

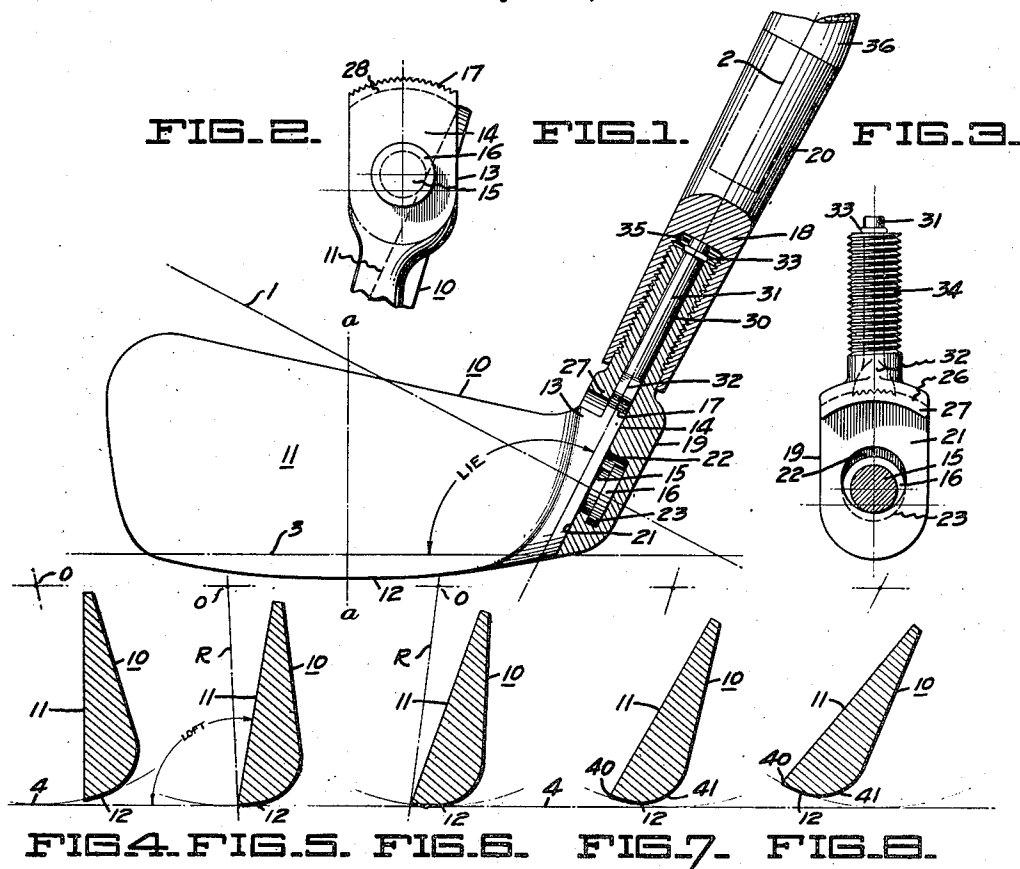
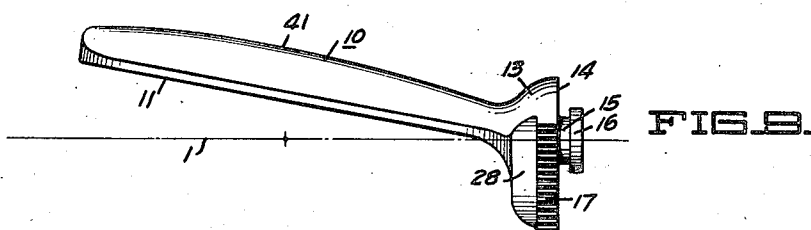
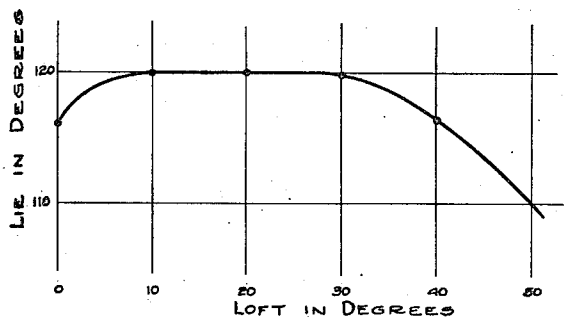
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ADJUSTABLE GOLF CLUB

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ADJUSTABLE GOLF CLUB.

Application filed April 15, 1926. Serial No. 102,108.

This invention relates generally to a golf club and particularly to a club which is provided with an adjustable head.

Golf clubs have previously been constructed with heads pivotally mounted so that the loft may be varied. In this way it has been proposed to make a single club perform the functions of several clubs. These clubs however were impractical since they failed to take into account the fact that the angle of lie should be consistent with the angle of loft. In other words, the club might have the correct angle of lie when adjusted to be used as a midiron but would not have the correct lie when adjusted for a putter or a niblick.

It is an object of this invention to devise an adjustable golf club in which the angle of lie will be maintained consistent with the angle of loft.

It is a further object of this invention to provide means in an adjustable golf club for maintaining the angle of lie substantially constant while the loft of the striking face is being varied from that of a driving iron to that of a mashie.

Further objects of this invention will appear from the following description in which we have set forth the preferred embodiment of our invention. It is to be understood that the scope of the invention is to be determined by the terms of the appended claims and the state of the prior art.

Referring to the drawings:
Figure 1 is a side elevational view of a golf club constructed in accordance with this invention, certain parts being shown in section.

Fig. 2 is a detail showing a portion of the interlocking means for securing the head of the club to the shaft.

Fig. 3 is a detail view showing parts of the locking mechanism.

Figs. 4 to 8 inclusive are cross sectional views taken along the line *a-a* of Fig. 1 showing several adjusted positions of the striking face.

Fig. 9 is a detail view of the club head as it appears looking parallel to the striking face.

Fig. 10 is a curve showing diagrammatically the manner in which the lie is maintained consistent for different angles of loft.

The golf club with which this invention

has been incorporated comprises generally a blade 10 having a flat striking face 11 and a sole 12. The heel of the blade is provided with an enlarged end portion 13 having a plane face 14 which is parallel to the shaft of the club. Extending from this plane face 14 there is an integral projection 15 which is provided with a head 16. The end portion 13 is preferably provided with an upper edge 17 which is arcuate in shape and provided with a series of serrations. The shank 18 of the club is preferably constructed in two parts, the lower portion 19 being pivotally secured to the club blade 10 and the upper part 20 being rotatable with respect to the part 19 in order to lock the blade of the club in any adjusted position. The lower shank portion 19 is provided with a plane face 21 which is similar in contour to the plane face 14 upon the heel of the blade. A recess 22 is formed within the shank portion 19 to receive the projection 15, the lower portion of this recess having an arcuate groove 23 within which the head 16 is adapted to interlock. The shank portion 19 is also formed with an arcuate recess 26 to receive the upper serrated edge 17 of the end portion 13, the lip 27 which is thus formed upon the shank portion being adapted to closely fit the upper arcuate surface 28 of the portion 13. Thus, as long as the serrated edge 17 is within the recess 26 the blade is securely locked to the shank of the club but when the blade is rotated to such a position that it may be lifted relative to the shank portion 19 then the projection head 16 may be lifted from the recess 23 to permit the blade and shank to be separated.

For locking the blade in any one adjusted position the shank portion 19 is provided with an axial bore 30 within which is slidably disposed a locking pin 31. The lower end of the pin 31 is provided with a serrated head 32 for engagement with the serrated edge 17, while the upper portion is provided with a retaining ring 33 whereby the pin is retained within the shank portion 19. In order to force the pin 31 into locking engagement with the serrated edge 17 the shank portion 19 is provided with external left hand threads 34 adapted to engage the internal threads 35 of the upper shank portion 20 whereby the inner end of the bore in

the shank portion 20 is brought into abutting contact with the upper end of the pin 31 to force the same into locking engagement. Thus it is seen that by this arrangement the blade of the club may be locked in any adjusted position merely by rotation of the shaft 36, this shaft being of course fixed within the shank portion 20.

With a club of the above construction the pivotal axis 1 of the blade will necessarily be substantially normal to the axis 2 of the shaft and inclined to the sole of the blade, since the projection 15 forms a bearing for the pivotal connection between the blade and the shank. The angle of lie of such a club is indicated in Fig. 1 and is measured by the angle between the axis 2 of the shaft and the chord of contact 3 of the sole 12. The angle of loft of such a club may be measured by the angle which the striking face makes with respect to a plane parallel to the axis of the shaft and to the lower edge of the striking face. In this invention it is proposed to have the angle of lie consistent with any angle of loft to which the blade may be adjusted so that for any given adjusted position of the blade the lie will be substantially the same as the standard golf club of that loft. This consistency of lie is made possible by inclining the pivotal axis 1 not only to the chord of contact 3 but also to the plane of the striking face shown in Fig. 9.

The effect of inclining the pivotal axis to the plane of the striking face has been illustrated in Figs. 4 to 8 inclusive. These views were taken along the line $a-a$ of Fig. 1 looking parallel to the plane of the striking face. Such a line $a-a$ has also been shown in Fig. 9, and the inner section of line $a-a$ with the axis 1 gives the point about which rotates the surface intersected by the plane of $a-a$. Taking 0 as this point, then the advancing edge 40 of the striking face will move in the arc of a circle with 0 as the center and R as a radius as the loft is varied. Naturally the club will have maximum lie when the contact point of the sole of the club is the greatest vertical distance below the point 0.

Fig. 4 shows the striking face at zero angle of loft or in a position in which the club is to be used as a putter. It will be noted that the sole is raised above the base line 4, thus showing that the lie for this position is substantially less than the maximum value. In Fig. 5 the loft is about 10 degrees which is the correct angle for a driving iron. In this position the sole has dropped down to the base line 4 indicating that the lie has been increased. In Fig. 6 the loft is approximately that for a midiron or about 25 degrees, in which position the lie has remained substantially constant with the maximum value.

If the sole of the club were made substantially flat then the lie of the club would not be sufficient when the loft is made about 30 degrees as shown in Fig. 7, which is correct value for a mashie. This has been overcome by providing a fillet 41 on the sole of the blade to the rear of the forward edge 40. This fillet or curved sole maintains a line of contact to the rear of edge 40 so that the effective lie of the club is maintained practically constant for changes in loft from a driving iron to a mashie. Fig. 8 shows the loft at substantially the right value for a niblick, in which position the lie is substantially less.

The relationship between the angles of loft and lie for this club is illustrated in Fig. 10 in which angles of loft have been plotted against angles of lie. The curve rises from zero loft to a maximum value of lie of a loft of about 10 degrees, remains practically horizontal between 10 degrees and 30 degrees and again drops rapidly to a minimum lie at 50 degrees loft. It is to be understood that this curve represents what may be termed consistency of lie for the range of adjustment of the club. However, it is obvious that the curve may be modified to suit the tastes of different individuals by varying the inclination of axis 1 or by varying the arc of fillet 41, or both.

We claim:

1. A golf club comprising a blade having a striking face, means for adjusting the angle of loft of said striking face, and means for automatically causing the angle of lie of the club to remain constant throughout a substantial variation in the angle of loft.
2. A golf club comprising a blade having a striking face, means for adjusting the angle of loft of said striking face, and means for causing the angle of lie to remain substantially constant for variations in the angle of loft from a driving iron to a mashie and to decrease when varied from a mashie to a niblick.
3. A golf club comprising a blade having a sole and a striking face, means for pivotally securing said blade to a shaft, the axis of said pivot being inclined to the line of contact of the sole with the ground, and means for automatically maintaining the angle of lie of the club substantially constant for a substantial variation in the angle of loft of the striking face.
4. A golf club comprising a blade having a sole and a striking face, means for pivotally securing said blade to a shaft, the axis of said pivot being perpendicular to the axis of the shaft, and means for maintaining the angle of lie substantially constant when changing the angle of loft from that of a midiron to that of a mashie.
5. A golf club comprising a blade having a sole and a striking face, means for pivot-

ally securing said blade to a shaft on an axis inclined to the line of contact of the sole with the ground whereby a change in the angle of loft will tend to cause a corresponding change in the angle of lie, and compensating means for maintaining the lie of the club substantially constant for a plurality of loft angles, but to permit a substantial variation in the angle of lie when the loft is varied from a midiron to a niblick.

6. A golf club comprising a blade having a sole and a striking face, means for pivotally securing said blade to a shaft on an axis inclined to the line of contact of the sole with the ground, and a fillet to the rear of the striking face adapted to form a line of contact with the ground for certain angles of loft.

7. A golf club comprising a blade having a sole and a plane striking face, means for pivotally securing said blade to a shaft on an axis inclined to the line of contact of the sole with the ground and to the plane of the striking face, and a fillet to the rear of the striking face adapted to form a line of contact with the ground for certain angles of loft.

8. A golf club comprising a blade having a sole and a striking face, means for pivotally securing said blade to a shaft, the axis of the pivot being inclined to the sole of

the blade, and means for maintaining the angle of lie substantially constant when changing the angle of loft from that of a midiron to that of a mashie. 35

9. A golf club comprising a blade having a sole and a striking face, means for pivotally securing said blade to a shaft, the axis of the pivot being inclined to the sole of the blade, and means for causing the angle of lie to be substantially the same for the midiron and mashie positions of the blade. 40

10. A golf club comprising a shank, a blade adjustable with respect to said shank and having a striking face, and means for automatically effecting a predetermined decrease in the angle of lie as the angle of loft is varied from the angle of a mashie to the angle of a niblick. 45

11. A golf club comprising a shank, a blade pivotally and adjustably secured to said shank and having a striking face, and means for automatically causing the angle of lie to be substantially the same for the midiron and mashie positions of the blade, the pivotal axis of said blade being at an angle to the sole of said blade. 50 55

In testimony whereof, we have hereunto set our hands.

JOSEPH A. NOVAK.
FRANKLIN C. FISHER.