Feb. 13, 1923.

H. C. LAGERBLADE.

GOLF CLUB.

FILED JUNE 29, 1921.

1,444,842.

Fig. 3.

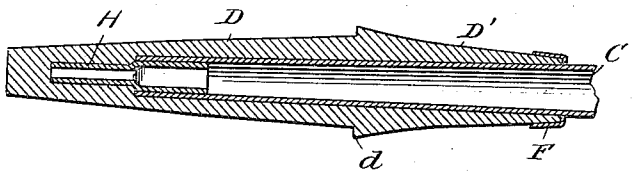
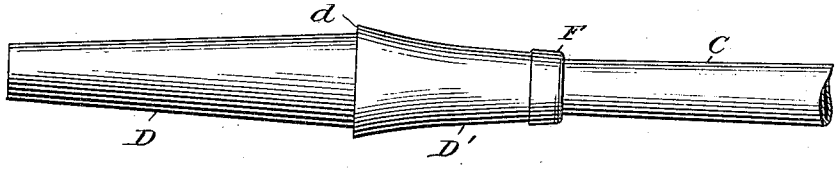


Fig. 1.

Fig. 2.



Witness

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UNITED STATES PATENT OFFICE.

HERBERT C. LAGERBLADE, OF BRISTOL, CONNECTICUT, ASSIGNOR TO THE HORTON MANUFACTURING COMPANY, OF BRISTOL, CONNECTICUT, A CORPORATION OF CONNECTICUT.

GOLF CLUB.

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To all whom it may concern:

Be it known that I, HERBERT C. LAGERBLADE, a citizen of the United States, residing at Bristol, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Golf Clubs; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

It is well recognized by those skilled in the art that a golf club must have certain characteristics of resiliency and balance to permit of the maximum effect on and control of the struck ball, and at the same time the vibration due to the impact must not be transmitted to the hands of the user. To attain the desired characteristics the distribution of the flexing strains set up in the shaft between the heavy head and the grip is an important factor heretofore secured only with the use of the highest grade of wood shafts properly shaped and tapered.

One of the objects of the present invention is to secure the said desirable characteristics with the use of a tubular metallic shaft which may, if desired, have a uniform taper from the grip to the end to which the head is secured. Another object of the invention is to provide a means whereby such tubular metallic shafts may be substituted for wooden shafts or employed in connection with heads of standard form designed originally for use with wooden shafts, while preserving the original characteristics of the club so that a user's "game" will not be affected by the change.

To the above ends the invention consists in the employment of an adapter inserted between the club head and the hollow metallic shaft, which adapter is of such form and material as to distribute the flexing strains through a considerable length of the shaft above the head. As a further development of the adapter the invention consists in forming the same of a cushioning non-resonant material which aids in the distribution of the flexing strains and also checks, absorbs, or deadens the vibrations due to impact of the tread against the object struck.

The invention further consists in certain novel details of construction to be hereinafter described, and pointed out particularly, in the claims.

In the accompanying drawings,—

Figure 1 is an elevation, partly in section, of a conventional golf club head with the lower end of a tubular metallic shaft and cushioning adapter;

Fig. 2 is an elevation of the adapter and lower end of the shaft;

Fig. 3 is a longitudinal section of a preferred form of adapter.

The golf club head A illustrated is conventionally shown as an iron which may be of any well known type or kind, but having a shaft socket A′ such as is adapted for the reception of the end of a wooden shaft. Usually these sockets taper or are of gradually decreasing internal diameter as shown in Figure 1.

C is a hollow or tubular metallic shaft which preferably tapers gradually from the grip (not shown) to the lower end which is located concentrically within the socket. The tubular shaft is of much less diameter than the socket and the adapter of the present invention is interposed to secure the parts firmly together and to cushion vibration and distribute the strains as before indicated. This adapter is conveniently formed of wood or fibre, the lower end D being tapered to accurately fit the socket B and the upper end D′ being tapered or of gradually reducing diameter and wall thickness from the end of the socket upwardly. As a matter of finish and appearance it is formed with a shoulder or housing *d* at the intermediate point of greatest diameter to fit over or upon the upper edge of the socket and present an unbroken surface in the finished club. The adapter is formed with an axial bore for the lower end of the shaft and within the socket fills the entire space between the shaft and socket wall.

In the preferred construction the lower end of the adapter is solid either by reason of an inserted plug as *e* in Figure 1 or by reason of the bore being stopped short of the lower end as in Figure 3. To prevent splitting or injury to the thin upper end of the adapter it may be protected by an end ferrule F and to prevent any possibility of the shaft separating from the head a transverse through pin G may be located in the socket as shown.

In some instances, where the adapter has to be filed or dressed away to fit the socket

of a metal head, for example, it is advantageous to form a reduced extension on the metal shaft which extends into the smaller end of the adapter. This construction will be understood by reference to Figure 3 where the shaft is provided with an extension H of reduced diameter and preferably cylindrical or of uniform diameter. As shown, this extension is in the form of a two diameter sleeve, the larger diameter fitting and secured firmly in the end of the shaft body and the smaller diameter extending beyond and fitting tightly within a corresponding bore in the adapter.

It will be noted that the adapter prevents localization of strains at any one point in the shaft with the result that flexure occurs gradually. The cushioning effect prevents transmission of vibration such as would be liable to occur were the head and shaft made an integral structure or connected rigidly in direct contact with each other. It will also be seen that with this invention a favorite golf club may be fitted with a metal shaft should the wood shaft be broken or destroyed.

What is claimed is:

1. A golf club comprising a head having a tapering shaft socket, a tubular metallic shaft having one end located concentrically within but of less diameter than the socket and an adapter surrounding said shaft and tapering from an intermediate point toward each end, one tapering end being seated within the socket and the other tapering end extending upwardly from the socket and closely embracing the shaft whereby localization of bending stress in a single plane is prevented.

2. A golf club comprising a tubular metallic shaft, a head having an inwardly tapering shaft socket and a non-metallic adapter seated in said socket around the end of the shaft and gradually tapering above and away from the socket to distribute the strains due to flexure or torsion through a considerable length of the shaft.

3. An adapter for connecting metallic shafts to the heads of golf clubs formed with an axial bore for the reception of the end of the shaft and an external contour cylindrical in cross section and tapering from an intermediate point toward each end, one of said ends being adapted to seat in the socket of the head and the other to closely embrace and extend along the shaft above the socket whereby flexure strains will be cushioned and distributed in the shaft.

4. An adapter for connecting metallic shafts to the heads of golf clubs formed of non-metallic, non-resonant material with an axial bore for the reception of the end of the shaft and an external contour cylindrical in cross section and tapering from an intermediate point toward each end, one of said ends being adapted to seat in the socket of the head and the other to closely embrace and extend along the shaft above the socket whereby flexure strains will be cushioned and distributed in the shaft.

5. A golf club comprising a head having an inwardly tapering metallic shaft socket, a tapered tubular metallic shaft having an extension of reduced diameter at its smaller end, and a nonmetallic adapter filling the space between the smaller end and extension of the shaft and the wall of the socket.

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