

March 2, 1937.

C. W. MORGAN

2,072,682

GAME OF SKILL

Filed July 29, 1932

2 Sheets-Sheet 1

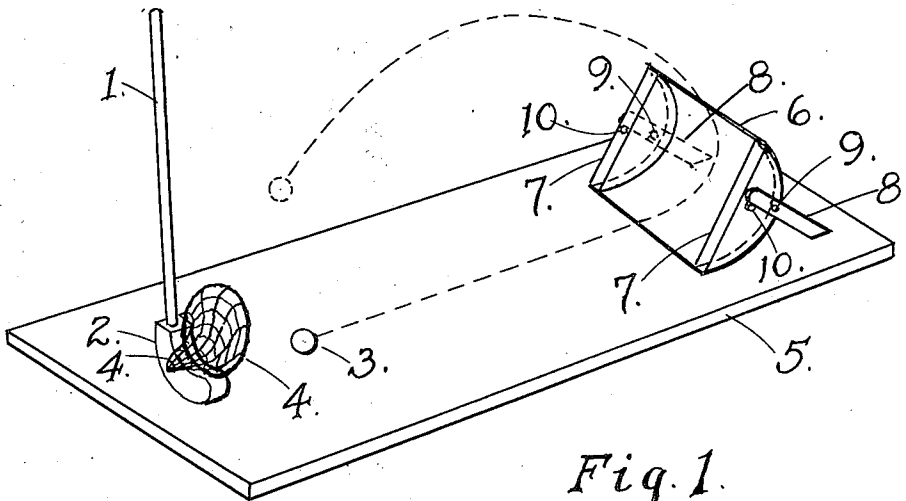


Fig. 1.

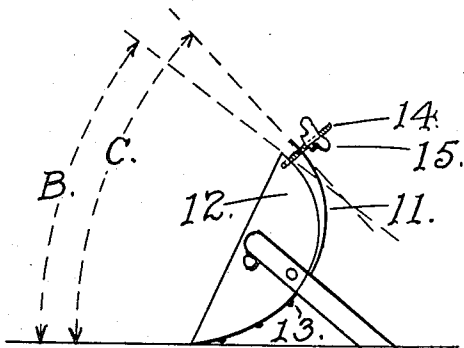


Fig. 2.

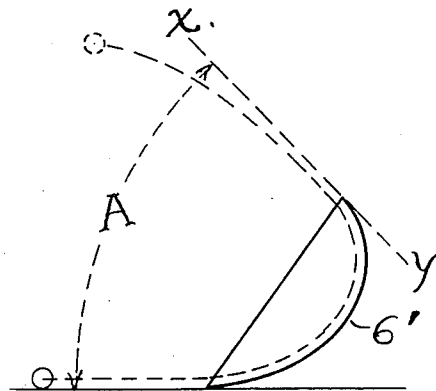


Fig. 3.

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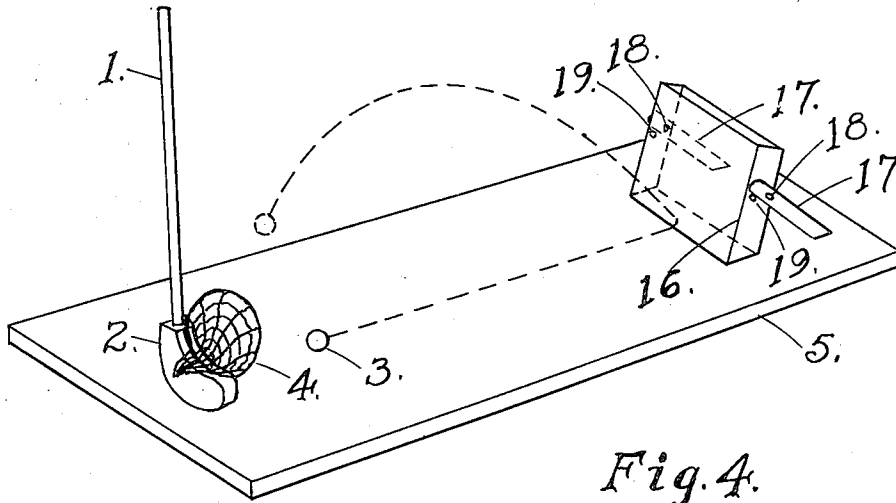


Fig. 4.

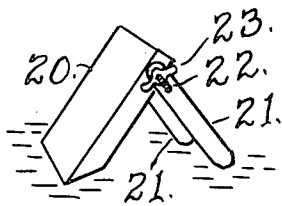


Fig. 5.

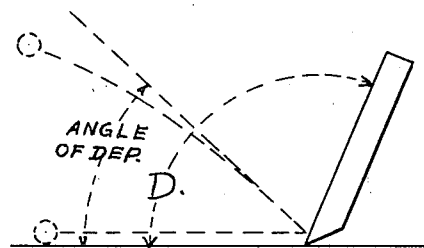


Fig. 6.

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UNITED STATES PATENT OFFICE

2,072,682

GAME OF SKILL

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Application July 29, 1932, Serial No. 625,973

1 Claim. (Cl. 273—96)

My invention relates to a new game of skill which may be viewed as belonging to that general class of games of the type of golf, hockey, and lacrosse.

5 The principal object of my invention is to devise a game of skill having features characteristic of both golf and lacrosse.

10 Another object is to devise a game having these features which may be played by a solitary player or by two or more in competition.

15 More specifically, I aim to provide a novel implement having a dual purpose,—one use being to serve as a club with which a player may drive a ball accurately in a desired direction as the golfer may do in putting, and the other being to serve as a device for catching the ball in the air in the manner somewhat comparable to the playing of lacrosse.

20 Another specific object I have in view is to provide means in the form of floor targets to intercept the swiftly rolling ball driven by the player and by its reaction upon the ball, project it upwardly and backwardly toward the player thus affording him the opportunity to plainly see 25 and catch it with the aforementioned implement he has in hand.

These objects will be more readily appreciated after considering certain defined embodiments of my invention which are described further on.

30 In the drawings forming a part of this specification, Fig. 1 illustrates a set of elements embodying my invention; Fig. 2 is a side elevation of what I term as a reaction target of the centripetal type and which is provided with means of adjustment; Fig. 3 is an explanatory diagram; 35 Fig. 4 is a second set of elements comprising a second embodiment of my invention; Fig. 5 is a view of a reaction target of the impact type and which is provided with means of adjustment; 40 and Fig. 6 is an explanatory diagram.

I shall now proceed to describe the set of devices in Fig. 1 which constitute a typical embodiment of my invention:—

45 1 is the shaft or handle of a striking implement somewhat similar to a golf or hockey stick. 2 is the ball-driving head shaped and faced properly so that the user thereof may drive the ball 3 in a desired direction whether he be right 50 or left handed. 4 is an open mouth ball-catching receptacle similar to a small dip-net which is rigidly affixed to the head 2. 5 is a level runway for the ball to roll on, and 6 is a reaction target of the centripetal type. I term this device 6, a 55 centripetal target for the reason that it reacts

upon a rolling ball by the centripetal pressure of its introflexed surface, while with the reaction target of the impact type described later on, the ball returns to the player because of the energy engendered at impact.

5 The structure of this typical centripetal target 6 is as follows: A substantially rectangular piece of rather flexible material such as sheet steel, is bent over and attached to the smoothly curved side members 7, 7. Legs 8, 8 pivoted on pins 9, 9 10 and limited in rearward extension by stop-pegs 10, 10 comprise a foldable support to facilitate packing for storage.

15 The reader will more fully appreciate the further description of the centripetal target after he is acquainted with the method of using the apparatus thus far explained.

Referring to Fig. 1, the player first places the ball 3 on the runway 5 a few feet from the target 6. He then drives the ball toward the target 20 with the implement 1, and in so doing tries to avoid lofting the ball in order that the travel of the ball may be one of pure rolling. The ball enters onto the concave surface of the target, rolls up 25 around it, and then departs therefrom toward the player, along a theoretical line tangent to the curved surface at the point of exit. When the ball returns near the player, he attempts to catch it in the receptacle 4. One simple competitive game, which may be engaged in by two 30 or more players is as follows. Each player when it comes his turn endeavors to make a perfect drive and catch in the fewest number of trials from a specified distance. The distance is then increased and the players repeat. Due to certain 35 hereinafter described improvements incorporated in my design of centripetal targets, one of these devices having a height of approximately one foot, will project a small sponge-rubber ball to a player standing over twenty feet therefrom, 40 the ball in flight rising to a height of six or seven feet.

45 The improvements referred to, involve in their development, certain principles of external ballistics with which the reader must be acquainted to fully appreciate the scope of my invention. It is a well-known theory that if a cannon could be fired in vacuo at an angle of inclination to the horizontal of exactly 45 degrees, the cannon- 50 ball would be projected over the longest range possible for the energy of the powder charge initially propelling it. In actual practice, opposition to flight of the cannon-ball or shell reduces the angle of elevation for longest range to 55

values approximating 30 degrees for guns of medium caliber.

In my invention, there are two objectives to be attained in the design of a non-adjustable reaction target of either the centripetal type under discussion or of the impact type to be described later on. One objective is that the range of the ball backward toward the player should be near to a maximum considering the velocity of the ball at departure from the target, and the second objective is that the ball shall rise to an appreciable height to afford the player ample opportunity to see and catch it for the reason that the target is at a much lower level than the player's eyes. A ball projected over a low rather flat trajectory would be extremely difficult both to see and catch.

Now referring to Fig. 3 which is an explanatory diagram, the swiftly rolling ball emerges from the target 6' along a line XY which is a tangent to the curved surface at its upper extremity. Therefore, in a centripetal target not provided with a means of adjustment, it is generally desirable to have the concave surface smoothly curved and limited in extent such that angle A approximates values not far exceeding 45 degrees nor much less than 30 degrees. Hereinafter, I term this angle A the angle of elevation of a centripetal target. As wind resistance does not have a very material effect on the ball used in this game, I find that centripetal targets having angles of elevation of approximately 45 degrees are quite satisfactory. However, if it is found desirable at some time to use very light weight balls, it may be necessary to reduce the angle of elevation somewhat to allow for wind resistance. Therefore, I wish it to be understood, I consider it within the scope of my invention to reduce the angle of elevation to values below 45 degrees but greater than 0 degree. A target of the latter angle would be useless for the purpose.

It will now be quite obvious to the reader that the player may wish at times to vary the general form of the trajectory followed by the ball. He may prefer to try his skill in catching the ball when it travels a rather low trajectory or he may wish to have the ball travel high in the air over a short horizontal range. To make such variation possible, I have devised the centripetal target shown in Fig. 2 which is equipped with means of adjusting its angle of elevation. In this device, the curved sheet 11 is closely attached to side piece 12 at several points one of which is the screw or nail 13. Above this there is the long stud 14 and wing-nut 15 thereon. Stud 14 passes through a hole in 11. This typical arrangement permits the player to draw downward the upper portion of 11 into close contact with side piece 12, by turning the wing-nut 15 and the one corresponding to it at the other side of the device. In that close adjustment, the angle of elevation will be the angle B. If the player wishes to have the ball travel a steep trajectory, he backs off the wing-nuts to some such position as is indicated in the drawings. The angle of elevation C in this case will be greater than B. It will be noted that this means of adjustment does not influence the lower half of the target nor does it change the relation between this lower half and the runway. It is assumed in this description that the sheet material used has some elasticity which will in-

sure that the upper end of the sheet will follow the wing-nuts as they are backed off.

In Fig. 4, I illustrate a second embodiment of my invention in a set of devices comprising the shaft 1, head 2, ball 3, receptacle 4, and runway 5, all shown and fully described in connection with Fig. 1. 16 is a reaction target of the impact type. This is fundamentally a body of rather weighty material having a plane surface face inclined backwardly from the perpendicular. The lower edge of this front face is devised to have close contact with the runway. When compactness for storage is desired, the legs 17, 17 on pivots 18, 18 and stop pegs 19, 19 comprise the elements of a foldable support.

The player employs this equipment in the same manner as has been described in connection with Fig. 1. In this case however, the ball returns to the player by bouncing backwardly and upwardly from the face of the target. The more nearly perpendicular the front face is, the flatter or lower will be the trajectory, and on the contrary, the greater the backward inclination of the front face is up to certain limits, the higher will be the trajectory of the ball.

The determination of the degree of inclination for the front face of my impact target 16 in Fig. 4, which has no means of adjustment, depends on the theory of external ballistics already treated and also on certain laws of elastic impact. It will be recalled that it is quite satisfactory for the purpose of this game, to have the ball depart from the target at angle approximating 45 degrees to the horizontal. Now the laws of elastic impact that have a bearing on the problem are to the effect that if both ball and target were constructed of materials perfectly elastic and if the ball struck the target without having any rolling motion at the instant of impact, the angle of rebound from the target face would equal the angle of incidence. In actual practice however, since ordinary materials do not possess perfect elasticity, the new course taken by the ball will be a little nearer parallel to the face of the target than the incident course. But this angular difference is small and hence what I term the angle of backward inclination D in Fig. 6 may for a non-adjustable impact target, be fixed at the theoretical value approximately. This is 90 degrees plus one half of 45 degrees which is equal to 112½ degrees.

In Fig. 5, I show an impact target provided with a means of adjustment. The body portion of this target 20 may be tilted and locked at any desired angle by means of the typical arrangement comprising supporting legs 21, 21 pivotally mounted on studs 22, 22 provided with wing-nuts 23, 23.

In using this target, if the player desires to catch the ball on a rather flat trajectory, he sets the target to an angle of backward inclination less than 112½ degrees. While if he prefers to catch the ball on a humped trajectory, he sets the target to a greater angle of backward inclination. Should the target be set an angle of 135° the ball would rise approximately perpendicularly when departing from the target.

While I have herein set forth satisfactory embodiments of my invention, it is to be understood I do not wish to be restricted to the specific mechanical constructions shown as typical devices and hold myself entitled to make such changes therefrom as fairly fall within the scope of what I claim.

I am aware that small box-like game devices provided with up-turned ends have been designed but from careful examination of drawings illustrating their structures, it becomes clearly apparent to me that these curved members are of such structure as to negate their utility as parts in my invention.

I am also aware that the act of bouncing a ball against a vertical wall is a very old and well-known amusement, but I am not aware that this sport has ever been improved upon in the design of special impact targets to be used therefor.

I am further aware of the detailed structure of a lacrosse stick and am convinced of its unfitness to service as an element of my invention. But recognizing the existence and structure of this device, I limit my claim having relation to the playing implement I have devised to such

improvements in structure as make my implement acceptable as an element of my complete invention.

Having fully described my new game of skill and the apparatus I have provided therefor,

I claim:

In game apparatus, a hand-implement comprising a shaft or handle, a curved head, a hoop and a flexible open-mouthed net or bag, the said net being attached to the hoop in a manner to retain the mouth of the net in the open position, the hoop being affixed to a curved portion of the head and the head being affixed to one end of the shaft and fashioned to a shape which provides oppositely-disposed faces so that either a right-handed or left-handed player may effectively contact a ball.

CHARLES W. MORGAN.