July 4, 1933. A. E. BUHRKE ET AL 1,916,963

GOLF CLUB

Filed Sept. 26, 1930

Fig. 1.

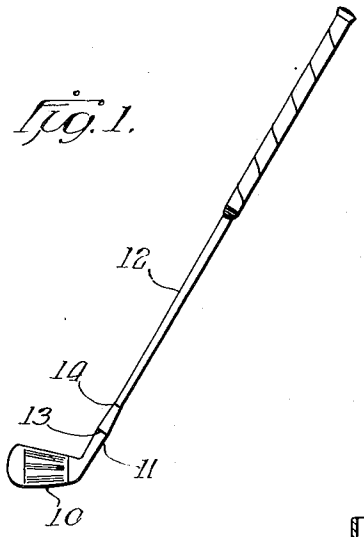


Fig. 2.

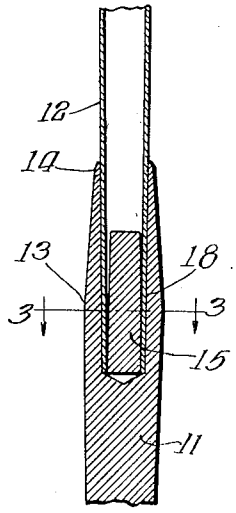


Fig. 3.

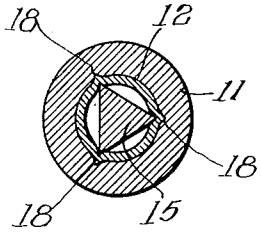


Fig. 4.

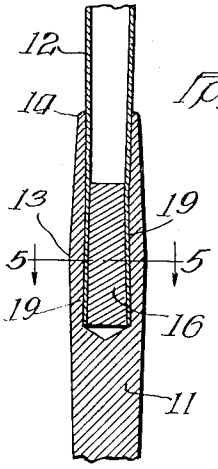


Fig. 5.

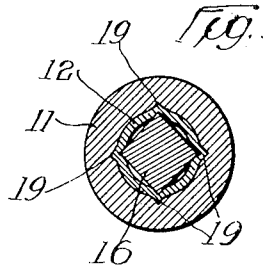


Fig. 6.

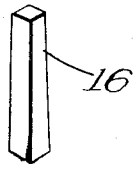
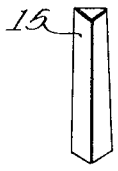


Fig. 7.



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Patented July 4, 1933 1,916,963

UNITED STATES PATENT OFFICE

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GOLF CLUB

Application filed September 26, 1930. Serial No. 484,534.

The invention relates to the novel and improved construction of golf clubs and has for its primary object to provide novel and improved means for securing hollow, tubular, metallic shafts in the hosel openings in the shanks of iron type golf clubs that shall be simple, economical and effective.

In the manufacture of the iron headed type of golf club, the head or tool of the club is ordinarily provided with an integral shank or neck portion bored to have a longitudinal hosel opening for the reception of the shaft carrying a handle portion at its outer extremity.

Our invention is directed to new and improved means for effectively and permanently locking tubular, metallic shafts in the hosel openings of iron headed clubs but dispensing with the use of transverse pins or rivets as heretofore used which, besides being unsatisfactory in appearance and making it difficult to give the shank of the club a uniform, finished appearance, are the cause of frequent breakages due to crystallization developed in the shaft of the club on account of weakness developed at the point where the shaft is bored.

Other objects of the invention will appear from the following description directed to the preferred embodiments thereof as shown in the drawing which forms a part of the specification, the novel features being set forth in the appended claims.

In the said drawing:

Fig. 1 is an elevation view of an ordinary iron headed type of golf club provided with a tubular steel shaft with a handle at the outer end thereof and illustrates the appearance of the completed club embodying our invention.

Fig. 2 is a broken, longitudinal, sectional view illustrating details of construction at the union of the head and shaft of the club where the invention is employed.

Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 2 looking in the direction indicated by the arrows. This view discloses in greater detail the shape of the locking wedge, triangular in cross section, as employed in the form of the invention shown in Figs. 2, 3 and 7.

Fig. 4 is a view similar to Fig. 2 showing the use of a locking device of the modified form of Fig. 6 in which the locking device is substantially square or rectangular in cross section as shown more clearly in the sectional view Fig. 5, which is taken on the line 5—5 of Fig. 4, looking in the direction indicated by the arrows.

The reference character 10 designates the metallic head of an ordinary iron headed golf club and 11 is the shank or neck portion thereof provided with a central longitudinal hosel opening adapted to take the lower end of the handle shaft 12 which is formed of tubular steel and is preferably slightly tapered or reduced in its diameter in a uniform manner from its outer end to its lower end where it is secured in the head or tool portion of the club.

The neck or shank 11, which is integral with the club head, will ordinarily be formed of metal such as a drop forging or die casting and for proper balancing purposes, the neck or shank portion 11 is usually tapered so that it gradually enlarges outwardly from the club head and we prefer to extend the shank beyond the larger portion, designated at 13, and make it conical in shape, reducing it in a manner to make it at the extreme outer end as indicated at 14, Figs. 1 and 2, only a little larger than the diameter of the tubular steel shaft 12 at that point.

The neck or shank 11 at the head will be provided with the usual bore or hosel to receive the lower end of the tapering tubular steel shaft 12 and when the parts are thus prepared and ready for assembly, the tubular shaft 12 will have preferably a firm drive fit in the hosel opening and if the shaft is in the position of the parts as illustrated in Figs. 2 and 4, one of the forms of locking devices as shown in Figs. 6 and 7 will be introduced in the larger and outer end of the tubular shaft and will be passed downwardly to the lower end of the shaft.

The invention requires that the locking devices, either triangular in cross section as shown in Fig. 7 or square or rectangular as

shown in Fig. 6 and designated by the reference characters 15 and 16 respectively, shall be constructed so that they shall properly co-operate with the lower end of the tubular steel shaft after it is driven into the hosel in a manner to force the material of the shaft outwardly and preferably cause some penetration of the material of the shaft into the surrounding hosel wall as more clearly illustrated in Fig. 3 where the triangular locking device 15 is shown crowding the material in the wall of a tubular steel shaft at 18 into the material of the neck or shank 11 on the inside of the hosel opening. The same result is accomplished with the use of the locking device 16, rectangular in cross section, as illustrated in Fig. 5 where the material of the tubular shaft 12 is shown as driven outwardly and penetrating the inner hosel wall 11 as indicated by the reference character 19.

We find the best results are obtained in the use of drawn steel tubular shafts 12 where the metal in the shanks 11 is somewhat softer than the steel of the shaft so that considerable penetration of the outwardly forced portions 18 and 19 of the shaft 12 will take place.

The clearance diameters of the locking devices 15 and 16 must be carefully gauged so that they will pass freely down the interior of the tubular shaft 12 to a point well within the hosel opening before any substantial forcing or driving is required as it is desired that the tubular shaft shall not be deformed above the point of its union with the shank of the head.

We find that the best results may be secured by the utilization of metal that may be hardened after being formed into the shape of the locking devices 15 and 16 as shown in Figs. 7 and 6 respectively and they must, in fact, be made of material harder than the steel of the shaft in order to assure the desired deformation and subsequent penetration of the walls of the steel shaft when the shank of the club head is of the requisite material to permit the desired penetration and locking effect.

Another important feature of our invention, although not a necessary requisite in the construction of the locking devices 15 and 16, resides in our discovery that the best results in producing the desired penetration of the outwardly forced walls of the shaft into the material of the hosel walls is attained by making the locking devices 15 and 16 of a slightly tapered form, or in the form of a frustum of a pyramid, and then inserting the larger ends of these locking devices first into the open ends of the shafts so that the enlarged ends thereof will finally rest at the bottom of the hosel opening adjacent the lower end of the tubular shaft resulting in a greater undercut or locking effect in the joint secured as herein described.

We find that our improved club construction results in a union between the tubular steel shaft and the club head which will not separate under the most severe usage without a failure in the material of the steel shaft and the construction of the locking joint is such that the shank of the club head may be finished by polishing or plating in a uniform manner without exposing the use of any transverse pins or rivets that are liable to be displaced or result in a weakness in the shaft at the point of its securement in the shank of the club head.

In order that the invention might be understood we have described in detail the preferred embodiments thereof but it is not desired to be limited to the precise details except as set forth in the appended claims.

We claim:

1. In a golf club, the combination with a metallic head portion provided with an integrally formed hosel and having a hosel socket therein, a tubular metallic shaft adapted to co-operate with said hosel opening, and a locking device angular in cross section on the interior of said shaft within the hosel opening and being adapted when driven thereinto to force the material in the walls of the tubular shaft outwardly to tend to conform to the cross sectional angular shape of the locking device and to cause the material of the tubular shaft thus distorted to penetrate the walls of the hosel.

2. In a golf club, the combination with a metallic head portion provided with an integrally formed hosel and having a tapered hosel socket therein being largest at its entrance opening, a tubular metallic shaft provided with a handle and being tapered at the end thereof opposite said handle to co-operate with said tapered hosel socket in the said head portion, and a locking device, angular in cross section, to provide a plurality of relatively sharp edges, adapted, when forced into the tapered extremity of said shaft within the said hosel socket of the head portion, by a wedging action, to expand the material in the walls of the said tubular shaft outwardly to conform to the relatively sharp edges of the locking device and cause the same to penetrate the walls on the interior of the hosel socket.

3. The herein described method of securing one end of a tapered tubular metallic shaft in the usual hosel opening in the shank of a metallic golf club head, which consists in forcibly expanding the walls of the tubular shaft within the hosel opening by inserting a hardened metallic member with relatively sharp radial edges on the inside of the tubular shaft and driving the same down into that portion of the shaft within the hosel opening to cause portions of the walls of the

tubular shaft to penetrate the metallic walls of the hosel into permanent locking engagement therewith.

4. The herein described method of securing a tapered tubular shaft, formed of relatively hard and firm metal, in the hosel opening of a metallic golf club head, formed of a softer metal than the metal of the said shaft, which consists in expanding the walls of the said shaft at a plurality of locations on the interior of the hosel opening by a hardened metallic plug angular in cross section inserted on the interior of the shaft, and to cause the said expanded portions of the shaft walls to penetrate the interior co-operating wall of the hosel of the club head and to be permanently held in said angularly expanded and penetrating relation for interlocking with the wall of the hosel.

5. In a golf club the combination with a metallic head portion provided with an integrally formed hosel and having a hosel socket therein which is of largest diameter at its entrance opening with a gradually decreasing taper toward the striking blade of the head portion to receive one end of a tubular metallic shaft provided with a handle and being tapered at the end thereof opposite said handle to co-operate with said tapered socket in the hosel of the head portion, the material of the said metallic shaft being relatively harder than the material of the metallic head portion of the club, and a metallic locking device formed of tempered steel harder than the material of the tubular metallic shaft and being angular in cross section to provide a plurality of relatively sharp radial edges adapted when forced into the tapered extremity of said shaft within the said hosel socket of the head portion through the handle end of the shaft by a wedging action to expand the material in the walls of the said tubular shaft to conform substantially to the relatively sharp edges of the said metallic locking device and cause the same to penetrate the walls on the interior of the hosel socket.

In testimony whereof, we have hereunto subscribed our names September, A. D. 1930.

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ALLEN F. HEETER.