J. A. DIENNER.

GOLF CLUB.

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1,428,015. Patented Sept. 5, 1922.

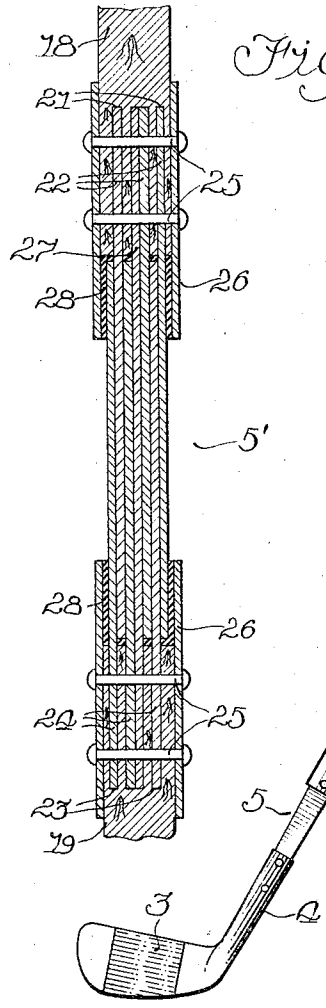


Fig. 3

Fig. 1

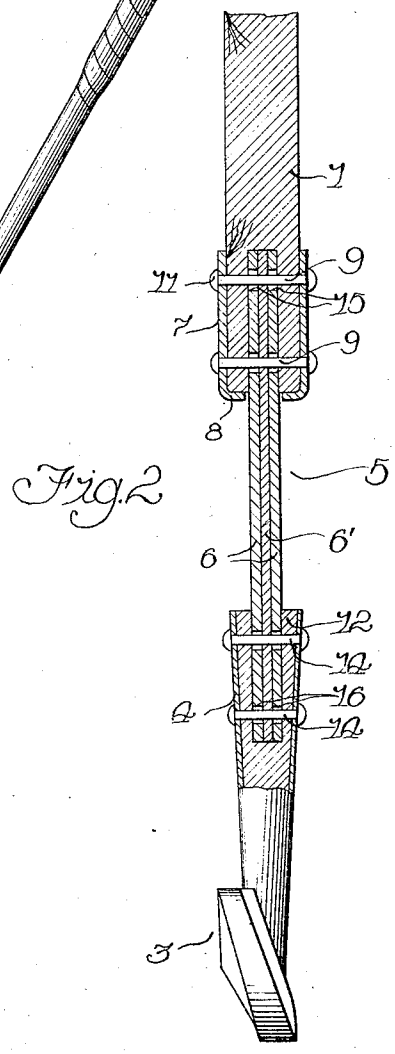


Fig. 2

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UNITED STATES PATENT OFFICE.

JOHN A. DIENNER, OF CHICAGO, ILLINOIS.

GOLF CLUB.

Application filed August 30, 1919. Serial No. 320,920.

To all whom it may concern:

Be it known that I, JOHN A. DIENNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Golf Clubs, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to golf clubs and other playing clubs or bats.

The primary object of my invention is to provide an improved golf club, peculiarly adapted for instruction purposes. The particular utility of this club lies in the fact that it is self-instructive of the correct mode of swinging a club. If swung properly, the club has a "feel" or balance similar to that of any ordinary golf club, but if swung improperly the club instantly feels unnatural and unwieldly and thus indicates that the swing has been improperly made. The value of such a club to the novice, or to the experienced golfer who is endeavoring to correct a faulty swing, will at once be apparent. It is to be understood that though the club is primarily intended for instruction purposes, it may be used for general playing as well.

The first rudiment in the philosophy of swinging a golf club lies in obtaining pure impact between the head of the club and the ball, wholly devoid of any "push" or "pull" transmitted through the club shaft. A characteristic fault is to transmit a pushing effort through the shaft to the head of the club, due to various causes, principally to an instinctive contraction or stiffening of the wrists during the downward swing of the club.

Another characteristic fault is the failure to properly "roll" the wrists in bringing the club back over the shoulder in the beginning of the stroke. This is also attributable to an unnatural and undesirable stiffening of the wrists, or to an incomplete arm movement, both of which tend to produce a stiff-arm swing of the club.

According to my invention I interpose a relatively flexible section in the shaft of the club which prevents the transmission of a pushing effort to the club head. I am aware that the provision of this flexible section has been heretofore proposed for other purposes than those above described, but in these prior experiments all control of the club head has been sacrificed to obtain flexibility in the club shaft. The present embodiment is distinctive from these prior experiments from the fact that the increased flexibility is only effective in one plane of the shaft, and thus the required rigidity and stiffness of the shaft for controlling the club head are unimpaired by the provision of this flexible section. The plane of flexibility of the shaft is in the plane of impact with the ball, so that the club is incapable of transmitting pushing effort through the shaft—in accordance with one of the primary objects of the club. Furthermore, if the wrists are not "rolled" properly when swinging the club back over the shoulder in beginning the stroke, the plane of flexibility of the club will coincide with the motion of the club and result in the vibration or flexing of the club head out of line with the shaft, which will be instantly apparent by an unwieldy feeling of the club. This action is analogous to that of a weight having its motion initiated or arrested through a vibratory stem. In swinging the club down from across the shoulder in the initial part of the stroke, the wrists should be rolled gradually to bring the club face into position for contact with the ball. The provision of the flexible section in the club insures that this motion of rolling the wrists shall be gradual in order that the head of the club shall have opportunity to gain the inertia of the shaft before the flexible section comes into position for flexure. Thus the golfer soon cultivates an instinctive rolling of the wrists to just the proper degree, which is determined by that point where he feels no bobbing influence of the club head on the end of the shaft.

The action of the club and the construction of the flexible section will be more apparent from the accompanying drawing wherein I have illustrated a preferred embodiment of my improved golf club.

Figure 1 is an elevational view of an iron club constructed in accordance with my invention;

Figure 2 is an enlarged fragmentary sectional view of the club illustrating the flexible section; and

Figure 3 is a similar view of a modified construction of flexible section.

The club which I have illustrated is of a mid-iron type, but it will be obvious that the invention is applicable to any type of club. The club comprises the shaft 1, which is made of a suitable grade of wood or of reticulated steel, and is provided with the leather hand grip 2. On the lower end of the club is mounted the head 3, which is formed with an integral neck or socket extension 4.

The flexible section, which is broadly designated 5, is arranged to connect the socket 4 with the shaft 1. As shown in section in Figure 2, this flexible section comprises a plurality of leaf springs 6, which are disposed substantially parallel with the face of the club and are secured in the socket extension 4 and in the lower portion of the shaft 1 as illustrated. In the present instance I have shown three leaf springs 6, but it will be obvious that the number of these springs can be varied depending upon the thickness of the spring and the weight and utility of the club head. These springs preferably consist of short sections of thin, flat spring steel of a width substantially equal to the thickness of the shaft 1. The upper ends of the spring 6 are rigidly secured to the end of the shaft 1 against angular motion by slotting the end of the shaft and pinning the springs in this slot. The slotted end of the shaft 1 is reinforced by a ferrule 7, which has an inwardly extending flange 8 extending over the lower end of the shaft. Two rivets or pins 9 are passed through holes in the wood shaft and in the spring leaves 6, and are headed over on the outside of the ferrule 7 as indicated at 11.

The lower ends of the leaf springs 6 are rigidly imbedded against angular motion in a filler 12, of wood, rubber, or any other preferred material which is set into the socket portion 4 of the club head 3. As illustrated in Figure 1, the spring leaves 6 are made slightly tapering in width to enable the lower ends of the springs to be inserted into the relatively small socket portion 4. The filler 12 is slotted similarly to the shaft 1, and the springs are retained in the slot by transverse rivets or pins 14 which pass through holes in the filler and in the springs, and are headed over on the outside of the socket 4. It will be noted that the holes provided in the two outermost springs 6 are of longitudinal slot formation, as indicated at 15 and 16, while the holes in the center leaf spring 6′ are of the same size as the pins 9 and 14, and fit snugly about the same. As a result of this construction, the central leaf spring 6′ functions to securely tie the club head to the shaft against longitudinal play, while the two side springs 6 have freedom for sliding motion along the central spring 6′ during the flexure of the springs. The springs have a snug fit in the slotted end of the shaft 1 and in the filler 12 so that they are in firm engagement with the shaft and with the head at all times. It will be apparent that this laminated series of springs will permit a certain degree of flexing of the club head in a plane transverse to the face of the club, but will effectually resist any tendency of the club head to flex outwardly or rearwardly from the axis of the shaft 1. Though the preferred construction is to dispose the spring flatwise to the club face, it will be obvious that they may be inclined slightly to the club face if desired.

While I have shown the lower ends of the springs 6 and 6′ as mounted in the socket 4, it is to be understood that the flexible section 5 may lie higher up on the club and may be inserted in the wooden shaft if desired, as this is a matter of choice.

In Figure 3 I have shown a modified arrangement of the leaf springs which compose the flexible section 5′. In this figure, the flexible section is illustrated as being interposed in the shaft between two sections of the shaft 18 and 19 at a point slightly above the club head. The precise location of this flexible section, as between the mounting in the socket 4 or interposed further up in the body of the shaft, is a structural point which can be varied to secure the most efficient action in the club. In referring to the "shaft" in the appended claims, it shall be understood that I have reference to that portion of the shaft above the flexible section 5′. The upper section of shaft 18 is provided with a plurality of parallel slots 21 into which are inserted the ends of a series of spaced leaf springs 22. The lower section of shaft 19 is similarly provided with a plurality of slots 23 in which are secured a cooperating series of spaced leaf springs 24. Both sets of springs 22 and 24 are rigidly held in their respective shaft sections by pins or rivets 25 which pass through ferrules 26 on the ends of the shaft sections. The two sets of springs are meshed, with a spring of one series between adjacent spaced springs of the other series so that the springs extending from the two sections of shaft are in alternating relation in the assembled flexible section. In the center of the assembled series of springs 22 and 24 is disposed a relatively long spring 27 which functions to tie the two sections of shaft together against longitudinal separation. The ends of this latter spring are extended up into the slotted shaft sections where they are rigidly held by the transverse pins 25. The free ends of the other springs 22 and 24 terminate just short of the ends of the shaft sections and are wedged in the extending ends of the ferrules 26, preferably by a yieldable packing 28 of rubber or any other suitable material. By this arrangement the two series of springs have entire freedom of sliding motion one

upon the other, during the flexing of the spring section 5′, and also have firm connection with the shaft sections.

The peculiar and novel action of the club obtained by the insertion of the characteristic form of flexible connection between the shaft and head of the club has been previously described. The ability of the flexible section to flex in the plane of impact obviates the undesirable tendency of some golfers to impart a "push" to the ball, and makes it imperative that the stroke or swing be properly made so that the inertia in the club head alone shall be sufficient to drive the ball. The ability of the flexible section to bend only in the plane of impact and not in any other direction always retains the club head under the control of the shaft, in so far as angle of direction, or inward or outward position of the club head with respect to the shaft is concerned. By "plane of impact" it shall be understood that I mean that plane in which the motion of the club head is transmitted to the ball and which extends substantially at right angles to the face of the club. This characteristic ability of the flexible section to flex in the plane of impact also has the very important function of requiring that the golfer "roll" the shaft properly when bringing the club back over the shoulder and when starting the downward swing. In these positions of the club the flexible section should be at such an angle as to present the springs edgewise to the plane of motion of the club, which corresponds to the correct position of the club head. If the club is turned so that the springs are flat-wise to the plane of motion of the club there is immediately felt a bobbing tendency in the club shaft produced by the vibratory play of the club head.

While I have described the invention particularly as embodied in a golf club, it is to be understood that the invention may be applied to good advantage to playing clubs or bats such as tennis racquets, baseball bats, and the like.

I claim:

1. In a golf club, the combination of a head, a shaft, a flexible section between said shaft and said head, said flexible section comprising a plurality of spring leaves, said leaves having relative sliding motion, one upon the other.

2. In a golf club, the combination of a head, a shaft, a flexible connection between said shaft and said head, said flexible connection comprising a plurality of leaf springs, one of said springs being rigidly connected to said shaft and to said head, the other of said springs being slidable relative to said first spring.

3. In a golf club, the combination of a head, a shaft, a flexible section between said head and said shaft, said flexible section comprising a first leaf spring, pins for rigidly securing the ends of said leaf spring to said shaft and to said head, and secondary leaf springs co-operating with said first leaf spring having slotted connection with said pins to permit relative sliding motion between said springs.

4. An instruction golf club for teaching the proper swinging of such implements comprising, in combination, a head of conventional design, a shaft of conventional design, and a connection between said head and shaft sufficiently flexible to permit the entire implement to function as a two-piece club when improperly swung, but capable of holding the head so as to constitute in effect a one-piece rigid club when the club is perfectly swung.

5. An instruction golf club for teaching the proper use of such implements, comprising, in combination, a head of conventional design, a shaft of conventional design, and a connection between said head and shaft permitting said head to yield along the line of impact in case the club is improperly swung so as to give the effect of a two-piece club, but capable of holding the head when properly swung to constitute in effect a one-piece club.

In witness whereof I hereunto subscribe my name this 13th day of August, A. D. 1919.

JOHN A. DIENNER.