Nov. 27, 1951 J. VERDERBER 2,576,866

ANGULARLY ADJUSTABLE GOLF CLUB AND LOCKING MEANS THEREFOR

Original Filed March 21, 1945 2 SHEETS--SHEET 1

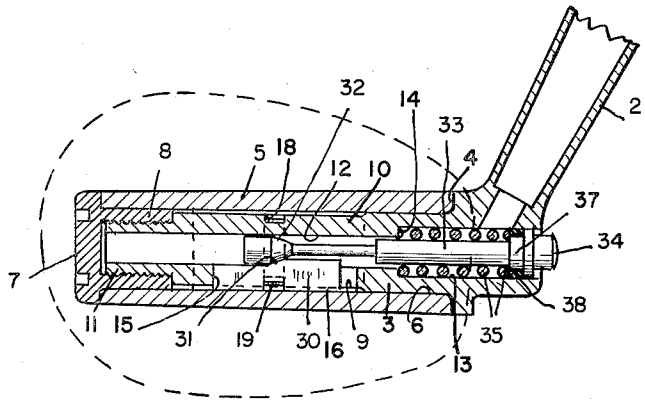


Fig. 5

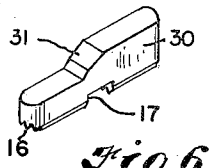


Fig. 6

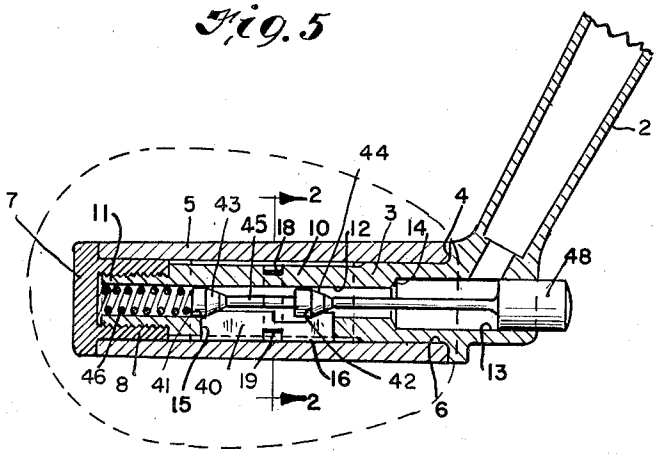


Fig. 1

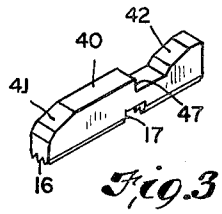


Fig. 3

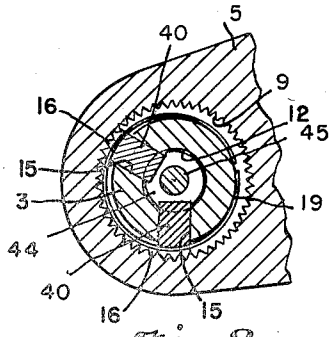


Fig. 2

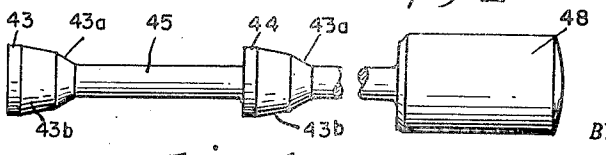


Fig. 4

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ANGULARLY ADJUSTABLE GOLF CLUB AND LOCKING MEANS THEREFOR

Original Filed March 21, 1945 2 SHEETS—SHEET 2

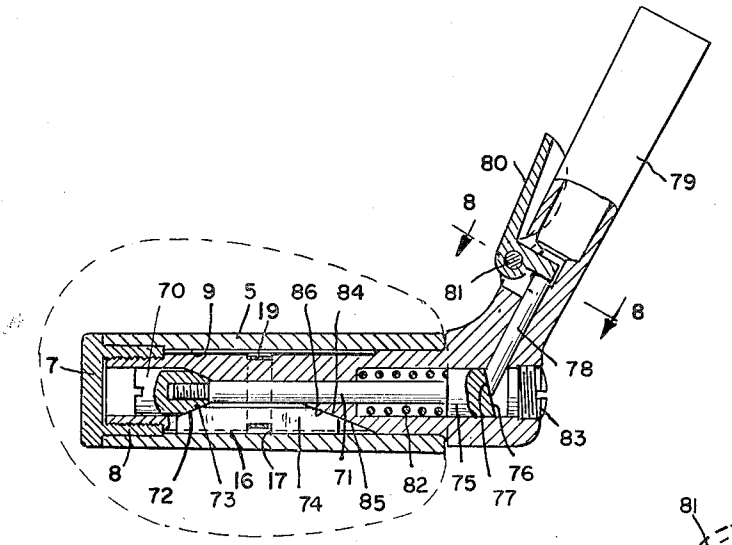


Fig. 7.

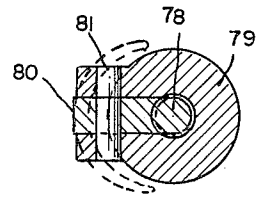


Fig. 8.

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## ANGULARLY ADJUSTABLE GOLF CLUB AND LOCKING MEANS THEREFOR

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Original application March 21, 1945, Serial No. 583,902. Divided and this application June 14, 1949, Serial No. 99,021

6 Claims. (Cl. 273—79)

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This invention relates generally to golf clubs, but has reference more particularly to golf clubs having angularly adjustable heads and to means for adjusting such heads.

This application is a division of my copending application, Serial No. 583,902, filed March 21, 1945, now Patent No. 2,475,926 granted July 12, 1949, which also relates to adjustable head golf clubs.

In my copending application, above referred to, I have disclosed an adjustable head golf club in which a radially movable member is utilized to interlock the head and shank of the club at selected positions of angular adjustment. The radially movable member is normally urged by a spring band to a position of disengagement, and a lock lever is utilized to retain the member in locking engagement against the action of the aforesaid spring.

It is the primary object of the present invention to provide an adjustable head golf club of the character described, in which improved means are provided for effecting the release of the club head for adjustment purposes.

Another object of the invention is to provide improved means for locking the club head in its adjusted position.

Still another object of the invention is to simplify the arrangement of the parts and reduce the number of parts required to effectively perform the aforesaid functions.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Fig. 1 is a longitudinal cross-sectional view of a golf club embodying the features of my invention.

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

Fig. 3 is a perspective view of one of the splined locking members used in the structure shown in Fig. 1.

Fig. 4 is an elevational detail on an enlarged scale of the head releasing pin shown in Figs. 1 and 2.

Fig. 5 is a view similar to Fig. 1 but showing a modified form of the invention.

Fig. 6 is a perspective view of one of the splined locking members used in that form of the invention shown in Fig. 5.

Fig. 7 is a cross-sectional view similar to that

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of Fig. 1, but showing still another modified form of the invention, and

Fig. 8 is a cross-sectional view taken on line 8—8 of Fig. 7.

Referring more particularly to that form of the invention shown in Figs. 1–4 inclusive, it will be seen that the pertinent structure includes a hosel 2 which has integrally formed thereon a shank 3 which extends at an obtuse angle thereto.

The shank 3 is provided with an outwardly extending circumferential shoulder 4 which serves as an abutment for a striking head 5 which is provided with a longitudinal bore 6 and which is rotatably mounted on the shank 3.

The shank 3 is provided with an intermediate portion 10 of slightly reduced diameter and terminates in an externally threaded stud 11 of still further reduced diameter.

The head 5 is secured against axial displacement relative to the shank 3 by means of a capnut 7, the head of which abuts one end of the head 5, and the shank 8 of which is threaded internally for engagement with the stud 11, the outer surface of the shank 8 constituting, in effect, a continuation of the outer surface of the shank 3 so as to form with the latter a bearing surface for the head 5.

The wall of the bore 6 is provided with a multiplicity of inwardly extending circumferentially-spaced serrations or teeth 9 which extend longitudinally of the head for a substantial portion of the length of the head, these serrations being practically coextensive in length with the length of the intermediate portion 10 of the shank 3.

The shank 3 is provided with an axial bore 12 which is counterbored as at 13 to provide a shoulder 14.

Extending radially from the portion of the bore 12 which lies in the intermediate portion 10 of the shank are a plurality of circumferentially-spaced slideways or slots 15 in which are disposed splined head-locking members 40, each provided at its radially outermost face with a series of parallel splines or serrations 16 which are adapted for engagement with the splines 9 of the head 5.

The members 40 are provided adjacent their ends with inclined surfaces 41 and 42, both of which surfaces are inclined in the same direction. A recess 47 is provided on the members 40 adjacent the foot of the inclined surface 42 and a recess 17 is also provided on the serrated surface 16 of the members.

The inclined surfaces 41 and 42 of the members

40 are engaged by conical cam elements 43 and 44 which extend from a pin 45 which is mounted for longitudinal reciprocal movement in the bore 12 of the shank, one end of said pin being enlarged to form a button 48 which projects out of the bore 13 of the shank 3.

The members 40 are normally maintained out of engagement with the serrations 9 by means of an annular spring 19 which is seated in an annular recess 18 formed on the shank portion 10, this recess being coextensive and in alignment with the recess 17 on the members 40. The spring 19 acts normally to retract the splined members 40 radially inwardly with reference to the shank and when thus retracted, the members 40 are out of engagement with the serrations 9 on the head 5, and the head 5 may be rotated relatively to the shank 3.

Locking means are provided by the previously referred to cam elements 43 and 44 which are normally biased by a compression spring 46 into camming relationship to the members 40. The spring 46 is interposed between the cap-nut 7 and the end of the cam element 43, and is substantially stronger than the spring 19.

In the position shown in Fig. 1, the members 40 have been forced into engagement with the serrations 9 of the head 5 by the camming action of the elements 43, 44 on the inclined surfaces 41, 42, which camming action is caused by movement of the pin 45 to the right in response to the force exerted by the spring 46.

The interengagement of the serrations 16 with the serrations 9 causes the head to be locked against movement relatively to the shank, and the head 5 will thus remain disposed in any selected position of angularity relative to the shank.

In order to release the head 5 from its locked position, the player merely pushes the button 48 to the left, as viewed in Fig. 1, against the action of the spring 46. This causes the cam elements 43, 44 to move out of camming engagement with the surfaces 41, 42 of the members 40 and permits the spring 19 to become effective to retract the members 40 in the manner previously described.

The head 5 is then freely rotatable to any desired position of angular adjustment and may be locked in such selected position by release of the button 48.

By reference to Fig. 4, it will be noted that each of the cam elements 43 and 44 is provided with a conical or tapered surface 43*a* which is inclined at an angle of about 30 degrees to the axis of the pin 45, and also has a conical or tapered surface 43*b* which is inclined at an angle of about 10 degrees to the axis of the pin, the latter surface corresponding to the angle of inclination of the surfaces 41, 42 of the members 40. In locking the head 5 to the shank 3, the initial action of the spring 46 causes the members 40 to be first engaged by the surfaces 43*a*, and, as these surfaces are at an abrupt angle of inclination, the camming action will be relatively rapid. Thereafter, the surfaces 43*b* will engage the surfaces 41 and 42 and the movement of the members 40, due to the reduced inclination of the surfaces 43*b*, will be slower and more forceful, culminating in the desired wedging of the members 40 in head-locking position.

By using two inclinations, such as the surfaces 43*a* and 43*b* on the cam elements, it is possible to obtain rapid and satisfactory locking engagement while using a spring 46 which need not be as strong as would be the case otherwise.



In that form of the invention shown in Figs. 5 and 6, the general construction of the parts is similar to that previously described with reference to Figs. 1–4, but in this case, the splined members 30 which correspond to the members 40 of the previously described form of invention, are provided with only a single inclined surface 31 intermediate their ends.

The surfaces 31 are engaged by a conical cam element 32 which is carried by a pin 33 mounted for reciprocatory movement in the bore 12 of the portion 10 of the shank 3. The pin 33 has an enlarged end 34 which projects out of the bore 13 of the shank 3 and serves as a button for effecting release of the locking members 30.

A compression coil spring 35 is interposed between the abutment or shoulder 14 of the bore of the shank and a flange 37 on the pin 33 so as to normally urge the pin to the right, as viewed in Fig. 5. A gasket 38 is interposed between the flange 37 and the wall of bore 13 so as to provide a dust-proof and water-proof seal which will prevent foreign material from entering the bore 13.

In the position shown in Fig. 5, the members 30 have been cammed by the element 32 into engagement with the serrations 9 of the head 5, thereby locking the head 5 and shank 3 together.

When the button 34 is depressed, the pin 33 is caused to move to the left against the action of spring 35 and as the cam element 32 disengages the members 30, the spring 19 retracts the members 30 so as to disengage the serrations 16 thereon from the serrations 9. The head 5 may now be rotated to any desired position of angularity relative to the shank 3.

After the selected position of the head has been obtained, the pin is released and spring 35 causes element 32 to again cam the members 30 into the previously described head-locking engagement.

Referring to Figs. 7 and 8, the construction therein shown is similar to that of Fig. 5, but in this case, the cam element 70 which corresponds to the cam element 32 is in the form of a nut which is threadedly secured to a pin 71, so as to permit adjustment between the inclined cam surface 72 of the nut and the inclined surface 73 of head-locking members 74 to compensate for the wear on these surfaces.

The members 74 have a serrated surface 16 which is adapted to engage the serrations 9 on the head 5. The ends of the members 74 opposite the surface 73 are inclined or sloped in the opposite direction to form surfaces 84 which engage correspondingly inclined surfaces 85 formed on the shank 86 and which act to cam the members 74 to head-locking position.

The pin 71 is provided with an enlarged head portion 75 which has an inclined end surface 76 which is engaged by the correspondingly inclined end 77 of a pin 78 which is mounted for reciprocatory sliding movement in the shank 86 of the hosel 79. The pin 78 is engaged at its upper end by a lever or trigger element 80 which is pivotally secured to the hosel as by a pivot pin 81.

It will be apparent that when the trigger element 80 is depressed toward the hosel 79, the pin 78 is moved downwardly against the tension of a compression coil spring 82 which is interposed between the shank 86 and the enlarged portion 75 of the pin 71. This downward movement causes the pin 71 to be cammed to the left, as viewed in Fig. 7, releasing the members 74

from camming engagement with the element 70.

The spring 19 which encircles the members 74 then retracts the members so that serrations 16 are withdrawn from engagement with serrations 9 on the head 5.

Upon release of the trigger element 80, the spring 82 acts to return the members 74 to locking position.

A screw cap 83 is provided to conceal the pin 71 and prevent ingress of dust and dirt into the shank of the club.

Thus, in each of the forms of my invention which I have described, the head of the golf club is firmly locked to the shank by means of serrated radially movable locking members which engage serrations on the head in response to the camming action of a spring-pressed cam element.

In each case, the head may be released for rotation to a different selected position of angular adjustment by displacing the spring-pressed cam element, which permits an annular spring to retract the locking members from engagement with the head.

It is thus seen that I have provided various adjustable head golf clubs having improved means for locking the club head in adjusted position as well as improved means for effecting the release of the club head for adjustment.

It is to be understood that the forms of my invention, herewith shown and described, are to be taken as preferred examples of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of my invention, or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In a golf club, the combination of a hollow shank, a plurality of serrated members slidably mounted in circumferentially spaced relationship on said shank for radial movement relative thereto, a head rotatably mounted on said shank, said head having serrations therein engageable with said serrated members, means resiliently urging said members out of locking engagement with said head, cam means contained within said shank for effecting radial displacement of said members and spring means of greater strength than said first named means, engaging said cam means to yieldably maintain said cam means in camming engagement with said members whereby to lock said head against rotation relative to said shank.

2. In a golf club, the combination of a hollow shank, a plurality of serrated members slidably mounted in circumferentially spaced relationship on said shank for radial movement relative thereto, a head rotatably mounted on said shank, said head having internal serrations engageable with said serrated members, means yieldably urging said members out of locking engagement with said head, cam means slidably contained within said shank and adapted to effect radial displacement of said members and spring means, of greater strength than said first named means engaging said cam means to yieldably maintain said cam means in camming engagement with said members whereby to cause interlocking of said shank and said head.

3. In a golf club, the combination of a hollow shank, a plurality of circumferentially spaced serrated members slidably mounted in said shank for radial movement relative thereto, said



members having camming surfaces thereon in communication with the bore of said hollow shank, a head rotatably mounted on said shank, said head having internal serrations adapted to mesh with said serrated members, means yieldably urging said members out of locking engagement with said head, camming means slidably contained within said shank for effecting outward radial displacement of said members and spring means, of greater strength than said first named means, engaging said camming means to yieldably maintain said camming means in operative engagement with said members whereby to lock said head against rotation relative to said shank.

4. In a golf club, the combination of a hollow shank, a plurality of circumferentially spaced serrated members slidably mounted in said shank for radial movement relative thereto, said members having camming surfaces thereon in communication with the bore of said hollow shank, a head rotatably mounted on said shank, said head having internal serrations adapted to mesh with the serrations on said members, means yieldably urging said members out of engagement with said head, a camming element slidably mounted for longitudinal movement within said shank and adapted to cooperate with the camming surfaces on said members and spring means, of greater strength than said first named means, engaging said camming element to yieldably maintain said element in operative engagement with said members whereby to effect outward radial displacement of said members into locking engagement with the serrations on said head.

5. In a golf club, a hollow shank, a head rotatably mounted on said shank, said head having internal longitudinal serrations, and means for locking said head against rotation, said means comprising splined members slidably mounted in said shank for radial movement relative thereto, said members having portions thereof projecting into the bore of said shank, a camming element slidably mounted in the bore of said shank, spring means engaging said camming element and yieldably maintaining it in operative engagement with said projecting portions of said members whereby to displace said members into locking engagement with the serrations on said head, and resilient means engaging said members for retracting said members from said locking engagement in response to the spring-opposed movement of said camming element.

6. A golf club as defined in claim 5 wherein said camming element comprises a stem and a conical cam mounted on said stem, said cam having two adjacent camming surfaces, one of which has a greater angle of inclination than the other to the projecting portions of said members whereby to initially cause rapid displacement of said members followed by a less rapid, more forceful displacement of said members.

JOSEPH VERDERBER.


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