Feb. 4, 1958 L. W. BROWN ET AL 2,821,922

ROCKET TOY AND LAUNCHER THEREFOR

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Fig. 1.

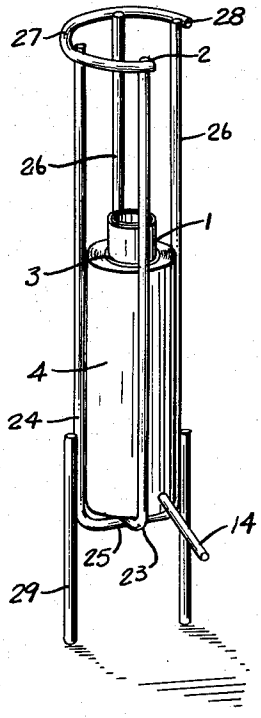


Fig. 2.

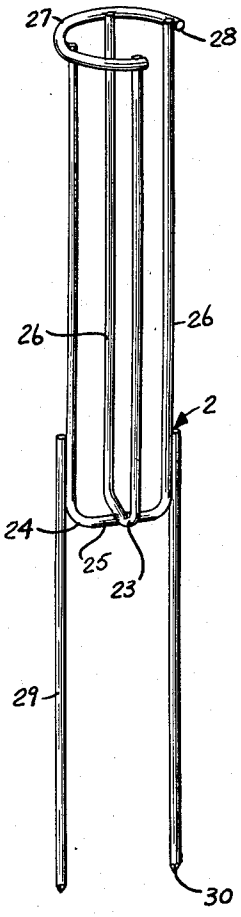


Fig. 3.

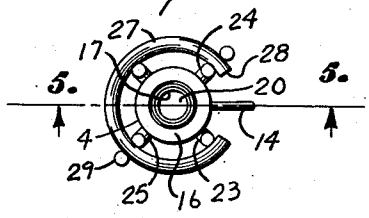
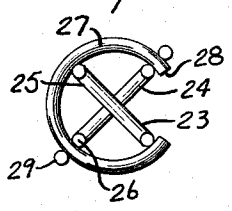


Fig. 4.



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Fig. 5.

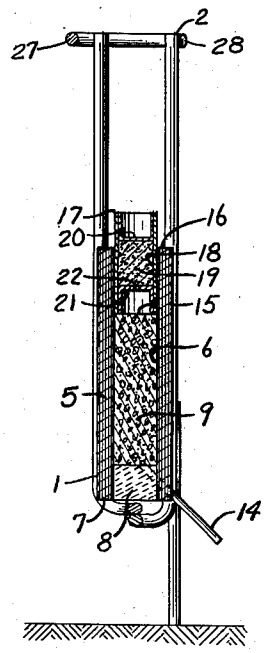


Fig. 6.

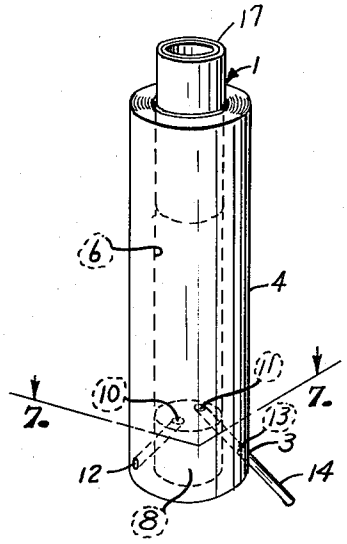


Fig. 7.

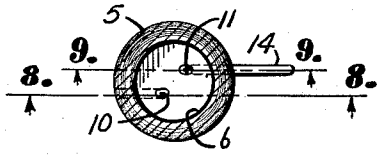


Fig. 8.

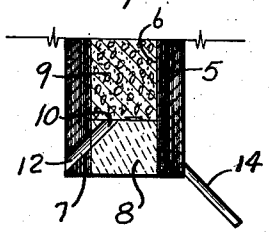


Fig. 9.

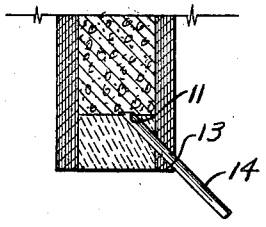


Fig. 11.

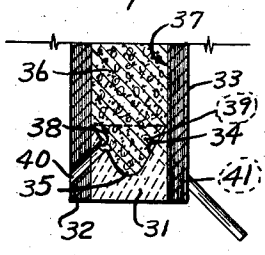
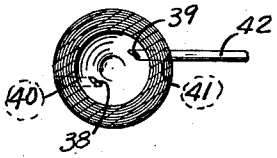


Fig. 10.



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ROCKET TOY AND LAUNCHER THEREFOR

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Application August 24, 1953, Serial No. 376,142

1 Claim. (Cl. 102—34.2)

This invention relates to rocket toys and launchers therefor, and more particularly to a rocket toy and launcher combination which cooperate in directing the line of travel of the rocket member.

The objects of the present invention are to provide a rocket toy and launcher therefor wherein the rocket toy contains a propellent charge and has jet apertures arranged for discharge of burning and expanding gases for rotating and lifting the toy into the air in a substantially straight line; to provide such a rocket toy with jet openings arranged at an angle to the axis of the toy, and adjacent one end thereof, for pushing said toy to effect lifting of same, said jet openings being offset from the axial center whereby burning and expanding gases discharged therefrom rotate said toy; to provide a frame-like launcher structure with an open side for passage of a fuse during insertion of the rocket toy in the launcher and a cooperative arrangement of jet openings whereby the burning of a fuse in one of the openings initiates burning of a propellent charge and escaping of the burning gases from the rocket body is initially through the opening that had contained the fuse, whereby the pressure created by the escape of the burning gases pushes the rocket body member against the opposite side of the launcher frame creating a friction which tends to hold the rocket body in the launcher until burning gases are expelled from all jet openings balancing lateral forces and continued escape of burning gases rotates the toy about the longitudinal axis thereof and pushes the body member thereof upwardly in a line defined by the launcher; to provide a rocket toy structure wherein the escaping, burning gases will not ignite any portion of the body member thereof whereby the jet apertures retain their size throughout the burning of the propulsion charge; to provide a rocket toy with separate, propellent and explosive charges arranged whereby the explosive charge is ignited at the end of the burning of the propellent charge for exploding said toy substantially at the peak of its flight; to provide a rocket toy with an explosive charge for substantially destroying the body member and snuffing out any flame so the toy is relatively safe in that no large or burning particles will fall after the explosion of the explosive charge; to provide a rocket toy wherein escaping gases create a noise; and to provide an amusing, economical and highly efficient rocket toy and launcher that is relatively safe to operate.

In accomplishing these and other objects of the present invention, we have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a rocket toy and launcher assembled for ignition and launching of a rocket toy.

Fig. 2 is a perspective view of the launcher.

Fig. 3 is a plan view of the rocket toy and launcher assembly.

Fig. 4 is a plan view of the launcher.

Fig. 5 is a vertical sectional view through the rocket toy and launcher taken on the line 5—5, Fig. 3.

Fig. 6 is a perspective view of the rocket toy.

Fig. 7 is a transverse sectional view through the rocket toy on the line 7—7, Fig. 6.

Fig. 8 is a vertical sectional view through the lower end of the rocket on the line 8—8, Fig. 7.

Fig. 9 is a vertical sectional view through the lower end of the rocket on the line 9—9, Fig. 7.

Fig. 10 is a transverse sectional view through the rocket showing a modified form of closure plug therein.

Fig. 11 is a vertical sectional view through the lower end of the modified form of rocket.

Referring more in detail to the drawings:

1 designates a rocket toy arranged to be directed in initial flight by a launcher 2. The rocket toy 1 preferably consists of a body 3 including a cylindrical tube 4 made substantially noninflammable by forming same of tightly rolled paper to provide a wall 5 of substantially uniform thickness defining a cylindrical, axial bore 6. One end 7 of the bore 6 is closed by a plug 8, preferably formed of ceramic material. The plug has a tight fit into the bore 6 of the tube and, if desired, may be cemented or otherwise secured in place with the flat, outer end of the plug flush with the end 7 of the tube, and in flight said end 7 is the rear end of the rocket toy.

In the form of the rocket toy illustrated in Figs. 5 to 9 inclusive, the forward or inner end of the plug 8 is flat and preferably perpendicular to the longitudinal axis of the body member. The flat, forward face of the plug 8 is engaged by the rear end of a propulsion charge 9, said charge preferably consisting of black powder or other suitable propellent powder pressed into a cylindrical shape to fit into the bore 6 of the tube 4. Spaced apertures 10 and 11 extend from the upper or inner face of the plug 8 downwardly and outwardly through said plug 8. The apertures 10 and 11 align with apertures 12 and 13 respectively which extend through the tube wall 5. The apertures 10 and 12 and 11 and 13 are preferably at an angle of approximately 35° to the longitudinal axis of the body member of the rocket toy and lie in spaced, parallel planes, offset from the longitudinal axis as illustrated in Fig. 7, whereby gases resulting from the burning of the propellent charge 9 escaping through the apertures 10 and 12 and 11 and 13 respectively provide resulting forces acting in alignment with said apertures which have components providing rotating forces on the body member of the rocket toy and other component forces acting to propel the body member along the line defined by the longitudinal axis of the rocket toy.

The apertures 10 and 12 and 11 and 13 are of equal size and preferably of a size to receive a standard size fuse 14 of suitable length whereby the inner end of said fuse is in contact with the propellent charge 9 and the outer end extends from the tube wall sufficiently for ease of igniting. The fuse 14 extends through one set of aligned apertures, the other set remaining open. If desired, the fuse may be secured in the respective apertures by cement or suitable adhesive to maintain the fuse in desired position and in contact with the propellent charge 9. While we have described the fuse and jet apertures as being located at an angle of approximately 35° with the longitudinal axis of the rocket toy, it is obvious other angularities would provide the same jet propulsion with some difference in lift provided by said jets.

The forward end 15 of the propulson charge 9 is preferably spaced from the forward end 16 of the tube 4, said spacing being sufficient to receive and hold a tubular member 17 formed of tightly rolled paper or the like, said tubular member having an outside diameter substantially the same as the bore 6 of the tube 4. The tubular member 17 is preferably cemented or otherwise securely anchored in the bore 6. The tubular member 17 is provided with a bore 18 adapted to receive an

explosive charge 19 preferably of granulated powder or the like pressed into cylindrical shape to fit the bore 18. The explosive charge 19 is preferably shorter than the length of the tubular member 17 whereby the ends of said charge 19 are spaced from the ends of the tubular member 17 and suitable packing or wadding 20 and 21 pressed into the bore 18 into contact with the explosive charge 19 to confine same and to seal each end of the tubular member 17.

The packing or wadding 21 is preferably provided with an aperture 22 whereby a flame from the burning propellent charge 9 will pass through the aperture 22 to ignite the explosive charge 19 when the propulsion charge has substantially completed its burning or the rocket toy is at the peak of its flight, thereby providing a loud noise to add to the amusement provided by the device. In some instances it may be possible to insert a firecracker, such as is commonly termed a salute, into the forward end of the bore 6 of the tubular member 4 to provide an explosive charge for the device. In such instances, it is desirable to remove the fuse from the salute, however, it is believed obvious that a fuse may be used to provide a delay in the ignition of the explosive charge if desired.

The launcher 2 is preferably formed of wire or the like and consists of two U-shaped members 23 and 24 each having bars 25 terminating in spaced, parallel legs 26, with the distance between the inner surfaces of the legs of the U-shaped members being slightly greater than the outside diameter of the tubular member 4 of the rocket toy. The legs 26 are substantially longer than the length of the rocket toy as illustrated in Fig. 1. The U-shaped members 23 and 24 are arranged with the bar of the U-shaped member 23 resting on and substantially perpendicular to the bar 25 of the U-shaped member 24, said bars being suitably secured together at their midpoints. A partial ring member 27 is arranged exteriorly of the upper ends of the legs 26 and is suitably secured to said legs to provide an upper support cooperating with the bars 25 to maintain the legs in substantially parallel condition to form a receptacle for cylindrical bodies such as the rocket toy 1. The partial ring 27 terminates as at 28 adjacent two of the legs to provide an open side of the rocket toy receiving portion or receptacle of the launcher. Wire posts or the like 29 are suitably secured to opposite legs 26 and extend downwardly therefrom in substantially parallel relation. The bottom ends of the posts are preferably sharpened as at 30 to facilitate insertion of same into the ground.

The operation of a rocket toy and launcher therefor constructed as described is as follows:

The launcher 2 is held in a substantially vertical condition with the sharpened ends 30 of the posts 29 engaging the ground, and pressure is applied to force the posts into the ground sufficiently to provide adequate support for the launcher. It is preferable that the bar 25 of the U-shaped member 24 remain spaced from the ground sufficiently for convenience in igniting the fuse of the rocket toy, as illustrated in Fig. 1. The rear or fused end of the rocket toy 1 is then inserted in the upper portion of the launcher between the ends of the legs 26 with the fuse 14 extending outwardly through the open side or between the open ends of the partial ring 27. The rocket toy is then dropped downwardly in the launcher between the legs 26 until the rear end rests on the bar 25 of the U-shaped member 23 and the fuse 14 ignited. Burning of the fuse will direct a flame into a propellent charge 9 where it contacts the upper face of the plug 8 to ignite said propellent charge. The initial burning of the propellent charge around the aperture containing the fuse creates gases which will escape through the said fuse aperture, creating forces which tend to both rotate and propel the rocket toy from the launcher. However, the gases will escape through the fuse aperture first and, since the rotating component is not balanced by escape of gases through the other aperture at that time, there will be a lateral component of the forces which tends to force the body member of the rocket toy into engagement with the legs 26 located on the opposite side from the open side of the launcher. This lateral force is sufficient to hold the rocket toy in the launcher for a sufficient time to allow further burning of the propellent charge, whereby the burning will extend over the other aperture and cause gas to escape or be discharged therethrough. The escape or discharge of gases through both of the apertures balances the lateral forces thereby freeing the rocket toy for propelling same from the launcher. The rotating component of the forces created by the escaping gas rotates the rocket toy body member about its longitudinal axis and the component of the forces acting along the longitudinal axis pushes the rocket toy in a line defined by said axis, forcing the rotatng rocket toy from the launcher. The rotation of the body member tends to hold the rocket toy in a straight line of flight. The plug 8, being of suitable ceramic material, prevents enlargement of the apertures 10 and 11 throughout the burning and maintains an even propulsion of the toy throughout its flight.

The propellent charge, being formed of black powder or other suitable charge pressed into a cylindrical shape, burns gradually from the point of ignition to the forward end of said propellent charge. When the burning has extended to the forward end of said charge a flame therefrom will pass through the aperture 22 to ignite the explosive charge 19. This takes place at substantially the end of the application of lifting force by the propellent charge or substantially at the peak of the flight of the toy. The explosive of the explosive charge 19 provides a loud noise to add to the amusement provided by the device and also the force of the explosion will blow out any flame if any portion of the toy should become ignited. However, there is substantially no danger of fire in the use of this toy as the tightly wound paper tubes 4 and 17 and other materials used in the construction of the toy are substantially noninflammable. Also the explosion of the explosive charge will effect separation of some of the parts of the rocket toy body and the pieces resulting therefrom will not drop with sufficient force to cause any injury or damage.

In the form of the invention illustrated in Figs. 10 and 11, the plug 31 closing the rear end 32 of a tubular body member 33 has a conical socket or recess 34 in its forward or inner end adapted to receive a conical projection 35 on a propulsion charge 36, said charge preferably consisting of black powder or other suitable propellent pressed into a cylindrical shape to fit into the bore 37 of the tube 33. Approximately midway of the depth of the socket 34 and the plug 31 is provided with laterally spaced apertures 38 and 39 which extend downwardly and outwardly at an acute angle to the longitudinal axis of the body member, preferably at approximately a 35° angle thereto. The apertures 38 and 39 align with apertures 40 and 41 respectively in the wall of the tube 33, said apertures being of suitable size to receive a standard fuse 42 of suitable length, the inner end of said fuse resting in the recess or socket 34 in contact with the charge 36 so that any burning of the fuse will ignite said charge. The apertures 38 and 40 are in a plane parallel to a plane in which the apertures 39 and 41 are located. The planes are equally spaced from the axis of the body member whereby burning of the charge 36 will cause gases to be discharged through the apertures, providing a rotating force as well as a propelling force on the body member.

The use of this toy combines the interest of a rocket and the noise and self-destruction of the toy when the toy has lifted itself a considerable distance in the air whereby there is no danger of any person being burned or injured by flying particles from said toy to combine the maximum of amusement with the maximum safety in such a device.

It is believed obvious that the present invention com-

bines a rocket toy and launcher which is economical to manufacture and provides the maximum safety and amusement in such devices.

What we claim and desire to secure by Letters Patent is:

A launcher for supporting and guiding a rocket toy having an elongate cylindrical body containing a propellent comprising, a frame providing a receptacle for the rocket toy body and having a bottom of two bars crossed and secured at right angles, said bottom bars terminating at their ends in upwardly extending equally spaced guide bars, said bars constituting pieces of wire each bent to provide opposite guide bars with the intermediate portion thereof forming the respective bottom bar, a partial ring member connecting the upper ends of the guide bars to define an open end of the receptacle, said partial ring member having one end fixed to one guide bar and the other end fixed to an adjacent guide bar whereby the intermediate portion of said partial ring member extends around the open upper end of the frame exteriorly of the guide bars and is secured thereto to cooperate with the bottom bars in retaining the guide bars in spaced parallel relation, said one guide bar and the adjacent guide bar to

which the ends of the partial ring member are fixed cooperating to define an unobstructed opening at one side of the frame from the bottom through the upper end of said frame, and a pair of elongate leg members having upper portions secured to opposite guide bars, said leg members being parallel and extending downwardly from the frame and terminating in sharpened lower ends.

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