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R. B. LEWIS

2,759,297

PARTITIONED TOY ROCKET

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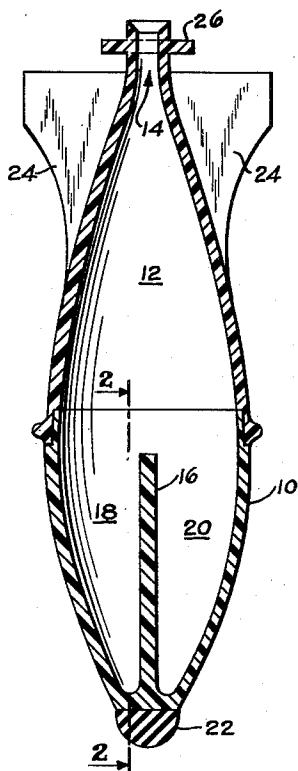


FIG. 1

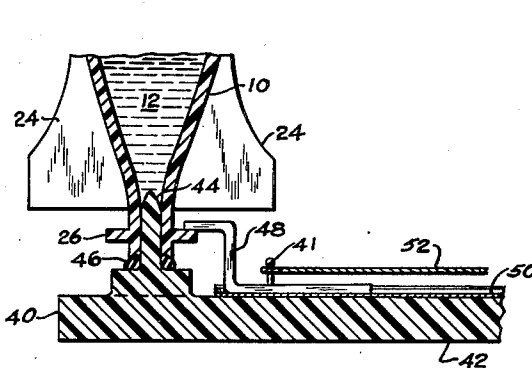


FIG. 5

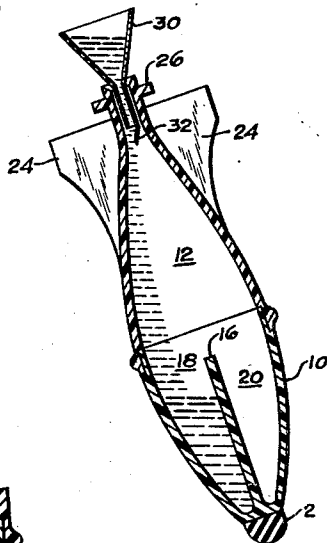


FIG. 3

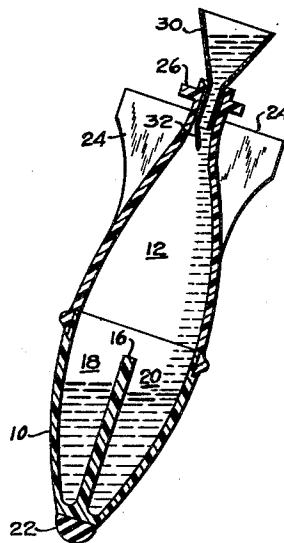


FIG. 4

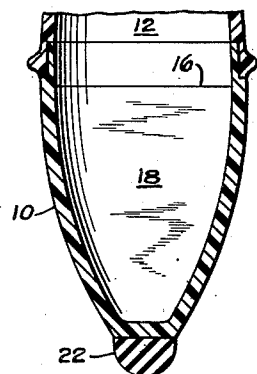


FIG. 2

INVENTOR
ROBERT B. LEWIS
BY *Victor D. Behm*
ATTORNEY

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PARTITIONED TOY ROCKET

Robert B. Lewis, Glen Rock, N. J., assignor to Curtiss-Wright Corporation, a corporation of Delaware

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6 Claims. (Cl. 46—74)

This invention relates to toys and is particularly directed to a rocket-propulsion device for toys.

An object of the present invention comprises the provision of a novel and simple toy rocket-propulsion device in which, in a first position of the device, chemicals can be separately introduced and stored in the device out of contact with each other and in a second position of said device said chemicals mix to produce a gas pressure which discharges from a nozzle opening to produce thrust. Another object of the invention comprises the provision of such a rocket device in which the chemicals can be introduced in liquid form for ease of handling and for rapid mixing of the chemicals so that there will be little or no waiting for the pressure to rise. A further object of the invention comprises the provision of such a toy rocket structure in which an excess of any of the chemicals introduced into the device immediately reacts with the other chemical before the outlet of the pressure chamber can be sealed thereby preventing the generation of high unsafe pressures.

Other objects of the invention will become apparent upon reading the annexed detailed description in connection with the drawing in which:

Fig. 1 is an axial sectional view through a toy rocket-propulsion device embodying the invention;

Fig. 2 is a sectional view taken along line 2—2 of Fig. 1;

Figs. 3 and 4 are sectional views similar to Fig. 1 and in addition illustrating the manner of loading the rocket; and

Fig. 5 is a partial view in section illustrating launching mechanism for the rocket.

Referring first to Figs. 1 and 2 of the drawing, reference numeral 10 designates the body member of a toy rocket propulsion device, said member being made of plastic or other suitable material. The body member 10 has a hollow thin-wall construction thereby forming a chamber 12 therein. As illustrated, the member 10 preferably has an elongate cigar-like shape whereby the chamber 12 has a similar elongate shape. The invention however is not limited to any particular shape of the member 10.

The body member 10 has a nozzle discharge passage 14 at its rear end so that gases generated within the chamber 12 can discharge rearwardly through said passage to provide forward propulsive thrust. A flat partition 16 is disposed across the forward end of the chamber 12 to divide said forward end into a pair of compartments 18 and 20. The partition 16 is disposed so that the axis of the nozzle passage 14 lies in the median plane of said partition. A member 22 of rubber-like material may be secured across the forward end of the body member 10 and stabilizing fins 24 are preferably formed at the rear end of rocket body. In addition an annular flange 26 is provided about the nozzle portion of the rocket body 10 to facilitate launching the rocket as hereinafter described in connection with Fig. 5.

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By positioning the rocket device 10 with its nozzle passage 14 directed upwardly and inclined to the vertical direction and so that the plane of the partition 16 is inclined to one side of the vertical direction then, as illustrated in Fig. 3, one of the compartments 18 and 20 can be filled to the extent desired with a desired chemical by pouring said chemical through the nozzle passage 14. If the rocket is now tilted so that the partition 16 is inclined to the opposite side of said vertical direction then, as illustrated in Fig. 4, the other of the compartments 18 and 20 can similarly be filled with a different desired chemical. As also shown in Figs. 3 and 4 a funnel 30 with a deflecting lip 32 at its discharge end may be used to facilitate said filling operations.

One of the chemicals used in the compartments 18 and 20 may comprise a solution of sodium bicarbonate in water and the chemical for the other compartment may comprise tartaric acid. After filling the compartments 18 and 20 with chemicals, if the rocket device 10 is turned over so that the nozzle passage 14 is directed downwardly, said chemicals will mix and react in the non-partitioned portion of the chamber 12 to generate a gas under pressure therein and to produce a new liquid solution. If the nozzle passage 14 is open, the gas pressure within the rocket chamber 12 will force said liquid out through the nozzle passage 14 to provide the rocket with propulsive thrust.

As illustrated in Fig. 5 suitable launching means 40 preferably is secured to the rocket device 10 before turning said device over to mix the chemicals. The launching means 40 includes a handle part 42 from which a plug 44 extends. The diameter of the plug 44 is such as to fit the nozzle passage 14. A clip 48 is slidably mounted on the handle 42 by guide rails 50, a cord 52 being attached to the clip 48 for moving said clip along the rails 50 in a direction away from the plug 44.

After the compartments 18 and 20 have been filled with the desired chemicals and while the nozzle passage 14 is still directed upwardly, the plug 44 of the launching means 40 is inserted into the nozzle passage 14, the seal ring 46 being compressed between the end of the nozzle and the launching means 40. The clip 48 of said launching means is then moved over the nozzle flange 26 to secure the launching means 40 to the rocket device 10. The nozzle passage 14 is now closed by the plug 44 and its seal ring 46. Then, the rocket device with the attached launching means 40 is turned upside down to the position illustrated in Fig. 5. After sufficient time has been allowed to permit the reaction of the chemicals to be completed to the desired extent the rocket device 10 may be launched by pulling the string 52 to withdraw the clip 48 from under the flange 26 thereby freeing the rocket device from the launching means 40. The gas pressure within the rocket chamber 12 thereupon forces the rocket upwardly out of the launching plug 44 and then discharges liquid and thereafter gas from the chamber 12 to provide propulsive thrust.

When filling the compartments 18 and 20, if one of the compartments is filled to overflowing, the excess chemical will spill over the partition 16 into the other compartment and react with a corresponding portion of the other chemical. The gas generated by the reaction of this excess chemical will promptly escape through the nozzle passage. This feature thereby limits the gas pressure which can be subsequently generated in the rocket chamber 12 when the rocket device is turned over to mix the chemicals of the two compartments 18 and 20. At this point it should be noted that the invention obviously is not limited to the particular chemicals previously mentioned.

As illustrated the device 10 is in the nature of a com-

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plete aerial rocket. Instead, however, of being a complete device, the device 10 may be arranged for attachment to another mechanism as for example a toy airplane, for which it is arranged to furnish thrust.

While I have described my invention in detail in its present preferred embodiment, it will be obvious to those skilled in the art, after understanding my invention, that various changes and modifications may be made therein without departing from the spirit or scope thereof. I aim in the appended claims to cover all such modifications.

I claim as my invention:

1. A toy rocket-propulsion device comprising a body member having a chamber with a nozzle discharge passage at one end portion of said chamber, a flat imperforate partition member extending across the opposite end portion of said chamber and part way toward said nozzle passage with the nozzle axis included in the median plane of said partition member to divide said opposite chamber end portion into a pair of open-ended compartments.

2. A toy rocket-propulsion device as recited in claim 1 in which said body member has means secured thereto for attachment of launching means thereto.

3. A toy rocket-propulsion device as recited in claim 1 in which said body member has an annular flange disposed about said nozzle discharge opening for attachment of launching means thereto.

4. A toy rocket-propulsion device comprising a body member having a chamber with a nozzle discharge passage at one end portion of said chamber; an imperforate partition extending across the opposite end portion of said chamber and part way toward said nozzle passage to form a pair of open-ended compartments in said opposite chamber end portion, one of said pair of compartments being formed between one side of said partition and the facing wall of said chamber and the other of said pair of compartments being formed between the other side of said partition and its facing chamber wall, with each of said pair of compartments communicating with the nozzle discharge end portion of said chamber through its open compartment end whereby in a first position of said device each of said pair of compartments is arranged to receive and hold a chemical and in a second position of said device each of said pair of compartments is arranged to at least partially empty into said nozzle discharge end portion of said chamber through its said open end for mixing chemicals to produce a gas pressure in said chamber.

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5. A toy rocket-propulsion device comprising a body member having a chamber with a nozzle discharge passage at one end portion of said chamber; an imperforate partition member extending across the opposite end of said chamber and part way toward said nozzle passage to form a pair of open-ended compartments in said other chamber end with each compartment communicating with the nozzle discharge end of said chamber through its open compartment end; launching means including a member for closing the nozzle discharge end of said chamber; retaining means coacting with said body member for maintaining said closing member in closed relationship with said nozzle discharge passage; and means for disengaging said retaining means.

6. A toy rocket-propulsion device comprising a body member having a chamber with a nozzle discharge passage at one end portion of said chamber; a flat imperforate partition member extending across the opposite end portion of said chamber and part way toward said nozzle passage to form a pair of open-ended compartments in said opposite chamber end portion, one of said pair of compartments being formed between one side of said flat partition and the facing wall of said chamber and the other of said pair of compartments being formed between the other side of said flat partition and its facing chamber wall; an annular flange disposed about said nozzle discharge passage and integral with said body member; launching means including a member relatively movable into and out of said nozzle discharge passage for closing said nozzle discharge passage when inserted therein and for guiding movement of said body member relative to said launching means; clip means slidably mounted on said launching means and contacting said annular flange for securing said body member to said launching means; and means for slidably moving said clip means out of contacting relationship with said annular flange.

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