



# UNITED STATES PATENT OFFICE

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## GOLF PRACTICING AND TEACHING APPARATUS

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1 Claim. (Cl. 273—35)

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This invention relates to apparatus for use in teaching and practising the game of golf and more particularly for practising that department of the game concerned with driving, i. e. when the club is applied with a full swinging movement to hit the ball with considerable force to drive it comparatively long distances. The object of the invention is to provide an apparatus, to which the club may be attached when practising, which will constrain the movement of the club, at or about that part of the shaft which is gripped by the hands, to conform to a correct swing, whilst permitting freedom of wrist movement and inclination of club.

The invention is based on the generally accepted principle that although the wrists shall in themselves be free to flex and turn naturally, they should nevertheless follow a correct trajectory, both as regards plane of swing and arc of swing in that plane, when swinging the club. Thus, regarding the wrists as a natural universal joint, the apparatus according to my invention permits the club to be axially twisted as well as moved into a wide range of inclinations radiating universally from such a joint, whilst at the same time it serves to keep the joint (or substantially so, i. e. the part of the club gripped by the hands) in a predetermined plane and on a predetermined arc lying in that plane. In this connection the plane may be vertical or inclined, usually inclined backwards from ground level towards the player, and such a plane may be selected, and the apparatus adjusted, according to the height and other natural attributes of the player or the nature of the shot (either as determined by a teacher or the player himself). Similarly, the apparatus enables a correct arc to be selected, from one extreme where it is very "wide" (on a long radius to the limit of the player's reach), to the other extreme where a "narrower" or much smaller circle is traversed. By these adjustments, not only can a correct combination of plane of swing and arc of swing be secured for the chief purpose of "the drive" but the apparatus can be made applicable for use with other shots involving less swing and less force.

In a preferred embodiment a limited degree of tolerance is allowed so that the player may displace the pre-arranged arc so that it lies in a plane differing from its originally set plane. This displacement may be in the forward direction to a position more over the ball so as to accommodate the player's natural forward movement when bracing the body to hit on the down swing.

In attaining these particular objects the in-

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vention serves to exercise a comparatively unobtrusive control over the main and important swinging action of the drive whilst not interfering with the natural universal movements of the wrist in twisting the shaft on its axis for "opening and closing" the face of the club (i. e. inclining the face of the club in relation to the direction of the desired path of the ball), and also adjusting the angle of the club in any selected position radiating from the grip.

Broadly the invention provides apparatus for use in teaching and practising the game of golf, wherein a rotatable control means is provided which allows a golf club carried thereby to be twisted about the longitudinal axis of its shaft, whilst constraining the club to swing in a controlled arc within a plane suitably angularly disposed to the axis of rotation of the control means. In one example of the invention the club is adapted to be fixedly mounted in a club carrier designed to clamp on to any selected part of the shaft in the region of the hand grip, and this carrier is itself supported by compound swivelling and pivoted joints so as to be movable universally or substantially so on one end of a control element which projects forward away from the player where it is anchored by its remote end, and by a rotatable joint, to a bracket adjustably mounted as to height on a fixed vertical post, wall fitting or the like. The composite joint would be positioned, when mounting the club, as near as possible to that part of the club shaft where the player's wrists would be located. The said control element is constructed to allow a limited parallel movement to and from the rotatable joint whereby during the natural pull on the rod when swinging back and upward there is an unalterable outward limit, but when on the down swing and "follow through" a slight forward movement towards the rotatable joint is possible so that the natural and desirable tendency to brace the body forward and thus to shift the arc towards and more over the ball is accommodated.

The general mechanical effect of the apparatus is that the end of the control element located near the player, and to which the club is attached, is, by virtue of the rotatable anchorage fitment of the other end to a fixture, always located in a pre-set plane determined by the effective length of the control element and the angle of the rotatable axis at the anchorage, whilst the arc described by this playing end when moving in the said pre-set plane is fixed by the distance the club clamping point lies off the axis of rotation

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of the said anchorage fitment. Both the plane and the arc may be varied by suitable adjustments.

In the embodiment of the invention which is illustrated by way of example in Figure 1 of the accompanying drawing the apparatus comprises a vertical post 1 on which is slidably mounted a rod-supporting bracket 2 which is adapted to be adjustably fixed in position on the post 1. The bracket 2 conveniently comprises a pair of clampable struts 2a and a bridging portion 2b. The post may be embedded in the ground and held rigid by guy ropes or other devices, or, for indoor work, it may be secured to a wall or other convenient fixed structure.

To the bracket 2 is secured a hollow journal-bearing 3 the axis AA of which is directed approximately towards the position which is to be occupied by the player, and said axis AA can be varied from approximately the horizontal to other positions inclined downwardly away from the bracket 2. One way of making such an adjustment is shown and consists in mounting the bearing 3 on a short platform 4 horizontally pivoted to the bracket 2 and supporting said platform 4 by a hinged strut 5 extending upwards from the bracket and having a pin-and-slot clamping connection 6 with the platform 4. By this device the angle of the axis AA to the horizontal can be varied, and consequently any element or assembly rotatable in the bearing 3 will itself turn about the axis AA so that the end of a member forming part of an assembly but offset from the axis AA will describe a path in a plane perpendicular to said axis. It will be seen therefore that by appropriately adjusting the location of the axis AA a plane of the character described can be pre-set in a variety of positions from the vertical to various degrees of inclination therefrom.

In the said journal-bearing 3 is rotatably mounted a stub shaft 7, there being radial and/or thrust bearings interposed so that the shaft 7 normally turns smoothly and easily in the bearing 3. This shaft 7 carries a device described later herein as the control assembly, and which is constructed so as to give the player freedom of movement for bracing the body forward (as referred to earlier herein) and to this end a parallel linkage is introduced between the rod (i. e. the control rod) and the shaft so that a limited degree of controlled variation of the pre-set plane may take place during play.

This parallel linkage comprises a diamond assembly of links 8, 9a, 9b and 10, one link, i. e. the basic link 8, being fixedly and angularly adjustably mounted on the shaft 7 and projecting downwardly therefrom at an angle to axis AA. Clamp means 11 are provided for securing the link 8 in desired angular relation to shaft 7. To the ends of said basic link 8 there are pivoted respectively the pair of upwardly directed side links 9a, 9b and pivotally mounted between the free ends of said side links is the final link 10 in the form of a control element which has a continuation projecting forwardly and downwardly from the side links 9a, 9b away from the direction of the shaft 7. This control element or rod 10 lies parallel with the basic link 8, and its free end carries the member to which the golf club shaft is secured. The contraction and/or expansion of the said parallel linkage may be under the control of a suitable spring 12.

The basic link 8, and thus the whole parallel linkage and the control rod 10 forming part there-

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of, is fixed in requisite angular relationship with the journal axis AA by the clamp device 11, which conveniently consists of a slotted quadrant on the basic link 8 co-acting with a bolt and clamping nut carried by the shaft 7.

By adjusting the angular position of the parallel linkage in relation to the journal axis AA, the free end 10a of the projecting control rod can be brought closer or nearer to the said axis AA and consequently the arc swept by the said free end of the control rod (when the whole control assembly turns about the journal axis AA) may be varied in radius. Moreover, as will be more apparent later, if the player presses forward, the parallel linkage will permit the plane of the arc of swing of the club to move forward, within limits, but always parallel to the plane pre-set by the original adjustment of the inclination of the axis of the shaft.

The control rod may be telescopically adjustable to displace the pre-set plane of swing nearer to or further away from the journal anchorage point, and also to raise and lower the member carried by the free end of the rod to which the club shaft is attached, a clamping screw 13 being provided to hold the rod 10 in the telescopically adjusted position.

The club carrier 14 takes the form of a tubular body 14a which is adapted to embrace the club shaft 15 with clearance and of two end rings 14b which are mounted on the tubular body 14a with the interposition of thrust bearings 14c, said end rings 14b having set screws 14d for clamping the club shaft 15 thereto. The club shaft 15 may thereby freely rotate on its longitudinal axis in the carrier 14 yet be fixed against axial sliding movement. The carrier 14 is provided with an arm 16 extending upwardly at an acute angle to the axis of the body 14a, and it is connected to the control rod 10 at the upper extremity by a pivoted joint on an element 17 swivelly rotatable in the hollow end 10a of the control rod 10 and constituting a form of composite or "universal" joint. The swivel joint is therefore spaced away from the club shaft 15 mounted in the carrier 14 by means of the arm 16, and will not interfere with the grip on the club, whilst at the same time it can serve to position the swivel joint centrally over the player's gripping hands. The swivel joint is not "universal" to the extent provided by a ball and socket type of joint, since the movement of the arm 16 relative to the swivel element 17 is limited to one of swinging about the transverse pivot pin 18. This form of joint giving substantially a universal movement is, however, preferred to the ball and socket type because of the restraint it imposes on the swinging movement of the arm 16.

The club shaft 15 is therefore capable of being clamped to the carrier 14 in the region of the grip, and can be freely inclined at any requisite angle radiating from the swivel joint, and twisted on its own axis to open and close the striking face of the club head 19.

In use, the ball is placed on the tee or other place on the ground between the player and the said vertical post 1. The control rod 10 is lifted to extend angularly downwards over the top of the ball, and well clear thereof, and the club shaft 15 placed in the carrier 14 at the most suitable angle to the ground with the driving head 19 accurately placed alongside the ball. The player takes his stance, grips the club and positions it nicely for a comfortable correct drive, and then

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the carrier 14 is clamped to the club shaft 15. The main anchorage of the apparatus as to height on the post 1 (or wall bracket or the like) is adjusted so that the control rod 10 is clamped to the club in the correct position on the shaft. The angle of the journal-bearing axis AA is adjusted to pre-set the plane of swing BB and the arc of swing is also set in the manner hereinbefore described.

It will be clear that although subsequently the downward inclination of the shaft 15 may be varied, and the shaft twisted (all according to natural wrist movements when driving), the arcuate path taken by the shaft at the region gripped by the hands during the swing is determined by the control rod 10 which swings about the journal bearing 3 associated with the rod-supporting bracket 2. The back and upward swing seeks to pull the rod 10 unless the player has acquired the delicacy of feel and accuracy of swing which comes with a good and correct swing, but the player is limited in this outward location of the arc. On the down swing and follow through after impact, the player may brace himself more forward for the driving effort and the parallel linkage of the control element permits the arc of swing, in this case, to move forward into a plane parallel to that set for the backward limit.

In teaching and practising certain golf strokes it may be desirable to be able to adjust the plane of the arc of swing of the club by a movement toward the journal bearing which is other than that obtained with a control assembly having a parallel linkage system as already described. It may also be desirable to be able to incline the axis of the control rod laterally in relation to the axis of the journal bearing.

Figures 2 and 3 of the accompanying drawings show a modified form of apparatus incorporating adjustment means for the purposes indicated above.

In the arrangement shown in Figure 2 the link 8 of the parallel linkage of the construction shown in Figure 1 is replaced by a quadrant plate 20 with an extending arm 21 inclined to the axis of the journal bearing 3 in an upward direction and the two links 9a, 9b are replaced respectively by a link 22 pivoted to the quadrant plate 20 at the centre of radius of its slot 11 and by a link 23 pivoted to the outer end of quadrant plate 20 at a point substantially in line with the axis of the shaft 7. Both links 22 and 23 are pivotally connected to the inner end of the control rod 10, and the tensioning spring 12 extends between the outer ends of arm 21 and link 23. The quadrant plate 20 has secured to it a pair of arms 25 whereby the said plate 20 is clamped to a sector plate 26 pivoted to the shaft 7 (see especially Fig. 3). The clamp screw 27 passing through the arcuate slot 28 of the pivoted sector plate 26 enables the whole of the control assembly to be

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inclined laterally in relation to the axis of shaft 7 and to be locked in the set position. The item marked 29 is a braking device which forms no part of the present invention.

The platform 4 which supports the journal bearing 3 of the shaft 7 is carried by a second quadrant plate 30 which is hinged to the bridging portion 31 which extends between two clampable collars 32 slidable on the post 1. A pointer 33 on the bridging portion 31 indicates by one end the inclination to the vertical of the control assembly and the height of the bridge 31, graduations on the vertical post 1 being provided to facilitate repeated setting at the same height. The post 1 may be made in a series of sections bolted together, the composite post being held erect by guy wires 34. The club mounting means are of the same construction as those shown in Figure 1 and like parts are given the same references as used in Figure 1.

I claim:

A device of the class specified comprising a supporting post adapted to be erected on the ground, a height-adjustable bracket on said post, a platform mounted on said bracket for adjustment of the angle of inclination of the platform toward the ground, a journal bearing on said platform, a stub shaft freely rotatably mounted in said journal bearing, an articulated parallel linkage of frame form attached to said shaft so as to rotate therewith and incorporating one limb constituting a control rod which extends beyond the linkage frame and one other limb which is directly swingable on said shaft, clamp means for setting said swingably adjustable limb of the frame in a fixed position relatively to said shaft, spring means associated with said linkage frame and tending always to pull said control rod toward the swingably adjustable limb of the frame, a control arm swivelly and pivotally jointed to said control rod, and club carrier means mounted on said control arm and including a freely revoluble sleeve adapted to receive and grip the shaft of a golf club, adjustment of the articulated parallel linkage in relation to said shaft setting the control rod in such a position as to dispose the club shaft for arcuate swinging in a desired plane of inclination in relation to the vertical.

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