

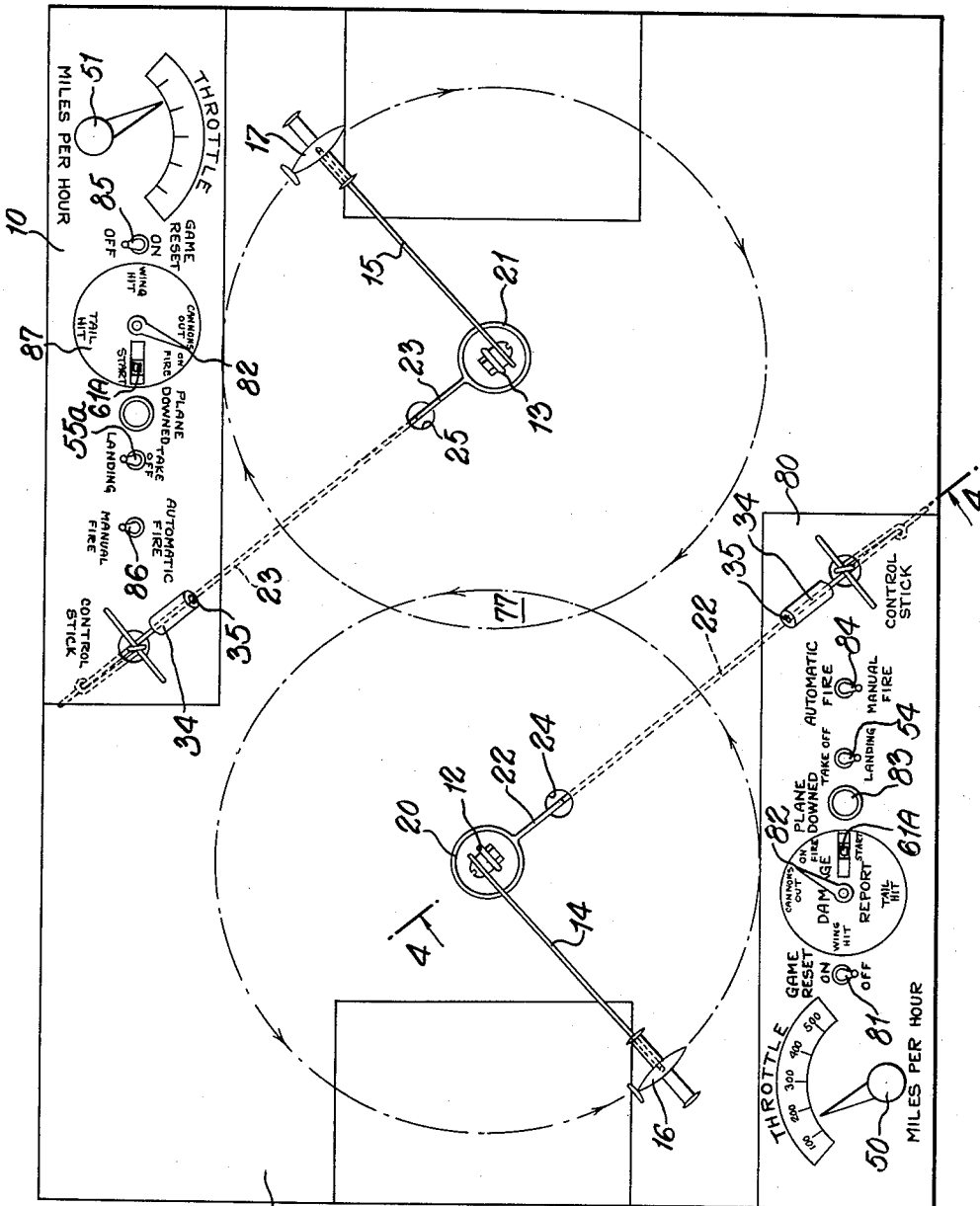
Dec. 12, 1961

S. FRIEDMAN
JET DOGFIGHT GAME

3,012,780

Filed April 29, 1959

4 Sheets-Sheet 1



INVENTOR.
SOL FRIEDMAN
BY *Albert F. Korman*
ATTORNEY

Dec. 12, 1961

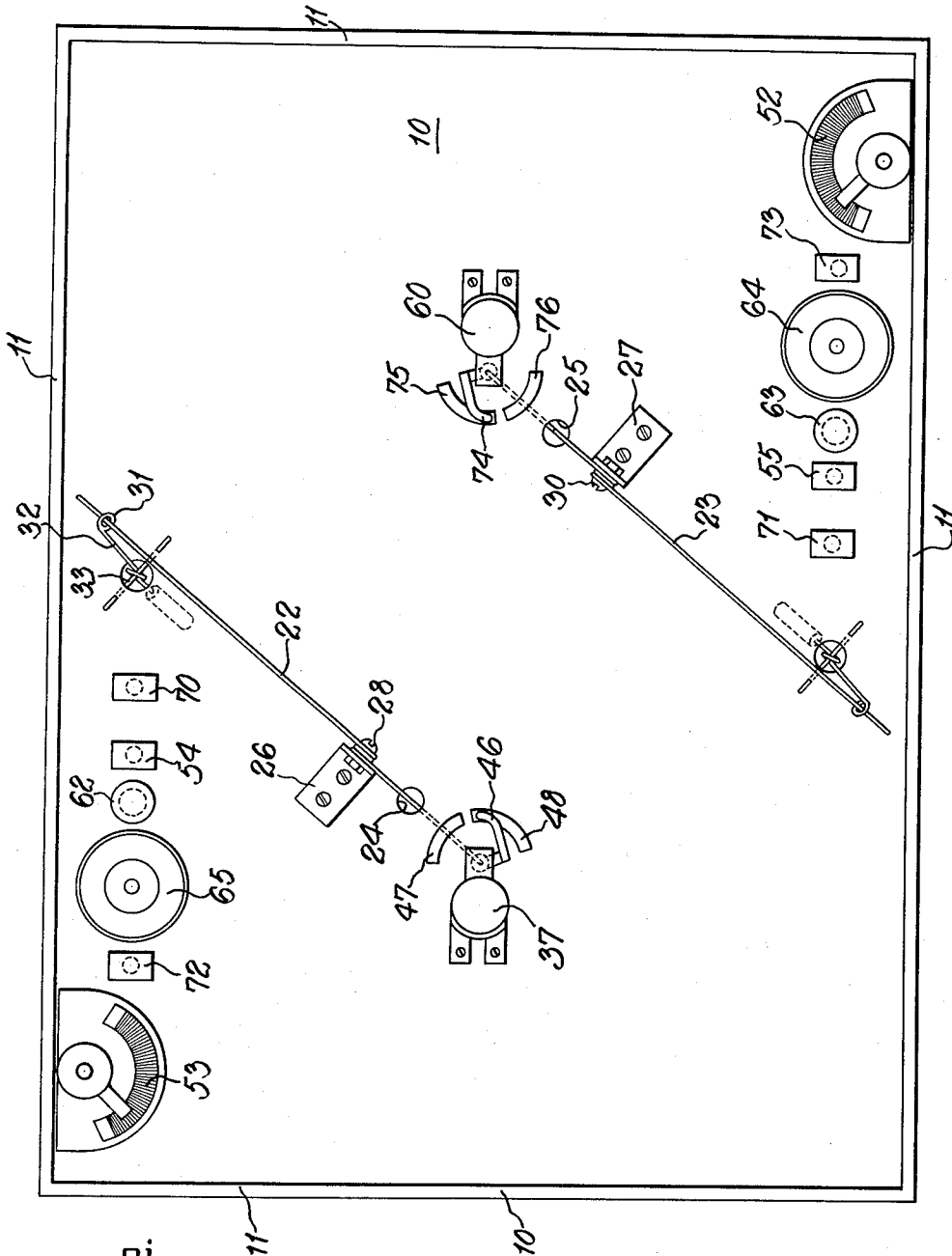
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INVENTOR.
SOL FRIEDMAN
BY *Albert F. Friedman*
ATTORNEY

Dec. 12, 1961

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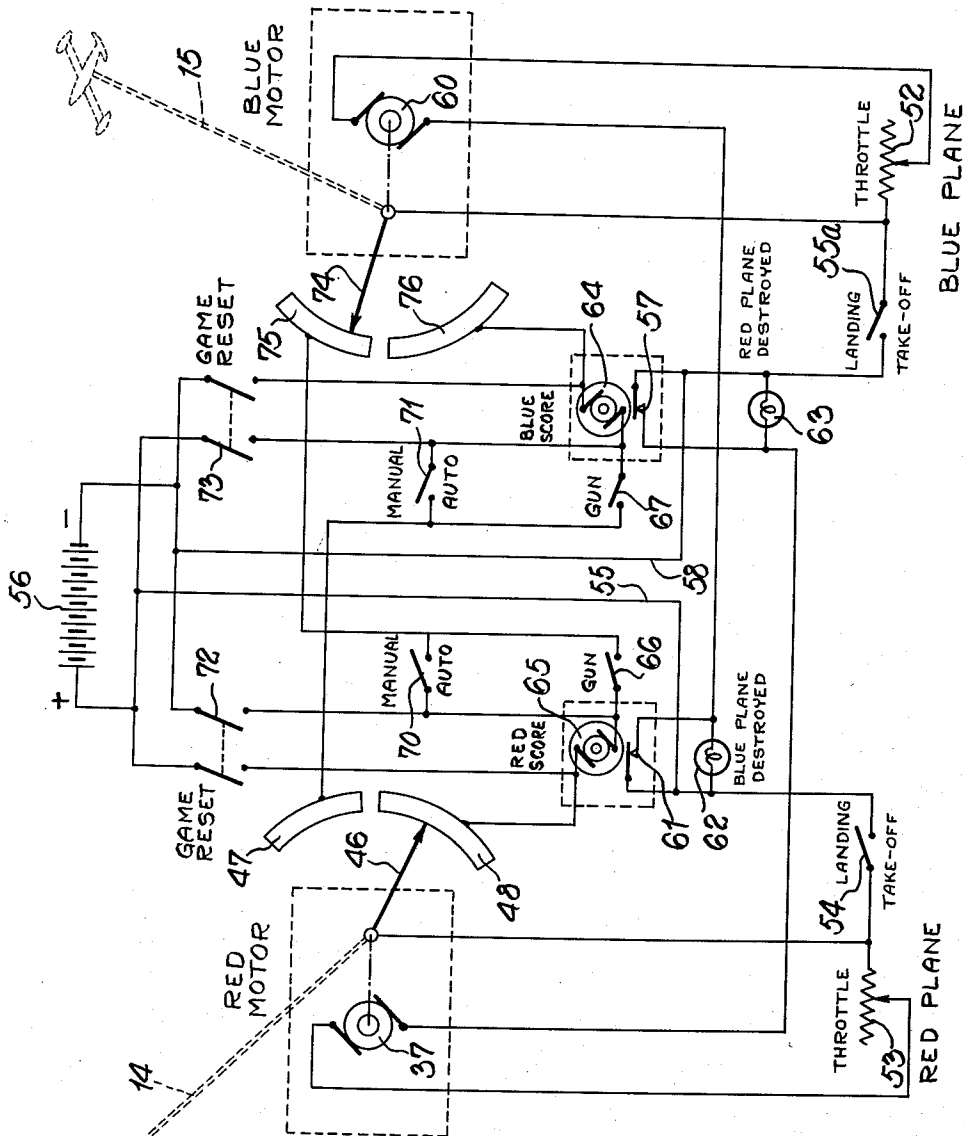


Fig. 3.

INVENTOR.
SOL FRIEDMAN
BY *Albert F. Kromman*
ATTORNEY

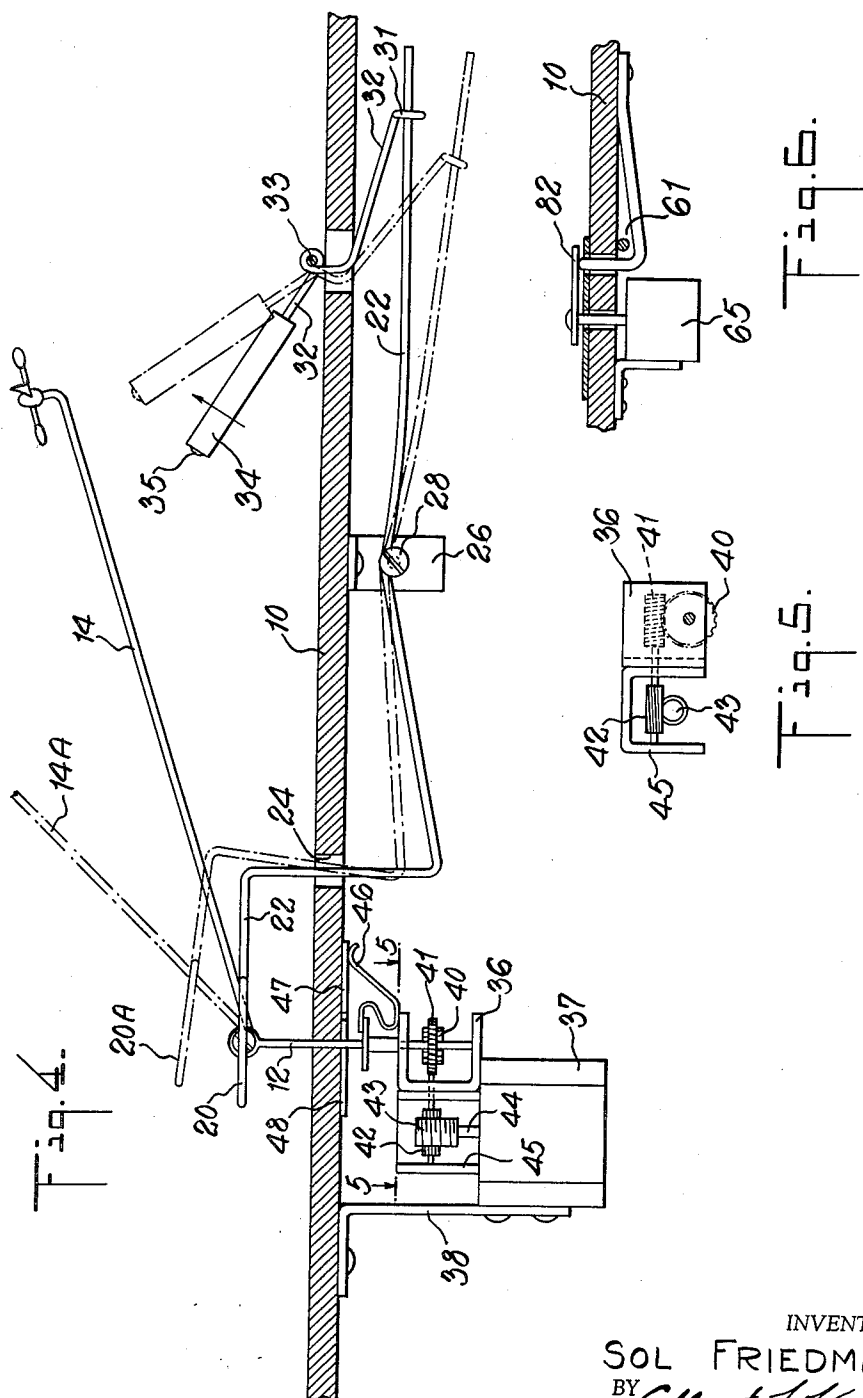
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4 Sheets-Sheet 4



INVENTOR.
SOL FRIEDMAN
BY *Albert F. Korman*
ATTORNEY

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3,012,780
JET DOGFIGHT GAME
Sol Friedman, 266 E. 200th St., Bronx 58, N.Y.
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4 Claims. (Cl. 273—1)

This invention relates to a game apparatus which includes the use of two model airplanes manually controlled to rotate about circular orbits. The invention has particular reference to an automatic circuit control which makes it possible to score a hit, for a game point, when the models are maneuvered into a desired position relative to each other.

The game described herein is competitive, both as to position and to speed, and requires that each player use judgement to maneuver his model fighter plane into a position where it can hit the opponent's plane. The requirement that each player adjust both speed and position, makes the game more instructive than the usual type of game where position is the only basis of winning.

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 game is to teach players to operate mechanisms which require the adjustment of both speed and position.

Another object of the game is to provide gun fire competition between two opponents without the use of missiles or the destruction of any game components.

Another object of the game is to provide competitive apparatus which is self-contained and requires no loose parts which may become lost.

The invention comprises a single container or box which includes a horizontal panel board on which are mounted the operating controls. A pair of spaced vertical shafts extend through holes in the panel board, each of the shafts being coupled to a variable speed motor for rotary movement and on the free end of each arm a model of an airplane is secured. A manually adjustable resistance in series with each of the motors and a source of electric power controls the speed of rotation of the arms. An electric commutator device associated with each shaft is connected to a counting register where "hits" are recorded.

One feature of the invention includes a mechanical control for adjusting the height of the path of the model airplanes above the panel board.

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 accompanying drawings.

FIG. 1 is a plan view of the panel board showing the controls and the rotatable arms with their model fighting planes.

FIG. 2 is a plan view of the underside of the panel board.

FIG. 3 is a schematic diagram of connections of the game apparatus.

FIG. 4 is a cross sectional view of the panel board taken along line 4—4 of FIG. 1.

FIG. 5 is a cross sectional view of a portion of the gear arrangement which couples one of the motors to one of the vertical shafts and is taken along line 5—5 of FIG. 4.

FIG. 6 is a cross sectional view of a portion of the instrument board showing the details of the "Damage Report" motor.

Referring now to the drawings, the game includes a top panel board 10 which is supported by side pieces 11. Two vertical shafts 12, 13, extend through the panel

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board and each is joined by a pivotal connection to a rotatable arm 14, 15. At the free end of each arm a model of a fighter airplane 16, 17, is secured and the arms are each controlled to maintain an adjustable angular position by means of a metal ring 20, 21, mounted concentric with their associated shafts 12, 13. As the arms rotate, they are supported by the top surface of the rings and a small variation in the height of the rings causes a large variation in the height of the model plane.

Each control ring 20, 21, is secured to a lever 22, 23, which extends through a hole 24, 25, in the panel board and is pivoted on a bracket 26, 27, by a bolt 28, 30. The details of lever 22 are shown in FIG. 4 where the other end of lever 22 is engaged by a loop 31 at the lower end of a control stick 32, pivoted on a pin 33 which is secured to the base of the panel board 10. The upper end of the control stick 32 is provided with a handle 34 for manual operation by one of the players. When the handle 34 is moved from the position shown in solid lines in FIG. 4 to the position shown in dashed lines, loop 31 rotates lever 22 and moves ring 20 up to position 20A forcing arm 14 to rotate at an angle indicated by dashed line 14A. This maneuverability adds more interest to the game and allows the plane models to rotate in their orbits without bumping. Handle 34 includes a "gun" switch button 35 which is connected to the electrical circuit. Its function will be described later.

Shaft 12 is supported by a U-shaped bracket 36 which is mounted beneath the panel 10 and is secured to an electric motor 37. The motor 37 is in turn secured to an angle bracket 38 supported by the panel board 10. Shaft 12 is fastened to a gear 40 which meshes with a worm 41, and worm 41 is connected to another gear 42 which meshes with a worm 43 fastened to shaft 44 of motor 37. The gear combination 42, 43, is also supported by a U-shaped bracket 45 which is also secured to motor 37. The two gear combinations 42—43 and 41—40 reduce the speed of the electric motor so that shaft 12 and arm 14 revolve at an average speed of approximately once per second, this speed being variable over wide limits by the use of a variable resistance to be described later.

Shaft 12 also carries a contact arm 46 which makes contact with two commutator segments 47 and 48 as it revolves. The mechanism just described and shown in detail in FIGS. 4 and 5 is only one of a pair of assemblies which are secured to the panel board. A similar mechanism, similar in all details to the one described is mounted in adjoining relationship on the panel as is evident from FIGS. 1 and 2. The only difference between the two assemblies is that the one shown to the right in FIG. 1 moves in a clockwise direction while the one shown on the left moves counterclockwise.

Besides being controlled to move up and down above the panel board each contestant may change the speed of rotation of arm 14 and 15 by adjusting a knob 50, 51, labeled a "throttle" and connected to a variable resistance 52, 53, attached to the underside of the panel 10. Each resistance is connected in series with the motor, a "landing-take-off" switch 54, 55a, and a direct current source of power.

The electrical connections for operating the game are shown in FIG. 3. All movable electrical components are connected to a direct current battery 16 which furnishes all the power for the motors, lamps, and other indicating devices. Motor 37 is a direct current variable speed motor and is connected in series with resistor 53, switch 54, conductor 55, to the positive side of battery 56. The other side of the motor is connected in series with a pair of contacts 57 and conductor 58 to the negative side of the battery. In a similar manner motor 60 which turns arm 15 is connected in series with resistor 52 and switch 55a to the negative side of battery 56 by means of conductor

58. The other side of motor 60 is connected in series with a pair of contacts 61 and conductor 55 to the positive side of battery 56. It will be evident from these connections that as soon as switches 54 and 55a are closed, or put into their "take-off" position, both motors will turn and arms 14 and 15 will revolve. It is assumed that all other switches are in their open position. It should be pointed out that two indicator lamps 62, 63, are not lighted because each is short-circuited by contacts 61 and 57, respectively (which are normally closed).

Two numerical registers 65 and 64, are associated with the motor circuits and these registers record the number of hits that one plane makes on another. These registers may comprise a solenoid-operated counter or a simple motor arrangement which indicates an additional digit each time current is applied to its terminals. Such registers are well-known in the art and can be purchased from several manufacturing companies. The registers are arranged to make a complete revolution of pointer 82 when 4 hits have been recorded. Pointer 82 moves clockwise as seen from the top of the panel, starting at the position marked "START." After four hits have been recorded the pointer 82 engages one end 61A of a switch 61 and pushes it down, opening the switch and cutting off power to the blue motor 60 and at the same time lighting lamp 62 indicating "Blue Plane Destroyed."

As mentioned above, each control stick 34 includes a push button 35 which closes an electrical switch. These switches are shown in FIG. 3 as 66 and 67. These switches are used to make the game more realistic and hits will be recorded only when the player presses down on button 35.

The game can be arranged to automatically record hits without the use of the switches 66 and 67 under buttons 35, and for such an operation the "automatic-manual" switches 70 and 71, are closed. While the game is in progress reset switches 72 and 73, remain open. After a game has been finished and a number of hits recorded by registers 64 and 65, it will be necessary to reset the counters to show zero before the next game can commence. In order to accomplish this, switches 72 and 73 are closed until the registers move to their zero position, then the reset switches are opened and the registers are ready to record the hits for a new game. It is contemplated that each register will be arranged to show hits from zero to four, inclusive, and if this is done, the reset switches 72 and 73 will move the registers in a positive direction to arrive at zero.

Motor 60 is similar to motor 37 and includes a contact arm 74 which makes electrical contact with commutator segments 75 and 76.

The operation of the game is as follows: With registers 65 and 64 set at zero, the take-off switches 54 and 55a are closed and both arms 14 and 15 start to revolve under control of throttle knobs 50 and 51, controlling variable resistors 52 and 53. The object of the game is to maneuver the speed of the planes so that one opponent's plane arrives at space 77 (traversed by both planes) after his opponent's plane. When this is achieved the following plane scores a hit on the preceding plane. The circuit which scores the hit may be traced from the positive end of battery 56, conductor 55, switch 54, arm 46 secured to shaft 12, segment 48, register 65, gun switch 66, segment 75, and arm 74 associated with motor 60, switch 55a, and conductor 58 to the negative side of battery 56. As soon as this circuit is completed the current through register 65 records one hit.

If the model plane on the end of arm 15 had been maneuvered to a position directly behind the model plane on the end of arm 14, then contact arm 74 would make contact with segment 76 at the same time that arm 46 made contact with segment 47 and a similar circuit could be traced through similar circuit components but this time causing register 64 to record one hit.

FIG. 1 shows a throttle, switches, indicator, and control stick for each contestant. On control panel 80 the game

reset switch 72 is controlled by a toggle 81 while the register 65 operates an indicator 82 which counts the number of hits scored by one player and may have damage designations on its dial. Lamp 62, when lighted after four hits, illuminates a window 83 indicating that the other plane has been downed and a toggle 84 controls the position of switch 70. In a similar manner toggles 85 and 86 control switches 73 and 71 while the dial 87 indicates the number of hits recorded by register 64.

The game may be played by a single person, and when this is done one plane is set at a constant speed and at a constant elevation, automatic-fire switch is thrown to "auto" position so that drone plane can score hits on plane under control and then the player tries to maneuver the other plane to score as many hits as possible within a given time or a given number of revolutions.

It will be obvious from the above description that all game components are secured to a single panel board and cannot become loose or get lost. There are only selected positions where hits may be recorded and these hits are dependent upon the position and extent of the commutator segments associated with revolving arms 46 and 74.

Having thus fully described the invention, what is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A game comprising, a container including a horizontal panel board, a pair of spaced apart vertical shafts each extending through a hole in the panel board and each coupled to a variable speed motor for axial rotation, a pair of rotatable arms each having one of its ends secured respectively to the upper ends of the shafts, a model of an airborne vehicle mounted at the other end of each arm, manually adjustable means for independently controlling the speed of rotation of said shafts, a pair of electric commutator means secured to the panel board and each having at least two segments, a brush secured to each of said vertical shafts and engaging said commutator segments during the shaft rotation, and indicator means connected to said commutators and brushes for showing when either one of said models is positioned adjacent to and in the rear of the other of said models and in contact with the commutator means.

2. A game comprising, a container for housing control and operating mechanisms and including a horizontal panel board, a pair of spaced apart vertical shafts each extending through a hole in the panel board and each coupled to a variable speed motor for axial rotation, a pair of rotatable arms each having one of its ends secured respectively to the upper ends of the shafts, a model of an airborne vehicle mounted at the other end of each arm, a pair of manually adjustable means each for independent control of the speed of rotation of said shafts within a predetermined range of speeds, a pair of electric commutator means secured to the panel board and each having at least two segments, a brush secured to each of said vertical shafts and positioned for resilient engagement of said commutator segments during the rotation of the shafts, and a pair of indicator means each connected in series with selected commutator segments and brushes for showing when either one of said models is positioned adjacent to and in the rear of the other of said models and in contact with the commutator means.

3. A game comprising, a container including a horizontal panel board, a pair of spaced apart vertical shafts each extending through a hole in the panel board and each coupled to a variable speed motor, an adjustable arm pivotally mounted at one end on each of said shafts for rotary movement above said panel, a model of an airborne vehicle mounted at the other end of each arm, manually adjustable means for independently controlling the speed of rotation of said shafts, mechanical means for adjusting the angular position of each arm with respect to the plane of the panel board, and an electric commutator means for completing a circuit through an indicating device when either of said models is positioned ad-

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adjacent to and in the rear of the other model and in contact with the commutator means.

4. A game comprising, a container for housing control and operating mechanisms and including a horizontal panel board, a pair of spaced apart vertical shafts each extending through a hole in the panel board and each coupled to a variable speed motor for axial rotation, a pair of rotatable arms each having one of its ends pivoted respectively to the upper ends of said shafts, a model of an airborne vehicle mounted at the other end of each arm, a pair of manually adjustable means each for independent control of the speed of rotation of said shafts within a predetermined range of speeds, mechanical means for adjusting the angular position of each arm with respect to the plane of the panel board, a pair of electric commutator means secured to the panel board and each having at least two segments, a brush secured to each of said

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vertical shafts and positioned for resilient engagement of said commutator segments during the rotation of the shafts, and a pair of indicator means each connected in series with selected commutator segments and brushes for showing when either of said models is positioned adjacent to and in the rear of the other of said models and in contact with the commutator means.

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