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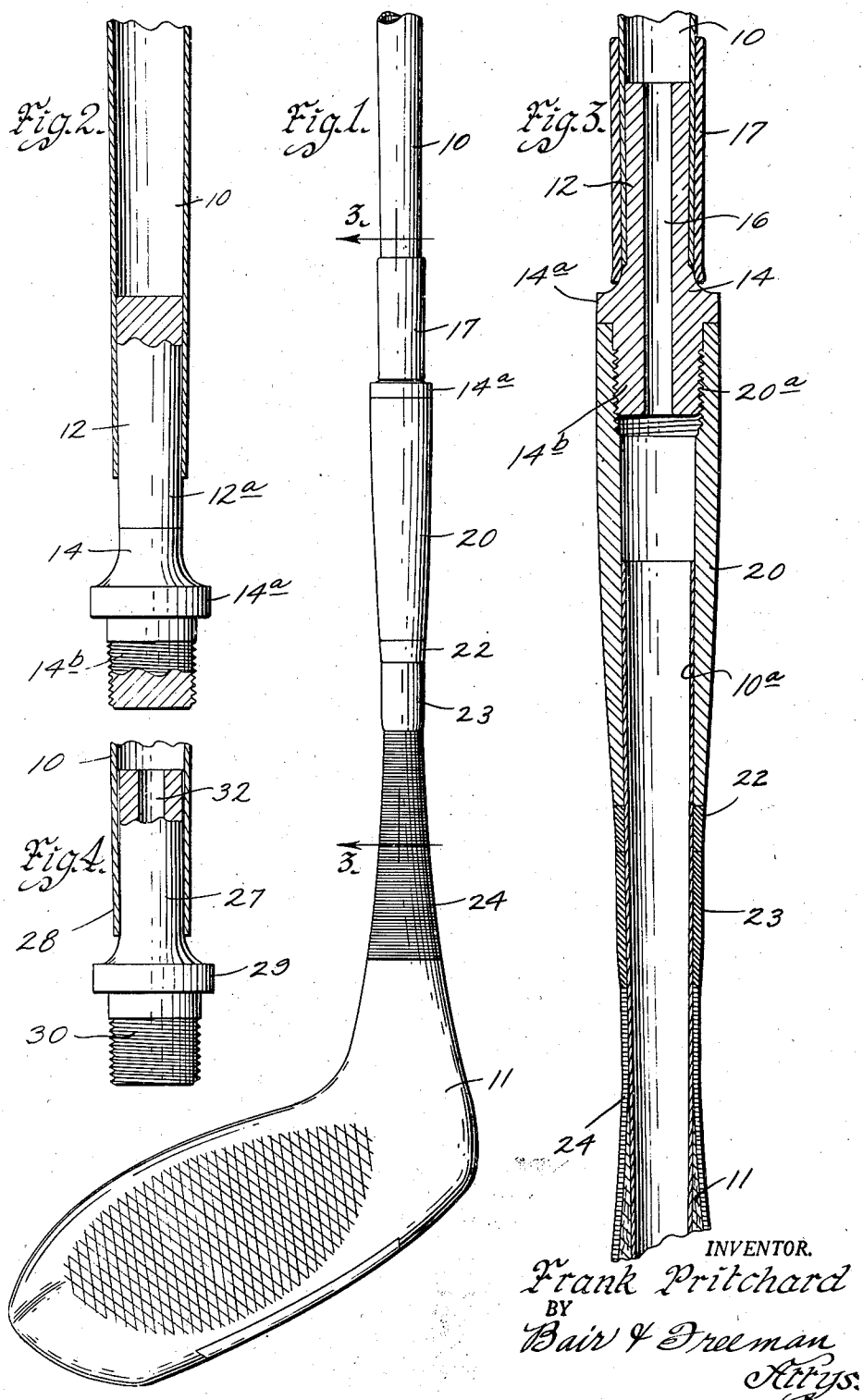
F. PRITCHARD

**2,463,053**

## GOLF CLUB CONSTRUCTION

Filed Aug. 19, 1943

2 Sheets-Sheet 1



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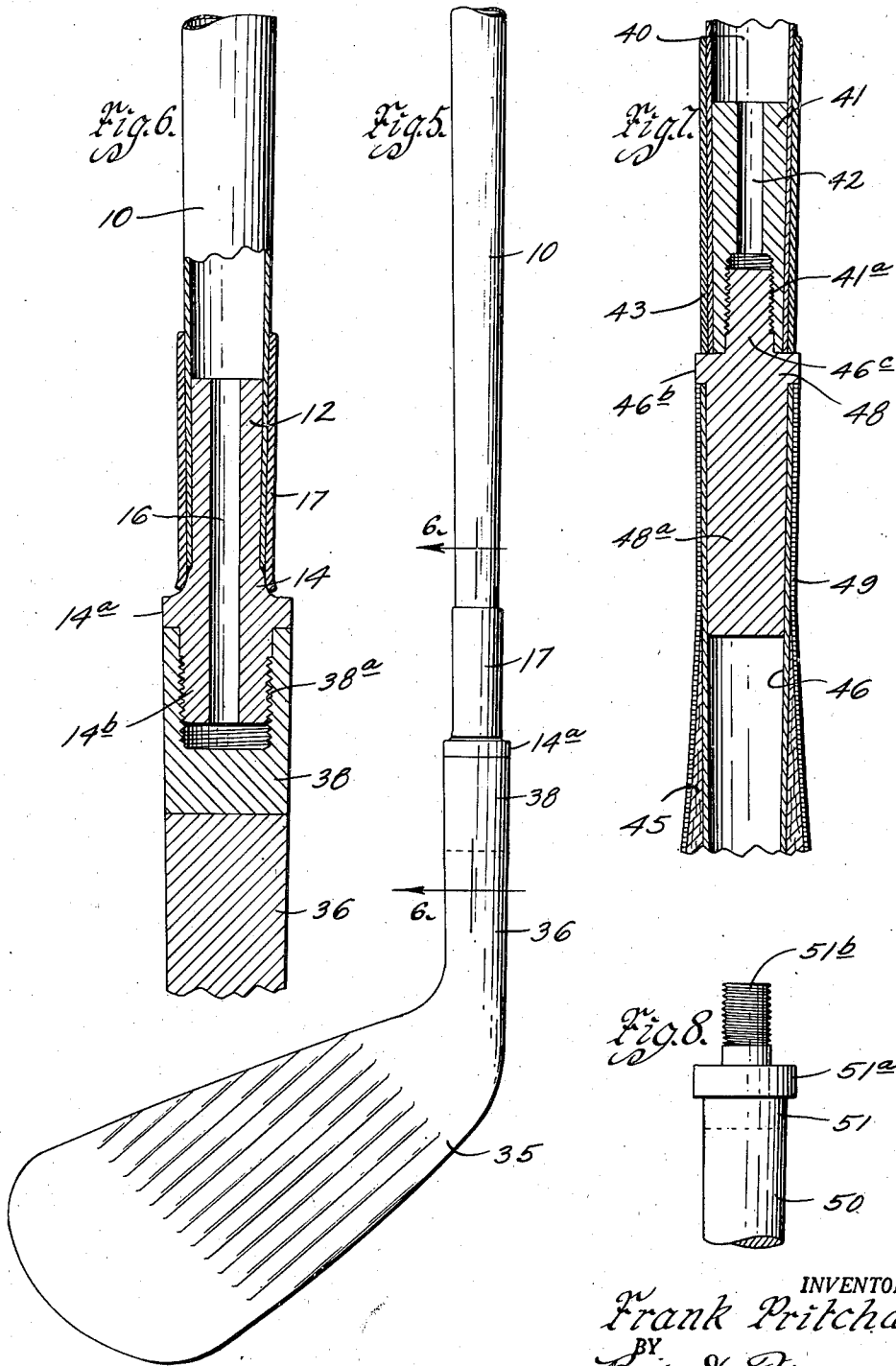
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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

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## GOLF CLUB CONSTRUCTION

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This invention relates to golf club constructions, and more particularly to golf club constructions of the type wherein a single tubular metallic shaft is adapted to be selectively and detachably connected to any one of a series of different club heads.

There have been numerous club constructions heretofore proposed (such as for example as shown in the Mears Patent No. 2,051,961, issued August 25, 1936) wherein a shaft may be detachably connected to a golf club head. Such prior constructions have not been found satisfactory due to the nature of the means constituting the detachable connection. Moreover, in constructions wherein a single shaft is adapted to be detachably connected to any one of a series of heads, as disclosed in the Mears patent, some provision must desirably be made for obtaining a shaft of a proper length for use in conjunction with the particular club head selected. In the Mears patent an adjustable handle is employed wherein the handle is adapted to be telescoped on the shaft proper and releasably secured in position. Such a handle construction, it is believed, would not be found satisfactory for two main reasons. First, the means for securing the handle at an adjusted position on the shaft will not remain sufficiently stable to preclude turning thereof, relatively to the shaft proper, during the process of driving a ball, and there will be a tendency of the handle to either telescope inwardly or outwardly with respect to the shaft, due to the forces set up in the club proper during the swinging stroke. Secondly, the handle as proposed in the Mears patent must be adjusted in an empirical manner each time that the shaft is connected to a different club head. This adjustment of the handle in addition to the consuming of time will frequently result in obtaining a shaft of only approximate length—at times it may be adjusted too long and at other times it may be adjusted too short. It is well known that the differences in length of shafts for the various clubs when manufactured as unitary club structures varies quite substantially. As, for example, there is a difference of several inches in length of the shafts of a driver and a niblick. Such differences in lengths of the shafts has long been considered important to the proper and efficient use of the clubs.

One of the objects of this invention is to provide novel and improved means for quickly and easily detachably connecting a tubular metallic shaft to any one of a series of different club heads, and wherein the assembled club will be

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properly balanced, and the connection between the shaft and the head substantial and durable, so as to render the club capable of proper and efficient use in the same manner as a permanent unitary club structure.

Another object is to provide a novel and improved means for detachably connecting a tubular metallic shaft to any one of a series of different club heads, and wherein the connection serves to reinforce the tubular shaft and the neck or hosel of the head.

A further object is to provide an improved golf club set composed of a series of different club heads having necks or hosels of progressively reduced lengths, adapted to be selectively and detachably connected to a single shaft to provide a club having a desired head and a shaft of a proper proportionate length.

Still another object is to provide an improved tubular metallic shaft having a suitable fitting integrally united to the lower end thereof, adapted to selectively and detachably engage with a co-operatively formed fitting on the upper end of the neck or hosel of each of a series of different club heads, and wherein the shaft may be fully and properly tempered after attachment of the fitting thereto.

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

Figure 1 is a side elevational view of the lower portion of a wood head golf club embodying the present invention.

Figure 2 is an axial sectional view through the lower end of the shaft of the golf club showing the position of parts constituting a threaded fitting, prior to final securement to the club.

Figure 3 is an enlarged vertical, axial section of my novel connecting means between the club head and lower end of the shaft, taken substantially as indicated at line 3—3 on Figure 1.

Figure 4 is a fragmentary sectional view of the lower end of the shaft attached to a modified form of threaded fitting.

Figure 5 is a side elevational view of a lower portion of an iron head club provided with connections embodying the present invention.

Figure 6 is an enlarged vertical, axial sectional view through the connection of the shaft and head, taken as indicated at line 6—6 on Figure 5, showing the relation of the fitting to the hosel of the iron head before permanent attachment thereto.

Figure 7 is an axial sectional view, similar to

Figure 6, showing a modified form of connection between the shaft and a wood club head, and

Figure 8 is a fragmentary side elevational view of the upper end of the hosel of an iron club head, embodying a modified form of connection.

The present invention contemplates a golf club set comprising a single tubular metallic shaft and a series of different club heads adapted to be selectively and detachably connected to the shaft. The set of heads may be composed of one or more wood heads and any desired number of iron heads. The hosels or necks of the iron heads are progressively reduced in length; for example, the length of the hosel of the midiron head is considerably less than the wood heads and the length of the hosel of the head of the mashie is less than the length of the hosel of the midiron, and the length of the hosel of the niblick may be practically zero. Thus, by varying the length of the hosels of the respective iron club heads, it will be possible at all times to obtain a proper proportionate shaft length for the particular iron club head to which the shaft may be connected. Thus the proper length shaft is obtained without any thought whatsoever on the part of the player and the player in effect obtains the equivalent of a multiplicity of different clubs having shafts of proper proportionate lengths. The varying lengths of shafts for the different clubs has long been considered of substantial importance for the benefit of the majority of players in order to permit proper and efficient execution of a particular golf stroke.

A complete set of heads may be conveniently stored in a suitable kit, which may be provided with a strap to be thrown over the shoulder of a player, or may be formed as a panel attached to a belt adapted to be secured around the waist of the player. Thus by such a club set construction the weight and bulk of the shafts of numerous clubs are entirely eliminated, as well as the major portion of weight which would normally be inherent in any suitable golf bag for carrying the clubs. When the club heads are carried in a suitable kit belted to the player, there is no interference whatsoever with the use of an assembled club in driving or pitching the ball.

Another advantage of such a construction is that it completely eliminates the necessity of a caddie, and the player may quickly and easily change club heads on the shaft in a few seconds of time while approaching the ball for the next shot or while judging distances. The use of such club sets will also increase the speed of play in that it will not be necessary to stoop or look for a golf bag, or to wait on a caddie in supplying the proper club.

In Figures 1 to 3 of the drawing, my novel connection is illustrated in conjunction with a shaft 10 and a wood club head indicated at 11. The shaft 10 is of conventional metallic, tubular stock, tapered downwardly from the upper end to the lower end. The lower end of the shaft and the upper end of the hosel or neck of the club head are formed with cooperating detachably connectible fittings. The fitting for the shaft includes a cooperatively tapered plug 12, wedged in the lower end of the tubular shaft, and rigidly secured in position therein by spot-welding, not shown. The plug has a terminal portion indicated at 12a, projecting a short distance below the lower end of the shaft. Butt welded to the lower end of the terminal portion

12a of the plug is a member 14, including an enlarged flange portion 14a, joined to a threaded stud 14b. The plug 12 and member 14 before connection together, are disposed in a relationship as seen in Figure 2 of the drawings. Due, however, to the butt welding operation, some of the metal at the juncture of the parts being welded, becomes burned away and the parts 12 and 14 finally assume a dimensional relationship, such as seen in Figure 3 of the drawings.

After the fitting is welded together and made a permanent part of the lower end of the shaft 10, a longitudinal duct 16 is drilled through the member 14 and plug 12, as clearly seen in Figure 3 of the drawing. The purpose of the duct 16 is to insure proper and uniform tempering of the shaft 10 after the cooperating fitting has been permanently assembled to the lower end thereof. The provision of the duct 16 permits the quenching oil in the heat-treating operation to flow entirely through the shaft and thereby obtain proper tempering thereof. The heat-treating operation simultaneously results in hardening of the threaded stud 14b, the purpose of which will be hereinafter described. After the fitting is thus assembled to the shaft, the external surfaces thereof may be finished in any well-known manner and a suitable hand grip may be provided on the upper end of the shaft, and a section of plastic tape, as indicated at 17, is wound around the lower end of the shaft, and projecting beyond said lower end so as to lap the butt-welded joint of the plug 12 and member 14.

In a standard wood club head construction, the tubular shaft is usually made of sufficient length so that its lower end portion is firmly anchored in place in the head proper. In my construction I utilize a standard length tapered, tubular metallic shaft, and sever the lower portion therefrom, as indicated at 10a, and anchor the same in a conventional manner in the wood portion of the club head. As may be clearly seen in Figure 3 of the drawing, the tubular portion 10a, which now becomes a part of the club head, is likewise tapered.

A cooperating fitting 20 of tubular form is tapered internally in correspondence to the shaft, for a snug wedge fit upon the upper end of the tubular member 10a, as seen in Figure 3 of the drawing, and is spot-welded in position thereon. The upper end of the fitting 20 is formed with a threaded socket 20a, for cooperative threaded engagement with the stud 14b of the fitting carried on the lower end of the shaft 10. The fitting 20, and particularly the threaded socket portion 20a, is preferably heat-treated so that the connection between the shaft and club head is increased in strength and capable of withstanding the stresses and strains set up therein, incident to the club impacting the ball. The hardened threads of the two cooperating fitting members also insures longer life and reduced wear incident to numerous operations of connecting and disconnecting of the shaft to the club heads.

Mounted on the tubular member 10a of the head, in abutting engagement with the lower end of the sleeve fitting 20, are two ferrules 22 and 23, which may be formed of any suitable material, such as plastic, and which serve to give the club head a neat and attractive finished appearance. The hosel of the wood head and the portion of the tube 10a below the ferrule 23, are provided with a conventional winding of thread, as indicated at 24.

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By virtue of the detachably connectible fittings, the shaft may be quickly and easily connected to and disengaged from the hosel of the wood head, and it may be understood that the threads of the respective stud 14b and socket portion 20a of the fittings are formed left hand for right hand clubs, and right hand for left hand clubs, so that when the ball is impacted by a club, the club head will normally tend to tighten with respect to the shaft.

In Figure 4 of the drawing I have shown a modified form of integral fitting for the lower end of the shaft. In this construction the fitting includes a cylindrical shank portion 27 telescoped into the lower end of the tapered tubular shaft indicated at 28, and spot-welded thereto. The fitting also includes an integral circular flange 29, the lower face of which is connected to a depending threaded stud 30, of the same dimensions and form as the fitting seen in Figure 2 of the drawing. The fitting is provided with a longitudinal duct, open at both ends, as indicated at 32, which is preferably formed therein after the fitting is spot-welded to the shaft. The purpose of the duct is the same as above described in connection with the construction illustrated in Figure 3 of the drawing.

In Figures 5 and 6 of the drawings, the shaft 10 is provided with a fitting of the type illustrated in Figure 3 and is shown in connection with an iron club head indicated at 35, which is provided with an upstanding neck or hosel 36, the upper end of which terminates in a flat end, as clearly seen in Figure 6 of the drawing, to which is butt-welded a socket fitting 38 having an internal threaded socket 38a for cooperative engagement with the threaded stud 14b of the lower end of the fitting carried by the shaft 10. When the socket fitting 38 is butt-welded to the hosel 36, there is a slight amount of burning away of the metal at the plane of juncture of the two parts, so that when the socket is finally secured in welded relation to the hosel, it is slightly shortened, as seen in Figure 5 of the drawings.

As above stated, the various iron heads of the entire series have hosel lengths gradually reducing in length as the number of the club increases, or to state it differently, as the face of the club is increased in inclination to a vertical plane. In the use of my novel fitting it has been found that in connection with clubs having greatly inclined faces, such as the niblick, I form the niblick head without a hosel and the socket fitting 38 is welded in proper relation directly to the head proper. By such variation in the length of the hosels of the iron club heads it is possible that the length of the shaft when used with any of the heads of the entire series, will always be of a proper proportionate length for the particular club head to which it is connected.

The fittings on the lower end of the shaft and on the upper end of the hosels of the respective club heads are preferably formed of high carbon steel so that when subjected to a heat-treating operation, the fittings are hardened and strengthened. This is particularly important in connection with the threaded stud 14b of the fitting on the shaft and the threaded sockets such as indicated at 20a of the fittings 20 for the wood club heads, and the sockets 38a of the fittings 38 secured to the upper end of the hosel of the iron heads, so as to provide a threaded connection wherein the threads will not be easily deformed or injured and which will not be subjected to appreciable wear incident to numerous connections

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and disconnections of the cooperating fitting members. The iron club heads usually are formed of a mild steel, of low carbon content, and hence to form the upper end of the hosel thereof with a threaded socket, similar to that embodied in the fitting as shown in Figure 6 of the drawing, would not permit obtaining a durable, hardened, threaded connection capable of fully and properly withstanding the stresses and strains set up in the club in normal usage. To form the entire iron club head of high carbon steel would greatly increase the cost of manufacture. Hence, by forming the socket fitting for the iron club heads as a separate element of high carbon steel and butt welding it to the end of the hosel of the head, results in a substantial reduction in cost of manufacture of a durable and strong head and connection to the shaft.

In Figure 7 of the drawings I have shown a modified connection between the shaft and a wood club head. In this construction, the tubular tapered metallic shaft indicated at 40, has wedged in the lower end thereof a cooperatively tapered metallic fitting 41, spot-welded therein, with the lower end terminating substantially flush with the lower end of the shaft. The lower end of the fitting 41 is formed with a threaded socket 41a. A longitudinal duct 42 is formed in the fitting, extending from the upper end and opening into the cavity of the threaded socket for the purpose of permitting proper and efficient tempering of the shaft after the fitting 41 is spot-welded in place. The external lower end portion of the shaft is surrounded by a band 43 of plastic tape, as indicated at 43, for enhancing the appearance of the club.

The wood club head, indicated at 45, is provided with a tubular portion 46, which may be a severed portion of a normal length of the club shaft as above described in connection with the construction shown in Figures 1 to 3. Mounted in the upper end of the tubular portion 46 is a fitting 48 having a cooperatively tapered shank portion 48a, spot-welded in the upper end of said tubular portion 46, and formed integrally with the shank is an enlarged flange 46b adapted to be seated upon the upper end of the tubular portion 46. Formed integrally with and projecting upwardly from the upper face of the flange is a threaded stud 46c, adapted to be connected to and disconnected from the threaded socket 41a of the fitting 41, in the lower end of the shaft 40. The outer surface of the upper end of the hosel of the head and the exposed portion of the tubular member 46 is wrapped with thread as indicated at 49, in a conventional manner.

As above mentioned the threaded portions of the respective fittings are preferably hardened by heat treating and the threaded portion of the fitting 41 may be hardened simultaneously with the tempering operation performed on the shaft 40.

When the shaft is formed with a fitting as seen in Figure 7 of the drawing, the iron club heads are provided with fittings as disclosed in Figure 8 of the drawings, wherein the hosel 50 of an iron club head has butt welded to the upper end thereof a fitting 51 having an enlarged flange 51a, the upper face of which terminates in an integral, upstanding threaded stud 51b. The fitting on the iron head, in all respects, except for its connection to the hosel of the head, is identical with the upper portion of the fitting of the wood club head shown in Figure 7, and the fit-

ting on the iron head is preferably hardened for the purposes above stated.

Although I have herein shown and described certain preferred embodiments of my invention, manifestly it is capable of modification and rearrangement of parts without departing from the spirit and scope thereof. I do not, therefore, wish to be understood as limiting this invention to the precise embodiments herein disclosed, except as I may be so limited by the appended claims.

I claim:

1. A golf club comprising a wood head having an upstanding hosel including a downwardly tapered tubular metallic member, a downwardly tapered, tubular metallic shaft, and means for detachably connecting said head and shaft, said means comprising a metallic fitting formed as a sleeve telescoped over and rigidly secured on the upper end of said member of the hosel, the upper end of said sleeve projecting above said member and being internally threaded, and a cooperating metallic fitting having a shank portion telescoped and fixedly secured in the lower end of said shaft, the lower end of said fitting projecting below the end of the shaft and terminating in a threaded stud.

2. A golf club comprising a wood head having an upstanding hosel including a downwardly tapered tubular metallic member, a downwardly tapered, tubular metallic shaft, and means for detachably connecting said head and shaft, said means comprising a metallic fitting formed as a sleeve telescoped over and rigidly secured on the upper end of said member of the hosel, the bore of the sleeve being tapered correspondingly to said member to insure a snug and firm connection thereto, the upper end of said sleeve projecting above said member and being internally threaded, and a cooperating metallic fitting having a shank portion telescoped and fixedly secured in the lower end of said shaft, the lower end of said fitting projecting below the end of the shaft and terminating in a threaded stud.

3. A golf club comprising a wood head having an upstanding hosel including a downwardly tapered tubular metallic member, a downwardly tapered, tubular metallic shaft, and means for detachably connecting said head and shaft, said

means comprising a metallic fitting formed as a sleeve telescoped over and rigidly secured on the upper end of said member of the hosel, the upper end of said sleeve projecting above said member and being internally threaded, and a cooperating metallic fitting having a shank portion tapered correspondingly to and telescoped and fixedly secured in the lower end of said shaft, the lower end of said fitting projecting below the end of the shaft and terminating in a threaded stud.

4. A golf club comprising a wood head having an upstanding hosel including a downwardly tapered tubular metallic member, a downwardly tapered, tubular metallic shaft, and means for detachably connecting said head and shaft, said means comprising a metallic fitting formed as a sleeve telescoped over and rigidly secured on the upper end of said member of the hosel, the upper end of said sleeve projecting above said member and being internally threaded, and a cooperating metallic fitting having a shank portion telescoped and fixedly secured in the lower end of said shaft, the lower end of said fitting projecting below the end of the shaft and terminating in a threaded stud, and a flange above the stud adapted to seat against the upper end of the sleeve when the head and shaft are connected together.

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