April 19, 1966 J. P. WALDROP 3,246,897

ROCKET AND SATELLITE GAME

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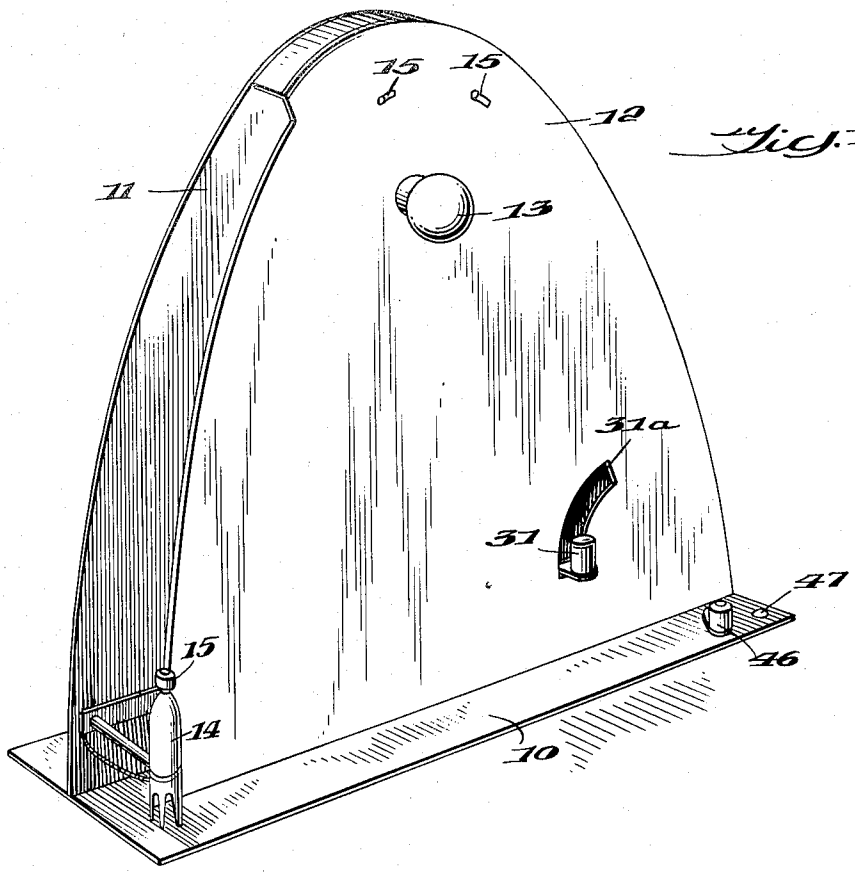
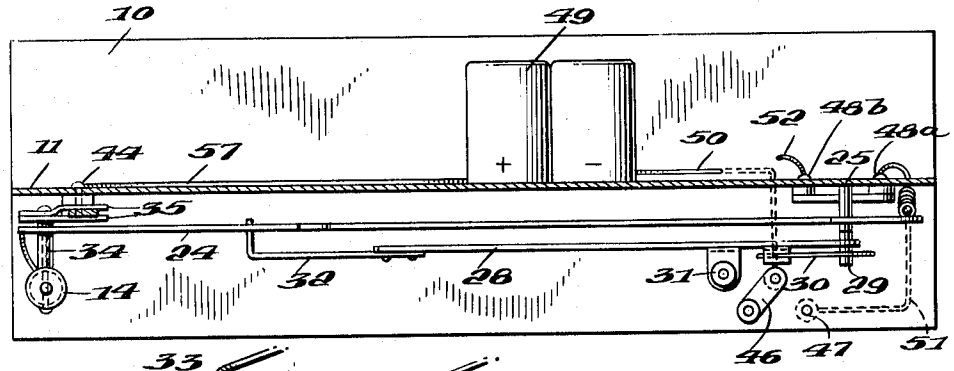



Fig. 1.

Fig. 6.



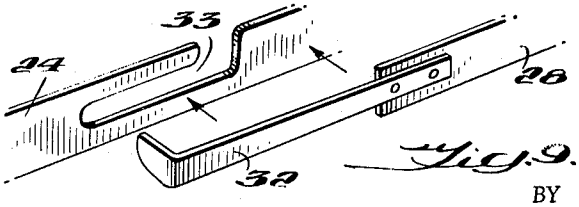




Fig. 9.

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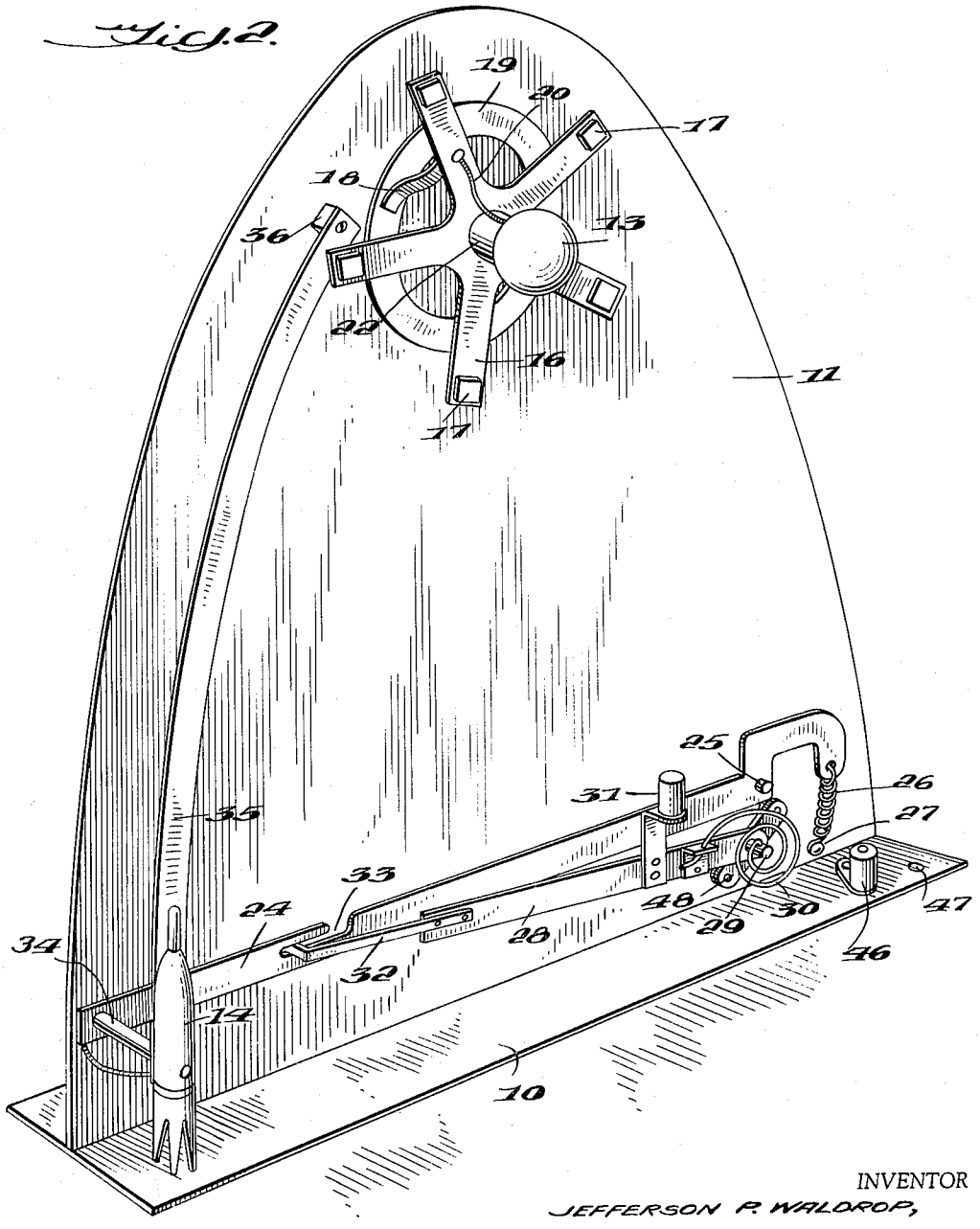
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ROCKET AND SATELLITE GAME

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Fig. 2.




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ROCKET AND SATELLITE GAME

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Fig. 4.

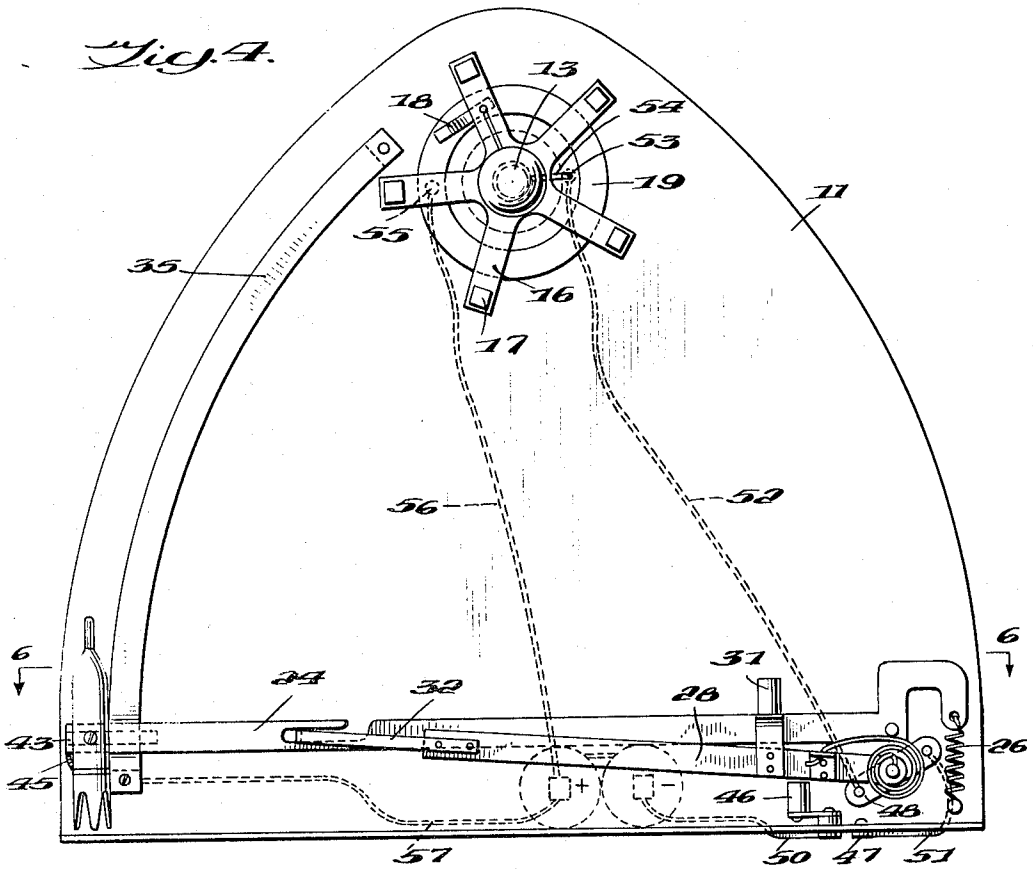
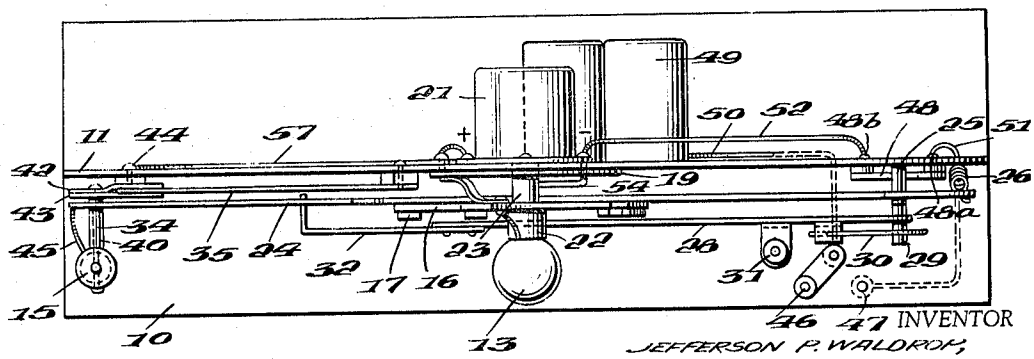



Fig. 3.




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Fig. 5.

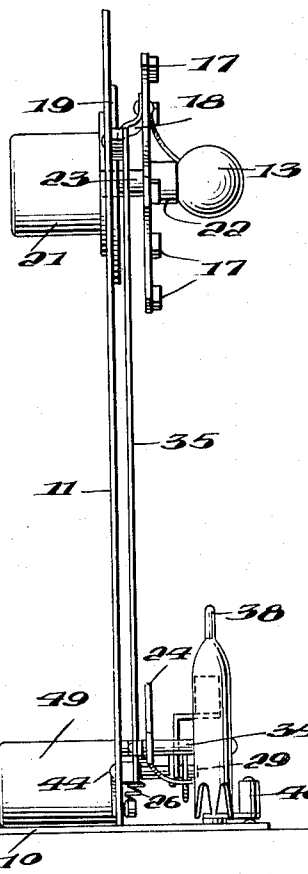



Fig. 7.

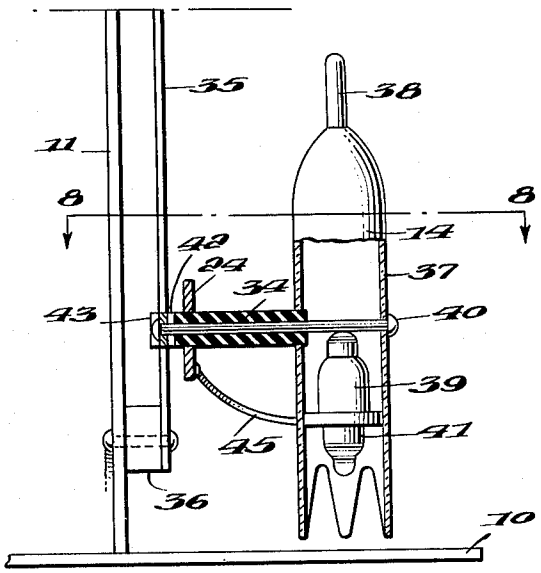



Fig. 8.

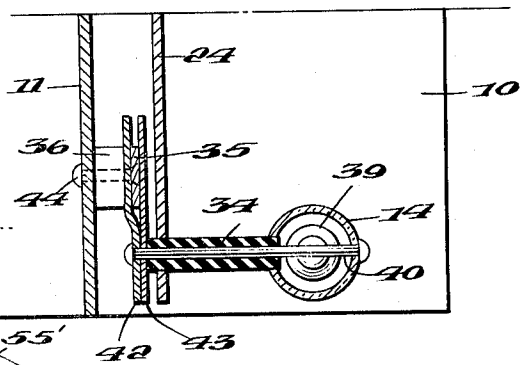
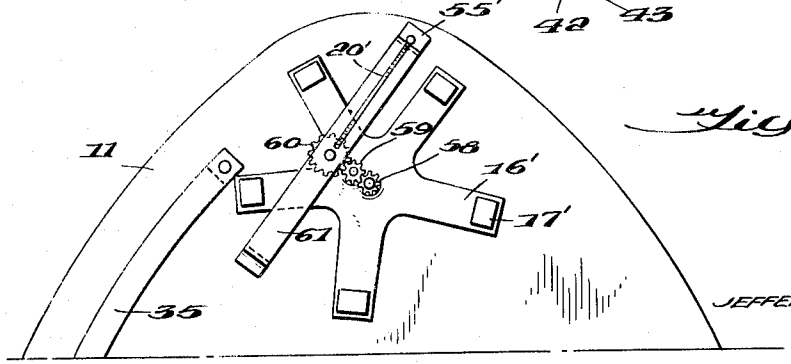



Fig. 10.




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United States Patent Office 3,246,897 Patented Apr. 19, 1966



3,246,897

# ROCKET AND SATELLITE GAME

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Filed Apr. 18, 1962, Ser. No. 188,366
10 Claims. (Cl. 273—101)

This invention relates to games and toys, and more particularly, to a game employing the concept of launching a rocket which will in turn, release a satellite. The toy further provides that, if the launching of the rocket is properly timed, the satellite will orbit around a planetary or other astronomical body.

Another important object of this invention resides in the provision of a game incorporating basic principles of science for educational enjoyment and skill.

A further object is to provide a game which will employ electrical circuits to simulate rocket exhausts and to enable rotating magnets to support the satellites in orbit about a lighted object.

Yet another objective is to arrange the game to operate in a vertical manner in order to realistically utilize gravity forces.

Still another object lies in the provision of a game which is simple to manufacture and is usable and attractive to persons of all ages.

Other and important objects and advantages will also become apparent during the course of the following description.

In the accompanying drawings forming a part of this invention, and in which like numerals are employed to designate like parts throughout,

FIG. 1 is a perspective view of the game as completely assembled,

FIG. 2 is a similar perspective, but with the front cover wall removed,

FIG. 3 represents a top plan view of the game,

FIG. 4 is a front view thereof,

FIG. 5 is a left end view,

FIG. 6 is a plan section taken on line 6—6 of FIG. 4,

FIG. 7 is an elevation view and partial section of the rocket assembly,

FIG. 8 is a sectional view taken on line 8—8 of FIG. 7,

FIG. 9 is an exploded detail of the arm engaging portions, and

FIG. 10 is a modified arrangement of the orbital system wherein the path of the magnets is eccentric to the rotation of the sphere.

In the primary embodiment shown in FIGS. 1–9, the combination toy and game comprises a base **10**, a vertical back support wall **11**, and an opaque front cover wall **12**. While the walls may be of any operable shape, they are shown here to have a generally arcuate or ogive shape. Near the top is a rotating sphere or body **13**. Along one side, a rocket **14** is provided for a launching movement in a vertical plane from the ground or base **10** position to its maximum height near the sphere **13**. Cover wall **12** has a recess along which the rocket **14** appears to travel. Freely mounted on the top of the rocket **14** is a tubular satellite **15** of magnetically attractable material. When launched, rocket **14** follows substantially the path defined by the recess in wall **12**. It then abruptly stops near the top whereat the satellite **15** by inertia continues to a position within the orbital range of the sphere **13**.

For realism, the sphere **13** is mounted so that it is lighted and will rotate. This may be accomplished by means of a small electric motor, for example, at 6 r.p.m. direct current miniature, as shown at **21** and attached to the back of support wall **11** with its armature oriented along a horizontal axis. An electrically conductive sleeve **23** is insulatively mounted to the armature of motor **21**. The sleeve **23** passes through wall **11**, and connected thereto is a further sleeve **22** of an electrically non-conductive or insulative material. A spider **16** having a plurality of arms is affixed to the inner end of sleeve **22** and is also preferably of insulative material. At the outer ends of the arms of spider **16** are permanent magnets **17**. Spider **16**, and thereby magnets **17**, rotate in a vertical plane between support wall **11** and cover wall **12**.



An electrical contact ring **19** is mounted on the front of support wall **11**. Ring **19** is concentric with the sleeves **22**, **23** and spider **16**. Cooperating with ring **19** is an electrical brush **18** fixed to one of the arms on the spider **16**. Electrical wire **20** is then used to connect brush **18** to the light bulb in the interior of sphere **13**. The particular electrical configuration and circuit will be described hereinafter.

The rocket launching means includes a rocket arm **24** to which the rocket **14** is attached. Arm **24** is pivoted about pin **25** fixed to the support wall **11**. Rocket arm **24** includes a short counterweight portion to which one end of a weak spring **26** is attached. Spring **26** is fixed to wall **11** at its other end by pin **27**. In this manner, the forces of gravity will cause rocket **14** to return to the position shown in FIGURES 1 and 2 after having been released by the launch actuator. The spring **26** is only strong enough to merely slow down the return of rocket **14** from any upright position. At least the rocket end of arm **24** is of electrically conductive material.

The launch actuator comprises launching arm **28** pivotably mounted to U-member **48** by means of pin **29**. U-member **48** is fixed to the support wall **11**, and the open ends **48***a*, **48***b*, of the U-member **48** project through to the back of the wall **11**. Arm **28**, pin **29**, and U-member **48** are also of electrically conductive material.

Coil spring **30** is fixed at one end to pin **29**, and at the other end to arm **28**, as shown. The spring **30** urges launching arm **28** in a clockwise rotational direction. A cocking button **31** is provided as shown to return the arm **28** in a counterclockwise direction to the launch position, as shown in FIG. 2. When the cocking button **31** is released, the arm rotates clockwise.

Fixed to the outer end of arm **28** is an L-shaped arm extension **32** of torsionally resilient and conductive material. The end leg of extension **32** fits within slot **33** of rocket arm **24**. In this manner, arm **24** is also forced to move in a clockwise directon when cocking button **31** is released. Because arm **28** has a pivot pin **29** below pivot pin **25** of arm **24**, it is obvious that during the clockwise movement, the leg of extension **32** will slide along the top edge of slot **33** until it reaches the slot opening shown. At this point, the leg of extension **32** is released, and launching arm **28** continues clockwise by the urging of spring **30** until the connector for the cocking button **31**, and thereby arm **28**, is stopped by the upper limit of slot **31***a* in cover wall **12**. Rocket arm **24** and rocket **14**, however, continue only until the clockwise moment is overcome, at which time the weight of the rocket **14** causes arm **24** to return to the launching position at base **10**.

Inside of the arcuate path of rocket **14** is an arcuate contact strip **35** along which rocket **14** and arm **24** ride. Strip **35** is fixed to and separated from support wall **11** by means of blocks **36**.

FIGS. 7 and 8 show in greater detail the construction of the rocket **14** and associated parts. Rocket **14** comprises a body section **37** of preferably opaque material, except for the bottom fluted portion, which may be opaque or of a translucent colored material, such as red plastic.

Within the rocket body **37** is a light socket **39** and light bulb **41**. If the entire rocket body **37** were of translucent material, socket **39** would include a collar as shown so that only the tail section may appear lit.

At the top of the rocket **14** is a nose portion **38** about

which the tubular satellite 15 rests. Connecting arm 24 and rocket body 37 is a hollow sleeve member 34 through which conductor rod 40 passes. Rod 40 is connected to the center contact of light socket 39.

To the interior end of sleeve member 34 are fixed contact elements 42, 43, between which is the contact strip 35. Elements 42, 43 are held in place by a rivet end of rod 40, as is rocket body 37. Elements 42, 43 are adapted to frictionally engage contact strip 35 throughout the movement of rocket arm 24 and rocket 14. Rod 40 provides electrical connection between elements 42, 43 and the center contact of socket 39. A wire 45 is included to electrically connect rocket arm 24 to the outer contact of socket 39.

The electrical circuit comprises a source of potential such as the battery casing 49 within which two flashlight cells, for example, may be placed. From one of the terminals, for example, the negative as shown, electrical wire 50 leads to a movable contact switch 46. Switch 46 is adapted to engage contact button 47 for completing the electrical circuit. Electrical wire 51 leads from button 47 to end 48*a* of the U-member 48. At this point the electrical circuit is divided, such that one leg continues through U-member 48 to its other end 48*b*, while the other leg passes through pivot pin 29 and to the launching arm 28.

As for the first mentioned leg, the circuit continues from end 48*b* through electrical wire 52 behind wall 11 to one terminal of the motor 21. A short lead wire additionally connects the negative pole to contact brush 54, which frictionally engages sleeve 23. Sleeve 23 at its portion within sleeve 22 and sphere 13 provides one of the contacts for a light socket and bulb within the sphere 13, while wire 20 provides the other. Wire 20 is connected to the brush 18 as before mentioned, and brush 18 is adapted to frictionally engage ring 19. Ring 19 is connected by short lead wire 55 to the other terminal of the motor 21. Lead wire 56 connects this motor terminal to the positive terminal of the power source. Motor 21 is adapted to rotate the sphere and spider in a clockwise direction as viewed in the embodiment described. Motor 21 will also operate even though the electric light within sphere 13 is burned out.

With respect to the second leg of the circuit, it continues from U-member 48 and pin 29, through arm 28 and extension 32, to rocket arm 24, whenever the extension 32 engages arm 24. From arm 24, the circuit continues through lead wire 45 to the outer contact of light socket 39, then through the light to the center contact and rod 40 and elements 42, 43 and through these elements to contact strip 35. Connecting pin 44 through the center of block 36 connects contact strip 35 to one end wire 57 behind support wall 11. Wire 57 completes the circuit by having its other end connected to the positive terminal of the power source 21. As can be seen the first leg and second leg of the circuit are in parallel arrangement so that, upon closing of switch 46, each circuit leg is operable independently of the other.

In operating the game, the contact switch 46 is initially open, and the rocket 14, by its slight excess weight, is in the launching position at the base 10 of the game. Cocking button 31, by the urging of spring 30 is in its uppermost position wherein it is held by the uppermost end of slot 31*a*.

The contact switch is then closed, thereby closing the first leg of the electrical circuit. Sphere 13 is now lighted by the interior light bulb, and both the sphere 13 and spider 16 commence rotation. Only the sphere 13 is visible from the front of the game, because of the opaque cover wall 12.

A tubular satellite 15 is then placed on the nose portion 38 of the rocket 14. Cocking button 31 is then pushed downwardly until extension 32 is felt to engage slot 33 of the rocket arm 24. At this time the second circuit leg is closed, and the bulb 41 at the base of rocket 14 lights.



The cocking button 31 is held in the downward position until the player determines the appropriate launch time, at which point the button 31 is released. The rocket 14 is then urged upwardly by launching arm 28, and during the time the spring extension 32 engages arm 24, the rocket light remains lit, through the engagement of contact strip 35 and elements 42, 43 during the launch movement.

A short time before the upper limit of the rocket path, the extension 32 is disengaged through the slot opening and the rocket light 41 is extinguished. By momentum, the rocket 14 continues upwardly until the contact element 42 strikes the upper block 36, at which time the rocket 14 stops, but the satellite 15 by momentum continues in the arcuate path over the front of cover wall 12 toward the orbital range of the sphere 13. If the satellite has been launched at an appropriate time, a magnet 17 will pass directly behind the satellite 15. If this occurs, the satellite 15 will be attached by the magnet 17 and will appear to orbit over the front of cover wall 12 and around the sphere 13. Otherwise, it will fall by gravity to the base 10 of the game. Meanwhile, the rocket 14 after having stopped, will fall gently to its launching position with the light in its base remaining extinguished. A second launching may now be made.

Many competitive game modifications are now apparent. For example, each of two players may have three satellites of one color, and there may be five magnets in orbit. Following alternating launchings, the first to get all three of his in separate orbital positions would win. A player might also attempt to "knock out" an opponent's orbiting satellite, keeping in mind, of course, that his may fall instead. Other examples and modifications may of course be worked out.

Sphere 13 of course should be translucent and could appropriately be decorated by color and/or relief to simulate the moon, a planet or other astronomical body. Cover wall 12 could also be decorated to depict the earth's surface near the base 10, with clouds and stars or other flying objects at higher levels, respectively. Except for the magnet and satellite, all of the material used are preferably of non-magnetizable material.

FIG. 10 depicts an embodiment which would convey more realism. In this case, a gear 58 rotates concentric with spider 16'. An additional idler gear 59 rotatably mounted on the cover wall 12 would transfer the rotation to a larger gear 60 supporting the sphere. A U-frame 61 would support the gear 60 and sphere. For the installation of the light within the sphere, the two contacts for the light socket may include the gears by means of the brush 54 to the one terminal of the motor, and a wire 20' through a brush 55' to the other terminal of the motor. In this manner, the orbital path will be eccentric to the sphere and have an appropriate apogee and perigee. The satellites, because of the larger gear 60, will also orbit at a faster rate than the revolution of the body. A consideration to this, however, is that there is more difficulty in getting a good indication of the position of the magnets 17, which serve as targets, from the rotation of the sphere. However, this may be simplified by designing gears 60 and 58 to be of approximately the same size.

It is of course to be understood that the particular embodiment shown is to be taken as a preferred example, and that the size, shape, arrangement, or reversal of parts and other changes may be made without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. In a satellite game for delivering a satellite to an orbiting arrangement operable to utilize said satellite, the combination comprising: a support wall, a rocket arm pivotably mounted to said support wall and having a first end, a rocket fixed to the said first end of the rocket arm and having means for releasably holding a satellite,

actuator means for moving the rocket arm, and target means proximate to the path of the rocket for attracting the satellite from the rocket.

2. The combination according to claim 1 wherein the actuator means comprises a launching arm pivotably mounted to the support wall at a point spaced from the point at which the rocket arm is pivotably mounted, one of said arms defining a slot and the other of said arms having an extension portion slidably engaging the slot; and spring means urging the launching arm and thereby the rocket arm in one of two rotational directions.

3. The combination according to claim 2 and further comprising a cover wall spaced from said support wall, the said arms and spring means being mounted between said walls, and the said wall having edge means defining an arcuate slot; and a cocking button attached to the launching arm for urging the launching arm in the other of the two rotational directions, the said cocking button being movable in the arcuate slot, and the edge means defining the slot limits the movement of the launching arm in said one of two rotational directions.

4. The combination according to claim 2 and further comprising a light mounted within said rocket, an electrical power source, and means for completing an electrical circuit between the light and the power source during the movement of the launching arm in the said one of two rotational directions.

5. The combination according to claim 4 wherein the means for completing the electrical circuit includes at least one contact element attached to the rocket arm, and an arcuate contact strip attached to the support wall, the said contact element frictionally engaging the contact strip during the movement of the rocket arm.

6. The combination according to claim 4 wherein the means for completing the electrical circuit includes current means passing through the extension portion to the said one of said arms, the extension being released from the said slot in the one of said arms at a position during the movement in the one of two rotational directions, thereby discontinuing the current means.

7. The combination according to claim 1 and further comprising a light mounted within said rocket, an electrical power source, and means for completing an electrical circuit between the light and the power source during at least part of the movement of the rocket arm.

8. In a satellite game for delivering a satellite to an orbital arrangement by means of a rocket, the combination comprising a movable rocket and means for selectively moving the rocket; means for mounting a satellite on the rocket; an electric light within the rocket; an electric power source; circuit means between the light and power source including a first lead comprising a fixed contact strip and a movable element frictionally engaging the strip, and a second lead comprising a first pivotable arm defining a slot and a second pivotable arm engaging the slot; a rotatable hollow body proximate to the path of the moving rocket and means for rotating the body; means for attracting a satellite mounted on the rocket to rotate with the body; a second light mounted within said body; and additional circuit means between said second light and said power source, said circuit means including a third lead having a circular contact ring concentric with said hollow body and a contact brush engaging said ring and rotatable with the body, and a fourth lead having a rotatable sleeve for supporting said body and second light and a second contact brush engaging the sleeve.

9. The combination according to claim 8 wherein the first mentioned circuit means and additional circuit means are connected to the power source in parallel relative to each other.

10. A satellite game comprising in combination: at least one magnet rotatable in a vertical plane about a horizontal axis, means including an arm for rotating said magnet about the axis, a rocket movable in a vertical plane, a satellite of magnetizable material mounted on said rocket, a vertical support wall, a rocket arm pivotably mounted to said support wall to rotate in a plane parallel to said wall, said rocket being mounted on one end of said rocket arm, spring means for urging the rocket and rocket arm in a direction towards said magnet from a position below the magnet, means for stopping the rocket to release the satellite for attraction by the magnet, a light mounted within said rocket, an electrical power source, and means for completing during the launching of said rocket an electrical circuit between said light and power source including at least one contact element attached to the rocket arm at the said end of which the rocket is mounted, and an arcuate contact strip attached to the support wall, the said contact element frictionally engaging the strip during the movement of said rocket.




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