May 7, 1946. L. A. SMITH 2,399,711

BALL IMPELLING DEVICE

Filed July 24, 1944 2 Sheets-Sheet 1

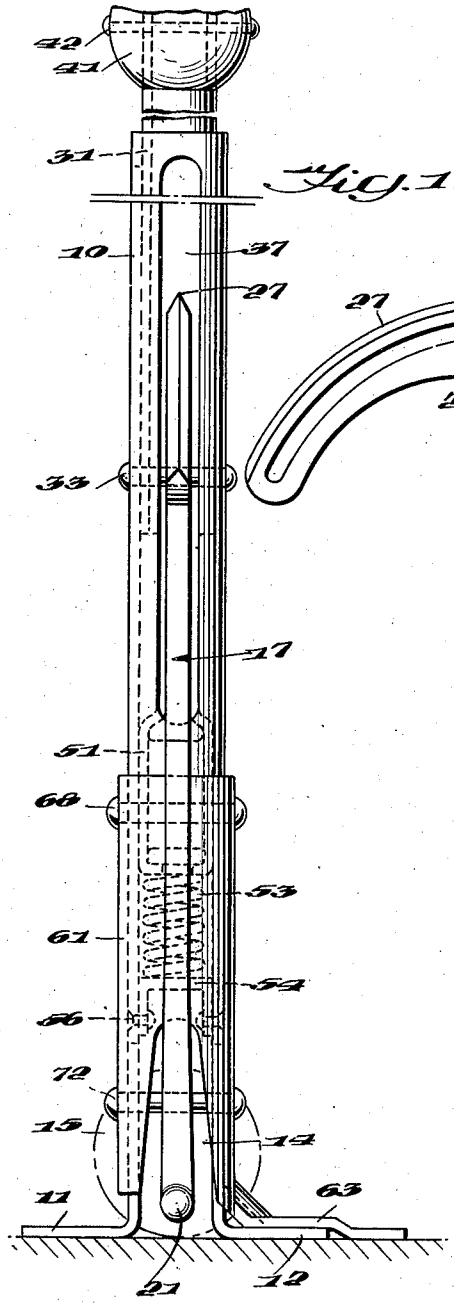


Fig. 1.

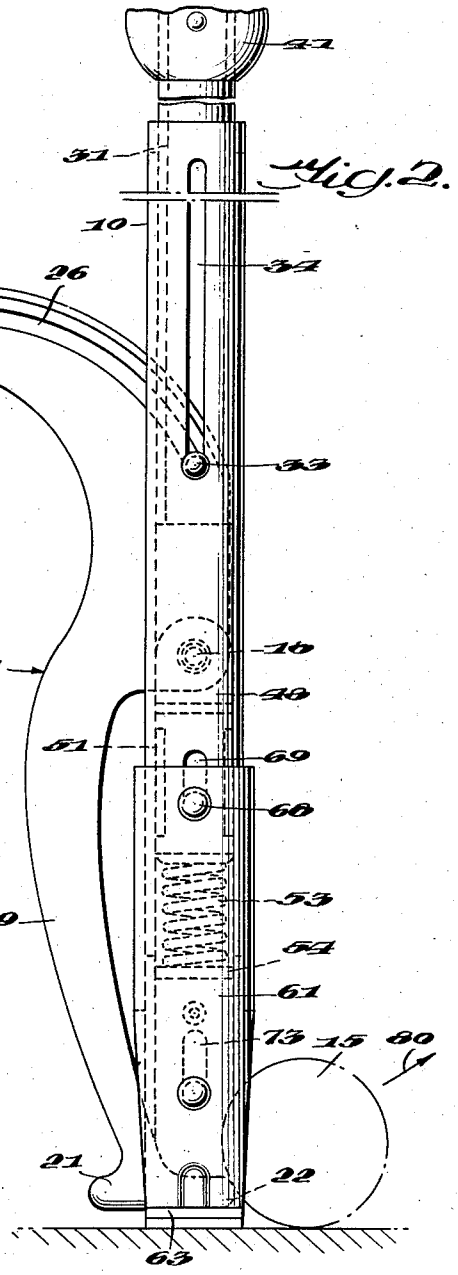


Fig. 2.

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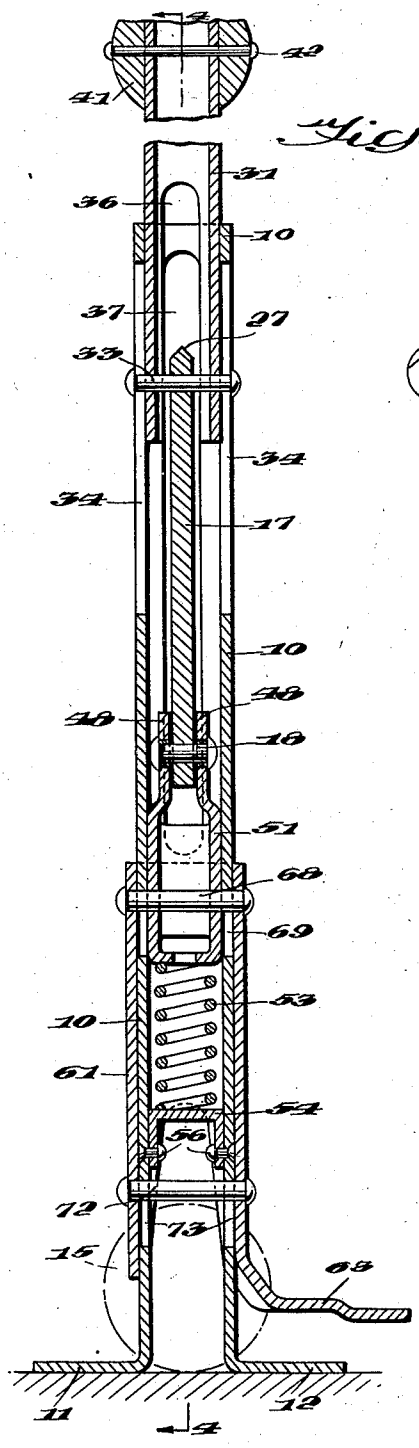


Fig. 3.

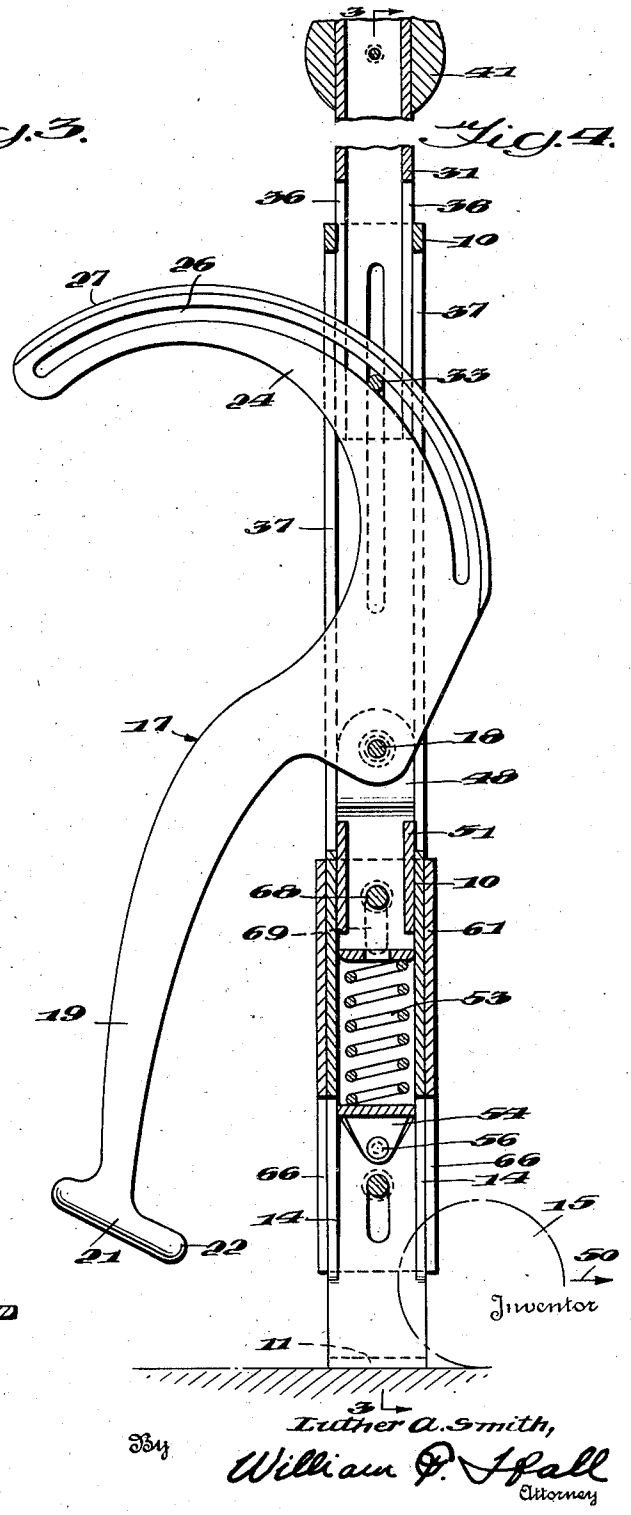


Fig. 4.

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UNITED STATES PATENT OFFICE

2,399,711

BALL IMPELLING DEVICE

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10 Claims. (Cl. 273—129)

The present invention relates to a device for projecting or driving a ball forwardly so that a game somewhat similar to that of golf may be played with a ball. The invention more specifically pertains to the structural features of a device for impelling a ball forwardly wherein the mechanism may be adjusted and so manipulated as to control the flight or path of the ball as it moves forwardly from the device.

An object of the invention is to provide a mechanism for impelling a ball without the use of a golf club so that a game simulating in many respects the game of golf may be played in confined quarters such as in a room of a house where the available space will not permit a club to be used to the extent necessary to inspire interest in the game.

A more specific object of the invention pertains to providing a relatively compact device for driving a ball forwardly including a driving member mounted for pivoting movement in response to longitudinal reciprocating movement whereby the toe portion of the driver may swing forwardly and engage the ball including means for adjusting the position of the pivot of the driving member in relation to the ball to thereby vary the point at which the toe of the driver engages the ball and accordingly control the path the ball will follow as it is projected by the device.

Other objects and features of the invention will be more apparent as the disclosure proceeds and upon consideration of the accompanying drawings and the following detailed description wherein an exemplary embodiment of the invention is disclosed.

In the drawings:

Fig. 1 is an end elevational view of apparatus emboding the invention.

Fig. 2 is a side elevational view of the device illustrating the manner in which the toe of the driver may be caused to engage the ball below the level of the center thereof.

Fig. 3 is a sectional view taken along the axis of the device and on the line 3—3 of Fig. 4.

Fig. 4 is a sectional view of the mechanism taken on the line 4—4 of Fig. 3, showing the driving member in side elevation.

Referring to the drawings, there is shown at 10 a body member which provides a chassis or frame for other parts of the ball impelling mechanism. The body member 10 may be of any cross-sectional shape and in the embodiment illustrated take the form of a tube or pipe. The tubular body member is provided at the lower end with laterally extending flanges 11 and 12 adapted to rest upon the ground or floor and thereby support the elongated body member 10 in a substantially vertical manner. These lateral flanges are provided for the purpose of maintaining the device in an upright position and for receiving a foot of an operator or player so as to more securely maintain the mechanism in a proper position in relation to the ball when imparting an impulse thereto. The lower end of the tubular body member 10 is provided with an opening 14 for the purpose of permitting a driver member hereinafter described to engage the ball through this opening. The opening 14 may be provided by cutting away diametrically opposite portions of the tube or pipe which forms the body member 10 and the lateral flanges or feet 11 and 12 may be formed of the portions of the pipe remaining after the diametrically arranged slots 14 are formed in the tube.

The mechanism is devised for the purpose of propelling spherical objects forwardly and a ball suitable for playing a game corresponding in many respects to that of golf is shown at 15. The ball employed may be of any suitable diameter and in a preferred type the ball has a diameter of about fifteen-sixteenths of an inch and may be formed of hard wood or other suitable material. The ball may be provided with indentations in the surface thereof and paint or other coloring material whereby the ball of one player may be readily distinguished from that of another. The slots providing the opening 14 are of sufficient length as to extend upwardly for a distance greater than the diameter of the ball 15 as will be apparent from a consideration of Fig. 1. These slots thereby provide an open space whereby the position of the ball 15 in relation to other parts of the driving mechanism may be observed by a player in making a shot as hereinafter described.

The device includes a driving member shown generally at 17 in the drawings. The driver is pivotally mounted to swing on a pin or stub shaft 18. The shape of the driving member represents a characteristic feature of the invention and includes a leg portion 19 which curves rearwardly and downwardly from the pivot pin 18 and this leg portion is of sufficient length as to extend to a point adjacent the opening 14. The lower end portion of the driver carries an impact member 21. The member 21 may be formed integrally with the leg portion 19 of the driver and is preferably cylindrical shaped in cross section as shown in Fig. 1. The member 21 thus provides a hammer at the lower end of the driver and the

forward tip or toe portion 22 may be spherical shaped as shown in Fig. 4.

The driver 17 above the pivot pin 18 curves upwardly and rearwardly therefrom to provide an arcuate shaped actuating portion 24. This portion of the driver is provided with an arcuate shaped slot 26 which extends throughout the actuating portion 24 of the driver. The top edge of the driver may be beveled so as to provide a substantially knife shaped edge 27 along the top of the arcuate portion. This knife edge 27 is provided for the purpose of permitting the operator or player to more accurately align the driver with the course in which the ball is to be propelled forwardly.

A device exhibiting the invention includes means for swinging the driver member 17 and in the embodiment illustrated such means takes the form of a reciprocal member including means for engaging the driving member within the slot 26 so as to swing the driver and move the toe 22 into engagement with the ball 15 and thereby impel the ball forwardly. A reciprocal member is accordingly mounted for sliding within the tubular body member 10. The reciprocal member may be formed as an operating sleeve 31 adapted to fit snugly within the tubular body member 10 and at the same time be freely movable in a guided manner therein. The sleeve 31 may extend upwardly to any desired height so as to be within convenient reach of a player and this sleeve may extend to such a point that the total height of the device is about thirty-six inches above the floor or ground. The lower end portion of the sleeve 31 is provided with means extending through the slot 26 for actuating the driver 17. Such means may take the form of a pin or rivet 33 which extends through the sleeve 31 and through the slot 26 in the driver. The pin or rivet 33 is of such length as to extend through slots 34 in the tubular body member 10. The outer ends of the pin or rivet 33 are thus guided within the slots 34 during reciprocation of the sleeve 31 in the tubular body member 10.

The sleeve 31 is also provided with openings 36 in the opposite walls thereof so as to permit portions of the driver 17 to move through these openings. It will be observed that portions of the driver also must swing through the body member 10 and this tube is accordingly provided with diametrically arranged slots 37 so that the upper end portion of the driving member 17 may swing through the tubular assembly when turning on the pivot pin 18. The slots 37 extend downwardly for distances sufficient for permitting the intermediate portion of the driving member 17 to turn on the pin or shaft 18 arranged at the axis of the tubular member 10. The upper end of the sleeve 31 may be provided with a knob or suitable hand grip 41 for convenience in manually operating the sleeve 31. In the embodiment illustrated the knob 41 is arranged over the sleeve 31 and secured thereto by means of a rivet 42.

In operating the device downward movement of the knob 41 will move the sleeve 31 downwardly within the tubular body member 10. The pin 33 carried by the sleeve 31 will likewise be guided in a vertical manner by the edges of the slots 34 in the tubular body member 10. The pin 33 which extends through the slot 26 will therefore act in a cam like manner on one of the surfaces defining the slot 26 so as to swing the top portion of the driving member 17 in a counter clockwise direction about the pin 18. The leg portion 19 of the driving member will therefore move forwardly so that the toe 22 will engage the ball 15 and drive it forwardly. The driving member may then be retracted to a position for striking the same ball or another ball by moving the knob 41 upwardly whereby the sleeve 31 moves upwardly in the tubular body member 10. The pin 33 then engages the upper boundary or cam surface of the arcuate shaped slot 26 and swings the actuating portion 24 of the driver in a clockwise direction about the pivot pin 18 to a position somewhat as shown in Fig. 4. Thus when the device is arranged adjacent the ball such as represented at 15 a sharp downward movement of the knob 41 will cause the toe 22 of the driver to engage the ball and impel it forwardly.

The ball driving device includes means for adjusting the position of the pivot pin or shaft 18 in relation to lower end of the device and accordingly with respect to the ground or the floor so that the point at which the toe 22 engages the ball may be varied. Thus if a player is stymied and desires to move his ball forwardly towards the hole being played and over the ball of an opponent it is desirable for the toe 22 of the driver to engage the ball 15 below the center thereof. It is for this purpose that the position of the pivot pin 18 of the mechanism is adjustable so that the skill of a player may be carried into operation of the mechanism and thereby enhance the interest of the players in the game by permitting various types of shots to be made with the mechanism.

The normal position of the pivot pin 18 is shown in Figs. 3 and 4 whereby the toe portion 22 of the driver will engage the ball 15 at a point substantially at the level of the center thereof. Thus the ball will under such circumstances move forwardly approximately in the direction of the arrow 50 shown in Fig. 4. The pivot pin 18 is carried by upstanding ears 48 of a pivot supporting piston 51. This piston 51 is mounted within the tubular body member 10 so as to be free for guided movement therein longitudinally of the tubular member. The piston 51 is normally biased to an upper position as shown in Figs. 3 and 4 by any type of resilient means such as a spring 53. The spring 53 may be of a coil type and supported at its lower end by the tubular body member 10 in any suitable manner such as by a bridge member 54. The bridge member 54 may be secured to the tubular body member 10 in any appropriate manner such as by means of rivets 56. The rivets 56 are preferably flush with the outer peripheral surface of the tubular body member 10. The spring 53 is therefore housed within the tubular member 10 and yieldably maintains the piston 51 in an upper position. The resilient means 53 is so designed as to be readily compressed by an average individual, but is nevertheless sufficiently unyieldable to prevent inadvertent changes in the position of the piston 51 and pin 18 when the operating member 31 is thrust downwardly.

The device includes means for moving the piston 51 and such means may take the form of an external flight control sleeve 61 embracing the lower portion of the tubular body member 10 so as to be guided thereon. The tubular sleeve 61 is provided at the lower end thereof with a laterally extending flange 63 as shown in Figs. 1 and 3. The lower end portion of the flight control sleeve 61 is also provided with diametrically arranged slots 66 aligned with the slots 14 in the tubular body member 10 so as to permit the lower end of the driver 17 to swing through this por-

tion of the assembly. The flight control sleeve 61 is connected to the piston 51 by means of a pin or rivet 68 which extends diametrically through the sleeve 61, the tubular body member 10 and the piston 51. The tubular body member 10 is provided with elongated openings 69 through which the pin 68 extends so as to permit movement of the flight control sleeve 61 and the upper ends of these openings 69 form abutment shoulders providing in cooperation with the pin 68 means limiting the upward movement of the piston 51 in response to the force applied by the spring 53. The lower portion of the flight control sleeve 61 may also be provided with a pin or rivet 72 which extends through openings 73 in the lower portion of the tubular body member 10. This pin or rivet 72 is provided for the purpose of reinforcing or bracing the lower end of the flight control sleeve 61 and also cooperates with the pin 68 in limiting the upper movement of the flight control sleeve 61.

The normal position of the pivot pin 18 and the piston 51 is in raised position as shown in Figs. 3 and 4 as a result of the force applied by the spring 53. When the pivot pin 18 is in this position the driving member 17 will swing about an axis which will provide that the toe portion 22 of the driver will engage the ball at a level approximating that of the center of the ball whereby it will be propelled forwardly without any material elevation in the flight trajectory. When it is desired to propel the ball forwardly and upwardly approximately in the direction of the arrow 80 as shown in Fig. 2, the player places one foot on the lateral flange 63 and thereby moves the flight control sleeve 61 and the piston 51 downwardly to position the pivot pin 18 in the desired location for the lower end of the driving member and the toe 22 thereof to engage the ball 15 at the desired point below the level of the center thereof. The flight control sleeve 61 may be moved to the lowermost position as shown in Figs. 1 and 2 whereby the toe 22 will engage the ball 15 at a point materially below the center thereof.

It will also be appreciated that the slots 14 and 66 arranged in the lower portion of the tubular assembly provides an open passage through which the point at which the toe of the driver will engage the ball may be clearly observed. Thus the driving device may be so moved and adjusted in relation to the ball as to permit the toe portion 22 to engage the ball at various off center positions whereby the ball will be impelled forwardly in any desired trajectory so as to simulate a "slice" or a "hook" thereby enhancing use of the device in permitting the skill of the operator to control the flight of the ball.

It will be observed that the body member 10 and the operating member 31 including flight control sleeve 61 and the pivot supporting piston 51 are of cylindrical shape in cross section and the tubular body member 10 forms a frame for the device also acts as the means for guiding the other elements. It will be appreciated that the cross sectional shape of all of these elements may be altered and still obtain similar functions of the body member guiding the other movable parts. In fabricating the device the various movable parts may be formed of some light weight metal alloy such as aluminum or the like so as to reduce the weight of the assembly. It will be appreciated that the ball impelling mechanism has been described with reference to specific structural details and changes may be made in the apparatus. Thus modifications may be made in the device without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. In a ball impelling device, an elongated body member, a driver including an intermediate portion and a depending leg and an actuating portion, means yieldingly supporting the intermediate portion of the driver for pivoting movement with respect to the body member, said actuating portion having an arcuate shaped cam surface thereon, an operating member longitudinally reciprocal with respect to the body member, and means carried by said operating member for engaging said cam surface to swing said driver on said pivot.

2. In a mechanism for projecting a game ball, a tubular body member having diametrically arranged slots therein, a driving member pivotally mounted with respect to the tubular body member so as to swing through said slots, yielding means supporting the pivot for said member, a leg portion carried by the driving member for engaging the ball, an operating member mounted for guiding reciprocation within said tubular body member, cam surfaces on said driving member, and means carried by the operating member for engaging said cam surfaces to swing the driving member upon longitudinal reciprocation of the operating member.

3. In a device for driving a ball forwardly, a tubular body member having an open passage at the lower end portion thereof, lateral flanges carried by the lower end of said tubular body member, a driving member including an intermediate portion, a leg portion depending from the intermediate portion of the driving member, said leg portion curving rearwardly and downwardly from the intermediate portion and terminating adjacent said passage, means adjustably supporting said intermediate portion of the driving member for swinging movement relative to the tubular body member, and a toe portion carried by the lower end of the leg portion of the driving member adapted to extend through said passage and engage the ball, and means for swinging the driving member.

4. In a game ball impelling device, a tubular body member, said body member having diametrically arranged slots therein, a pivot pin adjustably supporting at the axis of said tubular body member, a driving member pivotally mounted at an intermediate portion on said pivot pin, an actuating portion for said driving member adapted to swing through said slots, said actuating portion having an arcuate shaped slot therein, a pin extending through said arcuate shaped slot, an operating member mounted for longitudinal guiding reciprocation within said tubular body member for actuating said pin whereby the driving member will swing on said pivot during longitudinal reciprocation of the operating member.

5. In a mechanism for imparting a forward impulse to a ball, a substantially vertically arranged body member, a driving member including a toe portion adapted to engage the ball, a pin supporting said driving member for swinging movement relative to the body member, resilient means maintaining said pin in one position, and means movable with respect to the tubular body member for moving the position of said pin against the action of said resilient means.

6. In a device for imparting movement to a spherical object, an elongated body member

adapted to be arranged in a substantially vertical manner, a swingable driving member, means movable longitudinally with respect to the body member pivotally supporting said driving member, resilient means maintaining said movable means in one position, means longitudinally movable with respect to the body member for moving the first movable means against the action of said resilient means to adjust the position of the pivot and thereby the position of the driving member with respect to the spherical object.

7. In a device for impelling a game ball, a tubular body member adapted to be arranged in a substantially vertical manner, said tubular body member having diametrically arranged slots therein, a pivot supporting piston mounted within the tubular body member, a pin carried by said piston, a driving member pivotally mounted at an intermediate portion on said pin so as to swing through said slots, resilient means urging said piston upwardly in the tubular body member, a flight control sleeve embracing said tubular body member and guided for longitudinal movement thereon, means providing a connection between the flight control sleeve and the pivot supporting piston, and means limiting the upward movement of the flight control sleeve and the pivot supporting piston.

8. In a device for projecting a ball, a vertically arranged tubular body member, a pivot pin, a piston including upstanding ears supporting said pivot pin arranged within the tubular body member for guiding movement therein, a spring urging said piston upwardly, said tubular body member having an elongated opening therein, a rivet carried on said piston extending through said opening so as to limit the upward movement of the piston in the body member, a flight control sleeve embracing the tubular body member movable longitudinally thereon and engaging said rivet whereby the position of the piston within the tubular body member may be adjusted by movement of the flight control sleeve, and a driver mounted for swinging movement on said pivot pin.

9. A ball impelling device comprising, a tubular body member, said body member having slots therein providing a transverse opening therethrough, a piston arranged within said tubular body member for guided longitudinal movement therein, a spring within the tubular body member urging said piston in one direction, ears carried by said piston, a pivot pin carried by said ears, a driver rotatably mounted on said pivot pin so as to swing through said transverse opening, an operating member slidable in said tubular body member, a cam surface on said driver, means carried by said operating member engaging said cam surface to swing the driver upon movement of the operating member, a flight control sleeve embracing and guided on the tubular body member, a lateral flange carried by the flight control sleeve, and a pin carried by the flight control sleeve extending through an opening in the body member and engaging said piston to limit movement of the piston in response to the action of said spring and provide a connection for moving the piston with the flight control sleeve.

10. In a mechanism for imparting a forward impulse to a spherical object, a body member, a pivoted driving member having at one side of its pivot a surface for engaging said object, a manual element supported by the body member and acting upon the driving member upon the opposite side of the pivot thereof, and means for varying the point of contact of said surface of the driving member with said object.

LUTHER A. SMITH.