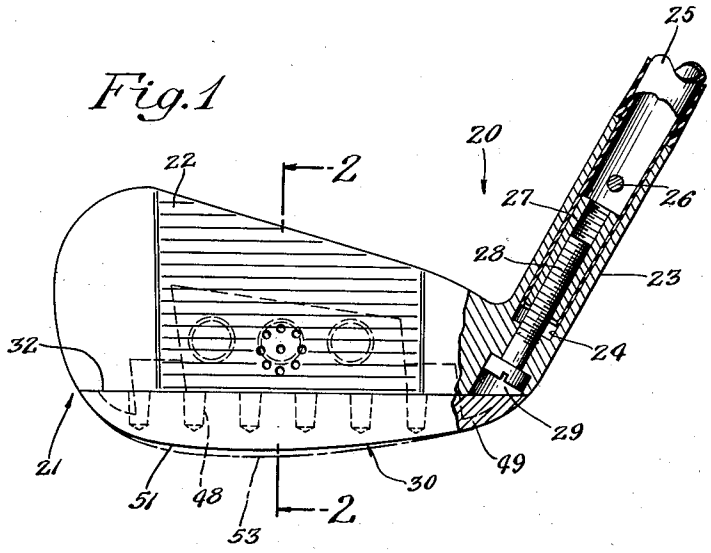
Oct. 19, 1943. M. B. REACH 2,332,342

GOLF CLUB

Filed March 8, 1940 3 Sheets-Sheet 1

Fig. 1



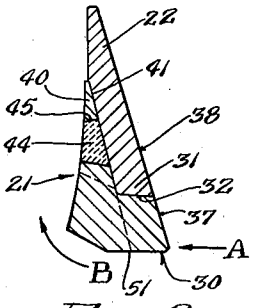


Fig. 2

Fig. 3

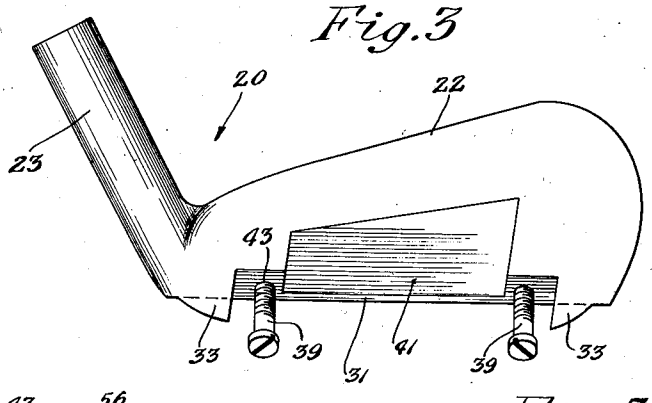


Fig. 4

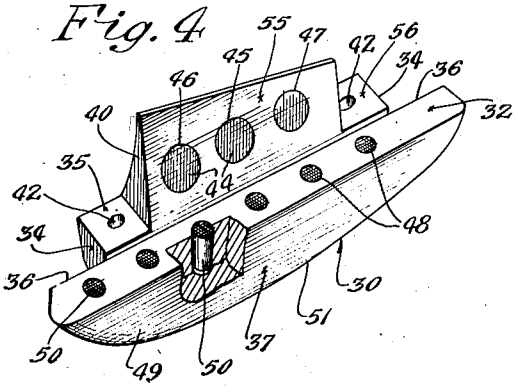
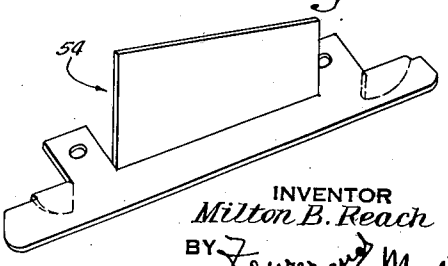


Fig. 5



INVENTOR
Milton B. Reach
BY Fryer and Mack
ATTORNEYS

Oct. 19, 1943. M. B. REACH 2,332,342

GOLF CLUB

Filed March 8, 1940 3 Sheets-Sheet 2

Fig. 6

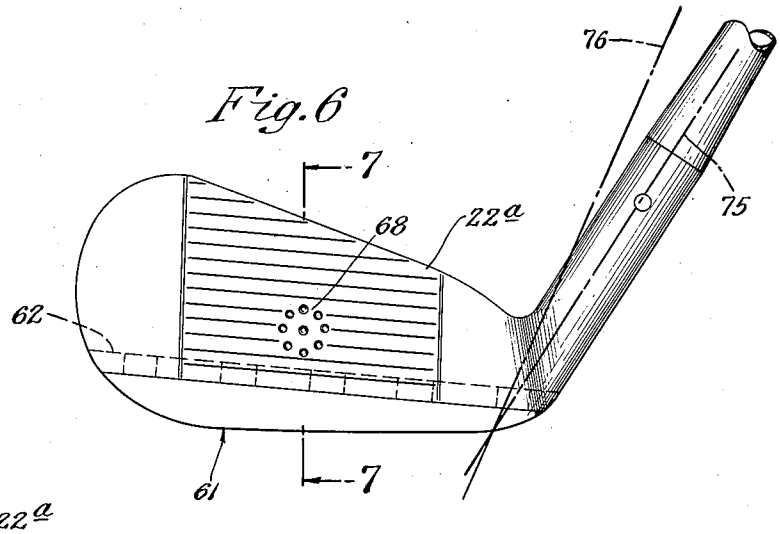


Fig. 7

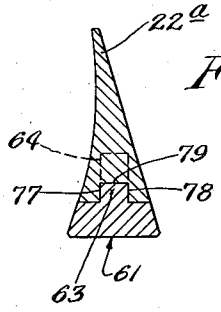


Fig. 8

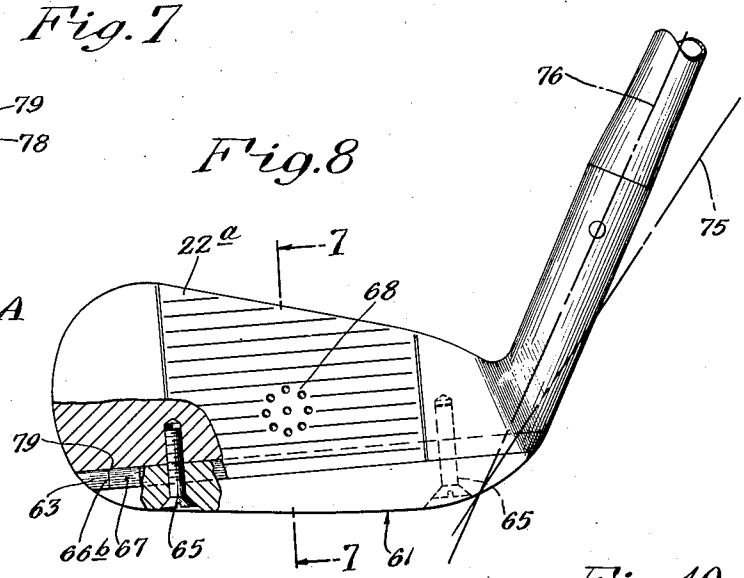


Fig. 7A

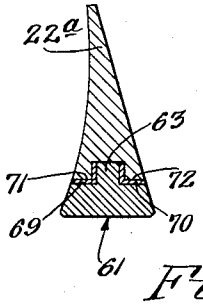


Fig. 9

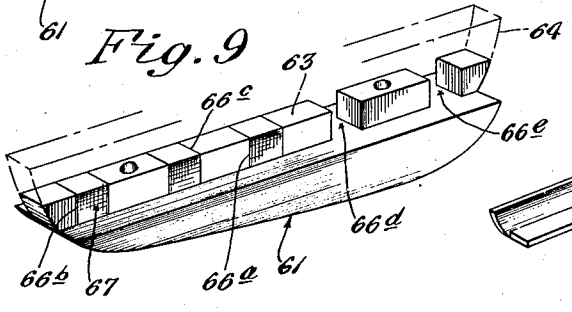
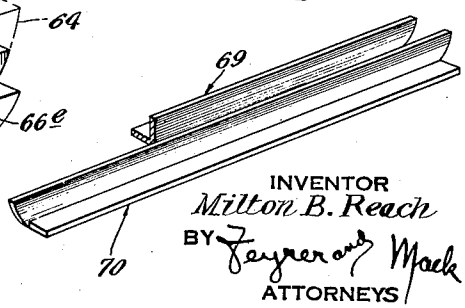


Fig. 10



INVENTOR
Milton B. Reach
BY Fayner and Mack
ATTORNEYS

Oct. 19, 1943. M. B. REACH 2,332,342

GOLF CLUB

Filed March 8, 1940 3 Sheets-Sheet 3

Fig. 11

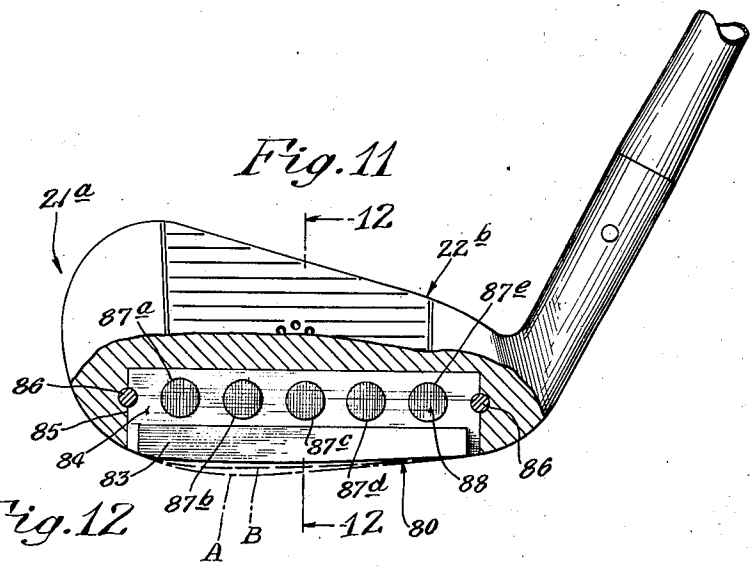


Fig. 12

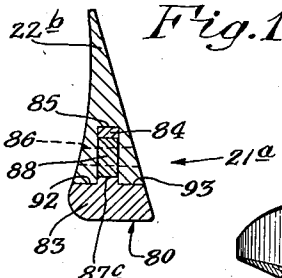


Fig. 13

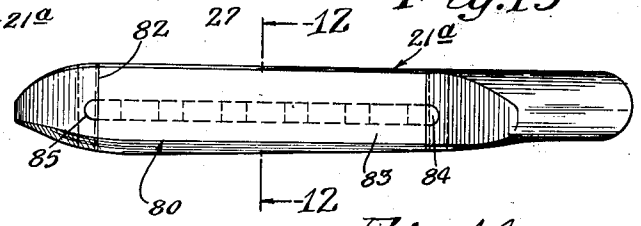


Fig. 15

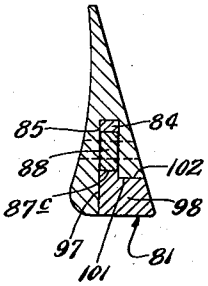


Fig. 14

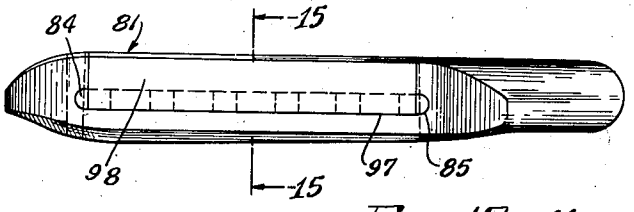


Fig. 16

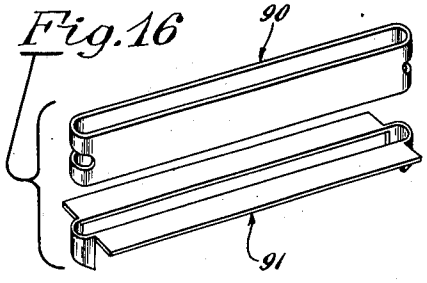
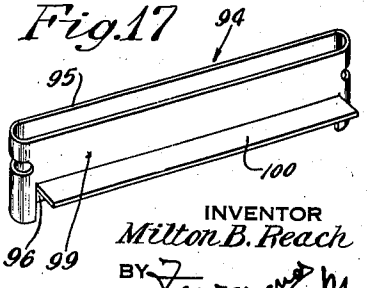


Fig. 17



INVENTOR
Milton B. Reach
BY Fryer and Mack
ATTORNEYS

Patented Oct. 19, 1943 2,332,342

UNITED STATES PATENT OFFICE

2,332,342

GOLF CLUB

Milton B. Reach, Springfield, Mass.

Application March 8, 1940, Serial No. 322,885

13 Claims. (Cl. 273—77)

This invention relates to improvements in golf clubs, and particularly golf irons.

Heretofore a number of problems have been encountered or have prevailed in connection with the manufacture of golf irons. For example, there are many special requirements and features in golf clubs, such as: light, medium or heavy club heads, depending somewhat upon the strength and desire of the player; weighting of club heads toward the toe or heel in order to overcome a hook or slice playing characteristic inherent in individual players or in certain types of clubs as handled by certain players; flat and upright lies to the club heads, depending upon the angle relative to the ground which the player likes to have the golf club shaft when addressing and hitting the ball.

Heretofore these requirements have necessitated the manufacture of special golf clubs, or the production of small quantities of regular clubs embodying one or more of these requirements in solid club heads, which, in many instances, took a number of weeks or months to process through the factory. For example, if a person desired a set of golf irons with an upright lie (shaft closer to the perpendicular than the average) if the store, pro or factory did not have the same in stock the factory would have to start with forgings of the desired shape and process a set or sets of clubs through to completion. The latter would require a number of weeks to process through the factory unless made special, and if made special such a set would disrupt the regular flow of production and result, indirectly at least, in excess manufacturing costs. Similar disadvantages occur if a player desires a set of irons which are heavier or lighter than those which the store or pro ordinarily carries in stock or which happen to be out of stock.

Although there have been some proposals in the past to weight golf woods no practical proposals have been made in connection with the weighting of irons because of the narrow blade.

It is a very important object of the present invention to provide golf irons which overcome the abovementioned disadvantages prevalent with present day types of golf irons; to wit, provide: a golf iron whch may have divers lies; golf irons which may have light, medium or heavy heads; golf irons in which the weighting toward the center, toe or heel may be effected with ease.

One feature resulting from the attainment of these objectives includes the provision of novel bottom plates which may be secured to the lower side of the blade in such a manner as to provide divers lies. One such embodiment includes a reversible plate which in one position gives an upright lie to the club and in another position gives a low lie thereto.

The foregoing represent real advantages to players, stores, pros and factories; to the player because he can have a set of irons with the type of lie which meets his exacting requirements; to the store and pros because it will be possible to quickly convert a set of low lie irons to a set of upright lie irons, or vice versa; to the factory because it may process a very large number of golf irons practically to the point of completion and then merely effect a final assembly of the particular forms of bottom plates to the lower part of the clubs in order to meet incoming orders for low or upright lie clubs.

Heretofore the manufacturer might have a large run of upright lie clubs processed, in stock or practically to the point of completion, and if he received orders for low lie clubs it would be necessary to start a new lot of clubs at the forging shop and perhaps lose as much as six or eight weeks before deliveries of the latter type. With the present invention he could immediately make shipment of either upright, low or other lie clubs.

With the old type of manufacture, wherein solid iron heads were used, it was very often necessary for a manufacturer to have a very large inventory, viz., stock a large number of upright and low lie clubs, in an effort to meet field requirements expeditiously. With the present invention it is possible for a manufacturer to greatly reduce his inventory and to thereby increase his profits.

There have been efforts in the past to provide single irons with adjustable faces or the like. However, most of these prior proposals included flimsy or necessarily weak pivoted connections at the hosel, between the hosel or shaft and the blade, which quickly loosened. This weakness is apparent when it is realized that there have been many such proposals, and although millions of golf clubs are manufactured each year such pivoted joint structures (for adjusting loft or face) have not come into general use.

The divers lies are achieved according to the present invention with a sturdy shock-absorbing structure.

Heretofore there have been proposals for wieghting golf woods. Because of the large mass in the head of a golf wood no special problems were involved. However, because of the relatively small mass in a golf iron special problems are involved in effecting a weighting. Most prior

efforts in this direction in connection with golf irons have been to build the weight into the solid forging. For example, a manufacturer might make up sets of irons to the maximum usual weights and if he receives an order for a medium or a light weight head he might have a certain amount of the bulk of the club ground or polished from the head. However, such practice, depending upon where most of the weight was removed, would very often shift the center of gravity appreciably and result in unbalanced or nonuniform clubs in a given set.

It is an important object of the present invention to provide golf irons which may be manufactured substantially to the point of completion and with which the manufacturer can in a final step provide customers or the trade generally with golf clubs of either light, medium or heavy weight of uniform head balance throughout a set.

A complemental object is the provision of golf club weighting which may be distributed toward the center, toe or heel at will in order to build certain playing characteristics into a set of golf irons.

Features resulting from the attainment of the foregoing weighting objects include the provision of a bottom plate for the lower section of the golf club or golf club head with special means for adding and/or taking weight from the golf club head near the sweet spot thereof, and to effect weighting toward the heel or toe of the club at will.

Other features in connection with the weighting include the provision of: novel structure whereby it is not necessary to use drills or other special tools in order to effect a desired weighting of the club; weighting means which are located at or very near the normal sweet spot of the club head; structural arrangements wherein the club head proper serves to lock or hold weighting slugs in the bottom plate; and a bottom plate and holding means therefor adapted to translate a striking force into an arcuate line of force, whereby the load may be dissipated and lightened.

In the general use of golf irons in the fairways and rough stones are very often encountered or struck at the time of the swing. Because of the metal head and usual metal connection between the head and the shaft an adverse vibration or shock is passed along to the hands of the player. It is an object of the present invention to provide means to prevent or minimize this adverse condition.

A feature resulting from the attainment of this latter objective includes the provision of an insulator between the lower edge of the club and the head proper. In its preferred form this insulation is vertically arranged in the club head in order to take the shock in a tilting direction.

In order to achieve a sweet feel in a golf iron when a ball is struck (viz., not cause excessive vibration or chatter through the shaft) it is desirable to have the head made of a mild steel or other nonhard metal. However, this quickly results in scuffed lower edges, very often almost like saw teeth, when the soft metal of the club engages rocks, etc. Considerable cost would be involved in trying to make a complete golf club head out of tool steel and of trying to harden the lower edge thereof because the material would cost much more than mild steel, the forging and machining cost would be appreciably greater, and special and almost impractical problems would be involved in just trying to harden the lower edge. Similarly, special problems are involved in trying to harden just the lower edge of a mild steel because only a skin or surface hardening can be effected with cyanide or case hardening treatment which would be quickly removed when the club head is polished, and because a pack hardening would leave the lower edge so brittle that it might crumble.

It is an important object of the present invention to provide golf irons in which the entire striking face may be of mild steel or other soft material to insure a sweet feel, and which may have a hard lower edge which will not scuff and cut into the ball. A feature resulting from the attainment of this objective includes the provision of a harder or hardened bottom plate which may be easily secured to the lower section of the golf head.

With certain types of golf irons it is desirable to have a connection between the shaft and the head which may be reached from the bottom of the club. However, such connections usually leave a large and unsightly opening, or when plugged very often result in the plug later falling out which changes the weight and balance of the club and results in an adverse appearance. Such an opening also allows water to adversely seep into the hosel and shaft connection.

It is an object of the present invention to provide a golf club which may have the advantages of an open bore at the bottom of the club leading to the shaft and hosel connection and which may be sealed in a permanent satisfactory and good-looking manner.

An important feature of the present invention is the provision of a bottom plate for golf irons which advantageously seals or closes the bore for the hosel and shaft connection.

Other objects, features and advantages will appear hereinafter.

In the drawings,

Figure 1 is a front view, partially in section, of one form of golf club embodying the present invention.

Fig. 2 is a cross-sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a rear view of the club shown in Figs. 1 and 2, without the bottom plate.

Fig. 4 is a perspective detail of the bottom plate.

Fig. 5 is a detail of the insulator.

Fig. 6 is a front view of another form of the present invention, illustrating a low lie.

Fig. 7 is a sectional view taken on line 7—7 in Figs. 6 and 8.

Fig. 7A is a view similar to Fig. 7 but includes the insulators.

Fig. 8 is a view similar to Fig. 6, but is partially in section and illustrates an upright lie.

Fig. 9 is a perspective detail of the bottom plate for that form of the present invention shown in Figs. 6 and 8.

Fig. 10 is a perspective of the insulator used with that form of the invention disclosed in Figs. 6 through 9.

Fig. 11 is a front view, partially in section, of another form of the present invention.

Fig. 12 is a sectional view taken on line 12—12 of Figs. 11 and 13.

Fig. 13 is a bottom view of the club shown in Figs. 11 and 12.

Fig. 14 is a bottom view similar to Fig. 13 but discloses a slightly modified form of safety plate.

Fig. 15 is a sectional view taken on line 15—15 of Fig. 14.

Fig. 16 is a detail of the insulator used with that form of the invention shown in Figs. 11, 12 and 13.

Fig. 17 is a detail of the insulator used with that form of the invention shown in Figs. 14 and 15.

Before describing the present improvements and mode of operation thereof in detail it should be understood that the invention is not limited to the details of construction and arrangement of parts shown in the accompanying drawings, which are merely illustrative of the present preferred embodiments, since the invention is capable of other embodiments, and the phraseology employed is for the purpose of description and not of limitation.

Referring first to that form of the invention shown in Figs. 1 through 5, the golf iron 20 comprises a two-part golf head 21 including a blade 22 with a preferably integral hosel 23. The hosel is provided with a bore 24 preferably slightly tapered, adapted to receive a golf club shaft 25 of any usual construction. The shaft may be forced or sweated into the bore 24. It may also be secured thereto by a crosspin 26, or it may be wedged and held in place as by a tapered plug 27 inside the shaft, which is drawn in place by a screw 28 inserted through a hole 29 at the bottom of the head 21. The latter results in a stronger and more satisfactory looking hosel than when the cross-pin 26 is employed.

Now, it should be particularly noted that the blade 22 is incomplete at the lower part thereof as may be seen best in Figs. 1 and 3, and is fashioned in a particular manner to advantageously receive and hold a bottom plate 30, as shown particularly in Fig. 4.

To the latter end the present invention particularly contemplates the provision of a base 31 adapted to receive a seating surface 32 on the bottom plate 30 and is further provided with depending lugs 33 adapted to envelop sides 34 of a projection 35 to prevent longitudinal shifting of the bottom plate on the blade, and to engage rear walls 36 of the bottom plate 30 to locate and maintain the front face 37 of the plate in proper alignment with a face 38 of the blade 22. Further, the depending lugs 33 act as a fulcrum to translate any striking force applied against the lower edge of the bottom plate, as indicated by the arrow A, into a substantially arcuate line of force, as indicated by the arrow B in Fig. 2, to absorb the force and to minimize the shearing action which might otherwise be imposed upon the holding screws 39. The bottom plate 30 is preferably provided with an upwardly extending projection 40 adapted to fit into a suitable recess 41 at the back of the blade 22. The entire bottom plate 30 may be suitably secured to the blade 22 as by a force fit between the projection 40 and recess 41 and/or by screws 39 located and tightened in suitable holes 42 in the bottom plate 30 and threaded into holes 43 of the blade 22.

It should be particularly noted that the projection 40 on the bottom plate 30 is provided with a plurality of preferably tapered sockets which may be left empty or which may be filled with weights 44 of lead or other heavy material in order to impart the desired weight characteristics to the club. It should be particularly noted that this weighting arrangement is provided at or near the normal sweet spot (best playing center of the club head). Thus, if a normal player buys a set of light weight clubs embodying this invention and wishes to increase the weight of the club heads in the set it is merely necessary to disconnect two screws 39 and insert a weight 44, which may be in the form of a slug in the center socket 45 of the projection 41. Alternatively, if he wishes a little more weight he may insert lead or other heavy slugs 44 in the two outer holes 46 and 47 alone or in conjunction with the slug in the center hole 45. Furthermore, if a player purchased a light set of these clubs and desires to get more weight into the toe or into the heel of the club in order to cause the club to overcome an inherent hook or slice playing characteristic, it is merely necessary to place a slug into the outer or inner holes 46 or 45, depending upon the club characteristic desired. If it is desired to keep the sockets closed normally this may be done by including slugs made of wood, magnesium, aluminum or other light material which may be replaced with slugs of lead or other heavy material in order to accomplish the weighting hereinbefore described.

Further weighting of the club may also be achieved according to the present invention through the provision of a plurality of holes 48 throughout the main part 49 of the bottom plate 30. Lead or other slugs 50 may be dropped into these holes at any desired points longitudinally of the club head in order to achieve weighting near the center of the club or toward the heel or toe as desired. Preferably these holes 48 are slightly tapered so that these slugs may be knocked out by merely tapping the bottom plate 30 when it is disassociated from the blade 22. They are securely held in place by the blade when the bottom plate 30 is secured to the former as by the screws 39.

The bottom plate 30 serves as an effective means for closing the bore 29 at the bottom of the club head and serves as a ready means for effecting access, if it is desired to disconnect the shaft for any reason, as for example when it is desired to replace one length or type of shaft for another.

It should also be particularly noted that the bottom plates 30 may be made with a comparatively flat lower surface 51 relative to the seating surface 32, which would result in an assembled club of substantial upright lie, or may be formed with a lower surface at a greater or more substantial angle relative to the seating surface 32, as indicated by the dot-and-dash lines 53, to provide an assembled club with a low lie. This is a very important feature because with it the manufacturer may make a very large number of complete golf irons (excepting only the bottom plate) and need merely add low lie plates to the club assembly or medium or upright lie bottom plates to the otherwise complete clubs in order to meet field requirements. This can be done without inconvenience by merely stocking the divers bottom plates and overcomes the usual delay of some six to eight weeks encountered when the usual solid head golf irons of various lies must be processed from the point of a special forging. The same holds true in connection with the manufacture of light, medium and heavy weight clubs and the manufacture of heel or toe weighted clubs for reasons pointed out hereinbefore in detail.

In its preferred form an insulator 54 of rubber, zinc, fiber or other vibration- and noise-absorbing material, as shown in Fig. 5, may be interposed between the surfaces 32, 36, 55 and/or

56 of the bottom plate and immediately adjacent surfaces of the blade 22.

Figs. 6 through 10 illustrate another form of the present invention embodying the features and advantages just described in detail in connection with Figs. 1 through 5, differing therefrom primarily in the provision of a modified form of bottom plate. It includes a modified form of connection between the bottom plate 61 and blade 22*a* which is adapted to receive an upstanding projection 63 on the bottom plate 61. The recess 62 and projection 63 may be of greater depth and height respectively, as shown by dot-and-dash lines 64 in Figs. 7 and 9 particularly.

It should be noted that in this form, and all forms of this invention, the outer extremities of the bottom plates are curved and meld or curve into the regular curved contour of the ends of the main body of the blade so that there will be no projecting edges which would cut into the ball.

The projection 63 may be forced into the recess 62 to hold the bottom plate 61 to the blade 22*a* and/or may be held therein by one or more screws 65, as shown in Fig. 8. The projection and associated construction provide a sturdy connection between the bottom plate and the blade, prevent any shearing strain from being imposed upon the holding screws 65, and prevent a direct blow or shock on the screws which would tend to loosen them. It should be particularly noted that the projection 63 may be provided with a plurality of sockets 66*a*, 66*b*, 66*c*, 66*d* and 66*e* adapted to receive lead or other heavy weight slugs 67 in order to change a light weight club into a heavier club and/or to weight the toe or heel sections of the club as desired. For example, if it is desired to make a light weight club slightly heavier the center socket 66*a* is filled with a slug 67 which has the weight at or near the sweet spot 68 of the club. Further weight may be added by placing slugs in the sockets 66*b* and 66*c*. If it is desired to merely weight the toe of the club one or both of the sockets 66*b* and 66*c* may be provided with slugs. Similarly, if it is desired to weight only the heel of the club in order to overcome an adverse playing characteristic it is merely necessary to add a slug to the sockets 66*d* and/or 66*e*.

If it is desired to cushion the bottom plate relative to the blade 22*a* it is merely necessary to provide insulator plates 69 and 70 between the projection 63 and seating surfaces 71 and 72, as shown in Fig. 7A.

It should be particularly noted that this form of the invention provides a single bottom plate with which it is possible to obtain a plurality of different lies in the one club and with the same parts. Fig. 6, for example, shows the bottom plate 61 assembled to the blade 22*a* in such a manner that the club shaft is at a substantial angle to the ground, see line 75 (notice thick section of bottom plate near toe), to provide a club with a low lie. By merely reversing this same bottom plate in the same blade 22*a*, as shown in Fig. 8, the thick section of the bottom plate may be brought near the heel of the club and the thin section thereof near the toe in order to move the hosel and the shaft into a more nearly vertical position relative to the ground and thereby convert the same club into one having a substantially upright lie, as shown by line 76.

It should be noted that this form of the invention has a feature characteristic of the first form described in detail; viz., structure for holding and in effect locking the weighting lugs 67 in the sockets 66*a*, 66*b*, 66*c*, 66*d* and 66*e* of the bottom plate 61. This is accomplished through the provision of side walls 77 and 78 and bottom 79 of the recess 62 enveloping and holding the lugs 67 in the sockets 66*a*, 66*b*, 66*c*, 66*d* and 66*e*. This structure is such that loose slugs may be dropped into the sockets and will be effectively held or locked in place by the walls.

That form of the invention shown in Figs. 11 through 17 is similar to the forms just described in detail, differing therefrom primarily in the provision of modified forms of bottom plates 80 and 81 which are, in effect, inserted into the base of the blade 22*b* through the provision of a vertically extending socket 82 suitably formed in the base of the blades. As shown in Figs. 11 through 13 particularly, the bottom plate 80 has a bottom section 83 which extends completely transversely across the bottom of the club to complement the blade 22*b* and with the latter to form a complete club head 21*a*. The bottom plate 80 further includes a projection 84 adapted to fit into a deeper recess 85. This type of connection is very sturdy and prevents the bottom plate from loosening relative to the blade 22*b* even though heavy blows or shocks are imposed thereon. It may be merely forced into the blade or it may be held therein by suitable pins or studs 86 which pass through the blade and partially enter the bottom plate 80, as shown in Figs. 11 through 13.

As with the other forms of the invention the bottom plate may be provided with sockets 87*a*, 87*b*, 87*c*, 87*d* and 87*e* adapted to be empty when it is desired to have a light weight club and to be filled varying amounts as with lugs 83 when it is desired to have heavier clubs. Further, the initial weighting may be in the center socket 87*c* or sockets 87*a*, 87*b* and 87*d* in order to achieve the major weighting, near the sweet spot of the club; or slugs may be added in all the sockets 87*a*, 87*b*, 87*c*, 87*d* and 87*e* in order to effect a balanced weighting of the club when a heavy club head is desired. Furthermore, one or both of the sockets 87*a* and 87*b* may be filled when it is desired to have a toe weighted club and one or both of the sockets 87*d* and 87*e* may be filled when it is desired to have a heel weighted club, to overcome certain adverse playing characteristics.

The base section 83 of the bottom plate 80 may be made thicker or thinner toward the toe section, as shown by dot-and-dash lines A—A and B—B, in order to have plates of such construction convert the golf club from an upright lie into a low lie club respectively, as will be appreciated from the detailed description hereinbefore.

Also, this bottom plate 80, and any of the bottom plates herein disclosed, may be made of a hard material, hardened tool steel, or a mild steel heat treated to withstand scuffing of the bottom edge of the club with the usual adverse results, and the remainder of the club may be left soft in order to give the desired sweet feel when the ball is struck. Thus, savings in material and heat treating costs can be effected with the present invention.

That form of the invention shown in Figs. 14, 15 and 17 is just like the form shown in Figs. 11, 12 and 13 described in detail, excepting that the base section terminates on the same plane as the back of the recess 85 (see Fig. 15) instead

of extending completely transversely across the bottom of the base of the blade, as shown in Figs. 12 and 13. The latter form is advantageous over the form in Figs. 14 and 15 from a manufacturing standpoint since it is easier to machine. However, that form shown in Figs. 14 and 15 does provide a stronger support for the bottom plate 81.

That form of the invention shown in Figs. 11 through 13 may have the bottom plate insulated from the blade by merely placing an insulator 90 of zinc, fiber, rubber or other sound- and vibration-absorbing material about the projection 84 and by having the width of the recess 85 sufficient to accommodate the same, as will be readily appreciated.

Use of the flat plate 91, as shown in Fig. 16, interposed between the seating surfaces 92 and 93 and adjacent the underside of the blade member 22b is optional but does tend to further insulate the bottom plate 80 from the blade 22b, and minimize vibration or shock reaching the player's hand, especially if the bottom plate strikes a stone or the like.

Similarly, and if preferred, the bottom plate 81 of Figs. 14 and 15 may be provided with an insulator 94, as shown in Fig. 17, having a looped section 95 adapted to envelop the projection 84 which fits into the recess 85, and having a depending apron 96 adapted to back up a rear wall 97 of the base section 98. Optionally, the forward wall 99 of the looped section may be provided with a horizontal extension 100 adapted to fit between the seating surface 101 of the bottom plate 81 and a lower wall 102 of the blade 22b. Use of the insulating interponents is optional, the Figs. 11 through 15 disclosing the structure without the insulator. However, as will be readily appreciated, it is merely necessary to make the various recesses which accommodate the bottom plates 80 and/or 81 slightly larger, equivalent the thickness of the insulators 90 or 94 used in order to include the same in the structure (see Figs. 7 and 7A which are illustrative).

The present invention provides a new economical and advantageous method of manufacturing golf clubs, including the steps of manufacturing a large quantity of like and nearly complete golf clubs toward the point of final assembly; making bottom plates of divers lie and weight characteristics; and assembling selected bottom plates to the like and nearly complete clubs to provide complete clubs with divers and desired lie and weight characteristics. The method also includes making a quantity of like and nearly complete golf clubs toward the point of final assembly; making a quantity of like reversible bottom plates; and then weighting and assembling said bottom plates to the like and nearly complete clubs to provide complete golf clubs with divers lie and weight characteristics.

As used in this specification, the length of a club head refers to the distance from hosel to the opposite end of the club, and the width refers to the distance from the striking face to the back of the club. Height refers to the normally vertical dimension.

Variations and modifications may be made within the scope of the invention and portions of the improvements may be used without others.

Having thus described the invention, what is claimed as new is:

1. In a golf iron the combination of a shaft; a head; a blade having a striking face, forming part of the head, and having a channel longitudinally extending the entire length of said blade; a bottom plate, having complementary surfaces forming the remainder of the head; a longitudinally extending projection on said bottom plate extending into said channel, said bottom plate providing a continuation of the striking face; and separable weighting means carried within said projection.

2. In a golf iron the combination of a shaft; a metal blade; a substantially rigid connection between the shaft and the blade; an end-for-end reversible bottom plate having a substantially different height at the toe and heel ends thereof, for imparting divers lies to the golf club; and means for securing said reversible bottom plate to the blade.

3. In a golf iron the combination of a shaft; a golf blade, having incomplete face and bottom sections; rearwardly located depending sections on and spaced from each other lengthwise of the blade; a replaceable bottom plate forming a complemental face and bottom section, resting against the depending sections; an upwardly extending projection in said bottom plate, said projection having cavities; detachable weighting means in at least one of said cavities; and means for securing said plate to the club.

4. In a head for a golf iron, said head having a length several times its width, the combination of a metal blade having an incomplete lower section, said blade having a channel extending the entire length thereof; a bottom plate of harder metal than the blade providing a safety edge for the blade; an integral projection on the bottom plate adapted to occupy said channel; and means for connecting said bottom plate to said blade, said means passing through the projection.

5. In a head for a golf iron, the combination of a metal blade with a normally vertical recess extending centrally within and throughout the entire length of the blade, and to a point near the sweet spot of the club head; a bottom plate adapted to provide a bottom edge to the blade; a projection on said bottom plate entering said vertical recess, said projection having a normally horizontal opening therethrough; a weight in said opening; and securing means passing through the projection for securing said bottom plate to the blade.

6. In a head for a golf iron, the combination of a metal blade with a normally vertical recess defined by lateral walls and a top wall, and extending to a point near and a substantial extent across the sweet spot, said blade including front and rear portions; a bottom plate; a projection on said bottom plate entering said recess, confined against adverse rearward movement only by said front and rear portions, said projection having a plurality of normally horizontal openings extending entirely therethrough and being defined by said walls and a bottom wall; a plurality of weights in said openings near and adjacent the sweet spot, said weights being confined against adverse movement in any direction by said lateral top, bottom and side walls of the recess and of the openings; and securing means passing through the projection for holding the bottom plate to the blade.

7. In a head for a golf iron, the combination of a relatively soft metal blade for the head, said blade being bifurcated to provide front and rear portions and one central recess extending the length of the head; a relatively hard metal

bottom section for the head; a projection on the bottom section, fitting into said recess; and means passing through the projection for securing said bottom section to the blade section.

8. In a head for a golf iron, the combination of a blade having an incomplete section substantially across the longitudinal lower section thereof; a bottom plate, completing the blade, said bottom plate having toe and heel portions substantially differing in height; and weighting means on said bottom plate at spaced points across the longitudinal top center of the bottom plate.

9. In a head for a golf iron, the combination of a metal blade having a groove; a bottom plate of harder metal than the blade; a tongue on the bottom plate fitting into the groove of the blade; means for translating a substantial part of any straight horizontal force imposed upon the bottom plate into an arcuate force; and means passing through the tongue for holding said blade and bottom plate together.

10. In a head for a golf iron, the combination of a metal blade with a normally vertical recess defined by lateral walls and extending to a point near and a substantial extent longitudinally across the sweet spot, said blade including front and rear portions; a bottom plate; a projection on said bottom plate entering said recess and confined against adverse rearward movement only by said front and rear portions, said projection having a plurality of normally horizontal openings extending entirely therethrough and being defined by side walls and a bottom wall; insulating means between the projection and the recess and between the bottom plate and the blade; a plurality of weights in said openings near and adjacent the sweet spot, said weights being confined against adverse movement in any direction by said lateral walls, side walls and insulating means; and securing means passing through the projection for holding the bottom plate to the blade.

11. In a head for a golf club, the combination of a blade having a central recess defined by four normally vertical walls; a bottom plate; a projection on the bottom plate, said projection having four normally vertical walls; insulating means adapted to envelop the four sides of the projection adjacent the four sides of the recess; and securing means passing through the projection to connect the bottom plate and blade.

12. In a head for a golf club, the combination of a blade having generally vertically and horizontally disposed walls relative to the final playing position; a bottom plate having generally vertically and horizontally disposed walls, the toe and heel portions of said bottom plate substantially differing in heights; and insulating means between said generally vertically and horizontally disposed walls of the blade and the bottom plate.

13. In a golf iron the combination of a shaft; a metal blade having a recess; a substantially rigid connection between the shaft and the blade; and a bottom plate for protecting the bottom and lower front edge of the club, said bottom plate having a toe and a heel end, the height of said bottom plate at the heel end being substantially different from the height of said bottom plate at the toe end, and said bottom plate being reversible end-for-end, whereby a different lie is achieved by reversing the position of said bottom plate end-for-end.

MILTON B. REACH.