This invention relates to a golf club accelerometer, and more particularly to an electronic golf swing reminder which senses improper swinging of a golf club.

Many golfers are prone to accelerate their clubs too much on the back swing tending to throw the player off balance. Also, the club may be slowed down too quickly at the top of the back swing or start into the down swing with a jerking motion. The golfer may also exhibit an incomplete follow-through.

It is a primary object of the present invention to provide an accelerometer for golf clubs which will emit a signal when the club is swung improperly. Another object of the present invention is to provide an accelerometer for a golf club which is relatively inexpensive to manufacture and may be readily attached to a golf club in one position to emit a signal when the club is subjected to a jerky swinging motion at the onset of a down swing and which may be readily rotated upon the shaft of the golf club to a second position where it will indicate an erratic swinging motion at the onset of the back swing or an incomplete follow-through.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood from the following description, taken in connection with the accompanying drawings, in which:

FIGURE 1 is an elevational view of a golf club with a device of the invention attached thereto in a first operating position;

FIGURE 2 is a vertical, cross-sectional view taken along line 2—2 of FIGURE 1;

FIGURE 3 is a vertical, cross-sectional view taken along line 3—3 of FIGURE 2;

FIGURE 4 is a transverse, cross-sectional view taken along line 4—4 of FIGURE 2;

FIGURE 5 is a partial cross-sectional view, on an enlarged scale, taken along line 5—5 of FIGURE 2;

FIGURE 6 is a partial cross-sectional view taken along line 6—6 of FIGURE 5;

FIGURE 7 is a perspective view of a clamp employed with the device in FIGURE 1;

FIGURE 8 is a perspective view of the clamp of FIGURE 7 mating with the shaft of a golf club in the lower portion of the figure and being assembled to the accelerometer of the invention in the upper portion of the figure;

FIGURE 9 is an elevational view of an accelerometer of the present invention in position on a golf club in a second operating position; and

FIGURE 10 is a top view taken along line 10—10 of FIGURE 9.

Referring again to the drawings, a golf club accelerometer of the present invention, generally designated 10, includes a cylindrical casing 12 having an encompassing side wall 14, a removable end plate 16 and a perforated mounting 18. A battery compartment 20 is mounted in the upper portion of the casing 12 and a compartment 22 is mounted in the lower portion of the casing 12 to house the electrical components 24 of the device. The electrical components 24 include an electric buzzer 26 having a coil 27, a pole piece 28 and an armature or vibrating plate 29. The pole piece 28 is riveted, as indicated by 30, to a bracket 34 which serves as a mounting bracket and a ground for buzzer 26. The bracket 34 is secured to the side wall 14 with a stove bolt 36. The vibrating contact plate 29 extends to a point adjacent the pole piece 28 and is attracted thereto by the electromagnet when the coil 27 is energized by completing a circuit through a lead 38, a set screw 40, a lead 41, a microswitch 42, a lead 43 and a pair of batteries 44. The frequency of the buzzer 26 may be adjusted by turning the set screw 40 which threadedly engages a sleeve 45 which, in turn, is mounted in a collar 46. The collar 46 is mounted in an insulating bushing 47 which is attached to the encompassing wall 14 with screws 48.

The microswitch 42 is adjustably mounted on a bracket 52. The bracket 52 is rigidly affixed to the bracket 34 by the screw 56 and includes slotted apertures 54 (FIGURES 5 and 6) through which microswitch mounting bolts 56 extend. A threaded plate 58 is employed to threadedly engage the bolt 56 and maintain the microswitch 42 in position on the bracket 52. The microswitch 42 is normally open and is actuated by depressing a push button 60. A plate 62 forms an integral part of a pendulum member 64 and depresses the button 60 when the pendulum 64 is swung in one direction. The pendulum 64 is swingably mounted on a pin 68 and carries a weight 68 at its lower end.

A bifurcated mounting bracket 70 is rigidly affixed to the casing 13 by a weldment 72 and is engageable by a clip 74 to secure the casing 12 to the shaft 76 of a golf club 78. A resilient pad 80 is encased by the clip 74 and grips the shaft 76 to prevent the accelerometer 10 from rotating about the club 78. The accelerometer 10 is shown mounted on the underside of the club 78 in FIGURE 1 and on the top side of the club 78 in FIGURE 9. This is because the accelerometer is actuated when accelerated in one direction only since the casing 12 permits movement of the weight in only one direction. The buzzer 26 is actuated when the pendulum 64 is swung in the direction of the arrow 82 shown in FIGURE 3 so that the plate 62 will depress the button 60. The sensitivity of the pendulum may be adjusted by moving the switch 42 up or down, as the case may be, in the slotted apertures 54 by loosening bolts 56 or by moving the accelerometer 10 up or down the shaft 76.

When the accelerometer 10 is mounted on the underside of the club 78, as shown in FIGURE 1, the accelerometer is actuated by a sudden stop at the top of the back swing or a jerking motion when starting into the down swing. The weight 68 and the arm or pendulum 64 weigh approximately 3/4 gram, which has been found to actuate the device against the switch bias on the button 60 only when a swing is not smooth. The device may be moved to the position shown in FIGURE 9 to indicate an erratic swinging motion at the outset of the back swing or an incomplete follow-through. In this position, the accelerometer is actuated from an opposite direction. It is understood that when the accelerometer is actuated in either mounting position to close switch 42, the buzzer 27 will be operated to indicate an unacceptable motion.

While the particular golf club accelerometer herein shown and described in detail is fully capable of attaining the objects and providing the advantages herebefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiment of the invention and that no limitations are intended to the
What is claimed is:

1. An accelerometer for a golf club comprising:
   inertia means including an inertia weight attached to an arm;
   a pivot pin rigid with the shaft of said club for pivotally mounting said arm, said arm normally extending parallel to said shaft, said arm when pivoted about said pin having a component of movement substantially perpendicular to said shaft, switch means positioned in the path of movement of said arm, yieldable restraining means to hold said arm in its normal position;
   and said switch means actuated by said arm when said arm has been caused to pivot by acceleration force developed on said weight during swing movement of said club at an undesirable high acceleration for producing a signal indicating undesirable movement of said club.  

2. An accelerometer for a golf club comprising:
   a housing for said accelerometer;
   means for attaching said accelerometer to the shaft of the golf club;
   inertia means comprising an inertia weight supported on an arm;
   a pivot pin carried by said housing for pivotally mounting said arm, said arm normally extending parallel to said shaft, said arm when pivoted about said pin having a component of movement substantially perpendicular to said shaft, switch means positioned in the path of movement of said arm, yieldable restraining means to hold said arm in its normal position;
   said switch means actuated by said arm when said arm has been caused to pivot by acceleration force developed on said weight during swing movement of said club in an undesirable manner to develop undesirable high acceleration; and
   indicator means actuated by said switch means for indicating undesirable movement of the club.

References Cited by the Examiner

UNITED STATES PATENTS
2,132,111 10/1938 Honegger ----------- 200—61.49
2,643,371 6/1953 Sleeper ------------ 340—261
2,686,853 8/1954 Mathieu ----------- 200—61.49
2,787,470 4/1957 Barrus et al. ------ 340—262 X
2,804,306 8/1957 Chedister et al. --- 273—186
2,942,456 6/1960 Hardway ----------- 200—61.49
2,986,615 5/1961 Hardway ----------- 200—61.49
3,106,403 10/1963 Kirkman ----------- 340—262
3,113,781 12/1963 Guier ------------- 273—186
3,113,782 12/1963 Guier ------------- 273—186

FOREIGN PATENTS
409,095 2/1925 Germany.

NEIL C. READ, Primary Examiner.