Sept. 15, 1942. J. MOZEL 2,295,599

AUTOMATIC GOLF BALL TEEING DEVICE

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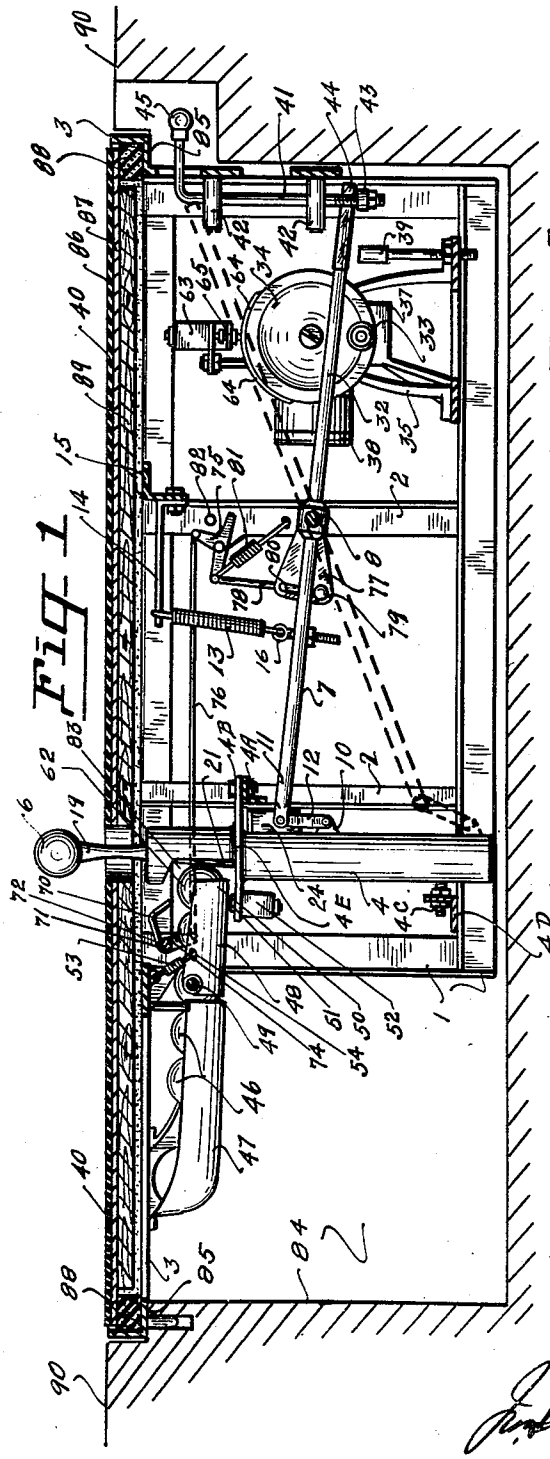


Fig. 1

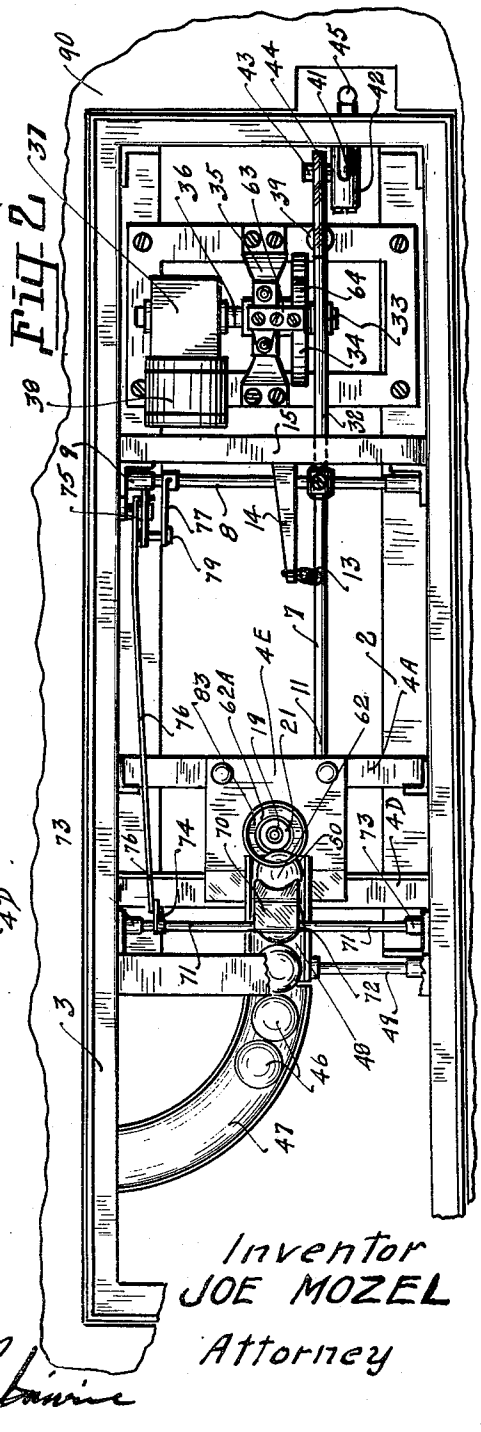


Fig. 2

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Fig 3

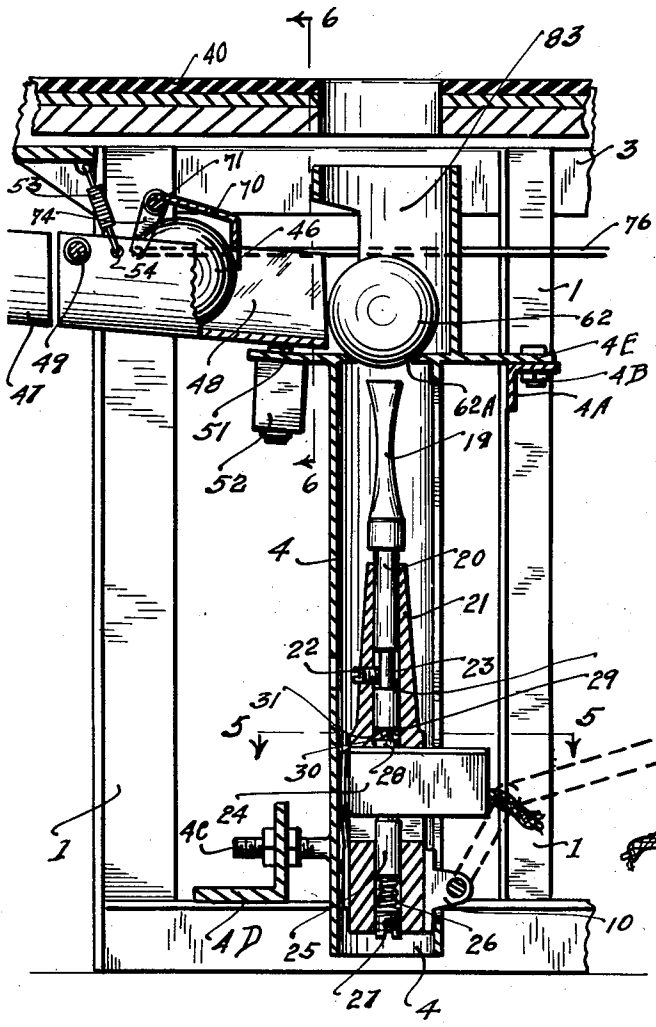
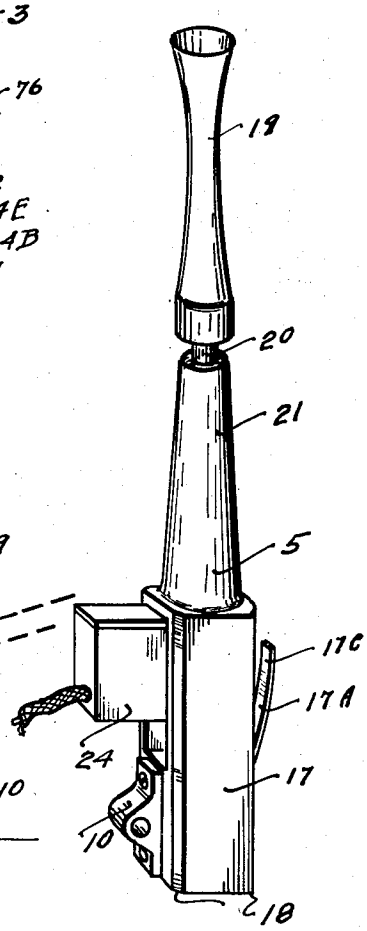


Fig 4



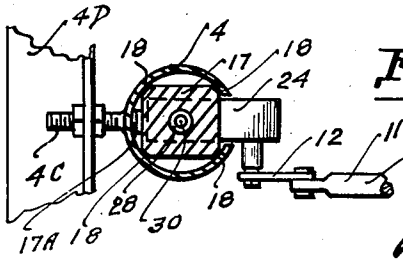


Fig 5

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AUTOMATIC GOLF BALL TEEING DEVICE

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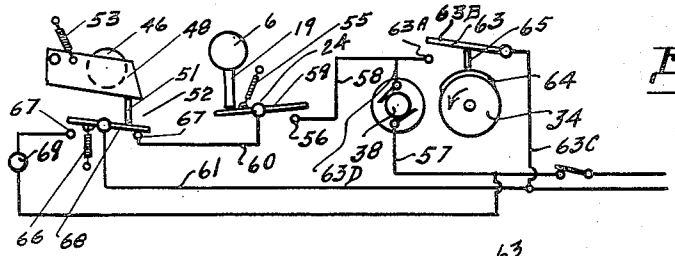
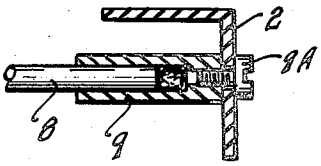


Fig. 10

Fig. 8



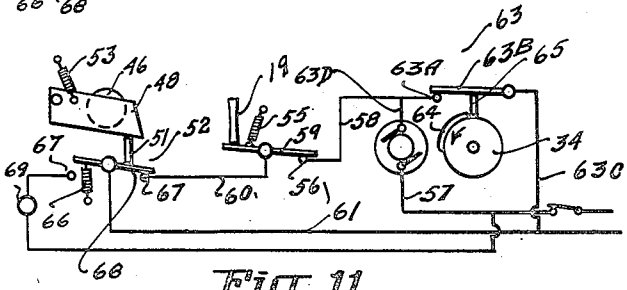


Fig. 11

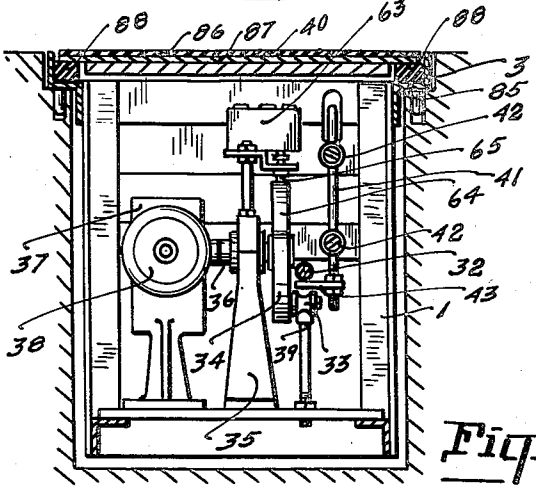


Fig. 1

Fig. 12

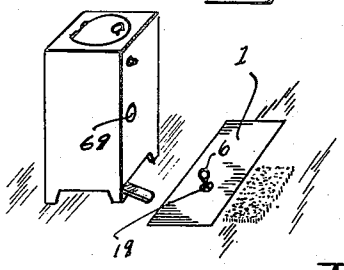
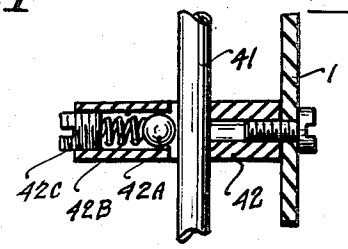


Fig. 9



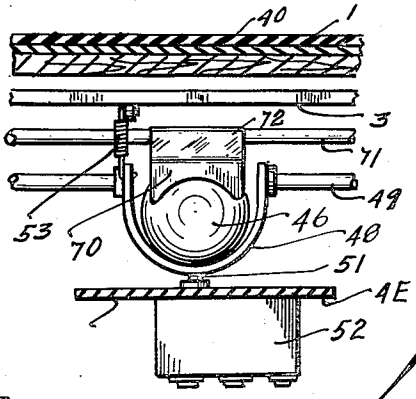


Fig. 6

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UNITED STATES PATENT OFFICE

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AUTOMATIC GOLF BALL TEEING DEVICE

Joe Mozel, Portland, Oreg.

Application December 18, 1940, Serial No. 370,729

14 Claims. (Cl. 273—33)

This invention relates to a device for automatically teeing golf balls, and is particularly adapted to be used in the teaching and practicing of golf, either outdoors or indoors.

The primary object of the invention is to provide a device that will automatically tee a golf ball under any and all conditions encountered in the driving of the ball, such as a wet or defective ball. In the teaching and practice of golf, a player can make greater progress when his attention is not distracted between drives by having to tee the ball. In my automatic golf teeing device the ball is always in place on the tee after each drive, requiring no attention whatever by the player.

A further object of the invention is to provide a mechanism for teeing a golf ball that is automatic. When the ball is removed from the tee a cycle of operation is commenced, automatically bringing the next ball into place on the tee. The cycle of operation is started by the removal of the ball from the tee, the weight of the ball controlling the operation of the machine.

Another object of my invention is the provision of means within the teeing device for adjusting the height of the ball to meet the requirements of different types of clubs used by the player.

A further object of the invention is to provide means for automatically rendering the device inoperative when the supply of golf balls has been exhausted.

And another object of the invention is to provide a golf ball teeing device whose working mechanism will be at complete rest, except during the teeing operation.

A still further object of the invention is the provision of a principle of operation that will protect the machine from damage by the player's club head at all times.

Another object of the invention is to provide a driving mat for covering the machine that will approach the resiliency of an ordinary turf and that will reduce the shock of the club to a minimum while driving the ball from the tee.

These and other incidental objects will be apparent in the drawing, specification and claims.

In the drawings:

Figure 1 is a sectional side elevation of my new and improved automatic golf ball teeing device.

Figure 2 is a fragmentary plan view, having the driving mat removed and parts broken away for convenience of illustration.

Figure 3 is a fragmentary enlarged sectional side elevation of the golf ball teeing mechanism, parts broken away for convenience of illustration, the tee in this figure is shown in lowered position ready to raise the ball to driving position.

Figure 4 is a detailed enlarged perspective view of the tee assembly.

Figure 5 is a fragmentary plan sectional view, taken on line 5—5 of Figure 3 of the tee mechanism.

Figure 6 is a fragmentary sectional detailed view of the ball stop mechanism, taken on line 6—6 of Figure 3.

Figure 7 is an end sectional view, taken on line 7—7 of Figure 1, looking in the direction indicated, illustrating the tee raising and lowering mechanism, consisting of the motor, gear reduction and one of the switch control mechanisms.

Figure 8 is a detailed sectional view of a preferred form of bearing support for mounting the operating cross shaft.

Figure 9 is a detailed sectional view of a friction control mechanism for governing adjustable height of the ball.

Figure 10 is a diagrammatical layout of the principles employed for controlling the operation of the teeing device, including the wiring circuit and illustrating the ball in driving position.

Figure 11 is the same as Figure 10, except that the ball has been removed from the tee and the machine has started a cycle of operation.

Figure 12 is a perspective view of the teeing device in connection with a hopper and dispensing machine for supplying the balls to the tee.

Referring to the drawings:

My new and improved automatic golf ball teeing device is indicated in general by numeral 1. The device consists of a suitable framework 2, supporting an upper frame 3, upon which is mounted the driving mat. Mounted within the frame is a vertical housing 4 within which operates the tee assembly mechanism 5. The housing 4 is held in position by the cross frame 4A, upon which rests the flange or bracket 4E, said flange forming part of the housing 4, suitable fastening means as bolts 4B hold the flange to the cross frame 4A. A stud bolt 4C extends from the lower end of the housing 4 into the cross frame 4D and is adjusted by suitable lock nuts.

The tee assembly is illustrated in Figure 1 in the raised position teeing the golf ball 6. An arm 7 is fixedly mounted to the cross shaft 8, the cross shaft 8 is journaled within the bearings 9, which are secured to the framework 2 by the cap screw 9A, as illustrated in Figure 8. The teeing

assembly 5 is connected to the end 11 of the arm 7 through the bearing block 10 and the link 12, the assembly is held in raised position through the action of the arm 7, link 12 and by the tension spring 13, the upper end of the spring 13 is supported by a suitable bracket 14, which is secured to a cross member 15 of the framework of the device. The lower end of the tension spring 13 is connected to an adjustable screw-eye 16, which is adjustably mounted to the arm 7, providing for accurate adjustment of spring 13.

I will now describe in detail the tee assembly mechanism. A specially constructed body member 17 works vertically up and down within the housing 4, its position being controlled by the operation of the arm 7. This body portion is constructed rectangular in cross section, best illustrated in Figure 5, so that only the corners 18 bear against the inner wall of the housing 4, preventing dirt or grit from binding or sticking the tee assembly mechanism within the housing 4 in its operation. It is very important that no play develop within the housing 4 in relation to the tee assembly. In order to overcome any vibrations that might be developed between the housing and the tee assembly a spring 17A is fixedly mounted to the lower part of the body member 17 at 17B, the upper end 17C riding against the inner wall of the housing 4 absorbing any vibrations developed by the tee assembly.

A specially constructed flexible rubber tee 19 is mounted to the vertical shaft 20, by any suitable fastening means. The shaft 20 works freely within the guide 21 and is retained within the guide by the set screw extending within the groove 23 of the shaft 20. An electrical switch assembly 24 is mounted within the body member 17 and is easily removed therefrom. A compression member 25 is slidably mounted within the lower end of the body member 17 and bears against the under surface of the switch 24, holding the same in place by the spring 26, said spring 26 is maintained in position by the holding screw 23, tapped within the lower end of the body member 17.

A metal boss 28 registers within the hole 29 of the guide 21 holding the switch plunger 30 in line with the tee shaft 20. The plunger 30 extends through the boss 28, and is connected to the switch operating mechanism 24, the plunger is held in raised position by a spring 55 within the switch assembly, best illustrated in the wiring diagram in Figure 10. The operation of the switch mechanism 24 is controlled by the weight of the ball, the weight of the ball forcing the tee and shaft 20 downward against the plunger 30, which in turn overcomes the spring 55 within the switch, opening the electric circuit to be described more fully later.

As stated before the tee assembly is held in raised position by the spring 13 raising the end 11 of the operating arm 7, best illustrated in Figure 1. In order to lower the tee assembly mechanism the end 32 of the arm 7 is raised by the cam roller 33, which is journaled to a wheel 34, the wheel 34 is journaled to a suitable base 35 by the cross shaft 36, said shaft is driven by a speed reducing unit 37 and motor 38.

Referring to Figure 1, the end 32 of the operating arm 7 rests upon a fixed stop 39 which controls the extreme height that the ball can be raised above the driving mat 40. An intermediate adjustment is provided by a vertical rod 41, working within the friction guides 42, the lower end of the rod has a right angle bar 43, providing a stop for the end 44 of the operating arm 7. The knob 45 determines the height of the stop 43, which in turn controls the downward travel of the end 44 of the arm 7, controlling the height of the ball to be teed. The friction stop 42 consists of a ball 42A, bearing against the vertical rod 41, by an adjustable spring tension 42B, controlled by the adjusting screw 42C.

The golf balls 46 are fed into the device by a chute 47, from any desired direction. These balls are delivered from the chute 47 to the chute 48, the chute 48 is mounted to the cross shaft 49 on its one end, having its opposite end 50 resting upon the plunger 51 of an electrical switch 52. When there are one or more golf balls resting on the chute 48, their weight will force the plunger 51, of the switch 52, downward closing an electrical circuit, which will be described later. In the event that there are no golf balls on this chute the plunger 51 will be allowed to rise, due to a spring 52A within the switch assembly 52, opening an electrical circuit. The spring mechanism within the switch assembly 52 may be assisted by an auxiliary spring 53 secured to the framework of the device and to the chute 48 at 54.

I will now describe a cycle of operation of my new and improved golf ball teeing device, and referring especially to Figure 10. When the ball 6 is removed from the tee 19, a spring 55 within the switch 24 raises the tee 19 and the vertical shaft 20, tilting the switch bar 59 sufficient to close the contact 56, completing an electrical circuit through the motor 38, from the supply line 57, conductor 58, switch bar 59, conductor 60 through the switch 52 by way of the switch bar 66 and back to the supply line.

Referring to Figures 1 and 2, when the above circuit is completed the motor 38 will rotate the wheel 34 in the direction of the arrow, bringing the cam roller 33 in contact with the end 32 of the operating arm 7, raising the end 32 of the arm and lowering the opposite end 11, forcing the tee assembly to be lowered within the housing 4. When this happens the golf ball 62 will roll into the position illustrated in Figure 3, directly over the tee 19 resting on the opening 62A. Before the tee 19 starts upward again, due to the cam roller 33 passing over top center and allowing the arm 7 to raise the tee assembly by the spring 13, a second electric circuit will be completed to keep the motor 38 running, completing the cycle of operation. When the tee 19 commenced to raise the ball 62, the switch 24 opened the circuit described above, but before this happened a second circuit had been completed in the following manner.

Referring to Figure 10, it will be noted that a switch 63 is operated by a cam surface 64 formed on the outer periphery of the wheel 34. This switch is normally open while the device is at rest and the ball is in teed position, but after the switch 24 has caused the motor to drive the wheel 34 a sufficient distance the cam 64 will permit the switch bar 63B to close, by allowing its operating plunger 65 to drop off the end of the cam 64, as illustrated in Figure 11, closing the switch contacts 63A, the switch 63 will thus complete an electric circuit through the motor 38, conductor 63C, switch 63, conductor 63D, motor 38 and back to the supply conductor 57, before the switch 24 is opened by the raising of the tee 19 under the ball 62. The switch mechanism 63 will then complete the cycle of operation bringing the wheel 34 to the position shown in Figures 1 and 10, allowing the spring 13 to raise the

tee assembly to the position illustrated in Figure 1. A master switch 52 is provided for stopping the operation of the entire device when the last ball has been delivered from the chute 48.

Referring to Figure 10, when there are no balls on the chute, the spring 53 of the chute and spring 66 within the switch 52 will open the contacts 67 so that a circuit cannot be completed through the motor 38, condutcor 58, switch assembly 24, as heretofore described, therefore, the machine will not start even though the ball 6 is removed from the tee 19. When the switch mechanism 52 has been operated, as above described, the contacts 67 will be closed by the switch bar 68 completing a circuit through the indicating signal light 69, which is usually located relative to the supply hopper, which indicates to the player that more balls will be required to continue playing.

In order to allow for smooth operation of the tee within its vertical housing 4, and to prevent the supply of golf balls 46 from causing too much pressure against the tee, a stop 70 allows but one ball to enter the receiving chamber 83 at one time. The stop 70 is secured to the cross shaft 71 at 72. The cross shaft 71 is journaled within bearings 73 within the frame of the machine. A crank 74 is fixedly mounted to the shaft 71 and is connected to a bell crank 75 through the connecting link 76, when the ball is in the position shown in Figure 1 the bell crank 75 holds the stop 70 out of engagement with the balls 46, through the action of the crank 77, which is fixedly mounted to the cross shaft 8 of the operating arm 7.

The bell crank 75 and the crank 77 are connected together by the link 78, the end 79 of the link operates within a slot 80. When the end 11 of the arm 7 is in the raised position, the crank 77 is also in its highest position, forcing the link 78 upwardly rocking the bell crank 75 in a direction to pull the link 76 to the right, raising the stop 70. A very slight movement downward on the end of the operating arm 11 will permit the stop 70 to be lowered its full distance holding the golf balls 46 back until the ball 62 is teed. The spring 81 provides the power for holding the stop 70 against the balls 46. Further travel downward of the arm 7 will not affect the bell crank 75, as it has been stopped by the stop 82, and the link 78 is allowed to work in the slot 80.

The driving mat 40 is constructed in the following manner: A resilient covering material 86 is secured to the plate 87, said plate 87 is of rigid construction, as for instance metal. The outer edge of the plate 87 rests upon the cushion material 88, preferably of sponge rubber, the cushion rests on the ledge 85 of the upper frame 3. A spacer 89 is provided underneath the plate 87, this spacer is made of deadening material and is for the purpose of centering the mat 40 within the cushion support 88. The cushion 88 absorbs the shocks transmitted to the driving mat 40 by the player's club heads in driving the ball from the tee.

In reviewing the operation briefly of the device, when the ball was removed from the tee 19, the electric switch 24 was closed starting the motor driving mechanism, operating the arm 7 positively against the tension spring 13 lowering the tee assembly sufficient to pick up another ball, the cycle of operation being completed by the closing of an auxiliary switch 63 by the cam 64, completing the electric circuit even though the switch 24 controlled by the tee was opened by the weight of the ball 62, at the same time the additional balls 46 were held in retarded position while the ball 62 was being teed.

I do not wish to be limited to this particular mechanical assembly, as other forms of mechanical embodiment may be employed, still coming within the scope of the claims to follow.

What is claimed as new is:

1. A golf ball teeing device including a frame seated in the recess in the playing area, a vertical housing secured in the frame, a golf ball support in the housing, a tee reciprocated vertically of the housing to engage and elevate the golf ball from the support in the upward movement of the tee and carried to a position above the playing area, the tee moving to a position below the support and free of the golf ball resting thereon at the downward limit of the tee, a guide movable in the housing below the support, a shaft depending from the tee and movable in the guide, a rod connected to the guide for reciprocating the guide and tee, a motor for moving the rod in one direction, a spring for moving the rod in the opposite direction, a switch carried by the guide, a circuit controlled by the switch for energizing the motor, means for moving the tee upwardly for a limited distance when released of the weight of the ball resting thereon, and means controlled by this limited upward movement of the tee for closing the switch.

2. A construction as defined in claim 1 including a second normally open motor circuit controlling switch, and means on the motor for closing the second switch to maintain the motor circuit when the first mentioned switch is opened in the downward movement of the tee.

3. A construction as defined in claim 1 including a controlling switch for the motor circuit normally closed by a ball in the chute in position to be delivered to the support, said switch automatically opening in the absence of such ball to prevent operation of the device when no ball is in position to be delivered by the tee.

4. A golf ball supporting tee comprising a frame seated in a recess in the playing area, a vertical housing carried by the frame, a golf tee capable of reciprocation in the housing, and movable to an operative position to project a golf ball for driving, or to inoperative position within the housing, means in the housing for supporting a golf ball in line with the tee and above the upper end of the tee when the latter is in an inoperative position, an element for reciprocating the tee, electrically operated means for moving the element, a switch carrying member movable with the tee and including a switch for controlling the electrically operated means, said switch being operated by the tee under the weight of a golf ball thereon to close the circuit and opened in the absence of the weight of the golf ball to break the circuit when the tee is in inoperative position, and a switch for interrupting the circuit in the absence of a golf ball in the housing in line with the tee.

5. A construction as defined in claim 1 wherein the housing is of cylindrical form and wherein the guide is of rectangular form having a diameter dimension corresponding to the diameter of the housing whereby the guide has corner bearing only on the housing.

6. A construction as defined in claim 1 wherein the housing is of cylindrical form and wherein the guide is of rectangular form having a diameter dimenision corresponding to the diameter

of the housing whereby the guide has corner bearing only on the housing, and a spring carried by the guide to engage the housing to prevent undue wear and play of the guide in the housing.

7. A golf-ball teeing device including a frame, a vertical housing in the frame, a golf ball tee movable in the housing, a motor for operating the tee, a chute for delivering golf balls to the tee, said chute including a movable section responsive to the weight of a golf ball, a normally-open circuit for controlling the motor, a switch for closing the circuit responsive to a predetermined limited movement of the tee, and a switch for controlling the circuit and operated by the movement of the movable section of the chute, said latter switch being opened in the absence of a ball in the movable chute section and preventing any circuit control by the first mentioned switch.

8. A construction as defined in claim 7, including a normally open circuit-controlling switch to be operated by the motor to maintain motor-energization following action of the first-mentioned switch.

9. A golf teeing device including a tee, means for operating the tee including a motor, means for moving the tee for a limited distance when such tee is in playing position and relieved from the weight of the ball, means for delivering golf balls to the tee, a circuit for the motor, and three switches for controlling such circuit, the first governed by the limited tee movement, the second controlled by the presence of a ball for delivering to the tee, and the third controlled by the motor.

10. A construction as defined in claim 9, wherein the opening of the second switch prevents any circuit control by either the first or third switch.

11. A construction as defined in claim 9, wherein the third switch is effective to control the motor circuit only following operation of the first switch.

12. A golf ball teeing device, comprising a frame seated in a recess in a playing area, a vertical housing carried by said frame below the playing area, a rubber tee movable vertically in the housing, means for reciprocating the tee longitudinally of the housing to a position to support the golf ball in driving position above the playing area, means fixed to the housing to support and center the golf ball above the lowermost position of and in line with the tee, a ball magazine and an independent element for insuring delivery of the golf balls singly from the magazine to the supporting means, and means for reciprocating the golf tee to correspondingly govern the ball delivery element.

13. A construction as defined in claim 12, including a motor and motor circuit for actuating the golf teeing reciprocating means, a switch in said circuit carried by the housing-carried means for supporting the golf ball, said switch being controlled by an independent element for delivering golf balls from the magazine.

14. A construction as defined in claim 12, wherein the independent element for the delivery of the golf balls singly from the magazine includes a pivotally supported chute having a delivery end terminating above the housing-carried ball supporting means and free of the ball in the movement of the latter on the tee.

JOE MOZEL.