May 28, 1957 A. DE CRESCENZO 2,793,860

ELECTRIC TARGET TOY

Filed June 20, 1955 4 Sheets-Sheet 1

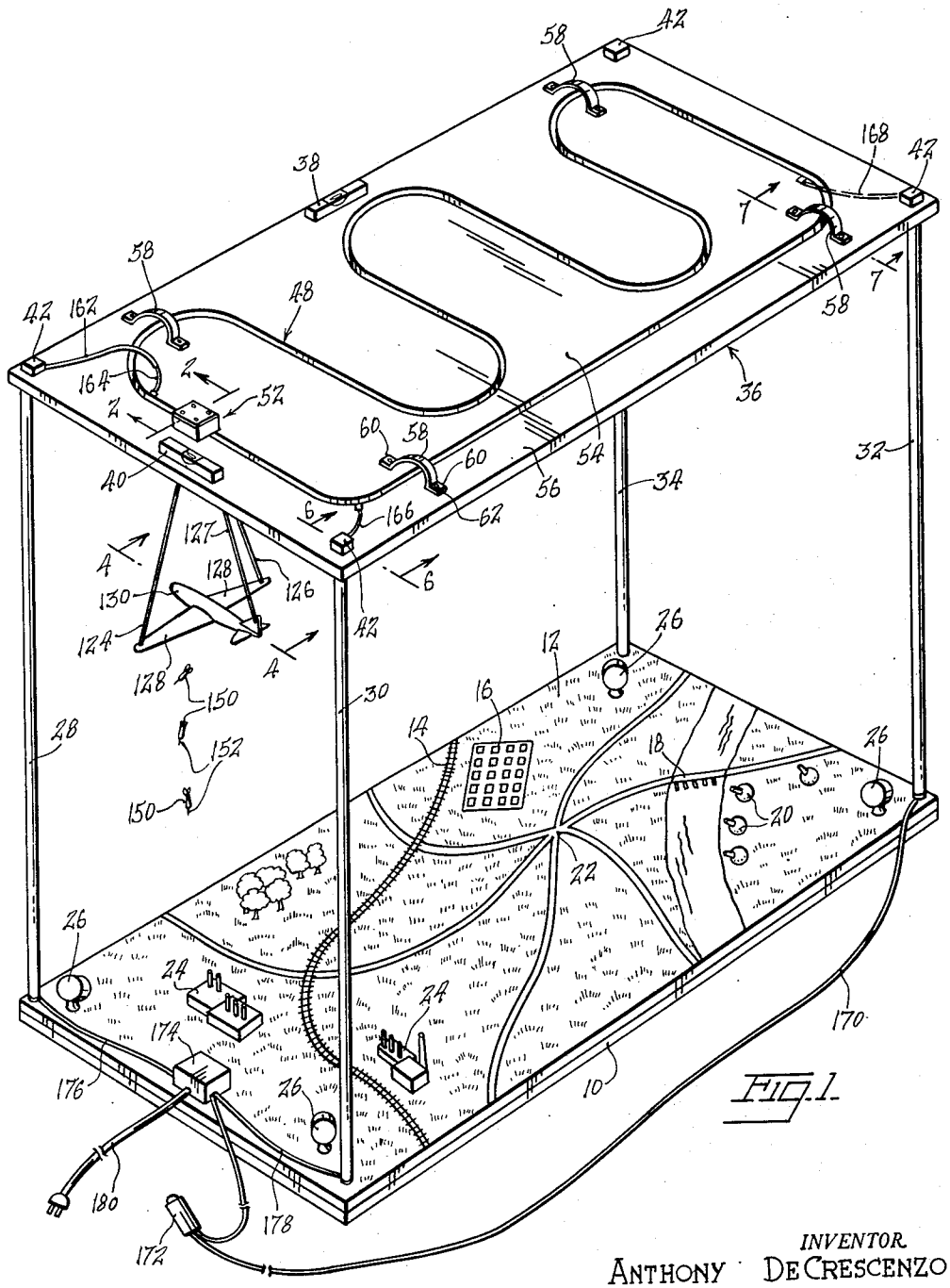


FIG. 1.

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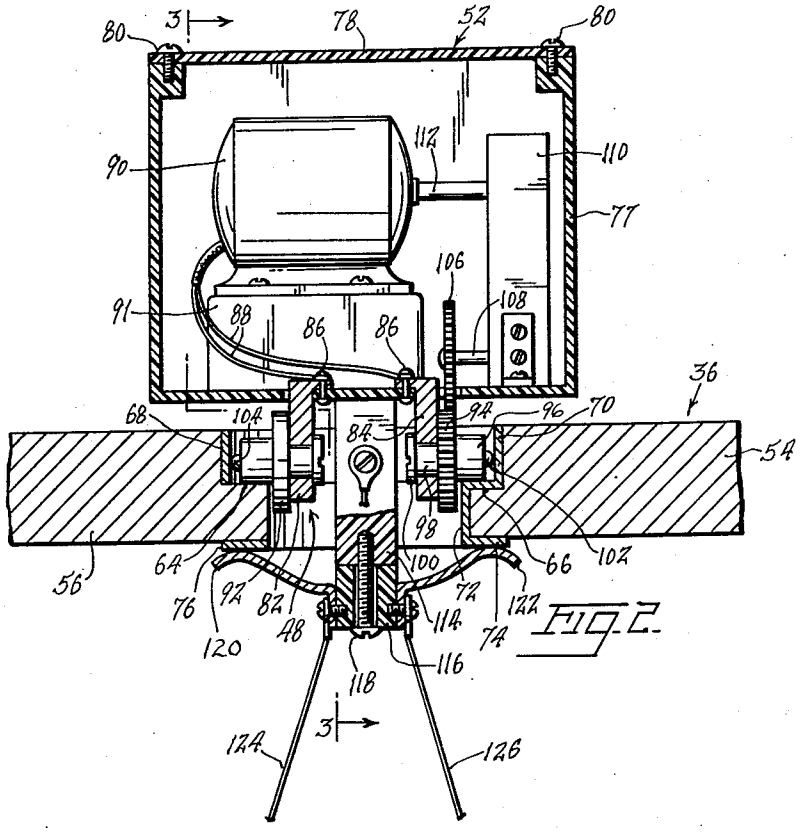


FIG. 2.

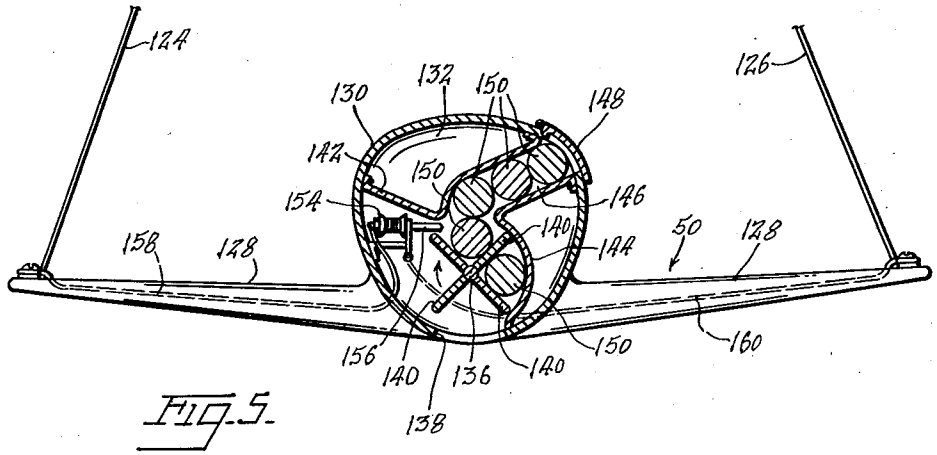


FIG. 5.

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ELECTRIC TARGET TOY

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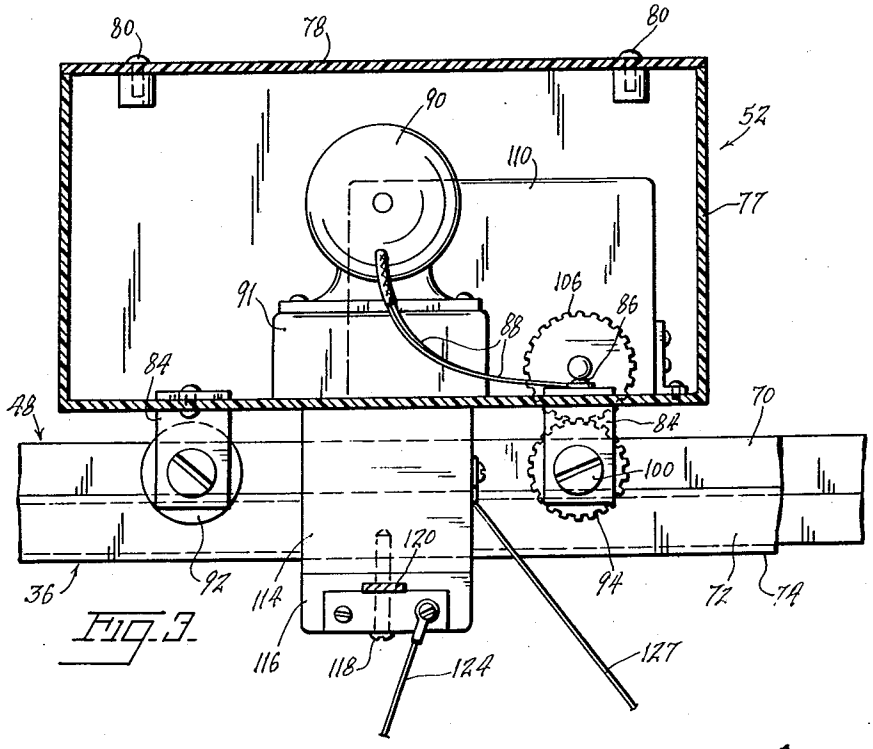


FIG. 3

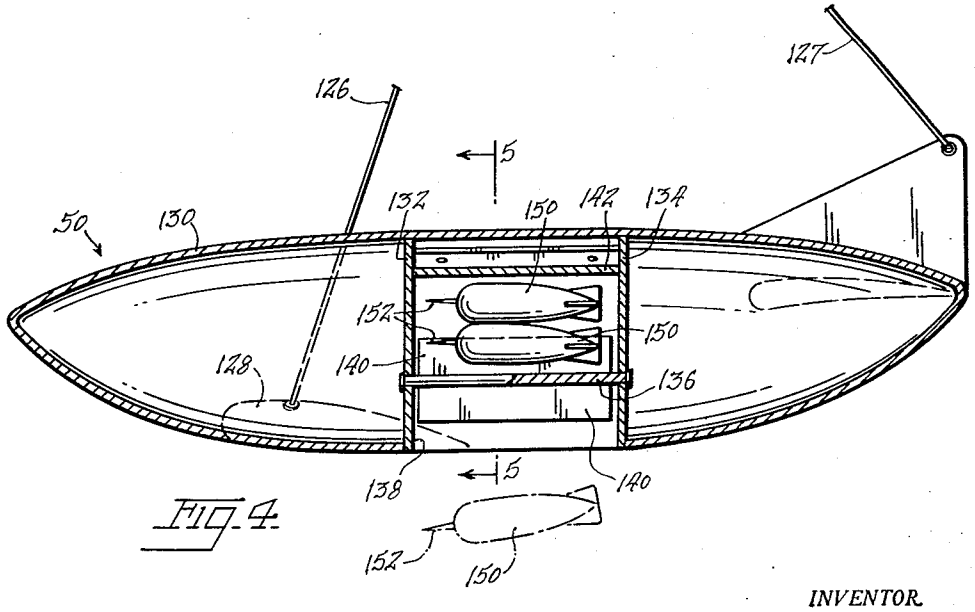


FIG. 4

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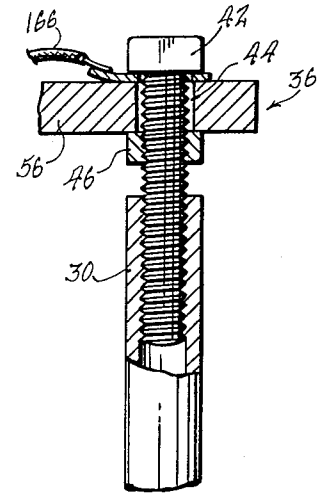


FIG. 6

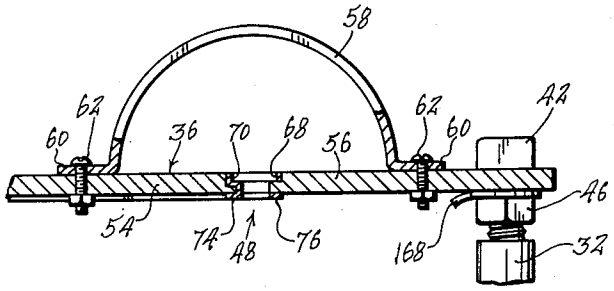


FIG. 7

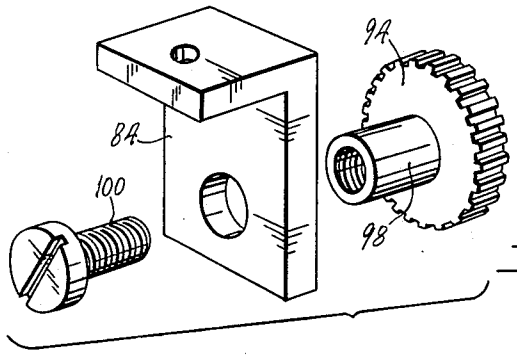


FIG. 8

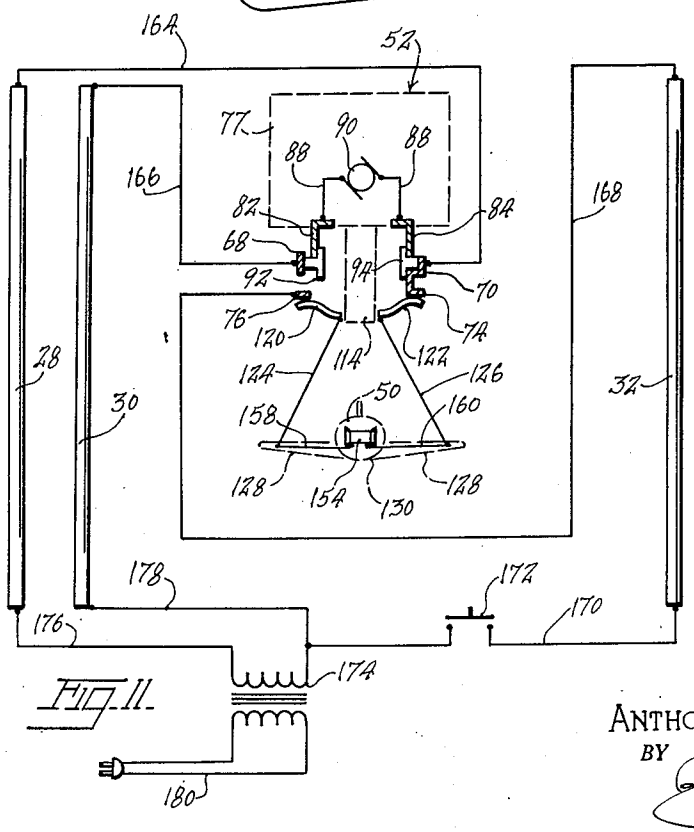


FIG. 11

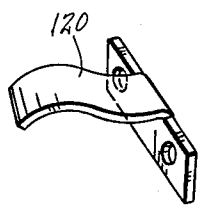


FIG. 9

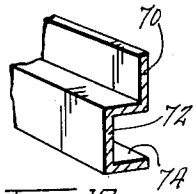


FIG. 10

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2,793,860

ELECTRIC TARGET TOY

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Application June 20, 1955, Serial No. 516,555

1 Claim. (Cl. 273—95)

This invention relates to a game apparatus, so designed as to include a toy airplane, suspended above a base painted or otherwise designed to simulate a ground surface area as it appears from the air. The apparatus, further, includes electrical means for causing the airplane to travel in a devious path above said ground surface area, simulating a bombing run, and associated with the airplane and the means for imparting simulated flight thereto is electrical means controllable from a remote location for, at periodic intervals selected by the player, dropping from the airplane darts simulating aerial bombs.

An important object of the present invention is to provide game apparatus of the type referred to, which will develop considerable interest in the players, in that the players, from a remote location, can, as the airplane makes its bombing run, select targets marked on the base, such as a road junction, railroad bridge, munitions dump, and factories, and can, as the airplane passes over the targets, release one or more of the darts for free fall onto the selected target.

Another object of importance is to provide game apparatus of the type referred to, which will be so designed as to provide a highly effective test of one's reflexes and ability to gauge the proper moment at which the darts should be released.

Still another object of importance is to provide a game apparatus of the character referred to which will be adapted for use in amusement parks and the like, with a suitable coin-operated mechanism being employed under these circumstances for the purpose of placing the airplane in motion and permitting the player to drop a selected number of darts.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claim in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a perspective view of a game apparatus formed according to the present invention.

Fig. 2 is an enlarged transverse sectional view through the traveling carriage from which the airplane is suspended, taken on line 2—2 of Fig. 1.

Fig. 3 is a longitudinal sectional view through said carriage, on line 3—3 of Fig. 2.

Fig. 4 is a longitudinal sectional ivew through the toy airplane, taken on line 4—4 of Fig. 1, on an enlarged scale.

Fig. 5 is a transverse sectional view through the toy airplane, on line 5—5 of Fig. 4.

Fig. 6 is a greatly enlarged detail sectional view on line 6—6 of Fig. 1.

Fig. 7 is an enlarged detail sectional view on line 7—7 of Fig. 1.

Fig. 8 is an exploded perspective view of one of the carriage wheels and the associated hanger therefor.

Fig. 9 is a perspective view of one of the leaf spring brushes of the carriage.

Fig. 10 is a fragmentary, enlarged perspective view of one of the conductive tract elements.

Fig. 11 is an electrical diagram showing the circuit employed in the apparatus.

Designated at 10 is a large, flat, rectangular base having over its entire area a covering layer 12 of cork material. Over the full surface of the covering layer, there is depicted thereon a ground surface area as it would appear from a high elevation, with said area being pictorially represented to include various targets, such as a railroad 14, munitions dump 16, a bridge 18 spanning a river, gun emplacements 20, a road junction 22, and factories 24. The bird's-eye view of the ground could, if desired, be printed upon a rectangular sheet corresponding in area and outer configuration to the base 10 and cover layer 12, with said sheet being adhesively attached to the covering layer 12.

To light the several targets, there are provided spotlights 26, which could be connected in circuit and supplied with power, separately from the various electrical devices to be described hereinafter having to do with the motion of a toy airplane, and with the releasing of darts therefrom for free fall onto a selected one of the several targets described.

Secured at their lower ends to the several corners of the base, and projecting upwardly a substantial distance from the base, are corner posts 28, 30, 32 and 34 supporting at their upper ends a top plate or table member of wood or other non-electrically conductive material, generally designated at 36.

It is desirable that the top plate be maintained in a perfectly horizontal plane, and accordingly, a pair of levels 38, 40 are attached thereto. To permit adjustment of the top plate, the posts are each formed with internal threads (see Fig. 6) at their upper ends, receiving a screw 42 passing through a smooth-walled corner opening 44 of the top plate. Threaded upon the respective screws are nuts 46, bearing against the underside of the top plate.

It will be seen that the screws can be threaded inwardly or outwardly, as necessary, in respect to their associated corner posts, and the nuts turned home against the underside of the top plate, so that the top plate can be adjusted upwardly or downwardly at its several corners until it is perfectly level.

The top plate is formed with an endless, devious trackway 48, the convolutions or loops of which can take any desired course, to simulate the path taken by an airplane generally designated 50, during the making of a bombing run. The airplane is suspended from a carriage generally designated 52, mounted in the trackway to travel therealong.

The trackway is formed as a slot in the top plate, extending fully from the top to the bottom surface of the top plate. Accordingly, since the slot is endless, and since as shown in Fig. 2 and described in full detail hereinafter, the airplane suspension means projects downwardly through the slot, it is necessary that means be provided for holding the top plate portion 54 circumscribed by the slot, assembed with the portion 56 of the top plate that surrounds the slot.

To this end, there are provided connecting brackets 58, shown in Figs. 1 and 7, each of these being arcuately bowed upwardly through 180° of a circle, and bridging the trackway. Integrally formed on the outer ends of the connecting brackets are outwardly projecting feet 60, apertured to receive connecting bolts 62, one connecting bolt of each bracket extending through the portion 56 and the other extending through the portion 54. The brackets can be located wherever desired, the illustrated arrangement being merely one of many that can be em-

ployed, and as many brackets will be employed as necessary to fixedly connect the inner and outer portions **54, 56** of the top plate in a coplanar relationship to define therebetween the trackway **48**.

Referring now to Figs. 2 and 3, the opposite side walls of the trackway-defining slot are formed with confronting, right-angled recesses **64, 66**. Engaged against the side wall of recess **64**, and extending through the full length of the trackway without a break, is a thin, electrically conductive track element or strip **68**. In the recess **66** is an electrically conductive strip **70**, and this, unlike the strip **68**, is secured not only against the side wall of the recess **66**, but also against the bottom wall, and further, is formed with a depending flange **72** terminating in a lip **74** underlying the inner portion **54** of the top plate. At the opposite side of the trackway, that is, at the side having the strip **68**, there is secured to the underside of the outer portion **56** a wide, flat, electrically conductive strip **76**, coplanar with the lip **74**. Strip **76** and lip **74**, like their associated track elements **68, 70** respectively, are endless, that is, they extend continuously throughout the full length of the trackway.

Rollably mounted on the trackway is the carriage **52**. This includes a rectangular housing **77** of non-electrically conductive material having a cover **78** attached by screws **80**. Formed in the bottom of the housing are front and rear pairs of transversely aligned slots through which extend the upper ends of electrically conductive hangers **82, 84** having lateral projections within the housing apertured to receive fastening elements **86** fixedly attaching the hangers to the housing bottom. Connected to the projections of the rear hangers are leads **88** extending to an electric motor **90** mounted on a pedestal **91** molded integrally with the housing bottom.

Rotatably mounted on the depending ends of the hangers are electrically conductive, flanged wheels **92, 94** rolling on the track shoulders defined by the angular recesses **64, 66** of the trackway. There are three of the wheels **92** and one wheel **94**, this last being mounted on one of the hangers **84**. The flange of wheel **94** has gear teeth, as shown in Figs. 2 and 8, and constitutes a drive wheel, in a manner to be presently described.

Wheel **94** has an outer cylindrical portion **96** (Fig. 2) rolling on the shoulder defined by recess **66**, the toothed flange previously mentioned, and a reduced, cylindrical stub axle **98** having an axial, threaded recess (Fig. 8) in which is engaged a headed screw **100**, holding the stub axle against withdrawal from a bearing opening formed in the associated hanger. The wheels **92** are similarly formed except for the omission of the gear teeth.

To reduce friction between the wheels **94, 92** and their associated tracks, and to provide an electrical contact between the wheels and the track elements **70, 68** respectively, ball elements **102, 104** of electrically conductive material are rotatably mounted in the outer end portions of the wheels in engagement with said track elements.

In mesh with the toothed flange of wheel **94** is a gear **106** secured to a shaft **108** extending out of a reduction gear box **110** having speed reduction gearing driven by the shaft **112** of motor **90**.

Molded on and depending from the housing bottom is the body portion of an airplane support block **114** including a non-electrically conductive extension block **116** secured to the body portion by a screw **118**. To the opposite sides of the extension block there are attached electrically conductive leaf spring brushes **120, 122** (Figs. 2 and 9) tensioned to engage at their free ends the strips **76, 74** respectively. Attached at their upper ends to the respective brushes are electrically conductive suspension wires **124, 126**, diverging downwardly and attached to the tips of the wings **128** of the airplane. A third suspension cord **127**, which need not be electrically conductive, is connected between the block **114** and the tail of the airplane.

The airplane (Figs. 4 and 5) includes a hollow fuselage **130** of plastic or other non-electrically conductive material, provided intermediate its ends with longitudinally spaced partitions **132, 134** defining between them a dart compartment in which extends a shaft **136** journalled at its ends in the partitions. The dart compartment is open at its bottom as indicated at **138** to simulate a bomb bay and secured to the shaft are radially extending, elongated fins **140** angularly spaced 90° apart. Extending over the shaft and fins is an upper guide wall **142**, and at one side of the compartment is a lower guide wall **144**, the lower portion of which is arcuately formed, the fins wiping thereover during rotation of the shaft. The wall **144** at its upper end is inclined to one side of the fuselage, in parallelism with the upper guide, to define a chute **146** to which access is had by means of a door **148** hinged to the fuselage. A quantity of darts **150**, simulating aerial bombs, are loaded in the dart compartment through the fuselage opening normally closed by the door, and gravitate within the chute into the lower portion of the dart compartment, each space defined between adjacent fins **140** holding a single dart.

The darts are formed with tapered bodies, and projecting from their larger ends are pointed tips **152**, while fins are provided on the smaller ends thereof to guide the darts in their free fall out of the outlet **138** to the base **10**. The darts may be weighted at their noses to insure their being pointed straight downwardly at the time they reach the base, so that they will stick in the cork cover layer.

Within the dart compartment, a solenoid **154**, mounted on a bracket attached to the fuselage, has a core **156** projecting, in the deenergized condition of the solenoid, in the path of the fins or blades **140**. Leads **158, 160** extend from the terminals of the solenoid to the suspension wires **124, 126** respectively, through the wings **128** and are electrically connected to the suspension wires.

An electrically conductive arm **162** (Fig. 1) is secured at one end to post **28** and is extended over the trackway at an elevation sufficient to clear the carriage **52**. Connected between the free end of the arm and the track element **70** is a lead **164**.

Between the post **30** and the track element **68** (Figs. 1 and 11) there is connected a lead **166**, while a lead **168** is connected between post **32** and the strip **76**. A lead **170** is connected at one end to the lower end of post **32**, and between its ends is provided with a switch **172** operable by a player to permit electrical current to flow through the lead **170**. At its other end, the lead **170** is connected to one end of the secondary winding of a transformer **174** mounted on base **10**. Also connected to the secondary winding, at opposite ends thereof, are leads **176, 178** connected to the lower ends of posts **28, 30** respectively. A cord **180** having a plug engageable in a convenient outlet, not shown, is connected to the primary winding of the transformer.

When the plug of cord **180** is engaged in said outlet, current will flow (see Fig. 11) to energize the motor, causing the carriage to be driven continuously along the tortuous trackway. The circuit may be traced as follows: from the secondary winding through lead **176**, post **28**, lead **164**, track element **70**, wheel **94**, hanger **84**, one lead **88**, motor **90**, the other lead **88**, hanger **82**, wheel **92**, track element **68**, lead **166**, post **30**, and lead **178** back to the secondary transformer winding.

With the carriage in movement, the airplane will be carried thereby, traveling along a tortuous path in simulation of a bombing run over enemy territory. When the user believes the plane is in proper position for bombing a selected target, he depresses button **172** momentarily. This energizes the solenoid, and when the core is retracted, the weight of the darts on one side of the paddle wheel **136, 140**, will cause the same to rotate clockwise in Fig. 5, causing one or more darts, depending on the length of time the switch is held closed, to drop out of the bomb bay in following order and fall free to the target.

The circuit closed to release the darts is traced as follows: from one pole of the secondary winding, through lead **176**, post **28**, lead **164**, track element **70**, strip **74**, brush **122**, suspension wire **126**, lead **160**, the solenoid **154**, lead **158**, suspension wire **124**, brush **120**, strip **76**, lead **168**, post **32**, lead **170**, the switch **172**, and the other pole of the secondary winding.

The apparatus can be used to advantage with coin-controlled mechanism in amusement parks and the like. Such mechanism, well known per se in the art, can be used to control the operation of a main switch, which though not shown, can be placed to control flow through the power supply cord **180**. Under these circumstances, the capacity of the aircraft should be increased so that it will hold an ample supply of darts. Alternatively, instead of using darts, the aircraft may be equipped with a downwardly beamed photoelectric cell, which may energize light-sensitive cells in the several targets to close a circuit to a signal device showing that the target has been accurately bombed.

While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claim.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

An aerial bombing game apparatus comprising a base depicting a target area, posts extending upwardly therefrom, a top plate supported on the posts and including a trackway, a carriage rolling on the trackway, a miniature airplane suspended from the carriage below the top plate, a plurality of bomb-simulating objects carried by said airplane, said airplane having a discharge outlet for said objects, means for driving the carriage along the trackway, and means to at times release at least one of said objects for free fall from the airplane to said target area, the airplane having a pair of suspension wires connected between the motor and the airplane, said wires being electrically conductive, the trackway including conductive strips having an electrical connection with the respective wires, said releasing means including a solenoid latch arranged to control release of said objects and connected in circuit with the respective wires, said releasing means further including a paddle wheel adjacent said outlet and having object-receiving spaces and being rotatable under the weight of the objects, for the discharge of said objects, the solenoid latch in its deenergized condition having a core extending in the path of rotation of the paddle wheel, the airplane having a chute-like space above said wheel adapted for gravitation of the objects, one at a time, into said spaces, said objects being formed with finned, tapering bodies and pointed tips on said bodies, the base having a cover layer penetrable by said tips.

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