United States Patent

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[54] **MOVING TARGET AND ROTATING CENTRIFUGAL PROJECTOR**
13 Claims, 4 Drawing Figs.

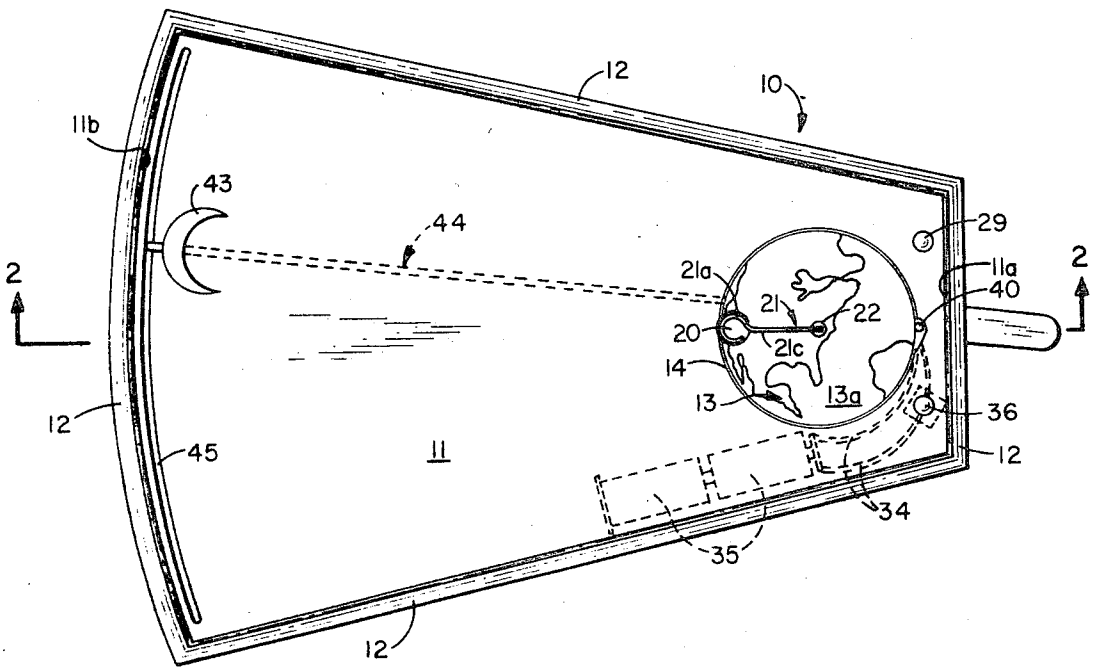
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[51] **Int. Cl.** **A63d 3/02,** A63b 65/12, A63b 71/00
[50] **Field of Search** 273/119, 122, 101, 127, 129; 124/6, 41

[56] **References Cited**
UNITED STATES PATENTS

1,706,329	3/1929	Smith	273/119
2,473,091	6/1949	Brooks et al.	273/129

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Assistant Examiner—Theatrice Brown
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ABSTRACT: A game simulating translunar injection. The game includes a sector-shaped board, a rotatable turntable coplanar with the board at the narrow end thereof, and a moon-shaped target movable along an arcuate path across the wide end of the board. A ball rests in a detent on the turntable face, a pushbutton-actuated mechanism permitting selective release of the ball as the turntable is rotating, skill being required to release the ball at a proper time so that it will be propelled centrifugally toward the target.



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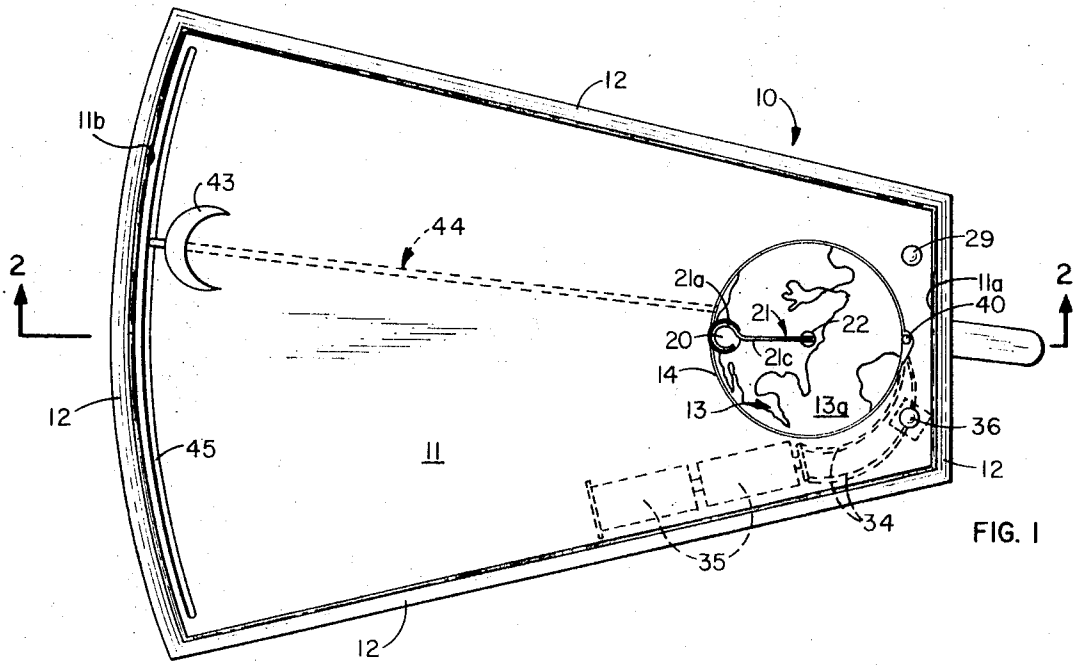


FIG. 1

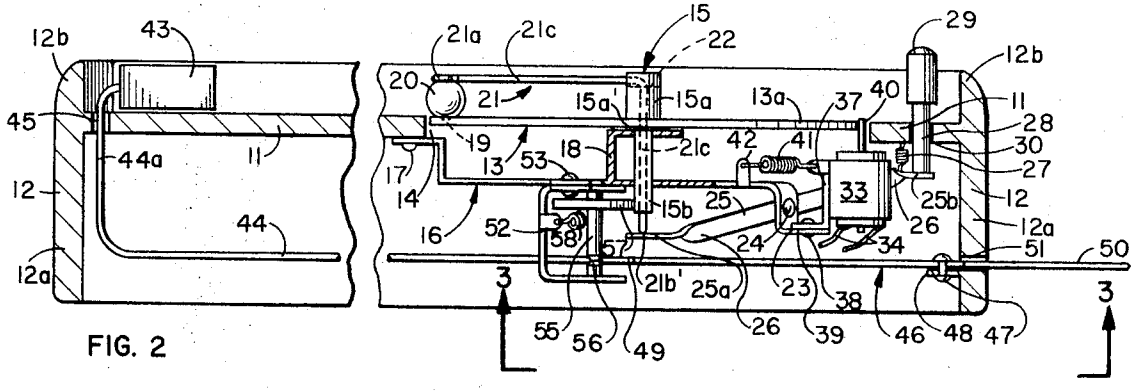


FIG. 2

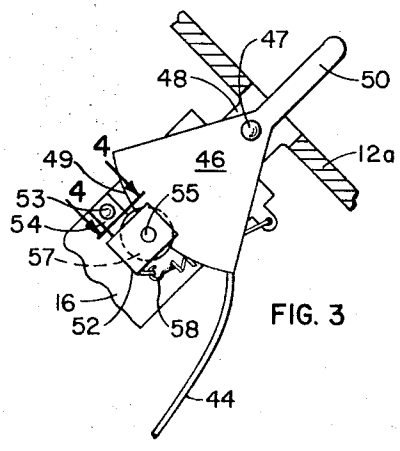


FIG. 3

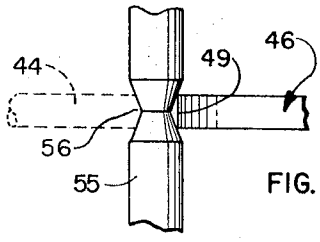


FIG. 4

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MOVING TARGET AND ROTATING CENTRIFUGAL PROJECTOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a game simulating translunar injection, and more particularly, to a game comprising a rotating turntable coplanar with a sector-shaped board, a target movable in an arcuate path on the board, and a mechanism to permit selective release of a ball held on the turntable at a proper time so that it might strike the target.

2. Description of the Prior Art

With the public's ever-increasing knowledge of the universe and awareness of the problems inherent in space exploration, there has been a concomitant demand for toys and games which accurately simulate space conditions and activities. Indicative of this demand is the recent phenomenon of space suits far outselling the traditional cowboy outfits at Halloween time. Despite this demand, however, no games have been available in the past which simulate the problem of launching a space vehicle from the rotating earth in an appropriate trajectory toward a moving target such as the moon or another planet.

Typical of prior art board games requiring skill to manipulate the position of a ball rolling across a planar surface are various pinball machines. These games all have a variety of stationary targets toward which a ball is projected. Generally, the ball is initially at rest, and is struck into motion by release of a spring-biased plunger. A plurality of operator-controlled paddles then may be used to deflect the linear path of the ball, hopefully toward the target. Such pinball-type games, while offering amusement to the player, lack the sales appeal of games more directly related to space problems.

The present invention relates to a game which overcomes this limitation of the prior art, the game accurately simulating the problems inherent in translunar injection, yet maintaining skill requirements which gave appeal to earlier known games.

SUMMARY OF THE INVENTION

In accordance with the present invention there is set forth a game simulating translunar injection. The game comprises a generally sector-shaped, horizontal board having a moon-shaped target movable in an arcuate path along the rim or periphery of the sector. A rotatable turntable, colored to resemble the planet earth as viewed from outer space, is provided coplanar with the board adjacent the narrow end thereof. A ball seats in a detent on the rotating turntable, and is selectively released by the operator while the turntable is rotating, centrifugal force projecting the ball along the board away from the turntable. Skill is required to release the ball at the proper time so that it will strike the moving target.

The turntable comprises a circular disc fixedly, coaxially attached to a tubular shaft. The ball release mechanism comprises a generally inverted L-shaped arm having a vertical section which extends downward through the tubular shaft, and a horizontal section extending radially above the surface of the turntable and terminating in a loop adapted to engage the top of the ball seated in the detent. The arm rotates with the turntable, but is free to move vertically, longitudinally of the turntable shaft. A button-actuated paddle is provided beneath the board to move the arm vertically, thereby releasing the ball, centrifugal force causing the ball to roll along the surface of the board toward the moon-shaped target.

The target itself is attached by means of an elongate rod to a rotatable, planar, sector-shaped member situated below the board in spaced parallel relation therewith. The sector is rim driven by a simple friction drive from the rotating turntable shaft. A handle fixedly attached to the sector-shaped member permits positioning of the target independent of the member drive system.

In alternative embodiments, the board may be completely circular in shape, and may be provided with a plurality of targets. In addition, various movable, stationary or selectively positionable impediments may be positioned on the board, simulating asteroids, space ships in orbit and the like.

Thus, is an object of the present invention to provide a novel game simulating translunar injection.

Another object of the present invention is to provide a board game including a moving target and a rotating turntable and means for selectively releasing a ball from the turntable toward the target.

It is another object of the present invention to provide a game wherein a rotating turntable, marked to resemble earth as viewed from space, supports an element simulating a space vehicle which element may be selectively released from the turntable to move toward a moving target simulating a celestial object.

It is yet another object of the present invention to provide a game comprising a board, a rotating turntable coplanar with the board, a target movable along an arcuate path on the board, and means for releasing a ball from the rotating turntable.

Still another object of the present invention is to provide a board game comprising a rotating turntable and a release mechanism cooperating therewith and permitting a ball to be centrifugally released from the turntable when the turntable is in an angular orientation selectable by the player.

A object of the present invention is to provide a board game having a board, a turntable coplanar with the board, a target spaced apart from the turntable, and means for simultaneously rotating the turntable and moving the target across the board.

It is a further object of the present invention to provide a game incorporating a movable target situated at the end of an elongate rod attached to a pivotable sector-shaped member, a handle for pivoting the sector manually, and a rim-driven mechanism for pivoting the sector mechanically.

BRIEF DESCRIPTION OF THE DRAWINGS

Still other objects, features and attendant advantages of the present invention will become apparent to those skilled in the art from a reading of the following detailed description of the preferred embodiments constructed in accordance therewith, taken in conjunction with the accompanying drawings wherein like numerals designate like parts in the several FIGS. and wherein:

FIG. 1 is a top plan view of a preferred embodiment of the inventive game simulating translunar injection.

FIG. 2 is a sectional view of the game shown in FIG. 1, as seen generally along the line 2–2 thereof. The motor for rotating the turntable, the moving target drive system, and the ball-release mechanism all are evident in this view.

FIG. 3 is a fragmentary bottom plan view, partly in section, of the inventive game as seen generally along the line 3–3 of FIG. 2. The rim-driven sector-shaped member used to drive the moving target is shown in this view.

FIG. 4 is a fragmentary sectional view of the target drive system as seen generally along the line 4–4 of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, and particularly to FIGS. 1 and 2 thereof, there is shown a preferred embodiment of the inventive game simulating translunar injection. As seen therein, a game 10 comprises a board 11 of generally sector shape. A vertical sidewall 12 surrounds substantially the entire periphery of board 11, a portion 12*a* of wall 12 maintaining board 11 in a horizontal plane raised above the level of the table or floor (not shown) on which the game is situated when in use. A portion 12*b* of sidewall 12 extends above the plane of board 11, forming a retaining ledge.

A planar rotatable turntable 13 is disposed in coplanar relation with board 11 adjacent the narrow end 11*a* thereof, the turntable seating within a circular opening 14 in board 11. The face 13*a* of turntable 13 (evident in FIG. 1) preferably is painted or otherwise marked to resemble the planet earth as viewed from space. Turntable 13 is fixedly, coaxially attached

to a tubular shaft 15, which shaft includes an upper portion 15*a* and a lower portion 15*b* having an outer diameter smaller than the outer diameter of upper portion 15*a*. A relatively short portion 15*a'* of shaft 15 projects below turntable 13, the remainder of shaft portion 15*a* projecting above upper turntable face 13*a*.

As evident in FIG. 2, a support member 16 is fixedly attached to the bottom of board 11 by means of fasteners 17. Integral with support member 16 is a generally C-shaped support 18 through which shaft 15*b* projects. Thus, shaft portion 15*a'* provides an annular shoulder reducing the friction between turntable 13 and support 18.

The turntable surface 13*a* is provided adjacent its periphery with a detent 19 within which may seat a ball 20. Ball 22 is maintained in place by the looped end 21*a* of a generally L-shaped release arm 21. Release arm 21 includes a vertical portion 21*b* extending coaxially through shaft 15, the length of vertical portion 21*b* being sufficiently long so that an end 21*b'* projects downwardly below the bottom of shaft portion 15*b*. Arm 21 also includes a horizontal portion 21*c* terminating in loop 21*a*. The end of horizontal arm portion 21*c* adjacent shaft 15 is disposed within a slot 22 cut in the end of shaft portion 15*a*. It will be apparent from this arrangement that release arm 24, when disposed in slot 22 as shown in FIGS. 1 and 2, will rotate in unison with turntable 13.

As evident in FIG. 2, support member 16 has a downwardly depending region 23 to which is pivotally attached, by means of shaft 24, a level 25. In the embodiment shown, lever 25 comprises an elongate strip of metal having a pair of approximately 90° twists 26 therein. In this manner, the central portion of lever 25 is disposed in a generally vertical plane so as to pivot about horizontal shaft 24, while the lever ends 25*a* and 25*b* lie in generally horizontal planes. Support region 23 is so situated that the horizontal end 25*a* of lever 25 is disposed beneath the bottom end of release arm vertical portion 21*b*. The other end 25*b* of lever 25 (see FIG. 2) is connected by a spring 27 to the underside of board 11. A rod 28 having a push button 29 at the upper end thereof extends vertically through a hole 30 in board 11, the bottom end of rod 28 seating atop horizontal lever end 25*b*.

Thus, it is apparent that spring 27 biases lever end 25*a* downward so that release arm 21 can maintain ball 20 seated on turntable 13. By depressing button 29, rod 28 presses against lever end 25*b*, causing the lever to pivot about shaft 24 and causing lever end 25*a* to displace the vertical portion 21*b* of release arm 21 upward. In turn, this causes horizontal arm portion 21*b* of release arm 21 upward. In turn, this causes horizontal arm portion 21*c* to move upward, releasing loop 21*a* from ball 20. When push button 29 is released, spring 27 biases lever 25 back to its rest position.

Turntable 13 may be driven by means of a small electric motor 33 (see FIG. 2) which is connected by wires 34 to appropriate batteries 35 mounted beneath board 11 and shown in phantom in FIG. 1. A normally OFF pushbutton switch 36 is connected in series with one of wires 34. Motor 33 is mounted on an L-shaped bracket 37 pivotally attached by a shaft 38 to a horizontal portion 39 of support member 16. The shaft 40 of motor 33 engages the rim of turntable 13, being biased into this engagement by means of a spring 41 extending between bracket 37 and a tab 42 extending from support member 16. with this arrangement, when pushbutton switch 36 is depressed, motor 33 operates under power from batteries 35, imparting rotational motion via shaft 40 to turntable 13.

Referring still to FIGS. 1 and 2, game 10 is provided with a target 43 adapted to move in an arcuate path above the surface of board 11. In the embodiment shown, target 43 is shaped like a crescent moon, however targets of other configuration may be used. For example, target 43 may be spherical, and painted or otherwise marked to resemble realistically the cratered moon. Target 43 is supported by the vertical portion 44*a* of generally L-shaped elongate rod 44, vertical portion 44*a* extending through an arcuate aperture 45 situated adjacent the wide end 11*b* of board 11. In an alternative embodiment (not shown) no sidewall support portion 12*a* may be provided for board end 11*b*, and vertical rod portion 44*a* may be situated beyond the end of board 11, looping back over the edge of the board into contact with target 43.

The long, horizontal portion 44*b* of rod 44 is disposed beneath board 11, being fixedly connected at end 44*b'* to one edge of a planar, generally sector-shaped member 46, most clearly shown in FIG. 3. Member 46 is disposed beneath board 11 in spaced parallel relation therewith, and is pivotally mounted via a vertical shaft 47 to a bracket 48 extending from sidewall 12*a*. Shaft 47 extends through the center of curvature of the sector rim 49 of member 46. Extending diagonally opposite rim 49 and forming a unitary portion of member 46 is a handle 50. Handle 50 projects beyond board end 11*a* through an opening 51 in sidewall 12*a*. It is apparent that sector member 46 may be pivoted in a horizontal plane about shaft 47 manually by means of handle 50. This pivotal motion of member 46 imparts similar motion to elongate rod 44 moving target 43 along an arcuate path defined by aperture 45.

Sector-shaped member 46, and hence target 43, also may be driven indirectly by motor 33 via a simple rim drive illustrated in FIGS. 2 and 3. As shown therein, a generally C-shaped carriage member 52 is pivotally attached to support member 16 by means of vertical shaft 53. Shaft 53 is not connected to C-shaped member 53 per se, but rather to a projection 54 extending from one side thereof (see FIG. 3).

Extending vertically between the top and bottom of C-shaped member 52 is a shaft 55 having an annular V-shaped groove 56 about its periphery adjacent one end thereof. As seen in FIGS. 2 and 4, rim 49 of sector-shaped member 46 seats within groove 56. Adjacent the other end of shaft 55 and fixedly attached thereto is a disc or wheel 57 the periphery of which is in friction engagement with shaft portion 15*b*. A spring 58 extending between C-shaped member 52 and support member 16 (see FIG. 3) causes pivotal motion of member 52 about shaft 53, thereby biasing wheel 57 against shaft portion 15*b* and biasing groove 56 in shaft against rim 49 of sector-shaped member 46.

As turntable 13 rotates, shaft 15 transmits rotational motion to wheel 57 and hence to shaft 55. Shaft 55, and particularly groove 56 thereof, is in peripheral contact with rim 49 thereby causing rotation of sector-shaped member 46 about shaft 47. Member 46 in turn carries with it elongate rod 44, causing target 43 to move along an arcuate path across board 11. Note that the rate of rotation of turntable 13 is considerably slower than that of motor 33, as determined by the diameter ratio between shaft 38 and turntable 13. Similarly, sector-shaped member 46, and hence target 43, move at a much slower rotational rate than does turntable 13, the additional reduction in rotational rate being related to the ratio of the diameters of shaft 15*b* and wheel 57 and the ratio of the diameter of groove portion 56 to the diameter of sector-shaped member 46.

Note that since motor 33 rotates in only one direction, target 43 will be driven in only one angular direction, as for example counterclockwise in FIG. 1. When target 43 reaches the counterclockwise end of aperture 45, it may be reset to the start position at the clockwise end of aperture 45 by using handle 50. The frictional contact between shaft 55 and the rim of sector-shaped member 46 and between wheel 47 and shaft 15*b* is sufficiently light so as to permit relative sliding motion of rim 49 with respect to groove 56.

The game is played by using handle 50 to position moon-shaped target 43 at its start position at the clockwise end of aperture 45. A ball 20 is placed on detent 19 and release arm 21 situated so that loop 21*a* maintains ball 20 in place, and so that part of horizontal arm portion 21*c* rests within slot 22 at the upper end of shaft 15. Switch 36 then is depressed, connecting current from batteries 35 to motor 33 and causing turntable 13 to rotate. Of course, ball 20 and release arm 21 rotate in unison with turntable 13. Moreover, rotation of turntable 13 drives (via wheel 57 and shaft 55) sector-shaped member 46, causing target 43 to move counterclockwise across board 11.

At the appropriate time during rotation of turntable **13**, pushbutton **29** is depressed, causing lever **25** to pivot about shaft **24** and to displace upwardly release arm **21**. Loop **21***a* of arm **21** thus is disengaged from ball **20**, and the centrifugal force imparted to ball **22** by rotating turntable **13** causes the ball to roll off of the turntable in a direction determined by the angular position of turntable **13** at the time pushbutton **29** is depressed. Of course, it is the objective of the game to effectuate this release at an appropriate time to send ball **20** along a trajectory terminating at target **43**.

To add variety to the game, various obstacles may be positioned on board **11** in a planned or random fashion. For example, objects such as dice may be shaken onto table **11** in random positions prior to the release of ball **20**. Ball **20** then must be released at a time appropriate not only to strike target **43**, but to follow a trajectory which avoids the obstacles placed on the board. Of course, these obstacles may be painted or otherwise configured to resemble asteroids, artificial satellites, or space "junk" which represent obstacles to be avoided in actual space travel.

It will be readily apparent that while a single moving target is shown herein, two or more such targets may be provided; these targets may be driven by the same rotating sector-shaped member **46**, or may be independently driven. The board need not be sector shaped, but may take other configurations including a complete circle. Further, the board itself may be painted black with pinpoints of white representing stars, so that the board will resemble the heavens when viewed from space.

Thus, the inventive game described herein presents a realistic simulation of the problems involved in translunar injection, and particularly of launching a space ship to the moon from a platform on a rapidly rotating earth.

While the invention has been described with respect to several physical embodiments constructed in accordance therewith, it will be apparent to those skilled in the art that various modifications and improvements may be made without departing from the scope and spirit of the invention.

I claim:

1. A game comprising:

a board;

a rotatable turntable coplanar with said board;

a target movable in an arcuate path along said board, said path being spaced from said turntable; and

release means for maintaining a ball on said turntable while said turntable is rotating and for selectively releasing said ball.

2. A game as defined in claim **1** further comprising:

means for simultaneously rotating said turntable and moving said target along said path, said ball being releasable while said turntable is rotating and said target is moving.

3. A game as defined in claim **1** further comprising motor means for rotating said turntable, and drive means cooperating with said rotating turntable for moving said target along said path.

4. A game as defined in claim **3** wherein said motor means comprises a motor, the shaft of said motor being in driving engagement with the rim of said turntable, and switch means for selectively energizing said motor.

5. A game as defined in claim **3** wherein said turntable is fixedly concentrically attached to a tubular shaft, and wherein said release means comprises a generally inverted L-shaped arm having a vertical portion extending coaxially through said tubular shaft and a horizontal portion extending radially from said shaft above said turntable, said horizontal portion being adapted to engage said ball, and means for vertically displacing said L-shaped arm longitudinal of said shaft, said vertical displacement releasing said ball.

6. A game as defined in claim **5** wherein said release means further comprises a detent in said turntable adjacent the periphery thereof, said detent permitting said ball to seat therein, and means for preventing relative rotational motion of said arm with respect to said turntable at least while said arm is engaging said ball.

7. A game as defined in claim **3** wherein said drive means comprises a planar, generally sector-shaped member adapted to rotate about the axis of said sector, said target being connected to said member, and means engaging the rim of said sector and driven by said rotating turntable for rotating said member about said axis.

8. A game as defined in claim **7** wherein said member is disposed beneath said board in spaced parallel relation therewith, and further comprising an elongate rod disposed beneath said board, one end of said rod being attached to said member, the other end of said rod being bent to project above said board, said target being attached to said other end.

9. A game as defined in claim **8** further comprising a handle fixedly attached to said member, said handle facilitating rotation of said member about said axis substantially independent of said means engaging.

10. A game as defined in claim **9** wherein said turntable is fixedly concentrically attached to a tubular shaft, and wherein said release means comprises a generally inverted L-shaped arm having a vertical portion extending coaxially through said tubular shaft and a horizontal portion extending radially from said shaft above said turntable, said horizontal portion being adapted to engage said ball, and means for vertically displacing said L-shaped arm longitudinal of said shaft, said vertical displacement releasing said ball.

11. A game as defined in claim **10** wherein said release means further comprises a dimple in said turntable, said dimple permitting said ball to seat therein, and means for preventing relative rotational motion of said arm with respect to said turntable at least while said arm is engaging said ball.

12. A game as defined in claim **3** wherein said target is generally moon shaped and wherein said turntable is configured to represent earth.

13. A game as defined in claim **3** wherein said board is generally sector shaped, and further comprising a peripheral sidewall around said board, said sidewall supporting said board in a raised, horizontal plane and providing a ledge for retaining said ball on said board.