

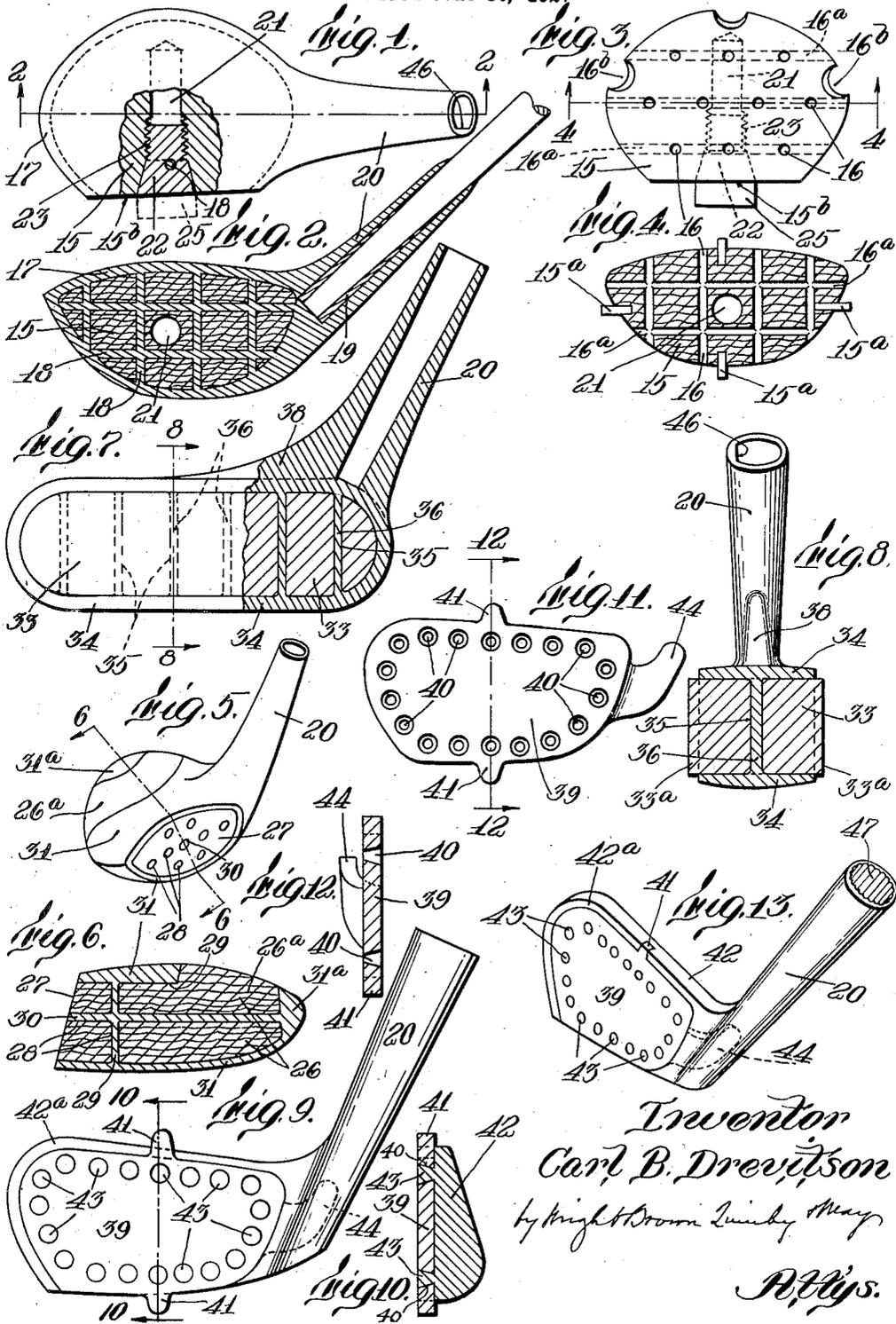
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GOLF CLUB

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GOLF CLUB.

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This invention relates to the head portion of a golf-club which includes two or more members, one of which I call a forming member to which a predetermined form is imparted before the members are united, the other member being a casting formed in part by a die-casting die, and in part by the forming member.

The chief object of the invention is to provide a club head, the members of which are firmly interlocked by the casting operation, so that neither is capable of any movement relative to the other.

I attain this and other related objects by the improvements hereinafter described and claimed.

Of the accompanying drawings forming a part of this specification,—

Figure 1 is a top plan view of a golf-club head of the driver type, constituting one embodiment of the invention, a portion being shown in section.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a top plan view of the forming member shown by Figure 2, and by dotted lines in Figure 1.

Figure 4 is a section on line 4—4 of Figure 3.

Figure 5 is a perspective view, showing another form of driver head.

Figure 6 is a section on line 6—6 of Figure 5.

Figure 7 shows partly in side elevation, and partly in section, a club of the putter type, constituting another embodiment of the invention.

Figure 8 is a section on line 8—8 of Figure 7.

Figure 9 is a side view of a club known as an iron, in which the invention is embodied.

Figure 10 is a section on line 10—10 of Figure 9.

Figure 11 is a side view of the forming member shown by Figure 9.

Figure 12 is a section on line 12—12 of Figure 11.

Figure 13 is a perspective view of the club shown by Figure 9.

The same reference characters indicate the same parts in all of the figures.

In each of the illustrated embodiments

of the invention, the club head comprises a forming member of predetermined form, having matrices within the surface and a cast metal member, preferably of aluminum, or an aluminum alloy, including a body portion cast by a die-casting operation upon the forming member, and ramifications integral with the body portion and cast within the matrices, whereby the cast member is interlocked with the forming member, the forming member and a suitable die-casting die being assembled, so that molten metal forced under pressure into the die cavity, is formed in part by the die, and in part by the forming member, the cast metal being caused to flow against the forming member and into the matrices thereof, so that the cast member is interlocked with the forming member wholly by the casting operation, no additional fasteners, such as screws or rivets, being employed.

In the driver type shown by Figures 1 to 4, 15 designates a core-shaped forming member which may be made of suitable material, preferably wood, bakelite, or other non-metallic material, of the form shown by Figures 3 and 4. The member 15 is bored by a suitable drill, or gang of drills, to form matrices extending between two opposite surfaces, there being preferably a series of matrices 16, extending in one direction, and a series of matrices 16^a extending in a different direction, and intersecting the matrices 16. As shown by Figure 3, there may be matrices 16^b, formed as notches or recesses in the external surface of the forming member. The forming member 15 is placed in a die-casting die, with its external surfaces spaced by any suitable means, such as pins 15^a (Figure 4), from the internal surfaces of the die, and molten aluminum is forced into the die, as in the usual die-casting operation, the metal filling the space between the forming member and the die, and forming an enveloping body portion or shell 17, and also filling the matrices, the metal which enters the matrices 16 and 16^a forming ramifications 18 (Figure 2), integral with the shell. When the metal solidifies by cooling, the shell 17 and ramifications 18 constitute a cast member interlocked with the forming member wholly by the casting operation, the ramifications 18 confining the shell 17 in

close contact with the external surfaces of the forming member, and preventing the possibility of looseness of the forming member within the shell. The ramifications cast in the matrices 16^b are sufficiently bulky to add weight to the shell or body portion 17, and may be located wherever added weight is desirable.

The metal casting in each of the illustrated embodiments, includes a shaft socket 20, cast integral with the casting portion which contacts with the forming member. The socket 20 is cast around a suitable core inserted in the casting die, before the casting operation. Said core may be a tubular bushing 19 (Figure 2), the bore of which forms a socket for the usual shaft or handle 20^a of the club. The casting die is formed to cooperate with the core and form the external surface of the socket 20. The core or bushing 19 may be of wood or other material which is lighter than the cast metal.

The cast body portion or shell 17 does not completely enclose the forming member 15, so that a portion of the external surface of the forming member is exposed, to form a striking face 15^b, surrounded by a marginal portion of the shell, as indicated by Figure 1. To reduce the weight of the head, a cavity 21 may be bored in the forming member, the mouth of the cavity being on the striking face and its inner end closed, as shown by Figure 1. A plug 22 of wood, bakelite, or other suitable material, shorter than the cavity, is secured therein, preferably by a screw thread connection shown at 23, so that the inner end portion of the cavity is vacant. The plug, as originally formed, may project from the striking face, as shown by Figure 1, the projecting portion 25, constituting a member adapted to engage a portion of a die-casting die during the casting operation, and being subsequently cut off flush with the striking face, the outer end of the plug then constituting a portion of the striking face. The length of the plug 22 may be varied, to vary the length of the vacant portion of the cavity.

The driver shown by Figures 5 and 6, includes a forming member 26 (Figure 6) of any suitable non-metallic material, having an exposed striking face 27, matrices 28, and a recess 29, extending across its upper side. Some of the matrices may extend through the striking face, so that the ramifications 30 formed therein, are exposed on the striking face. Other matrices 28 may extend from the upper to the lower surface of the forming member, so that the ramifications formed therein connect upper and lower portions of the body portion or shell 31 cast thereon.

A portion 26^a of the upper surface of the forming member 26 is exposed in the completed head, this portion contacting with the internal surface of the die cavity during the

casting operation, the die cavity being formed to provide the body portion 31 with a nose 31^a forming the end of the head opposite the striking face 27. In case the forming member in this driver, and in the driver shown by Figures 1 and 2, is made of wood, the grain of the wood extends at an angle to the striking face, so that the ends of the fibers of the wood are presented on the striking face. The direction of the grain of the wood relative to the striking face is indicated by the irregular lines in Figure 8.

Figures 7 and 8 show a type of putter in which the forming member 33 of any suitable nonmetallic material is oblong, as shown by Figure 7, and has a margin on which the body portion or shell 34 of the cast member is formed, and ends which are exposed within and surrounded by the shell. The forming member 33 has matrices 35, extending between the opposite surfaces of its margin and receiving ramifications 36 of the shell 34. The ends of the forming member may project, to form die cavity-engaging members 33^a, which are subsequently cut away flush with the margins of the shell, as indicated by dotted lines in Figure 8. The putter head thus constructed has two oppositely facing striking faces. A shaft socket 20 is cast integral with the body portion or shell 34, and is preferably strengthened by a brace 38 cast therewith.

In the iron shown by Figures 9 to 13, the forming member is a plate 39 of hard rustless metal, such as bronze, or stainless steel, having flat sides and the marginal contour shown by Figures 9, 11 and 13.

The marginal portion of the plate 39 is bored, to provide a plurality of matrices 40, which are tapered and decrease in diameter from the outer to the inner surface of the plate. On opposite edges of the plate are formed projections 41, to engage a casting-die which is formed to bear closely on the outer side of the plate and provide a cavity at the inner side thereof, formed to impart to molten metal forced into the die and flowing into the matrices 40, a cast member composed of a body portion 42, formed as indicated by Figures 9 and 13, and tapered ramifications 43, interlocked with the tapered matrices 40, as shown by Figure 10.

The casting die is formed to provide the body portion 42 with a flange 42^a which overlaps the upper edge and the end edges of the plate 39, leaving the lower edge of the plate exposed, as shown by Figures 9 and 13. A shaft socket 20 is cast integral with the body portion 42, and is reinforced at its junction with the body portion by a tenon 44, formed on one end of the plate 39, and offset therefrom, as shown by Figure 12, the socket being cast on the tenon.

After the casting has solidified, the projections 41 are cut away.

It will be seen that in each embodiment of the invention, the forming member has an external forming surface on which the cast member is formed in part, and matrices extending from the forming surface into the body of the forming member.

It will also be seen that the metal of the cast member is formed partly upon the forming member, and partly within the matrices therein, so that the cast member includes integral ramifications conforming to the matrices.

The forming member, especially when made of wood, may have its external surface treated, to prevent it from being charred by the hot metal during the casting operation. This may be accomplished by applying a fireproof paint, or a coating of bakelite, to the external surface before the metal is cast thereon.

When the core-shaped forming member is of a nonmetallic absorbent material, such as wood, and the cast member is interrupted to expose a surface portion of the forming member, as shown by Figure 1, or a plurality of surface portions, as shown by Figures 5, 6, and 8, the exposed surface portion or portions may be impregnated with wax, oil, or any suitable chemical, adapted to prevent the swelling and shrinking, by changes in the condition of the atmosphere, of the entire forming member, including the portion thereof covered by the cast member.

As shown by Figures 8 and 13, the bore of the shaft socket may be irregularly formed to prevent the shaft from turning therein. Figure 8 shows the bore provided with a flat portion 46, and Figure 13 shows the bore provided with longitudinal corrugations 47.

I claim:

1. A golf-club head comprising a forming member having matrices within its surface, and a cast metal member including a body portion cast upon the forming member, ramifications integral with the body portion and cast within the matrices, whereby the cast member is interlocked with the forming member, and a shaft socket integral with the body portion of the cast member and projecting therefrom, the forming member being provided with a hooked tenon on which the inner end portion of the shaft socket is cast.

2. A golf-club head comprising a forming member having matrices within its surface, and a cast metal member including a body portion cast upon the forming member, ramifications integral with the body portion and cast within the matrices, whereby the cast member is interlocked with the forming member, and a shaft socket integral with the body portion of the cast member and projecting therefrom, the base of the shaft socket being of uniform diameter from end to end, the head comprising also a bushing

of material lighter than the cast metal and having an external surface fitting the bore, and a tapered internal surface constituting the socket wall.

3. A golf-club head comprising a core-shaped forming member having matrices extending between opposite portions of its external surface, and a cast metal member including a shell-shaped body portion, cast upon and surrounding the forming member, and ramifications integral with the body portion, cast within and extending through the matrices and connecting opposite sides of the body portion.

4. A golf-club head comprising a core-shaped nonmetallic forming member having matrices formed as open recesses in the external surface of the member, and a cast metal member including a shell-shaped body portion cast upon the forming member, and ramifications integral with the body portion and cast within the matrices, whereby the cast member is interlocked with the forming member, the recesses being so formed that the ramifications therein increase the weight of portions of the head.

5. A golf-club head comprising a core-shaped nonmetallic forming member, having matrices within its surface, and a cast metal member including a shell-shaped body portion cast upon the forming member, and ramifications integral with the body portion and cast within the matrices, whereby the cast member is interlocked with the forming member, the said body portion having a lateral opening in which a striking face of the forming member is exposed.

6. A golf-club head comprising a core-shaped wooden forming member, and a cast metal member including a shell-shaped body portion cast upon the forming member, and ramifications integral with the body portion and cast within the matrices, whereby the cast member is interlocked with the forming member, the said body portion having a lateral opening in which a striking face of the wooden forming member extending at an angle to the striking face.

7. A golf-club head comprising a core-shaped nonmetallic forming member having matrices within its surface, and a cast metal member including a shell-shaped body portion cast upon the forming member, and ramifications integral with the body portion and cast within the matrices, whereby the cast member is interlocked with the forming member, the said body portion having a lateral opening in which a striking face of the forming member is exposed, the forming member being provided with a cavity opening on and extending inwardly from the striking face, to reduce the weight of the head, and closed at its inner end, the head comprising also a plug inserted in and par-

tially filling the cavity, the outer end of the plug being flush with the striking face and forming a portion thereof.

5 8. A golf-club head comprising a core-shaped forming member of absorbent non-metallic material, and a metal member cast upon the forming member and interrupted to expose a surface portion thereof, said

portion being impregnated with air and moisture-excluding material preventing the swelling and shrinking of the entire forming member including the portion thereof covered by the cast member. 10

In testimony whereof I have affixed my signature.

CARL B. DREVITSON.