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GOLF CLUB.

APPLICATION FILED JUNE 11, 1914.

1,167,106.

Patented Jan. 4, 1916.

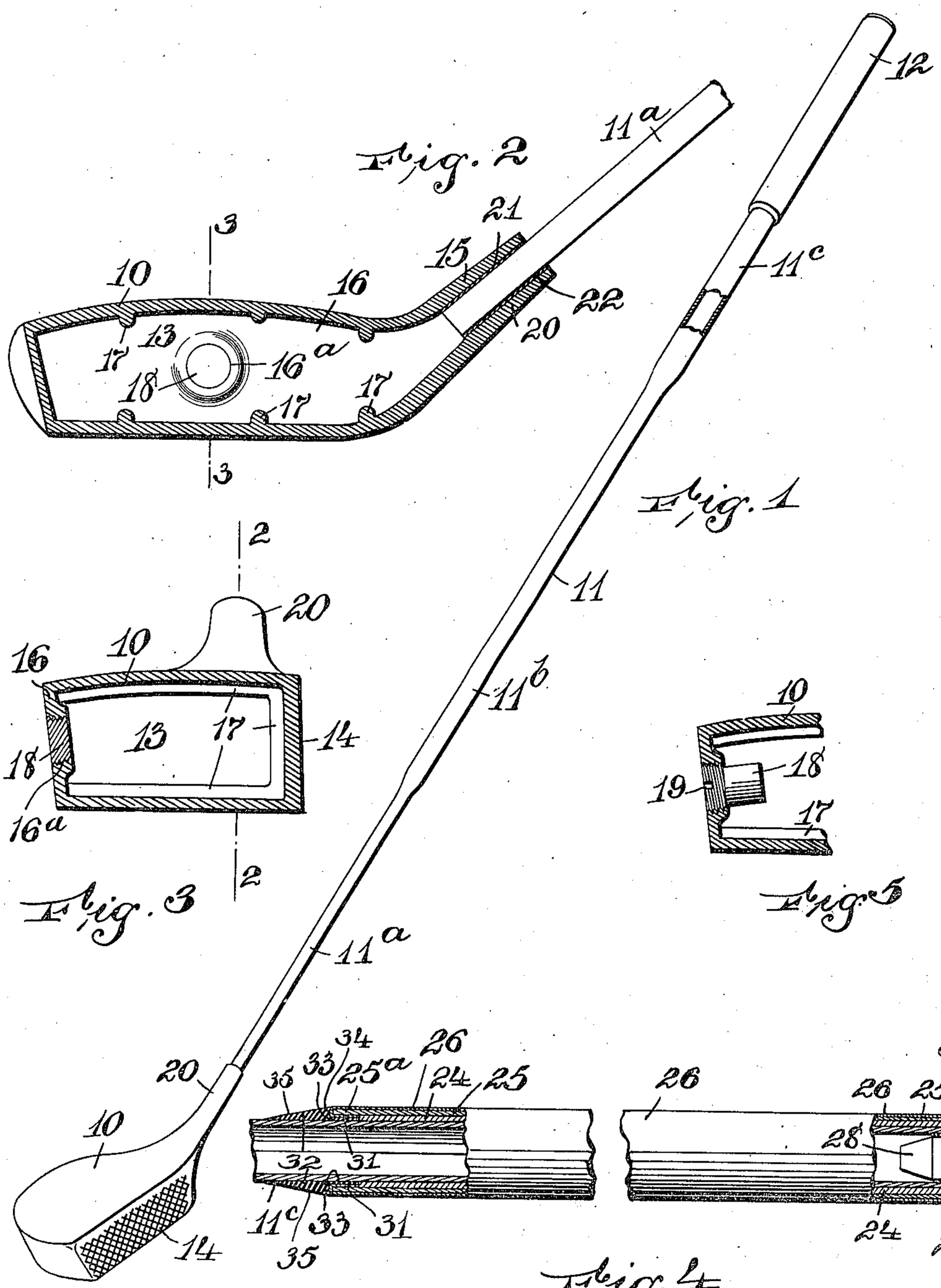

Fig. 2

Fig. 1

Fig. 3

Fig. 5

Fig. 4

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GOLF-CLUB.

1,167,106. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed June 11, 1914. Serial No. 844,460.

To all whom it may concern:

Be it known that I, OLIVER M. PALMER, a citizen of the United States, and a resident of Montclair, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Golf-Clubs, of which the following is a specification.

My invention relates to golf clubs, and among its objects are the improvement of such clubs in numerous important particulars, which will be hereinafter described and set forth in my claims, and with the foregoing and related objects in view my invention consists in the parts, improvements and combinations herein set forth and claimed.

In the accompanying drawing forming a part of this specification and wherein the same reference numerals are applied to designate the same parts throughout, Figure 1 is a perspective view of a golf club embodying my invention, a part of the shaft being shown in longitudinal section. Fig. 2 is a longitudinal section of the club head taken on the line 2—2, Fig. 3. Fig. 3 is a transverse cross-sectional view of the club head taken on the line 3—3, Fig. 2. Fig. 4 is a view partly in central longitudinal cross-section of the grip and showing its construction and preferable manner of attachment to the shaft, and Fig. 5 is a fragmentary transverse cross-sectional view showing a modified form of weight.

The numeral 10 designates the club head, 11 the shaft, and 12 the grip.

The head 10 of my improved club is made of hollow cast metal, the chamber formed therein being indicated by the reference numeral 13. The walls of such cast head are preferably of a substantially uniform thickness sufficient to give the proper weight to the head which, according to generally accepted practice, is in the neighborhood of 7 ounces, avoirdupois. There are, however, some thickened portions provided where exceptional strength is requisite, in the form shown such thickened parts being provided at the striking face 14, the neck 15, at the back of the head indicated at 16 where a screw-threaded aperture 16ª may be formed for the insertion of plugs of varying weight to adapt the weight of the club to the individual requirement of players, and the reinforcing ribs 17. The metal used for making such cast head must answer several important requirements; it must be strong and tough, fairly light, must have a good appearance and must flow, when molten, with exceeding limpidity so as to form the fairly thin casting required. I have found that manganese bronze meets these requirements in a very satisfactory manner. With this metal the principal portion of the walls of the cast head may have a thickness of about $\frac{1}{16}$ of an inch, the strengthened parts above referred to being somewhat thicker to produce a head of correct weight, but other metals may be used, and with lighter metals the thickness of the walls may be materially increased beyond the foregoing example. In order to provide varying weights of the cast metal head I preferably provide the threaded opening 16ª in the cast hollow head at the center back portion thereof. The provision of this opening gives a convenient opportunity to support the core in forming the casting, and after being threaded it is closed by a threaded plug as 18, which may be just long enough to form a convenient closure for the opening, as shown in Fig. 3, or threaded plugs of varying lengths, and therefore varying weights, may be substituted, as indicated in Fig. 5, in order to give what the individual player regards as the right weight for his requirements. Such plugs are preferably provided with a screw slot 19 for convenience in turning with a screw-driver, but other arrangements for this purpose may be resorted to. The opening 16ª is preferably given a tapered thread so that the loading plugs may readily be screwed tightly in place therein. The neck 20 is provided with a bore 21 of a form adapted to receive the end of the shaft. A round opening of substantially even diameter throughout is preferably provided when the shaft is formed of hollow steel tubing. The front wall 14 being thickened and reinforced by the top, side and bottom walls which extend substantially entirely around it, affords a very strong structure and the striking face so supported will give somewhat when the ball is struck, but is highly resilient and adapted to give very desirable results in driving the ball. I may, however, still further strengthen this most important part of the head by providing one or more ribs 17 on the interior of the head which preferably extend across the inside of the front wall and back along the top and bottom walls, as shown in Figs. 2 and 3.

The shaft 11 is preferably of cold drawn,

hollow steel tubing and may be drawn to several different diameters so as to give a substantially tapered form to the shaft, the tapering being secured by providing a plurality of "steps" each of uniform diameter, such diameters increasing from the head to the grip, and providing the necessary fairly thick diameter at the grip end, and a reduced diameter to give the desired resiliency and whippiness at the end where it is secured to the head. For example, the shaft may be a simple straight tubular shaft of uniform diameter, or it may be drawn of two, three or more diameters, and when drawn of three diameters as shown, and when made of hollow steel tubing, may have a diameter of about $\frac{3}{8}$ inch at 11^a at the neighborhood where it is inserted in the head, a second intermediate section of a diameter of about $\frac{7}{16}$ inch as at 11^b, and a third section including the grip part of a diameter of about $\frac{1}{2}$ inch. The above figures, which are merely illustrative, may, of course, be varied within proper limits.

Any convenient means of securing the metal shaft to the metal head may be resorted to, as, for instance, these parts may be soldered or brazed together, or put together with a driving fit and pinned or in any other equivalent way. In Fig. 2 I have indicated them as attached by solder 22. As will be apparent, a very secure joint may be obtained between the metal shaft and the metal head, and the joint may nevertheless be readily opened, as for repairs and the like, as, for instance, when the parts are secured together by solder, by heating.

When a hollow metal shaft is used, as is preferably done, I preferably form the grip as shown in Fig. 4. The grip section of the shaft is of uniform diameter throughout its length so that the grip may likewise be of uniform diameter throughout its length. Such grip preferably comprises an inner tube or shell 24 which may be of paper, cardboard or the like, and the section 11^c of the shaft is preferably coated with suitable glue or cement before the shell 24 is placed thereon. Outside of the tube or shell 24 I may place a second similar shell 25 which is preferably substantially flush with the inner shell 24 at the outer end of the shaft 11, as shown, but at the opposite end extends beyond the inner shell 24, as shown at 25^a. Such outer tube or shell 25 may be formed by wrapping proper material, such as waterproof paper, on the shell 24 in the presence of suitable glue or cement, in which way it may be built up to the diameter required by the individual player, or the tube 25 may have been previously made up complete, as will be understood. Over this tube or shell 25 I place the grip covering 26 which is preferably made of a tube of leather stitched together along a longitudinal seam, though other forms of covering may be used and, of course, other materials. On the outer end of the shaft 11 this grip covering is turned inward, and its inwardly turned end 27 is thrust into the hollow end of the shaft 11, and the shank 28 of a button 29 is inserted within the open end of the shaft, thus firmly gripping and holding the grip covering 27 between it and the inner walls of the hollow shaft 11. The button 29 may be formed or ornamented in any desired manner and forms a neat finish and affords a convenient means for marking the club with the owner's initials or other identifying data. Suitable glue or cement, may, of course, be used in putting on the grip cover and in putting the button 29 in place. If desired, a pin, as 30, may be inserted in a suitable opening in the end of the handle, preferably having its ends beneath the outer surface of the grip, as shown, so as to hold the parts securely and firmly together and not to mar the appearance of the club or to chafe the player's hands. The grip covering 26 at the opposite end of the grip is extended somewhat beyond the end of the outer sleeve 25 and the surplus length thereof is turned in to the interior of the extension 25^a of the sleeve 25 as shown at 31 and preferably cemented in place therein. A ferrule 32 terminating at its inner end in a sleeve 33 and having a preferably undercut shoulder 34 and a tapered outer part 35 is provided, and such ferrule is secured in place with the sleeve 33 abutting at its inner end against the inner sleeve 24 and fitting within the extension 25^a of the outer sleeve 25 so as to hold the grip leather at this end in substantially the same way as at the opposite end. The shoulder 34 resting against the turned over edge of the grip covering where it is turned over the sleeve extension 25^a makes the exposed tapered portion 35 at its larger end substantially flush with the grip covering so that the ferrule 32 forms a neat finish at the inner end of the grip and at the same time secures the grip and grip covering firmly and permanently in place. Suitable cement may, of course, be used in making this connection, and the ferrule 32 is preferably of such material as to be flexible and not to materially diminish the resiliency and whippiness of the shaft, as, for example, the ferrule may be of rubber or of a rubber containing composition, as shown, but, of course, other materials having the desired qualities may be used.

A golf club constructed in accordance with my invention has numerous advantages. Among such points of advantage are the following: The hollow cast metal head is very strong and durable and the club, when of the form shown, may be used both in the place of the usual driver and brassy; the driving

face is extremely resilient, being supported and reinforced at its edges and being free to exert its resilient action in the neighborhood of the center where the ball should be struck; such head is capable of taking a high polish giving a distinctive and striking appearance; when it is desired to duplicate a club such duplicate may be furnished with the greatest possible degree of exactitude, since it is only necessary to use the same mold and the same material, and accurate duplication, never possible with a wooden head, becomes a thing of the utmost ease; the weight of the head may be readily changed to meet individual requirements and such change requires no expert workmanship and the adjustment, once made, is permanent unless further change is made intentionally and voluntarily; when a metallic shaft is used with the cast metal head, the joint between the head and shaft is very readily and firmly and permanently formed and, instead of giving endless trouble and tending to destroy the balance of the club, as is the case with most wood to wood, metal to wood and wood to metal joints, the joint once properly made is permanent and the club is evenly balanced and all trouble is completely eliminated and at the same time the joint may readily be opened up, as, for example, to replace a broken shaft. Furthermore, the length of the neck 15 may be decreased to practically any extent, whereas when a metallic shaft is fitted to a wooden head the neck must be much longer and any mode of fastening which can be resorted to will sooner or later cause the neck and head to split; the hollow metal shaft, while so resilient and whippy, and of such light weight when compared with the weight of the metallic head that the ideal stroke in which the shaft merely serves as a means for "throwing the head at the ball," may be obtained even by the most inexperienced golfer, nevertheless yields but to an exceedingly small extent, and substantially not at all, to torsional strains so that slicing and pulling due to twisting of the shaft are avoided; the entire club being of metal with the exception of the grip which can be readily replaced when desired provides a club which will last for years without deterioration, the grip is substantially cylindrical in form and without taper so that when grasped at any point in its length the same kind of hold will be had, and there are still other features of advantage which need not be further referred to.

It is to be understood that changes may be resorted to from the specific disclosure, which is made for affording a clear understanding of my invention, and that my invention is as broad as my claims.

Having thus described my invention, I claim:

1. A hollow cast metal head for a golf club having its walls continuous and of substantially uniform thickness for the greater part, but having the wall containing the striking face thicker than the adjacent walls, substantially as set forth.

2. A hollow cast metal head for a golf club having a threaded aperture in its rear wall communicating with the hollow interior thereof, and a screw-threaded weighting plug in said aperture, substantially as set forth.

3. A continuous hollow cast metal head for a golf club, said entire head, including the striking face, being cast from manganese bronze, substantially as set forth.

4. A head for a golf club comprising a metallic striking wall, reinforcing walls about its edges and reinforcing ribs extending across the striking wall and back along the top and bottom walls, substantially as set forth.

In testimony that I claim the foregoing, I have hereunto set my hand, this 9th day of June, 1914.

OLIVER M. PALMER.

Witnesses:
M. A. JOHNSON,
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