH VIBRATION SENSING MEANS

Filed Jan. 15, 1965

FIG. 1.

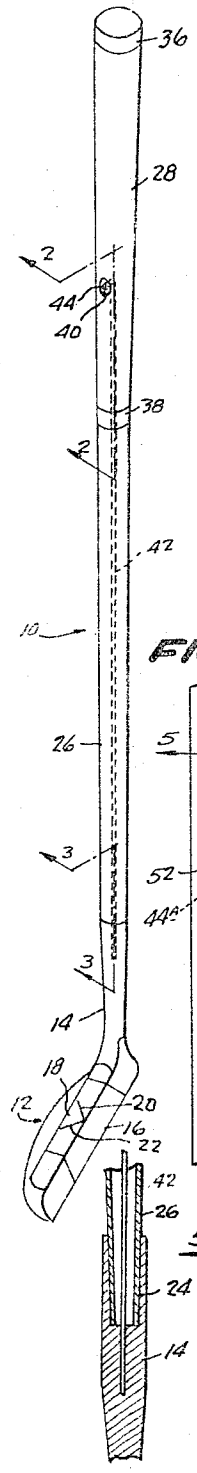


FIG. 2.

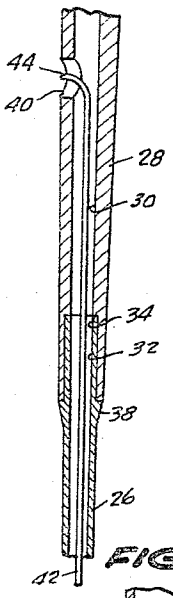


FIG. 10.

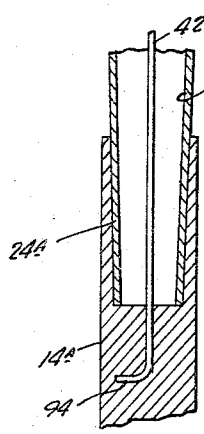


FIG. 11.

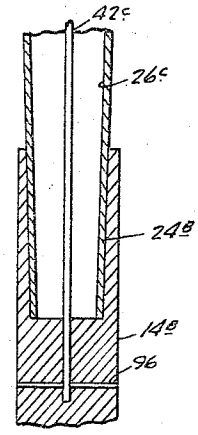


FIG. 9.

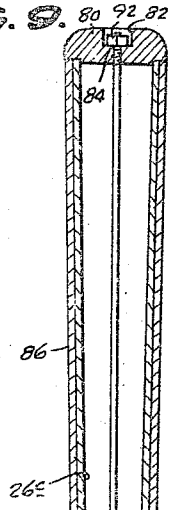


FIG. 5.

FIG. 6.

FIG. 7.

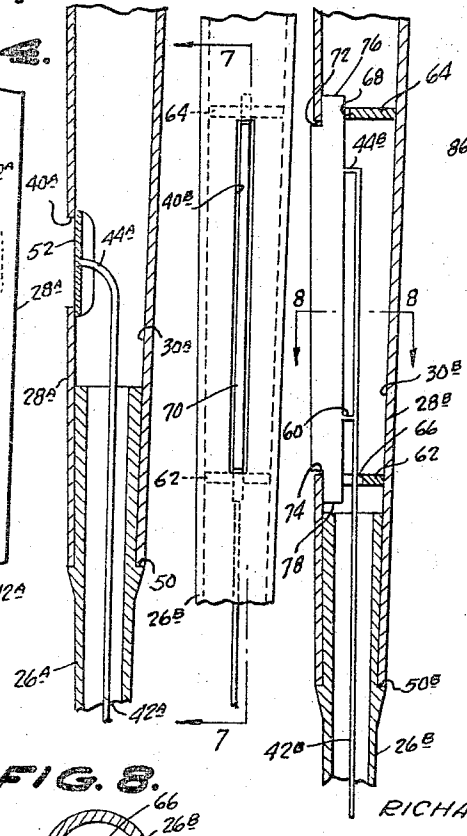


FIG. 4.

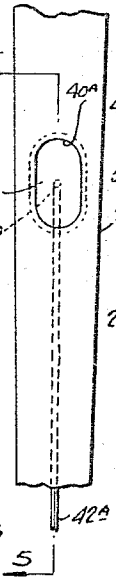


FIG. 12.

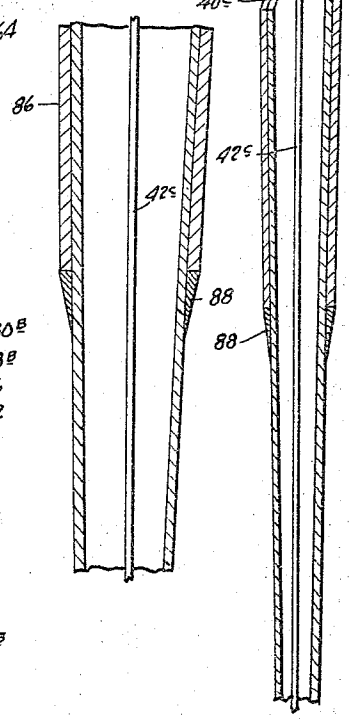


FIG. 8.

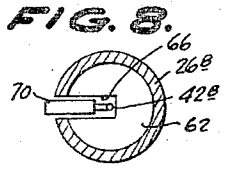


FIG. 3.

INVENTOR.
RICHARD R. KUNIHISA,
BY
Berman, Davidson & Berman
ATTORNEYS.

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GOLF CLUB HAVING A HANDLE WITH VIBRATION SENSING MEANS

Richard R. Kunihisa, 168 Dowsett Ave.,
Honolulu, Hawaii 96817

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12 Claims. (Cl. 273—162)

This invention relates to the general field of game apparatus or equipment and, more specifically, the instant invention pertains to golf clubs.

One of the primary objects of this invention is to provide a new and improved golf club which enables the user thereof to pre-calculate the length of his swing of the club and the necessary force to be exerted in order to obtain the optimum results during each stroke or shot.

Another object of this invention is to provide a new and improved golf club especially engineered to provide the user thereof with sensing means utilized in the predetermination of the length of the swing of the golf club and the impact force necessary to carry a golf ball its maximum distance.

A further object of this invention is to provide a new and improved golf club with means for transmitting vibrations thereof occasioned by impact of the golf club head with a ball to the thumb or fingers of the user whereby the same may be sensed and utilized in the pre-calculation of the length of the swing of the golf club on the next succeeding shot and the power to be utilized in making the next shot or stroke.

It is a still further object of this invention to provide in a golf club of the putter type, vibratory means connected with the golf club head and extending through the handle for engagement by one or more of the fingers of the user to be sensed thereby, the vibrations being utilized by the user in pre-calculating the length of the swing of the golf club on the next shot or stroke. It will be understood, of course, that this invention may be used in conjunction with golf clubs of types other than putters.

This invention has, and further contemplates the provision of a golf club of the type generally described supra, the golf club being inexpensive to manufacture and maintain, easily assembled, and which is durable in use.

Other and further objects and advantages of the instant invention will become apparent from a consideration of the following specification when read in conjunction with the annexed drawing, in which:

FIGURE 1 is a perspective view of a putter type golf club incorporating the instant invention;

FIGURE 2 is a fragmentary detail cross-sectional view, FIGURE 2 being taken substantially on the vertical plane of line 2—2 of FIGURE 1, looking in the direction of the arrows;

FIGURE 3 is an enlarged detail fragmentary cross-sectional view, FIGURE 3 being taken substantially on the vertical plane of line 3—3 of FIGURE 2, looking in the direction of the arrows;

FIGURE 4 is a fragmentary side elevational view of a second embodiment of this invention;

FIGURE 5 is a fragmentary detail cross-sectional view, FIGURE 5 being taken substantially on the vertical plane of line 5—5 of FIGURE 4, looking in the direction of the arrows;

FIGURE 6 is a fragmentary side elevational view of the handle portion of a golf club constructed in accordance with a third embodiment of this invention;

FIGURE 7 is a fragmentary detail cross-sectional view, FIGURE 7 being taken substantially on the vertical plane of line 7—7 of FIGURE 6, looking in the direction of the arrows;

FIGURE 8 is a detail cross-sectional view, FIGURE 8 being taken substantially on the horizontal plane of line 8—8 of FIGURE 7, looking in the direction of the arrows;

FIGURE 9 is a fragmentary, enlarged, detail cross-sectional view of the handle portion of a golf club constructed in accordance with a fourth embodiment of this invention;

FIGURE 10 illustrates an enlarged, fragmentary, detail cross-sectional view showing a still further means for anchoring one end of the vibratory device to the shank;

FIGURE 11 is an enlarged fragmentary detail cross-sectional view illustrating still another means for anchoring one end of the vibratory device to the shank; and

FIGURE 12 is an enlarged fragmentary detail cross-sectional view of the handle portion of the golf club.

Referring now more specifically to the drawing, reference numeral **10** designates, in general, a golf club constructed in accordance with the teachings of this invention. The club **10** includes a head **12** of conventional configuration, the head **12** being formed of steel or other desirable materials and being provided with an upwardly-projecting integrally-formed shank **14** at one end thereof. The head **12** is formed with a normally upright substantially plano ball-striking side **16**, and the upper end thereof may be provided with ball-centering indicia **18** defined by the scribed lines **20**, **22** or with other means, if so desired.

The upper end of the shank **14** (see FIGURE 3) is provided with a downwardly-opening socket **24** which receives, and has secured therein by conventional means, the lower end of an elongated, hollow, substantially cylindrical shaft **26** formed of steel or other desirable materials.

Reference numeral **28** (see FIGURE 2) denotes an elongated, downwardly-tapering, frusto-conical golf club handle having a central axially-extending passage **30** formed therein. The handle **28** may be constructed of any desirable substantially rigid material and, as is shown in FIGURE 2, the tapered lower end thereof is provided with a counterbore **32** that is in open communication and is coaxial with the passage **30**. The counterbore **32** provides an internal shoulder **34** and is adapted to receive, and have secured therein the upper end portion of the shaft **26** with the outer end seating on the shoulder **34** which thus serves as abutment means to limit the distance the shaft **26** may be telescoped within the handle **28**. The upper end of the handle **28** has a cylindrical closure cap **36** fixedly secured thereto sealing the passage **30** at the upper end thereof, and the lower end abuts an outwardly-flared shoulder **38** to seal the same.

Intermediate its ends, the handle **28** is provided with a cylindrical aperture **40** which extends transversely therethrough and is in open communication at its inner end with the passage **30**. The outer end of the aperture **40** opens, as is shown in FIGURE 1, over or in the direction of the upper end of the golf club head **12**. For reasons to be set forth below, the aperture **40** may be located in positions on the handle **28** other than that specifically stated, but it is essential for the operation of this invention that the aperture **40**, or a similar opening, must be provided in the handle **28**.

Fixedly embedded in the upper end of the shank **14** is one end of an elongated upright substantially rigid cylindrical or tubular rod **42** which may be formed of a metal, plastics, or other desirable material. The other end of the rod **42** extends substantially coaxially through the shaft **26** in spaced relation relative thereto and terminates in a radially or laterally-bent extension **44** that protrudes through the aperture **40** and which has its outer end preferably terminating in the plane of the outer surface of the handle **28**.

In use, the club **10** is designed to afford the golfer a

club to more effectively gauge the length of the putting stroke and the power behind the stroke to make an effective putting stroke leading to the sinking of the golf ball in the cup on the first stroke after reaching the green than is possible with previously designed putters. To this end, the user grasps the handle **28** in the conventional manner with the thumb of the lowermost hand overlying the aperture **40** and engaging and depressing the extension **44** without causing contact of the rod **42** with either the shaft **26** or the handle **28**. Upon stroking of the golf ball (not shown), vibrations of the impact of the plano surface **16** with the golf ball will be translated to the rod **42** and will be, in turn, transmitted to the extension **44** and thus to the thumb of the user. Observation of the ultimate position of the ball on the green after the stroke leads the golfer, through the vibratory response of the rod **42** and extension **44** as transmitted to the thumb, to the determination of the use of a longer or shorter stroke with more or less power behind the same on subsequent fast or slow greens.

Since the positioning of the hands on the golf club handle **28** varies from one golfer to another, the position of the aperture **40** and of the extension **44** will vary for the convenience of the user. However, the above-described construction of the golf club **10** remains the same as described, regardless of the positioning of the aperture **40** and the extension **44**.

FIGURES 4 and 5 illustrate a second embodiment of this invention wherein the same golf club head **12** is employed, as well as the identical shank **14**, all illustrated in FIGURES 1 to 3, inclusive. The same type of vibratory rod is employed in the second embodiment of this invention and is indicated at **42A**, the rod having the usual extension **44A**. The shaft, assigned reference numeral **26A**, is provided, as before, with an external enlarged integrally-formed circumferential shoulder **50** adjacent the upper end thereof. The apex end of an inverted substantially hollow tubular frusto-conical handle **28A** is telescoped over and is secured by conventional means to the upper end of the shaft **26A** with the apex end thereof abutting against the shoulder **50**. The handle **28A** is provided with a passage **30A** through which extends the upper end of the rod **42A** and its extension **44A**. In this embodiment, the aperture has been modified to an oblong configuration **40A** normally closed by an arcuate closure plate **52**. As shown in FIGURES 4 and 5, the plate **52** is carried on the outer terminal end of the extension **44A** and seats against the inner side of the handle **28A** in the passage **30A**, and extends across the aperture **40A** to completely close the same.

The use of this embodiment of the invention is the same as that described above with the exception that the thumb of the golfer now engages the plate **52** to move the same out of its seat across the aperture **40A** without effecting contact of the rod **42A** with the shaft **26A** or the handle **28A**. Here, again, vibrations set up in the rod **42A** are transmitted to the golfer's thumb and are interpreted by him in calculating the next putting shot or stroke to enable him to pre-calculate the length of the golf club swing and the power to be used in making each succeeding shot.

FIGURES 6, 7 and 8 illustrate a third embodiment of this invention which utilizes the same shaft and golf club head as shown and described in previous figures, and it is proposed to employ the same handle construction. The shaft is herein identified by reference numeral **26B**, its shoulder **50B**, and the handle and passage by numerals **28B**, **30B**, respectively. Extending through the upper end of the shaft **26B** and into the passage **30B** of the handle **28B** is the upper end of a rod **42B** similar in construction with respect to the rods shown in the two preceding embodiments of this invention. The upper end of the rod **42B** terminates in a radially or laterally-bent extension **44B**, and adjacent to but spaced below the extension **44B** is a strut **60**, the strut **60** being parallel to the extension **44B**.

As in seen in FIGURES 6, 7 and 8, the handle **28B** is provided with a pair of discoidal members **62, 64** rigidly secured thereto and which traverse the passage **30B** perpendicular to the longitudinal axis thereof. The discoidal members **62, 64** span an elongated substantially rectangular aperture **40B** that extends parallel to the axis of the handle **28B** and which faces the extension **44B** and the strut **60**. The discoidal members **62, 64** are provided, respectively, with radially-extending substantially parallel slots **66, 68** which also parallel the aperture **40B**.

Reference numeral **70** denotes an elongated substantially flat upright rectangular rib notched at its opposed ends to form the shoulders **72, 74** and end extensions **76, 78**. As shown in FIGURES 6, 7 and 8, the rib **70** is disposed in the passage **30B** and has a portion thereof extending through the aperture **40B** to dispose the shoulders **72, 74** in close juxtaposition relative to the ends of the aperture **40B**, and with the extensions **76, 78** normally engaging against the inner side of the handle **28B**. The front edge of the rib **70** projects slightly beyond the outer side of the handle **28B** and the rear edge thereof is fixedly connected to the extension **44B** and to the strut **60**.

The axially-extending rib **70** serves the same function afore-described in connection with the plate **52** and extension **44**, but in this instance, the rib **70** is of such length as to not only permit engagement of the golfer's thumb therewith, but also to permit the fingers of the golfer encircling the handle **28B** to make contact therewith. To attain full utilization of this invention it is only necessary to lightly depress the rib **70** so that the outer edge of the rib lies in or falls slightly behind the outer conic surface of the handle **28B** whereby impact vibrations are directly transmitted to the thumb and fingers from the rod **42B** and rib **70**.

It will be understood that the rods **42, 42A** and **42B** are formed of a flexible material whereby release of pressure on the terminal end of the extension **44**, the plate **52**, and the rib **70** will cause the rods to return to the inoperative positions of the same as is illustrated in the figures.

In the embodiments of this invention previously described, the handles **28, 28A** and **28B** have been considered as extensions of the shafts **26, 26A** and **26B** to which they are connected, respectively. In FIGURE 9 a fourth embodiment of this invention is illustrated in which is shown a modified handle and club shaft construction which may be used with any one of the shanks shown in FIGURES 3, 10 or 11.

In FIGURE 9, the upper end of the shaft **26C** is shown as extending for the full length of the club and terminates at its upper end in a cylindrical cap **80** having a centrally-located socket **82** formed therein that is closed by the end wall **84**. The handle portion of the shaft **26C** is wrapped with leather **86** or with some other suitable material which will offer the user a firm, non-slip type of grip. This is conventional construction and as is seen in FIGURE 9, the leather wrapping extends downwardly from immediately under the cap **80** to a ferrule **88** that may be sweated or otherwise secured on the shaft **26C**. The shaft **26C** is formed with a transversely-extending opening **40C** which is confronted by a similar opening **90** formed in the handle wrapping **86**.

The upper end of an elongated vibratory rod **42C** extends through the end wall **84** into the socket **82** and is threaded to receive a tightening nut **92**. The other end of the rod **42C** may be anchored in a shank **14** in the manner indicated in FIGURE 3, or may be, optionally, anchored as shown in FIGURE 10 or 11.

In FIGURE 10, the lower end of the vibratory rod **42C** is shown as terminating in a radial extension or hook **94** embedded in the upper end of the shank **14A** of a golf club. The lower end of the shaft **26C** is, of course, fixedly secured by conventional means within a socket **24A** formed in the shank **14A**.

With reference to FIGURE 11, the lower end of the shaft **26C** is fixedly secured within the socket **24B** at the

upper end of the shank **14B** in which is embedded the lower end of the vibratory rod **42C**. A pin **96** extends diametrically across the shank **14B** adjacent the upper end thereof and through the lower end of the rod **42C** to provide a secure anchor.

In using the devices illustrated in FIGURES 9 to 12, inclusive, it will be understood that by tightening the nut **92** tension on the rod **42C** will increase to increase the sensitivity of the rod **42C** to vibrations set up on impact of the golf club head upon impact with a ball.

The rod **42C** is provided with a radial projection or extension **44C** which extends through the openings **40C**, **90** for engagement by the user's thumb for the purposes above described.

Having described and illustrated in detail several embodiments of this invention, it will be understood that the same are offered merely by way of example, and that the instant invention is to be limited only by the scope of the appended claims.

What is claimed is:

1. A golf club including a golf club head having a normally upright shank projecting therefrom and an elongated substantially hollow tubular shaft having an end thereof fixedly secured to said shank, a substantially hollow tubular handle having an end thereof fixedly secured to the other end of said shaft, and an elongated rod having an end thereof fixedly secured to said shank and its opposed end extending through said handle in spaced relationship relative thereto, said rod having a lateral extension extending through a side of said handle for engagement by a finger of the golfer grasping said handle.

2. A golf club including a golf club head, a substantially hollow normally upright tubular shaft having a pair of opposed ends, said shaft having an end thereof fixedly secured to said head, an elongated substantially tubular handle having an end thereof connected to the other end of said shaft, said handle being coaxial with said shaft and having an axially-extending passage formed therein, an elongated flexible rod having an end thereof fixedly secured to said head, the other end of said rod extending through said shaft in spaced relation relative thereto and projecting beyond the other end thereof and into said passage formed in said handle, said handle having an aperture formed in a side thereof, and said rod having a lateral extension disposed and terminating in said aperture.

3. A golf club comprising a golf club head having a pair of opposed ends, a shank having a pair of opposed ends, said shank having one of its ends fixedly secured to said head adjacent one of its said ends, an elongated substantially hollow tubular shaft having a pair of opposed ends, said shaft having one of its said ends fixedly secured to the other end of said shank, an elongated substantially hollow cylindrical handle having an end thereof fixedly secured to the other end of said shaft, said handle having an aperture extending transversely through the sidewall thereof, an elongated rod having one of its ends fixedly secured in said shank, the other end of said rod extending through said shaft and said handle in spaced relation relative thereto, said rod at said other end thereof having a lateral extension disposed within said aperture, and said extension being disposed in spaced relation relative to said aperture.

4. A golf club comprising a golf club head having a pair of opposed ends, a shank having a pair of opposed ends, said shank having one of its ends fixedly secured to one of said ends of said head, an elongated substantially hollow tubular shaft having a pair of opposed ends, said shaft having one of its ends fixedly secured to the other end of said shank, an elongated substantially hollow cylindrical handle having an end thereof fixedly secured to the other end of said shaft, said handle having an aperture extending transversely through the sidewall thereof, an elongated rod having a pair of opposed ends, said rod having one of its ends fixedly secured to said shank with the other end thereof extending through said shaft and said handle in spaced relation relative thereto, and said other end of said rod terminating in a lateral extension disposed within said aperture in spaced relation relative thereto.

5. A golf club comprising a golf club head having a pair of opposed ends, a shank having a pair of opposed ends with one end of said shank being fixedly secured to said head, an elongated substantially hollow tubular shaft having a pair of opposed ends, said shaft having one of its ends fixedly secured to the other end of said shank, an elongated substantially hollow cylindrical handle having an axially-extending passageway formed therein and having an end thereof fixedly secured to the other end of said shank, said handle having an aperture extending transversely through the sidewall thereof, an elongated substantially rigid flexible rod having a pair of opposed ends, said rod having one of its said ends fixedly secured within said shank and the other end thereof projecting through said shaft in spaced relation relative thereto and projecting above the other end thereof into said handle in said passageway in spaced relation relative thereto, said rod at its said other end having a lateral projecting extending in and being contained in said aperture.

6. A golf club comprising a golf club head having a pair of opposed ends, a shank having a pair of opposed ends with one of said ends of said shank being fixedly secured to one of said ends of said head, said shank normally projecting upwardly from said head, an elongated substantially hollow tubular shaft having a pair of opposed ends, said shaft having one of its ends fixedly secured to the other end of said shank, an elongated substantially hollow cylindrical handle having an end thereof fixedly secured to the other end of said shaft, said handle having a passage extending axially therethrough coaxially-aligned with said shaft, said handle having an aperture extending transversely therethrough intermediate its said ends, an elongated rod having a pair of opposed ends, one of said ends of said rod being fixedly secured to said shank and the other end thereof extending through said shaft in spaced relationship relative thereto and extending into said passage, said rod having a radial extension at the other end thereof, and a plate fixedly secured to the outer end of said extension of said rod for sealing engagement against said handle in said passage.

7. A golf club comprising a golf club head having a pair of opposed ends, a shank having a pair of opposed ends with one of said ends fixedly secured to an end of said golf club head and normally projecting upwardly therefrom, a shaft having a pair of opposed ends with one of said ends thereof fixedly secured to the other end of said shank, said shaft being substantially hollow and tubular in construction, an elongated substantially hollow handle having a substantially cylindrical configuration with an axially-extending passage formed therein, said handle having one of its ends fixedly secured to the other end of said shaft, said handle having an axially-extending aperture formed therein, an elongated rod having an end thereof fixedly secured to said other end of said shank, the other end of said rod extending through said shaft and in spaced relation relative to said shaft and said passage, said rod having a lateral extension at the terminal end thereof, said extension being parallel to said aperture, a strut fixedly secured to said rod adjacent to but vertically spaced from said extension, and a rib fixedly secured to said extension and said strut, said rib extending through said aperture.

8. A golf club including a golf club head having a normally upright shank projecting therefrom and an elongated substantially hollow tubular shaft having an end thereof fixedly secured to said shank and terminating at its other end in a substantially hollow tubular handle portion, said handle portion having an opening extending transversely therethrough, a cap disposed on the outer end of said handle portion, an elongated rod disposed within and extending axially of said shaft in spaced re-

lation relative thereto, said rod having opposed ends connected with said cap and said shank, means connected with said rod to vary the tension thereon, and said rod having an extension thereof disposed intermediate its ends and extending through said opening to be sensed by the user's thumb.

9. A golf club including a golf club head having a normally upright shank projecting therefrom and an elongated substantially hollow tubular shaft having an end thereof fixedly secured to said shank and terminating at its other end in a substantially hollow tubular handle portion, said handle portion having an opening extending transversely therethrough, a cap disposed on the outer end of said handle portion, an elongated rod disposed within and extending axially of said shaft in spaced relation relative thereto, said rod having an extension at an end thereof projecting radially therefrom and embedded in said shank, the other end of said rod extending to and being connected with said cap, means connected with said rod to vary the tension thereon, and said rod having an extension thereon intermediate its ends extending through said opening to be sensed by the user's thumb.

10. A golf club including a golf club head having a normally upright shank projecting therefrom and an elongated substantially hollow tubular shaft having an end thereof fixedly secured to said shank and terminating at its other end in a substantially hollow tubular handle portion, said handle portion being provided with a transversely-extending opening, a cap disposed on the outer end of said handle portion, an elongated rod disposed within and extending axially of said shaft in spaced relation relative thereto, said rod having opposed ends with one of said ends being embedded within said shank, a pin extending diametrically across said shank and through said embedded end of said rod, the other end of said rod being connected with said cap, means connected with said rod to vary the tension thereon, and said rod having a radial extension thereon intermediate its ends projecting through said opening to be sensed by the user's finger.

11. A golf club including a golf club head having a normally upright shank projecting therefrom and an elongated substantially hollow tubular shaft having an end thereof fixedly secured to said shank and terminating at its other end in a substantially hollow tubular handle portion, said handle portion having an opening extending transversely therethrough, a cap disposed on the outer end of said handle portion, said cap having a centrally-located socket formed therein with a closure wall extending transversely across the inner end thereof, an elongated rod disposed within and extending axially of said shaft in spaced relation relative thereto, said rod having a radial extension at one end thereof embedded within said shank, the other end of said rod extending through said closure wall and into said socket, means on said other end of said rod cooperating with said closure wall to tension said rod, and said rod having a radial extension projecting therefrom through said opening to be sensed by the user's thumb.

12. A golf club including a golf club head having a normally upright shank projecting therefrom and an elongated substantially hollow tubular shaft having an end thereof fixedly secured to said shank and terminating at its other end in a substantially hollow tubular handle portion, said handle portion having a wrapping surrounding the same and said handle portion and said wrapping being provided with juxtaposed, confronting and aligned openings extending transversely therethrough, a cap disposed on the outer end of said handle portion, an elongated rod disposed within and extending axially of said shaft in spaced relation relative thereto, said rod having opposed ends connected with said cap and said shank, respectively, means connected with said rod to vary the tension thereon, and said rod having an extension projecting radially therefrom intermediate its ends and extending through said openings to be sensed by the user's thumb.

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RICHARD C. PINKHAM, *Primary Examiner.*

R. J. APLEY, *Examiner.*