ADJUSTABLE GOLF CLUB

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My invention relates in general to golf clubs and in particular to that type of club which has a head rotatably mounted upon a spindle with means for changing the relative positions of the head and spindle, whereby the loft or lift of the club may be adjusted to the position suitable for the stroke at hand. This present invention relates to the invention shown and described in Patent No. 2,217,333 issued to me on October 8, 1940.

The principal object of my invention has been to provide a golf club of this nature which shall have the clamping means self-contained and forming an attached part of the structure without requiring the use of any separate tool.

Another object has been to provide compact stop means for the head of my club for limiting the relative rotation between the head and the spindle.

Moreover, the locking means of my device are so designed that they will not be disturbed by the continued use of the club.

Furthermore, my club is light in weight, convenient to adjust, and relatively inexpensive to manufacture.

The above objects and advantages have been accomplished by the device shown in the accompanying drawing, of which:

Fig. 1 is a back view of my complete club.
Fig. 2 is a top plan view thereof.
Fig. 3 is an end view of my device showing the head in a number of positions.
Fig. 4 is a sectional view through the head taken on line 4-4 of Fig. 1.
Fig. 5 is an enlarged, fragmentary, sectional view showing details of the detent means.
Fig. 6 is an end view of the head with the spindle removed.
Fig. 7 is a fragmentary, sectional view taken on line 7-7 of Fig. 1.
Fig. 8 is a fragmentary, sectional view of a modified form of structure.

Referring now to the drawing, 1 represents the shaft of my club which has a shank 18. At the lower end of the shank there is a shank boss 17 extending from which is the spindle 16 of my club. This spindle and shank are preferably integral one with the other so that a very rigid construction is brought about. The balance or hang of my club is improved by locating the spindle 16 slightly behind the shank 17 so that the face of the head lies behind the plane of the shank, as clearly shown in Figs. 3 and 4.

The head 20 of my device is provided with a longitudinally arranged boss 21 which is joined to the lower edge 22 of the head by means of a supporting surface 23. A longitudinal bore 24 is provided through the boss 21 for the reception of the spindle 16. The supporting surface 23 is so disposed that it lies substantially parallel with the turf when the head is in the niblick position, whereby an extended area is presented to the turf if needed during the drive.

Extending upwardly from the boss 21 is a flange 25 which is interspaced in relation to the back surface 26 of the head. The locking means of my device is arranged within the space between the flange and the head. This locking means comprises an actuating lever 39 having an upwardly extending toggle arm 31 and a downwardly extending spindle arm 32. The spindle arm engages an arcuate slot 33 formed in the spindle 16 whereby when the spindle arm is reciprocated as hereinafter described, the spindle and the head will have relative sliding movement for locking and unlocking the head upon the spindle. The spindle arm 32 passes through a suitable aperture 37 formed in the cylindrical boss 21. The faces 34 and 35 at the ends of the arcuate slot form stops for limiting the relative rotation of the head upon the spindle at each end of the predetermined rotational movement of the head. The actuating lever is pivotally mounted upon a pin 41 carried by the head and the flange and it is provided with a lever toggle arm 42. Connecting this lever toggle arm with the toggle arm 31 of the actuating lever is a toggle link 43. The operating lever is curve shaped as shown in Fig. 1 and encloses the actuating lever and the toggle link when in their locked positions, as shown also in this figure.

A stop surface 44 is provided on the operating lever for engagement with the top surface of the toggle link 43 when the parts are in their locked positions, as shown in Fig. 1. A finger ridge 45 is provided at the extreme end of the operating lever whereby the operator may easily manipulate the lever to either of its positions. The toggle link 43 is connected at one end to the lever toggle arm 42 by means of a pivot 46 and at the opposite end to the toggle arm 31 by means of a pivot 47. The pivots 41, 46 and 47 are so arranged that a toggle action is produced between the parts.

The link and lever parts are so proportioned that a snap action is produced when the pivot
is moved to either side of a line drawn between the axes of the pivots 41 and 47, whereby the operating lever will be securely held in its closed position. This step action is produced because the head will have been drawn up to its locked position upon the spindle before the pivot pin 46 has reached the said line between the pivots 41 and 47 and some parts of the device must yield in order to allow the said pivot pin to pass beyond the said line. To this end the arm 31 of the actuating lever 30 is made flexible so that it will spring when the operating lever is manipulated.

The lever toggle arm 42 and the toggle arm 51 are each provided with a reduced portion 53 and 64, respectively, and the ends of the toggle link 43 are bifurcated for engagement with said portions. The lever toggle arm 42 is provided with a detent surface 65 which contacts with the bottom surfaces of the adjacent end of the toggle link 43 when the operating lever is pushed to its upper position, thereby stopping further movement of the lever. Since the operating lever is pushed downwardly when it is moved to its locking position, centrifugal action upon the head when the club is in use will aid in maintaining the operating lever and its associated locking means in locking position.

The head 20 is provided at the end adjacent the shank boss with a flange 50 which has its face, like that of the shank boss 71, arranged at right angles to the axis of the spindle. Each of these faces is provided with a plurality of ridges 51 formed by interlaced V-shaped grooves 52. These ridges and grooves are radially arranged as shown in Fig. 6 and therefore coat with one another to rigidly hold the head upon the spindle in its adjusted position. When the parts of the locking means are in the positions shown in Fig. 1, the head 20 will be forced against the shank boss 17 and the grooves and interengaged ridges of the two coacting surfaces will be held in firm contact with each other. When the parts of the operating means are moved to the dotted-line position, the head will be moved endwise upon the spindle so as to release the engagement of the interengaging ridges 51 and grooves 52 and the head will then be free to rotate upon the spindle.

So as to keep the head in its adjusted position upon the spindle while the locking means are moved to the position shown in Fig. 1, I provide a detent means clearly shown in Fig. 5. The head 14 is provided with a detent boss 53 formed with a bore 54 in which is slidably mounted a detent 55. The detent is provided with a central bore 56 in which is mounted a helical spring 57. The spring serves to force the detent outwards and to cause its point 59 which is of V-shaped formation into one of the V-shaped spaces 52 formed in the shank boss 17. Not only does this engagement of the detent with the grooves provide means for temporarily holding the parts in the adjusted position, but it also provides a clicking sound by which the position of the head upon the spindle may be accurately determined. In adjusting the head by this manner the head is rotated to either of the stops 34 or 35 at the ends of the arcurate groove 33 and then counting is started from either point while moving the head in the opposite direction. So as to provide visible indication of the relative position of the head upon the spindle a plurality of lines 61 are provided upon the shank boss 17, each line being preferably identified by means of a numeral. The head 20 is provided with an index line 62 which extends preferably across the boss 53 in registerable position with either of the lines 61.

In Fig. 8 I show a modified form of structure in which the toggle link 65 is preferably of U-shape and made of spring material. This link is connected at 76 to the lever toggle arm 42 of the operating lever 40 at one end and at its opposite end to the toggle arm 71 of the actuating lever 72 at 73. This lever is provided with a spindle arm 32 similar to the spindle arm of the other form of device. In this modification, it will be seen that as the operating lever is moved downwardly to its locking position the springing action will be produced by the toggle link 65.

Obviously, instead of connecting the operating lever with the actuating lever by means of toggle linkage, the operating means may if desired be provided with an eccentric. These and other modifications may be made without departing from the spirit of my invention or the scope of the appended claims and I do not, therefore, wish to be limited to the exact embodiment herein shown and described, the form shown being merely a preferred embodiment thereof.

Having thus described my invention, what I claim is:

1. A golf club, comprising a shaft, an integral spindle carried by said shaft, a head rotatably mounted and axially movable upon said spindle, means for non-rotatably locking said head to said spindle upon relative axial movement of said head and spindle in one direction, and lever actuating means carried by said head and engageable with an arcuate slot formed in said spindle, said lever and slot acting as a stop for limiting the free rotational movement of said head on said spindle and for locking said head when moved to its non-rotative position on said spindle.

2. A golf club, comprising a shaft, an integral spindle carried by said shaft, a head rotatably mounted and axially movable upon said spindle, means for non-rotatably locking said head to said spindle upon relative axial movement of said head and spindle in one direction, and toggle actuating means carried by said head and engageable with said spindle for moving said head axially thereto and for holding it in its locked position.

3. A golf club, comprising a shaft, an integral spindle carried by said shaft, a head rotatably mounted and axially movable upon said spindle, means for non-rotatably locking said head to said spindle upon relative axial movement of said head and spindle in one direction, and toggle actuating means carried by said head and engageable with said spindle for moving said head axially thereto and for holding it in its locked position.

4. A golf club, comprising a shaft, an integral spindle carried by said shaft, a head rotatably mounted and axially movable upon said spindle, means for non-rotatably locking said head to said spindle upon relative axial movement of said head and spindle in one direction, spring means for forcing said head axially on said spindle in the opposite direction, and lever actuating means carried by said head, said means being engageable with said spindle for moving said head axially thereon and for holding it in its locked position.

5. A golf club, comprising a shaft, an integral spindle carried by said shaft, a head rotatably mounted and axially movable upon said spindle, means for non-rotatably locking said head to said spindle upon relative axial movement of said head and spindle in one direction, spring means for forcing said head axially on said spindle in the opposite direction, and lever actuating means carried by said head, said means being engageable with said spindle for moving said head axially thereon and for holding it in its locked position.
head and spindle in one direction, and actuating means for moving said head on said spindle, comprising an actuating lever pivotally carried by said head and engageable with said spindle to move the head axially thereon, an operating lever pivotally mounted on said head, and a toggle link pivotally connecting said actuating and operating levers.

6. A golf club, comprising a shaft, an integral spindle carried by said shaft, a head rotatably mounted and axially movable upon said spindle, means for non-rotatably locking said head to said spindle upon relative axial movement of said head and spindle in one direction, actuating means for moving said head on said spindle, comprising an actuating lever pivotally carried by said head and with a toggle arm and a spindle arm, said spindle arm being engageable with said spindle, an operating lever pivotally mounted on said head, and a toggle link pivotally connecting said operating lever with said toggle arm.

7. A golf club, comprising a shaft, an integral spindle carried by said shaft, a head rotatably mounted and axially movable upon said spindle, means for non-rotatably locking said head to said spindle upon relative axial movement of said head and spindle in one direction, toggle actuating means carried by said head and engageable with said spindle to move said head axially thereon, the parts of said toggle means being rotatably mounted upon one fixed pivot, an outer movable pivot and an inner movable pivot, said parts being so proportioned that when moved to locked position said inner pivot is movable beyond a straight-line arrangement of said pivots, and spring means for retaining said toggle parts in their locked positions.

8. A golf club, comprising a shaft, an integral spindle carried by said shaft, a head rotatably mounted and axially movable upon said spindle, means for non-rotatably locking said head to said spindle upon relative axial movement of said head and spindle in one direction, toggle actuating means carried by said head, comprising an actuating lever engageable with said spindle and having a flexible arm, an operating lever pivotally carried by said head and having a lever toggle arm, and a toggle link connecting said flexible arm with said lever toggle arm.