March 10, 1931. T. W. BRYANT 1,796,274

GOLF CLUB SHAFT

Original Filed July 1, 1925

Fig. 1.

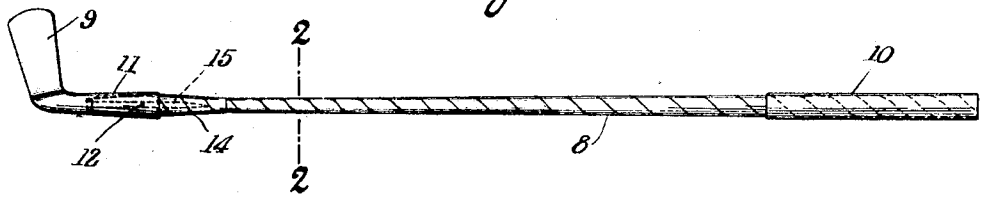


Fig. 2.

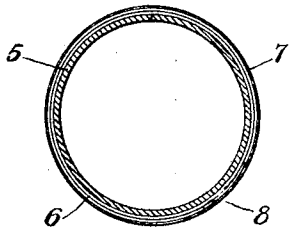
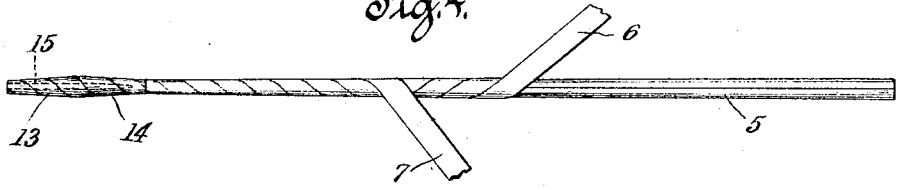


Fig. 3.



Fig. 4.



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UNITED STATES PATENT OFFICE

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GOLF-CLUB SHAFT

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My invention relates particularly to shafts for golf clubs. One object is to provide a light but very strong and durable construction having desired uniform characteristics as to stiffness and flexibility.

Another object is to provide a construction of this character which can be made and finished at a reasonable cost and yet which is neat and attractive and which is not subject to rapid deterioration.

Another object is to provide a construction which can be used for various kinds of clubs and which may have any suitable form of handle.

In carrying out my invention I provide a tubular metallic core and apply to it fibrous material which is coated or impregnated with a siccative substance. The finished shaft may be used like any other shaft.

Fig. 1 is a side view of a golf club embodying one form of the improvements of my invention.

Fig. 2 is a transverse sectional view on the plane of the line 2—2 of Fig. 1, but on a much enlarged scale.

Fig. 3 is a side view of the core member of the shaft.

Fig. 4 shows a shaft in process of formation.

The core 5 is preferably of very thin steel and may be rolled or otherwise formed from strip stock and then hardened. The thickness of the stock will depend upon the characteristics of the material available and the required weight and strength of the shaft. A carbon steel may be employed of from say ten to fifteen thousandths of an inch in thickness.

This core is preferably covered with one or more layers of material such as strips of paper 6 and 7 which may be wound helically as shown in Figure 4. These strips may be very thin and should be applied tightly so as to provide a maximum re-enforcing strength. Preferably the material is somewhat absorbent.

These strips may be coated or impregnated with a waterproof compound 8, which will be hard when dried or baked. A suitable compound is carbaloid, or other plastics such as phenolic condensation products and the like. This material may be applied to the individual strips at the time of winding or the shaft may be coated with the compound after the core has been wound. This may be dried and hardened in any suitable manner. There should be some of the compound between the core 5 and the strips 6 and 7 so that the strips will adhere strongly to the steel. When the compound is entirely dry and hard, it may be sand-papered, finished, or turned in a lathe if desired. The impregnated and hardened covering substantially re-enforces the metal tube so that the finished article has the necessary resistance against crushing strains, against bending, and against twisting. This also ensures a permanent protection to the shaft which is not possible with ordinary painted or varnished shafts or shafts which have been coated with copper or similar substances which do not themselves constitute any substantial re-enforcement and which quickly wear through unless made so thick that the weight and cost is prohibitive. Furthermore, varnish applied directly to a metal core will crack and peel due to the necessary twisting and bending of the shaft when in ordinary use.

In the drawing I have illustrated a head 9 intended to typify any suitable golf club head applied on the smaller end of the shaft, and a handle 10 of any suitable form applied directly on the other end. The particular head shown has a hozel or socket 11 to receive the end of the shaft. In constructions of this character it is customary to employ a transverse pin 12 and to crimp the outer end of a hozel into the material of the wood shaft. This crimping is of course impractical with an ordinary steel shaft; but is entirely feasible where the shaft has a fabric or fibrous covering according to my invention. The present invention also makes it entirely practical to apply several additional layers of the fabric so as to thicken the coating as at 13 and give it the necessary size and taper to fit a standard hozel, in fact, the head end of the shaft may be made somewhat larger in diameter than the rest of the shaft and sand-papered or turned down to fit any desired club

head. It may also be desirable to extend the enlargement backward as at 14 and taper it off gradually into the small part of the shaft some little distance from the head so as to furnish a re-enforcement immediately adjacent the end of the hozel where the greatest strain occurs. I may also provide an interior plug member 15, for instance of wood, within the small end of the shaft. This plug reinforces the shaft at that part through which the anchorage pin 12 passes, and also at the point adjacent the end of the socket or hozel 11. The plug being of softer or more yielding material than the shaft can be made to fit the shaft without straining the material of the shaft. The upper end of this plug may be tapered off or pointed so as to permit a maximum bending of the tube without severely stressing the very thin wall of the tube.

By the use of my invention, it is possible to make the core of the shaft of a strip material such as steel and rolled into form which is the cheapest method of producing a tube of this character. The tube may be formed with either a butt or lap-joint and does not require brazing, which is not reliable and which is an expensive operation when properly done. With my invention it is possible to apply the re-enforcing strips or material in a uniform manner so that the finished product can be made according to definite standards. As a result there will be very little, if any, variation in weight, stiffness or strength in shafts made according to my invention. It is thus possible to make a shaft not only very light in weight but very strong and durable and capable of withstanding all the peculiar stresses and strains to which a golf club shaft is subjected.

I claim:

1. A golf club shaft formed of thin sheet metal externally reinforced throughout its length by a fibrous coating, having an excess thickness at one end to adapt the same to be turned down to fit the socket of a head.

2. A shaft for golf clubs and the like embodying a hollow resilient metal core and a tubular outer casing formed of fabric impregnated with a condensation product hardened and tightly embracing and adhering to the core for movement therewith under strain.

3. A golf club having a head with a tubular shaft stepped in the head and reinforced internally by a plug within that part of the shaft which is within the head and reinforced externally by an outer protective covering including carbaloid or similar condensation product hardened and tightly embracing the the shaft and adhering thereto for movement therewith under strain.

4. A resilient somewhat torsionable golf club shaft formed of a tapered metallic tubular core having a thin wall and a tapered tubular protecting and reinforcing outer casing of non-metallic, hard and flexible material of a length co-extensive with the length of the main core of the shaft, said casing being formed on the core and hardened in place and permanently adhering to the core for movement therewith under strain.

5. A shaft for golf clubs embodying a resilient core and a flexible tubular outer protective casing including a condensation product hardened and tightly embracing and adhering to the core for movement therewith under strain and extending for at least the full length of the part of the core between the head and grip of the club.

6. A golf club having a head with a socket and a tubular shaft received therein and a reinforcing plug tightly fitting within that part of the shaft which is within the socket and having a tapered end projecting into the shaft just beyond the outer end of the socket.

7. A golf club comprising a head having a socket, a tapered tubular resilient shaft having a handle portion at its upper large end and being tapered to its smallest diameter at the neck a short distance above the socket, said shaft increasing in diameter from the neck to the end of the socket and having its lower end secured within the socket.

8. A tubular shaft of thin sheet metal having a molecularly open longitudinal joint and a flexible water proof material under tension holding the sides of the joint together, covering the shaft to prevent oxidation, adhering to said shaft with movement thereof under strain and reinforcing the same, said flexible waterproof material comprising a hardened plastic material adapted to withstand flexure and torsion of play when used as a golf shaft without becoming loose from the shaft.

9. A flexible metal golf club shaft having a flexible waterproof reinforcing cover comprising a hardened plastic material under tension, binding said shaft tightly enough to be moved therewith under distortion, extending over at least the major portion of the shaft length, and of sufficient toughness to prevent cranking and breaking off in use.

10. The combination with a hollow metal shaft, of a golf club head having a socket in which said shaft is received, and a plug member fitted inside the received end of said shaft, said plug member being tapered upwardly adjacent the open end or upper end of the socket.

11. The combination with a hollow metal shaft, of a golf club head having a socket in which said shaft is received, a plug member of softer material than said metal shaft within said shaft and socket, said plug being tapered beyond said socket and fitted to reinforce the shaft against flexure, adjacent the top of the socket.

12. A golf club provided with a steel tubular shaft having a thin wear and corrosion

resisting protective coating comprising strips of material impregnated with a condensation product and hardened, said coating being applied under tension to adhere to said shaft under strain when hardened and tough enough not to crack off under normal flexure and torsion thereof.

13. A golf club shaft comprising a tapered split tube of thin sheet metal held together and entirely enclosed by a number of strips of thin material wound thereon throughout the greater part of its length and coated with a wear resisting waterproof compound.

THOMAS W. BRYANT.