July 14, 1959 L. G. SIMJIAN 2,894,754

GOLF TRAINER

Filed Sept. 16, 1955

FIG. 1

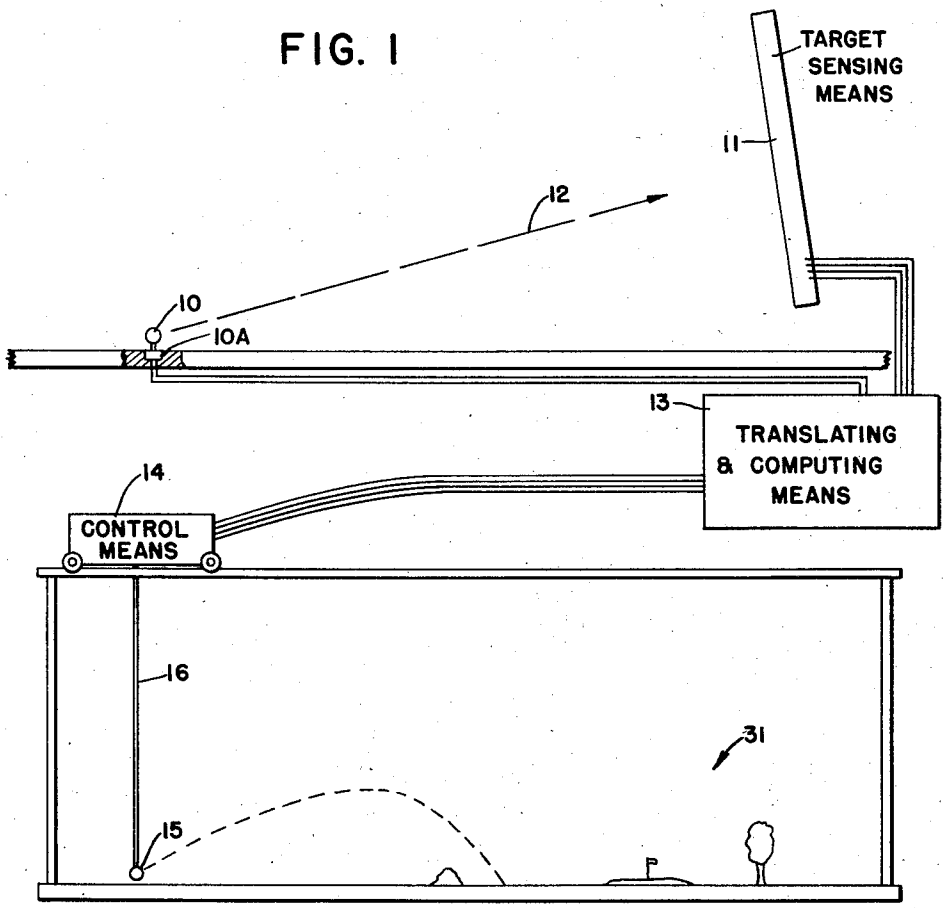
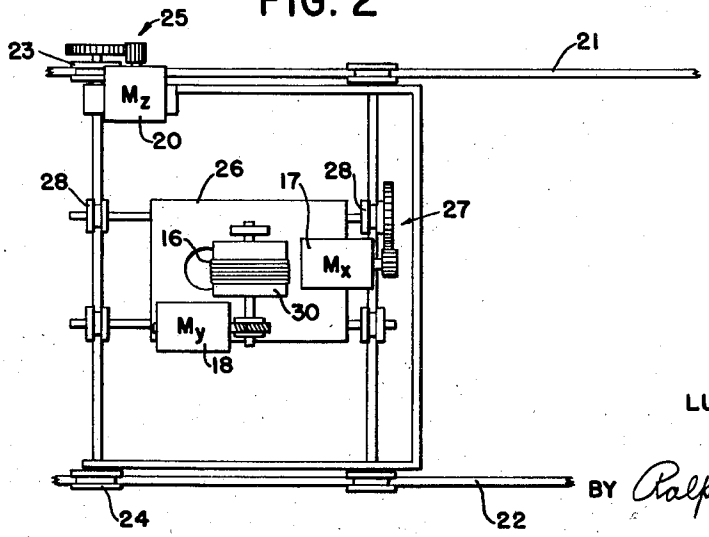


FIG. 2



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GOLF TRAINER

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7 Claims. (Cl. 273—185)

This invention relates to a game apparatus which permits a player to propel a missile within the restricted space of an enclosure and then view the results of his efforts on a miniature scale, showing the approximate path of the missile if the play had been made out of doors. The invention has particular reference to an apparatus which will show the results of a player throwing or batting a ball on a baseball diamond or of a golfer driving a golf ball on a golf course.

There have been several structures devised which will permit a golf or baseball player to practice indoors but none of these structures shows the player the approximate trajectory of the propelled missile in three dimensional space. The present invention employs a free ball within the restricted space of a room or otherwise restricted enclosure, using a target to sense the direction of the propelled missile. A miniature game field is provided which simulates an outdoor playing field and the path of the ball is indicated in three dimensions by a plurality of motors which project a ball on the miniature course or field in the same direction but with a much lower velocity as the ball would have taken if played out of doors. One prior art device has endeavored to show the approximate trajectory of a propelled missile by the movements of a projected spot of light on a viewing screen. Such an arrangement has obvious disadvantages since the movement of the spot occurs in two dimensions only, and does not give the player a true picture of the movement of the missile.

One of the objects of this invention is to provide an improved game apparatus which avoids one or more of the disadvantages and limitations of prior art arrangements.

Another object of the invention is to provide a game apparatus which may be used indoors in a restricted space and which has many of the advantages of a game out of doors.

Another object of the invention is to provide a three dimensional visual result of a player's efforts.

Another object of the invention is to instruct a player by showing some of the faults and errors made by a player while projecting a missile toward an objective.

Another object of the invention is to provide a game apparatus which may be used in competitive play by two or more players.

Another object of the invention is to simplify and reduce the cost of indoor games while at the same time making them more accurate in showing the results that would have happened if a missile had been projected out of doors.

For a better understanding of the present invention, together with other and further objects thereof, reference is made to the following description taken in connection with the accompanying drawings.

Fig. 1 is a schematic representation of the components of the game apparatus showing a target sensing means, a translating means, and a control means which moves a missile in a miniature three dimensional space which is a model of an outdoor playing field, and

Fig. 2 is a detailed plan view showing one form of a control means which can be used to show the motion of a missile in three dimensional space.

Referring now to Fig. 1, a missile **10** is indicated on a supporting means in a position to be driven toward a target sensing means **11**. The missile **10** may be a golf ball, a base ball, or football. The general direction of the path of the missile is indicated by a dotted line **12**. The target sensing means **11** is connected to a translating and computing means **13** which determines the approximate direction, height, and speed of the missile and operates a control means **14** to position a miniature missile **15** held by a string **16** to simulate the motion of the missile on a small scale.

In order to move the missile **15** in three dimensional space in accordance with the approximate trajectory of the struck missile, three motors **17**, **18**, and **20**, shown in Fig. 2 are employed. These motors are mounted on a movable frame which moves on rails **21** and **22**, the motion along the rails being provided by motor **20** which is coupled to wheels **23** and **24** by means of a gear and pinion arrangement **25**. Motion to the right or left of a desired direction is controlled by motor **17** which moves a carriage base **26** at right angles to rails **21** and **22** by means of a gear coupling **27** between motor **17** and wheels **28**. The vertical motion of missile **15** is controlled by motor **18** which moves a drum **30** on which is wound a portion of string **16**. The operation of such an apparatus may be briefly described as follows: The missile is propelled by the player against the target sensing means **11** and when the missile leaves the starting position, switch contact **10A** is actuated which is connected to translating and computing means **13**. The approximate path of the missile in free flight is determined by the missile impact position on target sensing means **11** and the velocity of the missile is determined by the elapsed time interval between actuation of contact **10A** and the impact on target sensing means **11**. Information furnished by the target sensing means and contact **10A** is applied to the translating and computing means **13** and then the control means **14** causes the missile **15** to be raised and lowered above a miniature playing field **31**, showing the player the approximate path of the missile if his drive had been made out of doors.

One form of target sensing means has been described in detail in application No. 474,812, filed December 13, 1954, by Mr. Luther G. Simjian, now U.S. Patent 2,784,001, issued March 5, 1957. This disclosure shows a target sensing means which employs crossed conducting wires in connection with a chargeable capacitor and a series of three motors connected to a computing system. This application also discloses a motor normalizing circuit which could be used in the apparatus described herein.

The application describes in detail the generation of electrical signals which are proportional to the trajectory of the missile in unrestricted space along the two normal axes in the horizontal plane and along the vertical axis as sensed by the impact position of the missile on the target and as a function of the missile's time of flight between the support means and the target which in turn, is a measure of the missile's velocity and hence, of the missile's distance in unrestricted space.

It will be evident from the above description that a game apparatus has been disclosed wherein a free missile such as a golf ball, a base ball, or foot ball, may be impelled against a target sensing means and the resulting trajectory observed on a miniature playing field.

While there has been described and illustrated a specific embodiment of a game apparatus, it will be obvious

that various changes and modifications can be made therein without departing from the field of the invention which should be limited only by the scope of the appended claims.

I claim:

1. A game apparatus comprising in combination: means to support a missile which upon receipt of a propelling force is caused to traverse a restricted space; a target disposed to intercept the path of the missile through said space; said target equipped with sensing means determining the impact position of the missile thereupon, and said impact position being related to the trajectory of said missile in said restricted space; translating and computing means connected to said sensing means and to said support means and being actuated in response to the operation of said sensing means and the missile leaving said support means; said computing means producing signals proportional to the trajectory of said missile in unrestricted space along the three normal axes in space; means mounting a missile simulating object above a miniature playing field; a plurality of actuating means connected to said mounting means and receiving said signals proportional to the trajectory of said missile whereby said object is caused to be guided in a three-dimensional path above and relative to said field, and the path of said missile simulating object being proportional to the missile trajectory in unrestricted space.

2. A game apparatus comprising in combination: means to support a missile which upon receipt of a propelling force is caused to traverse a restricted space; a target disposed to intercept the path of the missile through said restricted space; said target equipped with sensing means determining the vertical and horizontal impact positions of the missile thereupon, and said impact positions being related to the trajectory of the missile in said restricted space; translating and computing means connected to said sensing means and to said support means and being actuated in response to the operation of said sensing means and the missile leaving said support means; said computing means producing signals proportional to the trajectory of the missile in unrestricted space along the two normal axes in the horizontal plane and along the vertical axis; means mounting a missile simulating object for displacement above a stationary miniature playing field; a plurality of actuating means connected to said mounting means and receiving signals from said computing means proportional to the missile's trajectory along the horizontal plane and vertical axis respectively whereby the missile simulating object is guided by said actuating means along a three-dimensional path above and relative to said field, and said path being proportional to the missile trajectory in unrestricted space.

3. A golf game as set forth in claim 2 wherein said actuating means comprise electrically energized translating devices.

4. A golf game as set forth in claim 2 wherein said actuating means comprise three electrical motors which operate simultaneonsuly.

5. A golf game as set forth in claim 2 wherein said actuating means comprise three electromagnetic means, two of said electromagnetic means receiving signals for guiding the missile simulating object along the two normal axes in the horizontal plane and the third electromagnetic means receiving the signal for guiding the object along the vertical axis.

6. A game apparatus comprising in combination: means to support a missile which upon receipt of a propelling force is caused to leave said support and traverse a restricted space; a target disposed to intercept the path of the missile through said restricted space and impede further forward motion of said missile; said target equipped with sensing means determining the vertical and horizontal impact positions of the missile thereupon, and said impact positions being related to the trajectory of the missile in said restricted space; translating and computing means connected to said sensing means and to said support means and being actuated in response to the operation of said sensing means and the missile leaving said support means; said computing means producing signals proportional to the trajectory of the missile in unrestricted space along the two normal axes in the horizontal plane and along the vertical axis as determined by the impact position of the missile on the target and the time of flight of the missile between the support and the target; a stationary miniature playing field; a movable frame disposed above said playing field; a missile simulating object dependingly supported from said frame; a plurality of actuating means connected to said frame for moving the frame along the two normal horizontal axes relative to the playing field and a further actuating means disposed on said frame and connected to said missile simulating object for moving said object along the vertical axis relative to said playing field; said actuating means receiving the corresponding signals from said computing means whereby the missile simulating object is guided along a three-dimensional path above and relative to said field, and said path being proportional to the missile's trajectory in unrestricted space.

7. A game apparatus as set forth in claim 6 wherein said missile simulating object is dependingly supported from the frame by means of a flexible cord.

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