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Ready

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[54] GAME TARGET

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[52] **U.S. Cl.** .....**273/182 R,** 273/185 R
[51] **Int. Cl.** **A63b 69/36**
[58] **Field of Search**.....273/181, 182, 184, 185, 176, 273/102.1, 102.2, 103, 104

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[57] **ABSTRACT**

A forwardly inclined target board is rotationally mounted on each of five horizontally extending pivot shafts which are vertically spaced from each other: Each lower board extends upward to a position forward of the lower portion of the board immediately thereabove. An upright member positioned rearwardly of the target boards is mounted so as to be pivoted rearwardly about a pivot axis at its lower end in response to rearward movement of any of the target boards about its associated pivot shaft. The rearward movement of the upright member actuates a hydraulic system which provides the golfer at the tee area with an indication of the probable distance the ball would have been driven had it not hit one of the target boards. If a driven ball hits a narrow central zone of any target board with a force that would have enabled the ball to reach the cup in a putting green, suitable electrical components are provided to indicate that a hole-in-one has been scored. Additional boards and electrical components may be provided on opposite sides of the above mentioned five boards to indicate that a ball has been driven into a bunker or the rough. Golf balls are deflected downward from the target boards into a trough for being returned to the tee area.

16 Claims, 3 Drawing Figures

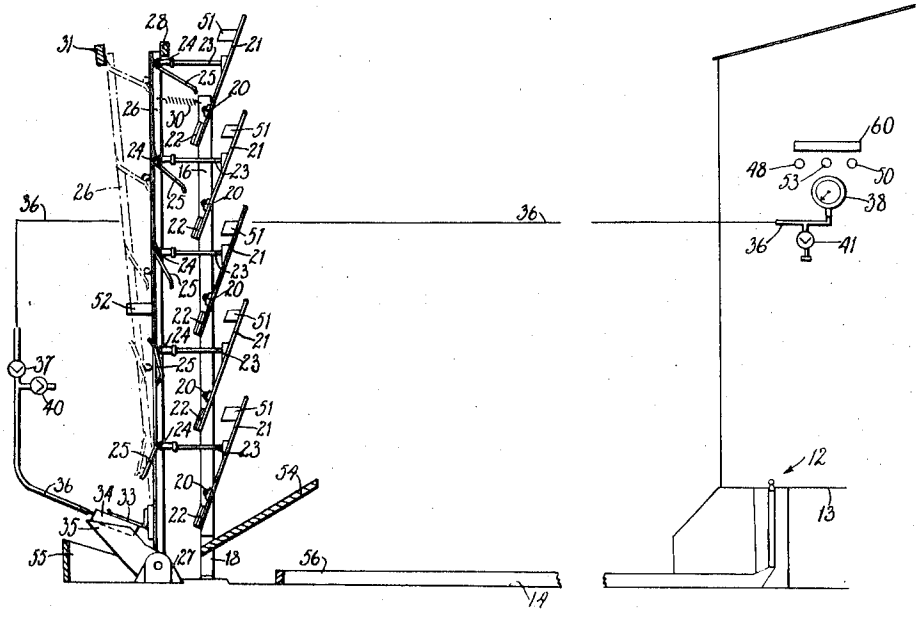

Fig. 2

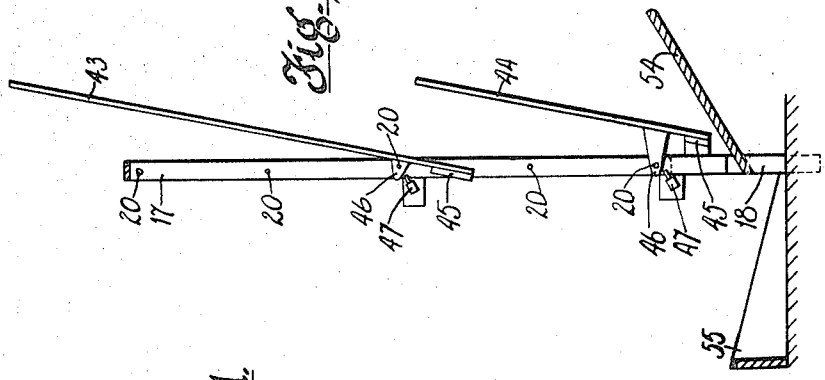
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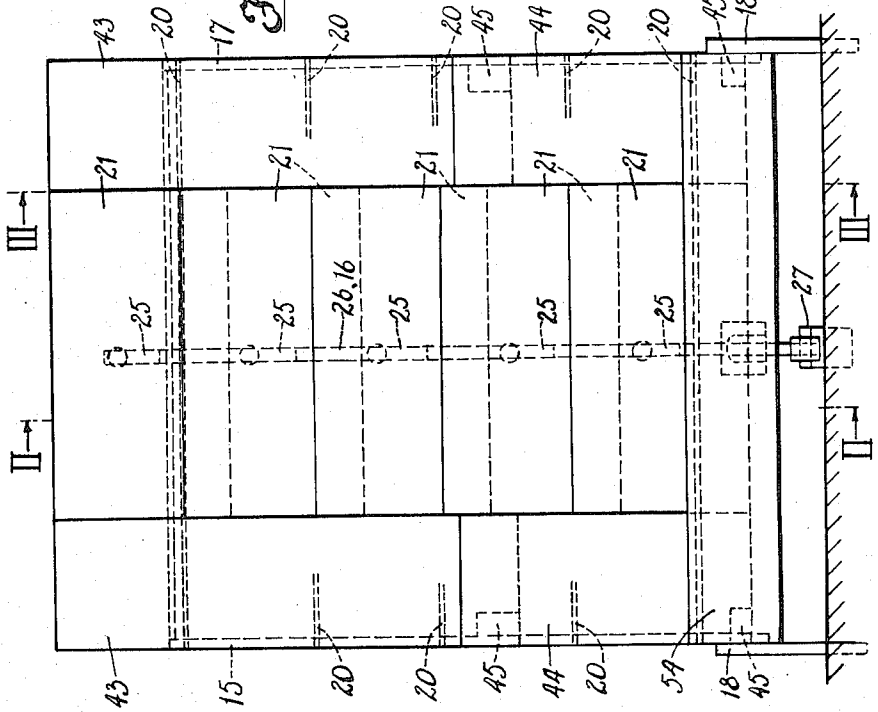
Fig. 1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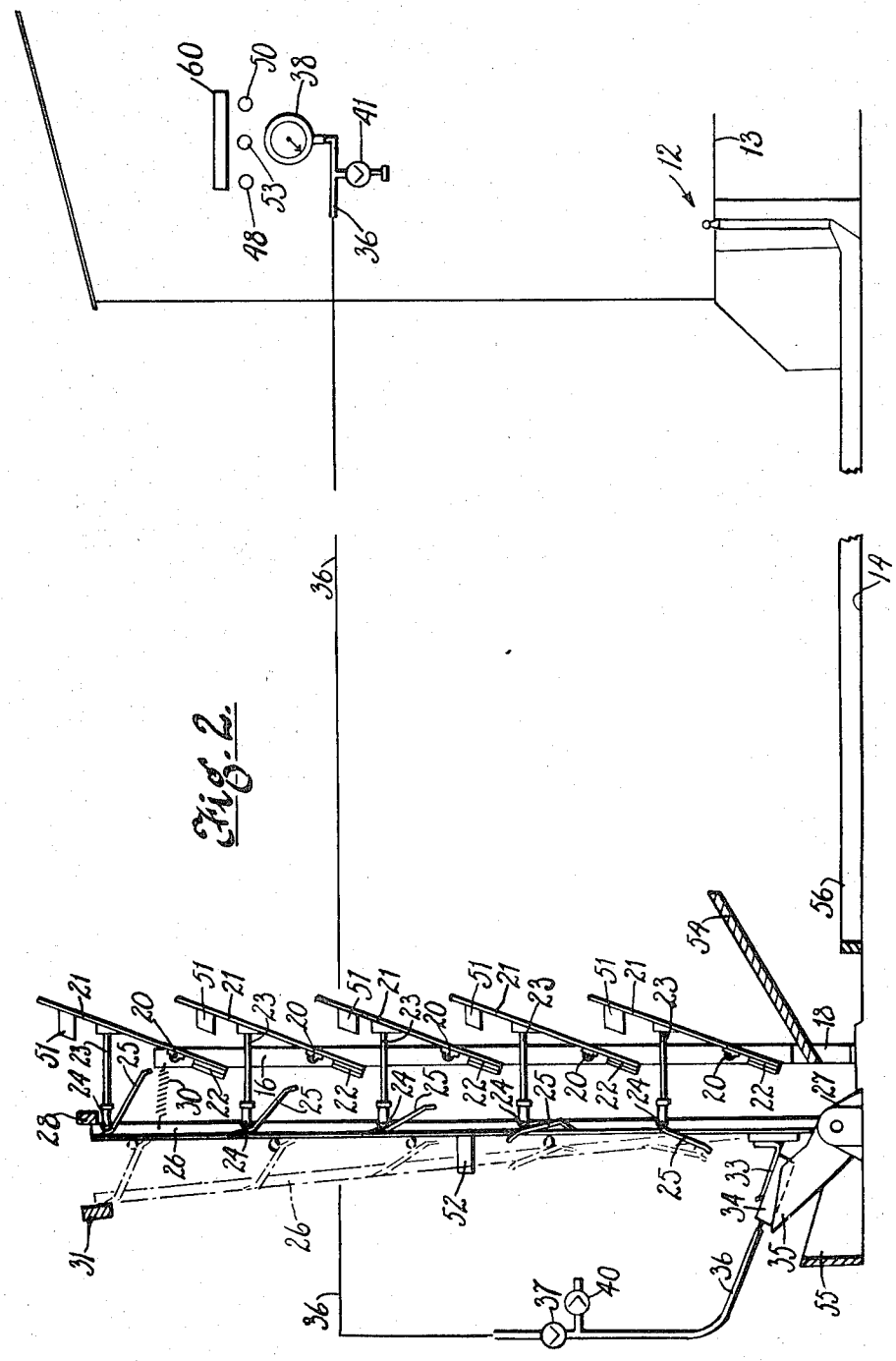
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Fig. 2.

GAME TARGET

This invention relates to apparatus for use in tests of skill, such as golf and archery. With the continued and increasing interest in the playing of golf and the pressures on the capacities of golf courses, there is a need for places off the course where golfers may practice driving during periods of both light and dark and of inclement weather. While practice areas are already known, where the golfer drives into a net, the golfer is given no indication of the length or accuracy of his drive, if the ball had not been brought to rest by the net. Where no net is used, and the golfer drives a succession of balls from a fixed tee into a field, a large area of land is required and problems of ball collection arise.

Apparatus for use in tests of skill comprises, according to this invention, a target towards which a ball or other projectile is to be directed and indicating means coupled to the target and arranged to give a single indication which increases with increasing force of impact of the projectile on the target and with increasing height of impact. The indication is thus at least approximately representative of the distance the projectile would have travelled if it had not met the target.

When applied to golf practice, the present invention provides a golf target which may be located close to the driving point; the indicating means then gives an indication representative of the length of drive, if the ball had not been impeded by the target. In this way, the area employed may be relatively small and the problem of ball retrieval mitigated. Indication of the accuracy of drive may also be given.

A second aspect of the invention resides in golf driving practice apparatus comprising a target including a plurality of independently mounted and upstanding target boards arranged at successively different levels, and indicating means coupled to all the boards and arranged to be operated by the impact of a ball on a board to a degree dependent on both the height of the board struck and the force of impact of the ball on that board.

Each of at least some of the target boards may carry means which when the board is struck on a limited zone with a prescribed impact operates an indicator representing a "hole-in-one." Preferably, the target boards are flanked by auxiliary boards, which are arranged to give a separate indication when struck, and which represent that the ball has been driven wide. The separate indication may thus represent "rough".

The invention will be more readily understood by way of example from the following description of a golf driving target in accordance therewith, reference being made to the accompanying drawing, in which

FIG. 1 is a front view of the target,

FIG. 2 is a section on the line II—II of FIG. 1, showing the target boards and the tee, and

FIG. 3 is a section on the line III—III of FIG. 1, showing the "Rough" and "Bunker" boards.

Referring first to FIG. 2, the target, which is shown at the left-hand side of that figure, is located a relatively short distance from the driving point indicated at 12. This distance may be as short as 20 feet, but is desirably about 45 feet. In the arrangement illustrated in FIG. 2, the Tee level 13 is disposed above the ground level 14.

The target has a steel structure consisting of uprights 15, 16, 17, connected by cross members and permanently secured in the ground by feet 18. The uprights 15–17 carry five horizontal pivot shafts 20, which are spaced at regular intervals vertically and which extend the full width of the target. These shafts 20 pivotally support a number of target boards.

Centrally of the target, there are a number, shown as 5, of target boards 21 mounted on the respective shafts 20 and therefore disposed at different vertical heights. Each target board 21 is pivotally mounted below center and is normally restrained in an inclined position by a stop 22 which is secured to the central upright 16. As will be seen, each target board 21 is inclined forwardly, with the upper edge nearer to the driving point than the lower. Further, each board 21, except the uppermost, overlaps the next higher board, when viewed from the front, up to the height of the shaft 20 of that higher board.

Above the pivot shaft 20, each target board carries a rigid, rearwardly directed arm 23 which terminates in a cam-follower in the form of a roller 24. Each cam-follower 24 runs on an associated cam 25 secured rigidly to an upright member 26, which is shown as a steel section and which is pivotally mounted on trunnions 27 secured in the ground. Movement of the member 26 in a clockwise sense, as viewed in FIG. 2, is limited by a stop 28, while movement in the counter-clockwise direction is restrained by a spring 30 and limited by a second stop 31. The cams 25 are individually shaped to conform with the movement of the cam-follower on pivotal movement of the respective board 21.

When a ball driven from the tee 12 strikes one of the target boards 21, the member 26 is driven anticlockwise by an amount dependent on (a) the force of impact with which the ball strikes the board, and (b) the height of the board that is struck. Thus, for a ball of a given speed, and thus a given force of impact, the angular movement of the member 26 is greatest when the ball strikes the uppermost target 21 and least when it strikes the lowermost target. As the distance that the ball would have travelled, if it had not been impeded by the target is dependent both upon its speed and the height of its trajectory, the angular movement of the member 26 is an indication of that distance. The member 26 is coupled to indicating means which indicate at the driving position the distance represented by the movement of that member.

One such indicating means will now be described. In FIG. 2, the member 26 is shown as having secured to it a pressure member in the form of a foot 33 engaging on a cylinder 34 of flexible material, such as rubber. The cylinder 34 is supported in an arm 35 secured in the trunnions 27 and has an internal diaphragm (not shown) separating a volume of liquid within the cylinder from the cylinder outlet which is connected to a flexible pipe 36. Pipe 36 is connected through a non-return valve 37 to a pressure indicator 38 which is disposed at the driving position and which is calibrated in yards of drive. A second non-return valve 40 connects the pipe 36 with atmosphere and is disposed at the target position. A manually operated reset valve 41 disposed adjacent to the indicator 38 can be opened to release any pressure in the air line between valve 37 and indicator 38.

When the member 26 is driven anti-clockwise, the foot 33 acts on the flexible cylinder 34 to distort the in-

ternal diaphragm and force out of the cylinder an amount of air dependent on the angular movement. This air passes the non-return valve **37** and, increasing the pressure in the line beyond valve **37**, causes the indicator **38** to register the distance driven. The movement of the member **26** is of course transitory, and the member **26** is almost instantaneously returned to the normal position against the stop **28**. However, the non-return valve **37** ensures that the indicator **38** will continue to record the distance driven, until the valve **41** is opened to bring the pressure within pipe **36** to atmospheric. As soon as the member **26** is returned to the normal position, air is drawn into pipe **36** through the non-return valve **40**, permitting the cylinder **34** to return to its initial shape.

While the hydraulic-pneumatic system illustrated and described for indicating the movement of the member **26**, and hence the length of the drive, has the merit of being simple and inexpensive, bearing in mind the distance between the target and the display point, other methods, particularly electrical, of measuring and displaying the displacement of the member **26** may be provided in its place, provided that the display, corresponding to the dial **38**, gives a permanent indication of the impact-movement of the member **26**, until reset manually to zero.

On each side of the boards **21** are two auxiliary boards — an upper "Rough" board **43** and a lower "-Bunker" board **44**. Each auxiliary board **43,44** is pivotally mounted on one of the shafts **20** and is normally restrained in the inclined position shown by a stop **45** mounted on an upright **15**, or **17**. Each board **43, 44** additionally carries a rearwardly - directed cam **46** which co-operates with a micro-switch **47**, so that, if the board is caused to move anti-clockwise on being struck by a ball, the cam **46** engages its switch **47** to complete an electrical circuit, which illuminates an appropriate indicator lamp **48, 50** at the driving position. The lamp **48, 50** remains illuminated until reset manually.

Each target board **21** additionally carries a micro-switch **51**, which is closed when the board is struck on a narrow central zone, which may have a width less than the diameter of a golf ball. The switches **51** are connected in parallel with a further switch **52** and with a "-hole-in-one" indicator lamp **53**. Switch **52** is closed when the member **26** is driven backwardly through a distance representing the distance of the "hole" from the driving position. Thus, if a switch **51** is closed by the ball being driven accurately centrally of the target and the distance driven is correct, the circuit is completed and the lamp **53** illuminated.

Balls striking the boards **21, 43, 44** are deflected downwardly and are directed by a deflector board **54**, disposed below the level **13**, towards a trough **55**, where the balls are collected and eventually returned through a further trough **56** running from the target to the driving position. At the latter location, the balls may be raised automatically and one at a time to the tee **12**.

The whole target, constituted by the boards **21, 43, 44** is preferably painted to represent the fairway, rough, bunkers etc., and includes a representation of the hole itself, located on the central line of the boards **21**. A series of such targets may be located side-by-side, each with its own driving location, which may be separated from the next by walls to form separate booths, in which are located the various display elements **38, 48, 50, 53**. The various booths and targets are preferably separated from each other by nets extending from the sides of the booths to the sides of the targets.

In order to increase the similarity between the practice area illustrated in the drawings and the actual conditions on the course, the equipment may be modified to simulate all the shots from tee to pin, rather than only the initial drive. Thus, when the first drive has been made, the distance indicated on the indicator **38** may be substracted from the distance from tee to hole and the remaining distance indicated on the further indicator **60** in the booths. A second shot may be made to cover that remaining distance. When the ball has figuratively been brought within a given distance from the hole, corresponding to the usual putting distance, the hole may be completed on a "putting green" provided with a hole in the area between the tee **12** and the target.

I claim:

1. In apparatus for use in tests of skill, comprising
a plurality of independent upstanding target boards, and
means for independently mounting said target boards at successively different vertical levels, the improvement comprising
common indication generating means for all said boards, and
means for individually coupling said boards to said generating means whereby said generating means give an indication when any said board is struck by a projectile,
each said coupling means being dependent on the height of the associated board whereby said indication varies according to which of said boards is struck by said projectile.

2. Apparatus according to claim **1** in which said generating means includes a flexible fluid reservoir, a pressure member which is forced into the reservoir when one of said target boards is struck, and means for indicating the resulting increase in pressure.

3. Apparatus according to claim **1** for practicing the game of golf in which the indicating means also indicate a bunker and/or "rough."

4. Apparatus according to claim **1** for practicing the game of golf in which said target boards are so constructed that a ball striking any said board is guided into a trough, for reuse.

5. In golf driving practice apparatus comprising
a plurality of independent upstanding target boards, and
means for independently mounting said target boards at successively different vertical levels,
improved indication means comprising
an upstanding member,
means for pivotally mounting said member about an axis at or below the lowermost of said boards,
separate coupling means for each said board, coupling the associated board to said member at a height dependent on the level of the associated board,
means for restraining said member, and

means for displaying the movement of said member in response to the impact of a ball on any said board.

6. Golf driving practice apparatus according to claim 5 in which the target boards are of substantially equal width and arranged one above the other.

7. Golf driving practice apparatus according to claim 5 in which each board is mounted for limited pivotal movement about its own horizontal pivot axis.

8. Golf driving practice apparatus according to claim 7 in which each board, except the lowermost board, is overlapped by that immediately lower up to at least the pivot axis.

9. Golf driving practice apparatus according to claim 5 in which each board is inclined to the vertical, the upper edge being closer than the lower edge to the driving point.

10. Golf driving practice apparatus according to claim 9 in which there is a trough below the boards for the collection of balls deflected downwards after striding the boards.

11. Golf driving practice apparatus according to claim 5 in which each board is pivoted about a horizontal axis and has an arm which engages against a cam track secured to the member.

12. Golf driving practice apparatus according to claim 5 in which the display means comprises a pneumatic or hydraulic cylinder which is operated on by the member to displace fluid in order to display the angular movement of the member at the driving point.

13. Golf driving practice apparatus according to claim 5 in which each of at least some of the boards carries means which when the board is struck on a limited zone with a prescribed impact operates an indicator representing a "hole-in-one."

14. Golf driving practice apparatus according to claim 13 in which the means carried by the board comprises an electric switch arranged to be operated when the board is struck on the limited zone and electrically coupled with the indicating means to complete a circuit to the "hole-in-one" indicator when the indicating means indicate that a prescribed distance has been driven.

15. Golf driving practice apparatus according to claim 5 in which the target boards are flanked by auxiliary boards which are arranged to give separate indication when struck.

16. Golf driving practice apparatus according to claim 15 in which each auxiliary board is horizontally pivotally mounted and is provided with an electric switch arranged to be operated when the board is pivoted on being struck by a ball.

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