May 12, 1970 R. F. PIPPIN, JR 3,510,980

PROPELLED TOY ARRANGEMENT AND METHOD

Filed Oct. 24, 1965 2 Sheets-Sheet 1

FIG. 1

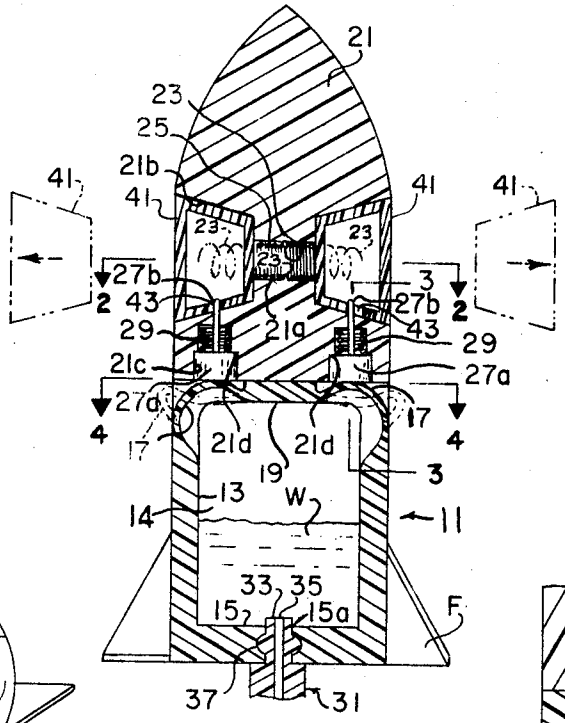
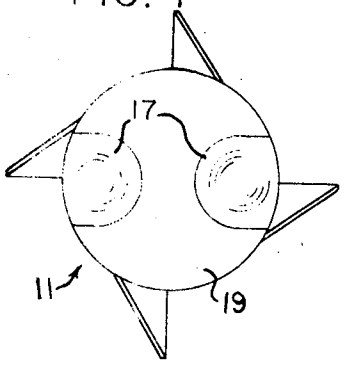


FIG. 4



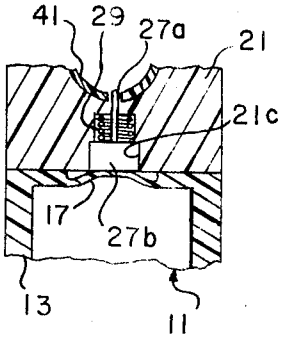


FIG. 3

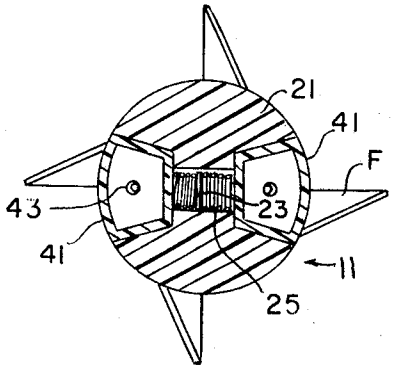
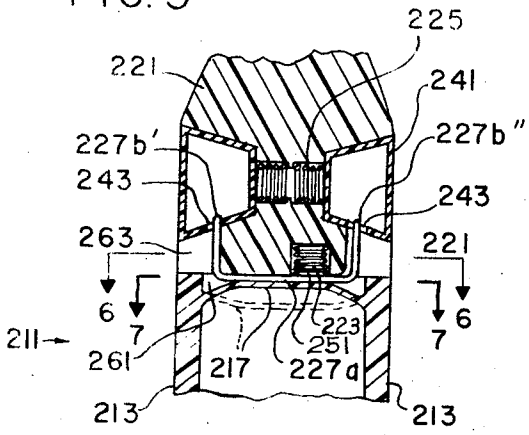


FIG. 2

FIG. 5



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PROPELLED TOY ARRANGEMENT AND METHOD

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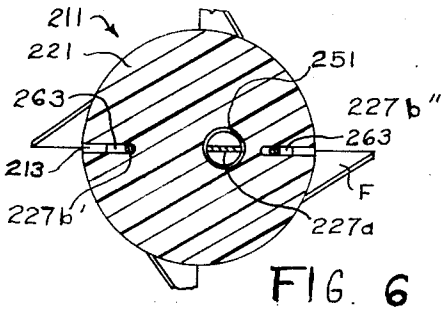

FIG. 6

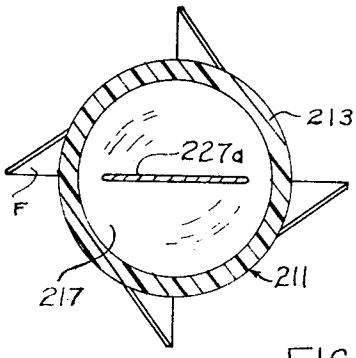

FIG. 7

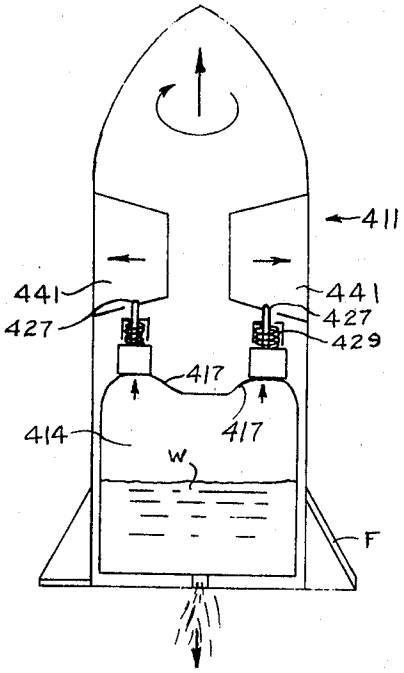

FIG 10

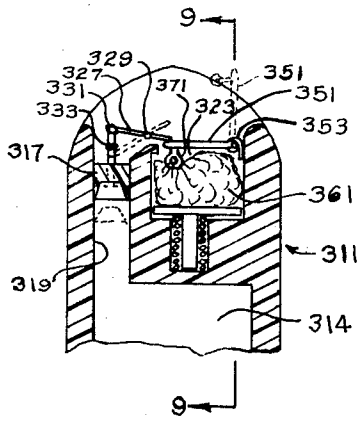

FIG. 8

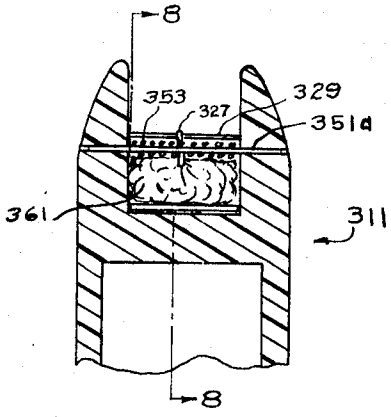

FIG. 9

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PROPELLED TOY ARRANGEMENT AND METHOD

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Int. Cl. A63h 27/00
U.S. Cl. 46—74 46 Claims

ABSTRACT OF THE DISCLOSURE

A propelled toy vehicle body in the form of a simulated rocket missile is propelled by fluid discharge from a pressurizable fluid chamber, the vehicle body carrying one or more satellite bodies which are releasably retained with the vehicle body during a portion of its travel. The pressurizable fluid chamber has a movable wall, the position of which controls the retention or release of the satellite bodies. The retained satellite bodies are retained within opposed transverse openings in the vehicle body by releasable retainers, including the movable wall and simultaneously or sequentially releasable detents which are moved by one or more movable portions of the movable wall as a function of the pressure in the pressurizable fluid chamber. Satellite separation is aided by either or both of centrifugal force through vehicle body rotation or stored spring energy. In one embodiment a parachute is released through movement of a movable wall of the pressurizable fluid chamber.

This invention relates to a propelled toy arrangement and method, and more particularly to a pressurized liquid expulsion or reaction motor propelled toy, which preferably takes the form of a rocket, and which effects release of and launching of one or more satellites or other members such as a parachute after a period of flight dependent upon fluid pressure in the rocket body.

It is a feature of the invention to provide a propelled toy arrangement and method, and particularly a reaction motor rocket simulation toy, which effects release and launching of selected objects after a period or periods of time after launch from the ground or other site.

A further feature is the provision of such a reaction motor toy arrangement in which the satellite or satellites, or other objects such as a parachute, are released and launched as a function of the extent of discharge of fuel from the reaction motor.

Still a further feature is the provision of a satellite launching rocket type toy in which the satellites are launched from the rocket body under the influence of a spring force which is delayed in its action until a period after launch of the rocket.

Another feature is the provision of a satellite launching rocket type toy in which the satellites are launched from the rocket body under the influence of centrifugal force resulting from spin stabilization of the rocket during flight, with or without spring action satellite launching assistance.

Still a further feature is the provision of a satellite launching rocket toy in which a plurality of satellites are launched at different times during the flight of the rocket body.

Still other objects, features and attendant advantages will become apparent to those skilled in the art from a reading of the following detailed description of several physical embodiments according to the invention, taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a longitudinal section view of a toy rocket embodiment according to the invention,

FIG. 2 is a cross-section view taken on line 2—2 of FIG. 1,

FIG. 3 is a section view taken on line 3—3 of FIG. 1,

FIG. 4 is a section view taken on line 4—4 of FIG. 1,

FIG. 5 is a fragmentary section view of a modified satellite holding and release arrangement,

FIG. 6 is a section view taken on line 6—6 of FIG. 5,

FIG. 7 is a section view taken on line 7—7 of FIG. 5,

FIG. 8 is a fragmentary section view of a further modification, providing for parachute holding and release as a function of reaction motor internal pressure,

FIG. 9 is a section view taken on line 9—9 of FIG. 8,

FIGURE 10 is a schematic illustration of a further modification according to the invention.

Referring now to the drawings, in FIG. 1 is shown a self-propelled liquid ejection type reaction motor rocket toy **11** having a pressurizable liquid storage chamber **14** enclosed by annular side wall **13**, rear end wall **15** and forward end wall **17, 19**. Various suitable materials may be used, considering the required functions of the parts, including rubber or plastics such as nylon, polyethylene, Delvin, acetal resin, polypropylene, etc. As in prior rocket toys of this general type the storage chamber **14** may be loaded through a discharge orifice with a charge of fuel in the form of liquid such as water W, and the chamber is subsequently pressurized and launched, normally in a generally vertical direction, from a suitable launcher. Various launcher arrangements may be used, such as that shown in the Holderer Pat. 3,046,694, or Krautkrawer Pat. 2,732,657. The Holderer type launcher is shown for purposes of illustration at **31**, and is preferable since it is pressure-responsively self-releasing in action. This type lanucher **31** includes a nodule detent **37** in an orifice-sealing stem **33** having a pressurizing bore **35** through which air and/or water may be pumped to effect desired pressurization of chamber **14**, and subsequent self-release of the rocket **11** upon build-up of pressure beyond a given value within the chamber **14**. Propulsion of the rocket **11** is effected by reaction from the discharge of liquid from the chamber **14** through orifice **15***a*, and in the illustrated and preferred embodiment stabilization of the rocket is effected by fins F which are preferably canted to provide spin stabilization and other effects such as aiding in the launching of the satellites as will be described hereinafter.

The nose section **21**, which is preferably separately formed from the lower section **13, 15, 17, 19** for ease of molding, is secured to the lower section as by suitable adhesive, spin welding, etc., through a face junction with the upper surface of rigid wall section **19**.

Rocket **11** carries a pair of diametrically opposed "satellite," "space capsule," or "space ship" members **41**, the shape of which is frusto-conical with a plano-convex outer base end conforming to the general curvature of the adjoining outer surface of a nose section **11**. This general shape enables advantageous holding and launching and has the added feature of resembling the general shape of early manned space capsules which are well remembered by children who may use this toy. The satellites **41** are releasably held in their respective complementary openings **21***b* by satellite retaining means which in the illustrative and preferred embodiment takes the form of positive retention detents which are normally resiliently urged away from holding engagement with the satellites and which are urged into such holding engagement by positive pressure in the liquid fuel storage chamber **14**. In the illustrated embodiment each of these detents take the form of detent plungers riding in a respective guide bore **21***c* (which bore **21***c* serves as means movably mounting the satellite retaining means **27***a*, **27***b*) and having an enlarged lower end **27***a* and a smaller diameter detent end **27***b* which engages with a hole or recess

43 formed in the wall of satellite 41. Compression springs 29 resiliently urge the detents away from satellite holding position, while positive pressure within chamber 14 effects movement of the detents upwardly against the compression springs 29 and toward engagement with shoulder stops 21*d* to effect holding engagement with the satellites 41, as shown in FIGS. 1 and 3. This upward movement is accomplished through upward flexing and expanding movement of flexible diaphragm sections 17 of the forward wall of chamber 14. Upon reduction of pressure in the chamber 14 as a function of expulsion of the liquid W from the jet orifice 15*a* the spring will eventually overcome the upward force exerted on the detent plungers 27*a*, 27*b* by the wall sections 17 and the detents will be moved downward out of holding engagement with satellites 41, whereupon the satellites will be forcefully propelled outwardly from their respective compartments 21*b*, under the influence of the stored energy in previously compressed compression spring 25, and the centrifugal force exerted on the satellites through the spin imparted to the rocket by canted fins F. If only spring ejection of the satellites is desired then fins F may be made straight; however it is considered that the spin imparted motion substantially enhances the desired orbiting satellite simulation action.

Due to the centrifugal ejection forces exerted on the off-axis satellites of FIG. 1 as a result of spin stabilization of the rocket by canted fins F it will be seen that one may also effect launching of the satellites from the rocket without employing spring 25, although this spring is most helpful and desirable in providing for greater launching distance of the satellites than is imparted by centrifugal force alone for a given spin rate. An embodiment illustrating this alternative modification is shown schematically in FIG. 10, wherein the rocket 411 is spin stabilized by canted fins F, and satellites 441 are releasably retained in the rocket body by spring biased detent plungers 427 which are pressure-releasably biased into holding position by flexible diaphragm wall sections 417 of the chamber 414.

A modified arrangement is shown in FIGURE 5 in which the spring force is unequal on the two detents for the respective satellites, thereby tending to effect movement of one detent out of holding engagement before the other. The satellites 241 are retained in their compartments against the radially outward action of compressed compression spring 225 as in FIG. 1, through the medium of detents 227*b'* and 227*b''* engaging with respective detent receiving openings 243 in the satellites. Detents 227*b'* and 227*b''*, which may suitably be made of metal for desired strength, move in guide slots 263 and are integrally connected as a unit by an intermediate central connecting section 227*a* which is engaged by a compressed compression spring 251 disposed in a recess 223 above single unitary flexible diaphragm wall 217 and detent connecting section 227*a*. As recess 223 and spring 251 are off center with respect to detent section 227*a* the spring biasing action of spring 251 will be greatest on detent 227*b''* and this detent will thus tend to be moved down out of holding engagement with its respective satellite 241 before detent 227*b'*, thereby releasing and enabling launching of this respective satellite before the other satellite. The unbalanced lateral reaction force exerted by launching a single satellite will cause the rocket to tilt or yaw at that time, with probable change of rocket course, and subsequent launching of the other satellite will be along a different path than would have otherwise occurred with simultaneous release and launching.

In the modification of FIG. 8 a parachute 361 and parachute compartment door 351 are releasably held in parachute-retention condition by a lever 327 pivotally mounted in the nose end of the rocket as indicated at 329. Lever 327 is moved against the force of door opening spring 353 and parachute ejection spring 365 by wall-forming self-sealing obturating piston plunger 317 moving

in complementary bore 319 in the nose of the rocket. Piston plunger connects to lever 327 through linkage articulated as at 331, 333, and is moved upwardly under the influence of pressure in the liquid storage chamber 314 which is in fluid connection with bore 319 and piston plunger 317. In response to decrease of pressure in the chamber 314 springs 365 and 353 urge door 351 up, the spring 365 also moving the parachute body up and out of its compartment 323 by movement of floor 363 and guide pin 364 for wind opening and blooming thereof. The shroud lines of the parachute 361 are secured to an eyelet 371, and thus the opening of door 351 tends to aid in full ejection and blooming of the parachute as the shroud lines will be pulled up from the compartment by the eyelet 371 adjacent the end of the door 351. This embodiment aids in recovery of the rocket with minimum or no damage due to descent.

While the invention has been illustrated and described with respect to several illustrative physical embodiments thereof, it will be appreciated that various modifications may be made without departing from the scope and spirit of the invention. For instance, the flexible diaphragm wall section(s) could be made of highly elastic material and be self-returnable to a non-expanded position, and by forming the satellite detents on the diaphragm or securing the detents to the movable diaphragm wall sections, the desired satellite detent release-movement force could be derived directly from the diaphragm elasticity and with fewer parts. Also, while spin enhances the satellite launching action of the embodiments of FIGS. 1 and 5, it will be apparent that straight fin stabilization can be employed with sacrifice of the spin force action on the satellite members, since the laterally acting launching spring will itself suffice to launch the satellites from the main body of the rocket. This may be particularly desirable in some instances, as where non-simultaneous or sequential release of the satellites is effected as in FIG. 5, in which case one released satellite would go in one lateral generally horizontally extending direction and the other satellite woud be launched more toward the ground due to the reaction force from the launching of the first satellite, whereas with spin stabilization the particular general direction of launch of the second satellite member is not readily predictable, being dependent on rate of spin and time delay between satellite releases. For simulation toy purposes the sequential release of satellite members with a non-spinning rocket could be said to yield a first generally horizontally directed or satellite orbiting launch as to the first released satellite and a bomb or air-to-surface missle as to the subsequent released more downwardly directed laterally launched member, assuming an initial substantially vertical rocket flight path and a generally vertical position of the rocket body at time of first satellite release. Also, while the satellites are disposed for launching substantially perpendicular to the rocket axis, and such is preferred, it will be apparent that generally other launch directions can be provided for one or more satellites or other launched members. While two satellites are shown and are normally adequate and preferred due to their balancing effect any desired number may be provided within the space available. Further, while the parachute of FIG. 8 is attached and is preferred as a recovery chute for damage minimization, the chute could be released fully free. Additionally, for ease of molding or otherwise forming the parts, the flexible diaphragm wall sections 17, 217, 417 may be separately formed and suitably secured in sealed position as by a suitable cement, adhesive, or welding. It will thus be appreciated that the invention is not to be limited by the specific illustrative embodiments but only by the scope of the appended claims.

That which is claimed is:

1. A propelled toy arrangement comprising a first body having a pressurizable fluid chamber and a fluid discharge orifice in fluid connection between said chamber and the outside atmosphere, said body having a pressure-respon-

sively movable wall in fluid connection with and movable in response to pressure in said chamber, a member held in a first position with respect to said first body as a function of the position of said movable wall in response to internal pressure in said body chamber, and a spring secured to one of said first body or said member at other than the discharge orifice thereof for effecting a force resiliently urging said member away from its held first position.

2. A propelled toy arrangement according to claim 1, said movable wall comprising a piston plunger movable in a bore formed in said body, said bore being in fluid pressure connection with said fluid chamber.

3. A propelled toy arrangement according to claim 1, said movable wall being a diaphragm-like section flexibly inwardly collapsible and outwardly expansibly movable as a function of pressure in said fluid chamber.

4. A propelled toy arrangement comprising a first body having a pressurizable fluid chamber and a fluid discharge orifice in fluid connection between said chamber and the outside atmosphere, said body having a pressure-responsively movable wall in fluid connection with and movable in response to pressure in said chamber, a member held in a first position with respect to said first body as a function of the position of said movable wall in response to internal pressure in said body chamber, and means for effecting a force resiliently urging said member away from its held first position, said member being disposed in a laterally extending opening in said body in unsymmetrical off-axis position relative to the longitudinal axis of said body, and rotation imparting means for effecting rotational spin of said body and member about the longitudinal axis of said body to thereby effect lateral centrifugal force on said body and said member acting to aid in effecting lateral separation and movement of said member away from said body in response to decrease in pressure within said chamber and movement of said movable wall.

5. An arrangement according to claim 4, said rotation imparting means being canted fins on said body.

6. An arrangement according to claim 4, and a second member disposed in a laterally extending opening in said body opposite to the first said laterally extending opening, and spring means disposed and extending laterally between said two members and resiliently urging said members laterally outwardly in opposite directions away from said body.

7. An arrangement according to claim 6, said movable wall being a longitudinally movable flexible diaphragm wall, and a pair of detents connecting between said members and said diaphragm wall.

8. An arrangement according to claim 7, said detents being formed on a common member, and spring means resiliently urging said detents away from member-holding position.

9. An arrangement according to claim 8, said spring means being disposed for exerting unbalanced moving force on said two detents to thereby tend to effect holding release of one of said detents before the other.

10. A propelled toy arrangement comprising a first body having a pressurizable fluid chamber and a fluid discharge orifice in fluid connection between said chamber and the outside atmosphere, said body having a pressure-responsively movable wall in fluid connection with and movable in response to pressure in said chamber, a member held in a first position with respect to said first body as a function of the position of said movable wall in response to internal pressure in said body chamber, and means for effecting a force resiliently urging said member away from its held first position and spring means attached to said first body and resiliently urging said movable wall section toward a position whereby said member is released by said first body.

11. A propelled toy arrangement comprising a first body having a pressurizable fluid chamber and a fluid discharge orifice in fluid connection between said chamber and the outside atmosphere, said body having a pressure-responsively movable wall in fluid connection with and movable in response to pressure in said chamber, a member held in a first position with respect to said first body as a function of the position of said movable wall in response to internal pressure in said body chamber, and means for effecting a force resiliently urging said member away from its held first position, said member being a releasable door mounted on said first body, and a parachute-holding compartment, said door effectively covering said parachute-holding compartment when in said held position.

12. An arrangement according to claim 11, said movable wall section comprising a piston plunger movable in a bore formed in said body, said bore being in fluid pressure connection with said first chamber.

13. An arrangement according to claim 12, and a pivoted mechanical linkage between said plunger and said door.

14. A propelled toy arrangement comprising a first body having a pressurizable fluid chamber and a fluid discharge orifice in fluid connection between said chamber and the outside atmosphere, said body having a pressure-responsively movable wall in fluid connection with and movable in response to pressure in said chamber, a member held in a first unsymmetrical off-axis zone with respect to said first body as a function of the position of a portion of said movable wall in response to internal pressure in said body chamber, and rotation-imparting means for said body and member to impart a centrifugal force urging said member radially of the axis of rotation and away from its held first zone.

15. A propelled toy arrangement according to claim 14, and a second member held in a second off-axis zone with respect to said first body as a function of the position of a portion of said movable wall in response to internal pressure in said body chamber.

16. An arrangement according to claim 15, said movable wall including two integrally connected spaced movable sections connected by a common substantially rigid section, and two movable detent members operatively engageable in holding relation each with a respective one of said held members as a function of the flexed position of its respective said movable section.

17. An arrangement according to claim 16, and spring means resiliently urging said detent members away from holding relation position.

18. A propelled toy arrangement according to claim 15, said first body being elongate and generally cylindrical, said rotation-imparting means being canted spin-imparting and stabilizing fins thereon, said two held members being disposed in diametrically oppositely outwardly facing cavity openings in said body and generally symmetrical with respect to one another.

19. A propelled toy arrangement according to claim 18, said members being tapered in shape and having a blunted end and having a plano-convex face conforming to the outer surface shape of said first body.

20. The method of launching a toy satellite member with a generally horizontal path from a height above ground level comprising transporting said satellite in a generally vertically upward direction by reaction from fluid discharge in a generally downward direction from a pressurized chamber while retaining said satellite against lateral release as a function of positive pressure in said pressurized chamber, and releasing and imparting lateral generally horizontally directed motion to said satellite when said chamber pressure falls below a selected level.

21. The method according to claim 20 and spinning said satellite with its center of gravity off from the axis of spin during said generally vertically upward directional transport, said lateral generally horizontally directed motion being effected through the centrifugal force thus exerted onto said satellite.

22. The method according to claim 20 wherein said generally horizontally directed motion is imparted by

a resiliently urging force acting on said satellite during its upward transport.

23. The method of launching a toy satellite from a height above ground level comprising imparting upward movement to a carrier and said satellite while imparting off-axis spin to said satellite by spinning said carrier about an axis along the general line of flight thereof and releasing said satellite to travel transversely of said line of travel under action of centrifugal force thereon after a period of upward travel.

24. The method according to claim 23 including imparting upward and off-axis spin movement to two separable satellites with their centers of gravities disposed in substantially balancing off-axis position relative to the axis of spin thereof, and releasing each of said satellites after a period of upward travel.

25. The method according to claim 24 including substantially simultaneously releasing said satellites for travel in generally opposite directions.

26. The method of launching a toy satellite from a height above ground level comprising imparting upward movement to said satellite while imparting off-axis spin thereto about an axis along the general line of flight and releasing said satellite to travel transversely of said line of travel under action of centrifugal force thereon after a period of upward travel, imparting upward and off-axis spin movement to two separable satellites with their centers of gravities disposed in substantially balancing off-axis position relative to the axis of spin thereof, releasing each of said satellites after a period of upward travel, and releasing one of said satellites before the other to thereby unbalance the orbiting spin of the other satellite and change the spin axis thereof and thereafter releasing said other satellite.

27. A propelled toy arrangement comprising a first body having a pressurizable fluid chamber and a fluid discharge orifice in fluid connection between said chamber and the outside atmosphere, said body having a pressure-responsively movable wall in fluid connection with and movable in response to pressure in said chamber, a member held in a first position with respect to said first body as a function of the position of said movable wall in response to internal pressure in said body chamber, and releasable stored potential energy means secured to one of said first body and said member during interconnected movement of said first body, and said member, said releasable stored potential energy means being other than said movable wall and other than forming a discharge orifice, for effecting a releasable stored potential energy force urging said member away from its held first position.

28. A propelled toy arrangement according to claim 27, and a further unit carried by said first body, said held member being a movable detent positively engaging said further unit and retaining said further unit when said held member is in its held first position.

29. A propelled toy arrangement according to claim 27, said movable wall comprising a flexibly movable diaphragm portion flexibly outwardly expansibly movable and inwardly collapsibly movable as a function of differential pressure between the internal fluid chamber pressure and opposing external pressure on said flexibly movable diaphragm portion.

30. A propelled toy arrangement comprising a first body releasably carrying a satellite unit, said first body having propulsion means including a pressurizable fluid chamber having a discharge orifice, satellite retaining means on said first body and retaining said satellite as a function of positive pressure in said pressurizable chamber, means movably mounting said satellite retaining means for movement to satellite release position as a function of decrease of said chamber pressure, and transverse-force-and-motion-imparting means acting transversely on said satellite to effect transverse lateral motion thereof transverse to and away from the line of travel of said first body as a function of satellite release by said satellite retainer.

31. A propelled toy arrangement according to claim 30, said satellite retaining means including a pressure-responsively movable wall in fluid connection with and movable in response to pressure in said chamber.

32. A propelled toy arrangement according to claim 31, said movable wall comprising a flexibly movable diaphragm portion.

33. A propelled toy arrangement comprising a first longitudinally propelled body carrying a satellite body releasably retained therewith in off-axis position relative to the combined longitudinal spin axis of said bodies, means for propelling said first body and its carried satellite body along a longitudinal path of travel, rotation-imparting means for spinning said first body and satellite body generally about said longitudinal spin axis during longitudinal propelled motion thereof along its longitudinal path of travel to impart a centrifugal force to said satellite body radially of said spin axis and in a direction away from said first body, and means for releasing the retention of said satellite during longtiudinal flight of said first propelled body and said satellite body whereby said satellite is moved transversely to and away from the path of travel of said first body as a function of the centrifugal force thereon.

34. A propelled toy arrangement according to claim 33, said first propelled body carrying plural said satellite bodies similarly releasably retained therewith with their centers of gravity disposed in substantially balancing off-axis position relative to the axis of spin of said first body and said plural satellite bodies.

35. An arrangement according to claim 34, said satellite bodies being carried on substantially opposite sides of the longitudinal axis of said first body, and substantially simultaneous dual release means carried by said first body for substantially simultaneously releasing said satellites for travel in generally opposite directions.

36. A propelled toy arrangement comprising a first propelled body carrying a satellite body releasably retained therewith in off-axis position relative to the combined longitudinal spin axis of said bodies, rotation-imparting means for spinning said first body and satellite body generally about said longitudinal spin axis during longitudinal propelled motion thereof to impart a centrifugal force to said satellite body radially of said spin axis and in a direction away from said first body, and means for releasing the retention of said satellite during flight whereby said satellite is moved directly transversely away from the path of travel of said first body as a function of the centrifugal force thereon, said first propelled body carrying plural said satellite bodies similarly releasably retained therewith with their centers of gravity disposed in substantially balancing off-axis position relative to the axis of spin of said first body and said plural satellite bodies, and sequential separate time release means carried by said first body for sequentially and separately releasing each of said plural satellite bodies.

37. A propelled toy arrangement comprising a first propelled body carrying a satellite body releasably retained therewith in off-axis position relative to the combined longitudinal spin axis of said bodies, rotation-imparting means for spinning said first body and satellite body generally about said longitudinal spin axis during longitudinal propelled motion thereof to impart a centrifugal force to said satellite body radially of said spin axis and in a direction away from said first body, and means for releasing the retention of said satellite during flight whereby said satellite is moved directly transversely away from the path of travel of said first body as a function of the centrifugal force thereon, said first propelled body carrying plural said satellite bodies similarly releasably retained therewith their centers of gravity disposed in substantially balancing off-axis position relative to the axis of spin of said first body and said plural satellite bodies, said first

body having fluid propulsion means including a pressurizable fluid chamber and a fluid discharge orifice in said first body, said first body having a pressure-responsively movable wall in fluid connection with and movable in response to pressure in said chamber, said satellite bodies being retained and released as a function of the position of said movable wall.

38. A propelled toy arrangement comprising a first propelled body having fluid propulsion means including a pressurizable fluid chamber and a movable wall with two spaced apart individually longitudinally movable wall portions movable as a function of internal pressure in said chamber, and two transversely separable units releasably carried by and separable from said first body, said separable units being releasably retained with and released from said first body as a function of the respective positions of said movable wall portions.

39. A propelled toy arrangement according to claim **38**, said movable wall portions each comprising a flexible diaphragm.

40. A propelled toy arrangement comprising a first propelled body having fluid propulsion means including a pressurizable fluid chamber and a movable wall with two spaced apart individually movable wall portions movable as a function of internal pressure in said chamber, and two separable units releasably carried by and separable from said first body, said separable units being releasably retained with and released from said first body as a function of the respective positions of said movable wall portions, the movable wall portions being flexible diaphragms spaced from one another, and a relatively rigid wall portion separating said flexible diaphragm wall portions.

41. A propelled toy arrangement according to claim **40**, and spring means urging each of said wall portions away from its pressurized expanded position to assist in release of said units as a function of decrease in pressure within said chamber.

42. The method of launching a toy satellite member comprising transporting said satellite in a first direction along a line of travel by reaction from fluid discharge in a generally opposite direction from a pressurized chamber while retaining said satellite against lateral release as a function of positive pressure in said pressurized chamber, and releasing and imparting transversely directed motion to said satellite relative to said first direction of motion.

43. The method according to claim **42** wherein said first direction is generally upward and said satellite member is released from a position above initial launch level and during movement along said upward direction.

44. The method according to claim **42** and spinning said satellite with its center of gravity off from the axis of spin during said generally first directional transport, said lateral generally transversely directed motion being effected through the centrifugal force thus exerted into said satellite.

45. The method according to claim **42** wherein said generally transversely directed motion is imparted by a resiliently urging force acting on said satellite during its transport along said first direction.

46. The method of launching a toy satellite from a height above ground level comprising imparting free flight upward movement to a carrier and to said satellite while retaining said satellite with said carrier, and releasing and imparting separating flight motion to said satellite transversely of the movement of said carrier by a stored spring action.

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