May 7, 1963 R. L. CLAY 3,088,450

TOY ROCKET AND LAUNCHER

Filed Feb. 17, 1961 3 Sheets-Sheet 1

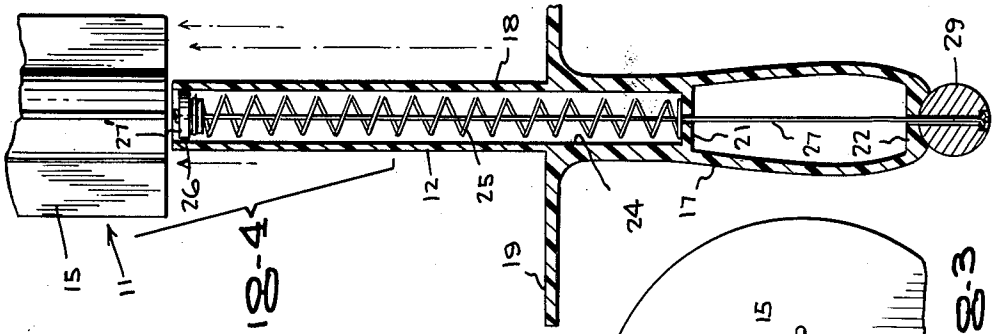


FIG-4

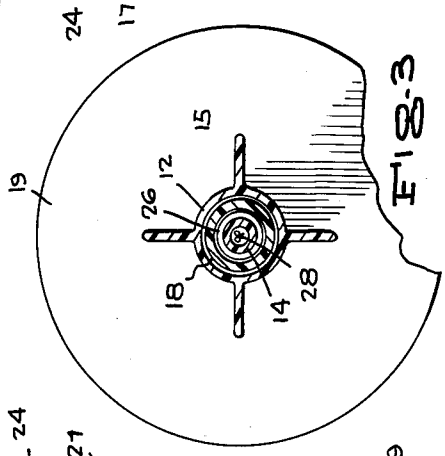


FIG-3

FIG-2

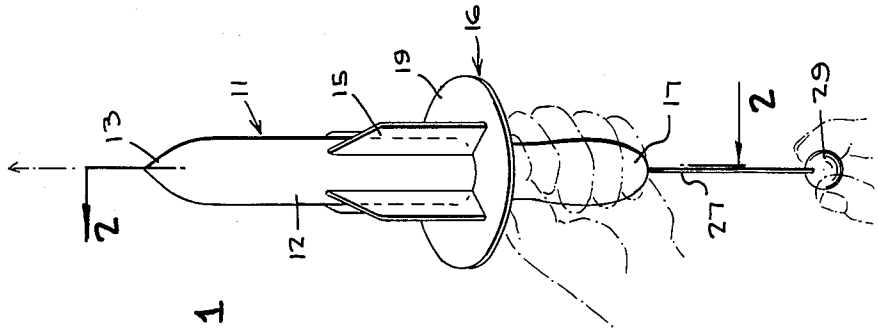


FIG-1

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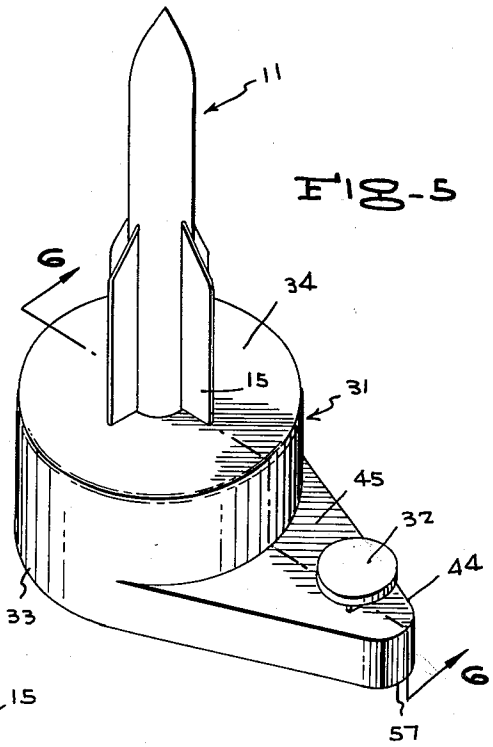


FIG-5

FIG-6

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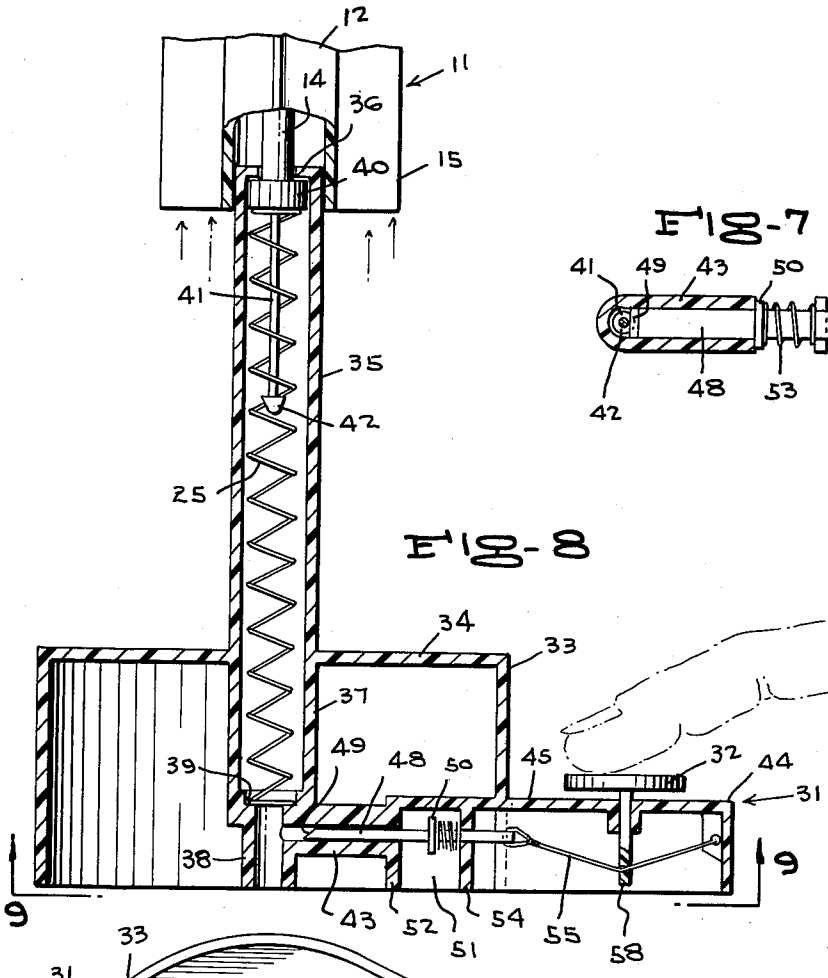
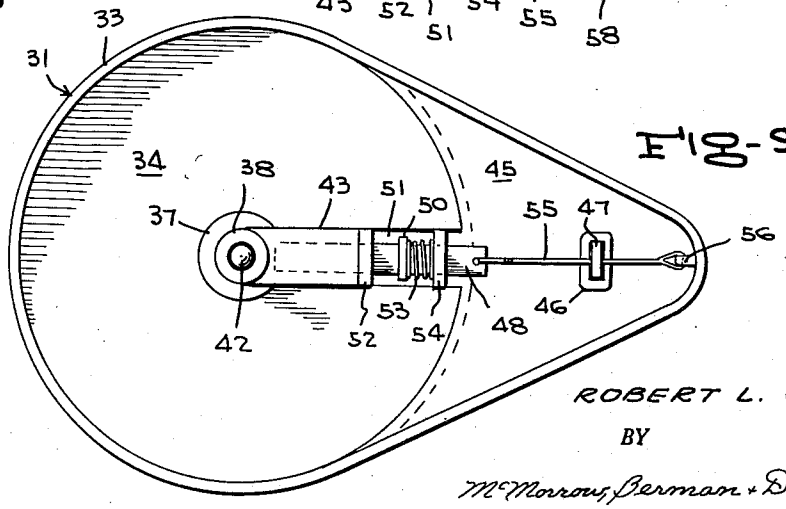


FIG-7

FIG-8

FIG-9



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TOY ROCKET AND LAUNCHER

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1 Claim. (Cl. 124—26)

This invention relates to toys, and more particularly to toy projectiles of the rocket-simulating type and launching means therefor.

A main object of the invention is to provide a novel and improved toy rocket and launching means which is relatively simple in construction, which is easy to operate, and which provides a relatively close simultation to an actual rocket.

A further object of the invention is to provide an improved toy projectile of the rocket type and launching means therefor which may be economically and inexpensively manufactured, which is durable in construction, and which provides a high degree of entertainment to the user thereof.

A still further object of the invention is to provide an improved toy projectile and launching means therefor which is neat in appearance, which is safe to use, and which is practical to manufacture.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

FIGURE 1 is a perspective view showing an improved simulated rocket and launching means constructed in accordance with the present invention and illustrating the manner in which the launching means is held prior to launching the rocket.

FIGURE 2 is an enlarged vertical cross sectional view taken substantially on the line 2—2 of FIGURE 1.

FIGURE 3 is a fragmentary horizontal cross sectional view taken substantially on the line 3—3 of FIGURE 2.

FIGURE 4 is a fragmentary vertical cross sectional view, similar to FIGURE 2, but showing the simulated rocket projected from the launching means.

FIGURE 5 is a perspective view showing a modified form of toy rocket and launching means constructed in accordance with the present invention.

FIGURE 6 is an enlarged vertical cross sectional view taken substantially on line 6—6 of FIGURE 5.

FIGURE 7 is a horizontal cross sectional view taken substantially on the line 7—7 of FIGURE 6

FIGURE 8 is a vertical cross sectional view similar to FIGURE 6 but showing the toy projectile being launched from the launching means.

FIGURE 9 is an enlarged bottom plan view of the device illustrated in FIGURE 5, said view being taken substantially on the line 9—9 of FIGURE 8.

Referring to the drawings, and more particularly to FIGURES 1 to 4, 11 generally designates a simulated rocket which comprises an elongated, generally cylindrical main body 12 provided with the pointed top end 13, the body 12 being hollow and being integrally formed with an axially extending hollow shaft 14 which is almost coextensive in length with the main body 12 and which terminates a short distance above the level of the bottom end of said main body, as is clearly shown in FIGURE 2. The body 12 is integrally formed with the evenly spaced, longitudinally extending radial stabilizing vanes 15 of substantial length, serving to guide and stabilize the toy projectile 11 as it moves through the air.

Designated generally at 16 is a launching device which comprises a handle 17 adapted to be held in the manner illustrated in FIGURE 1, said handle being integrally formed with a cylindrical tube 18 of substantial length which is coaxial with the handle and which is adapted to be received in the space between the wall of the main body 12 and the axial tube 14 thereof in the manner illustrated in FIGURE 2. The launching device 16 is further formed with the generally circular supporting flange 19 of substantial diameter adapted to support the toy projectile 11 in the manner illustrated in FIGURE 2, namely, in a position wherein the tube 18 is received in the annular space between the main wall 12 of the toy projectile and the hollow shaft 14 thereof. The tube 18 is of substantial length, as above mentioned, so that it serves as a guide means for properly directing the toy projectile 11, to insure that the projectile will travel generally in a direction in which the tube 18 is pointed.

The handle 17 is hollow and is provided with the intermediate centrally apertured transverse wall 21 and with the centrally apertured bottom end wall 22 which is formed with the concavely shaped, downwardly facing recess 23. Disposed in the upper cavity portion 24 of the handle 17 is a coiled spring 25 in the top end of which is seated an annular, flanged impact-transmitting bushing 26, the bushing 26 being annularly grooved below the flange 27' thereof to provide a seat to lockingly receive the top turn of the coil spring 25. The bottom end of the coiled spring bears on the centrally apertured intermediate wall 21, as is clearly shown in FIGURE 2. A flexible string 27 extends upwardly through the central apertures of bottom wall 22, intermediate wall 21 and the impact-transmitting bushing 26 and is formed with a knot 28 at its top end so that it is retained relative to the bushing 26 and so that it can transmit downward force to said bushing. Fastened to the bottom end of the flexible cable element 27 is a spherical ball 29 which serves as a gripping means for applying downward tension to the flexible string 27 while the device is held in the manner illustrated in FIGURE 1. Thus, with the toy rocket 11 positioned on the launching device 16 in the manner illustrated in FIGURE 2, namely with the tube 14 received inside the tube 18 and with the bottom edges of the guide vanes 15 resting on the flange 19, the ball 29 may be pulled downwardly to compress the spring 25, as shown in FIGURE 1. Thereafter, the ball 29 is released, allowing the spring 25 to expand and allowing the impact-transmitting bushing 26 to travel upwardly at high velocity, whereupon the bushing 26 strikes the bottom end of the impact shaft 14 of the simulated rocket 11, transmitting its momentum to the rocket and transmitting the expansive force of spring 25 thereto, causing the rocket to be projected upwardly from the launching device 16 in the manner illustrated in FIGURE 4. The ball 29 is receivable in the concave recess 23 to limit the upward extension of the spring 25 substantially to the position thereof shown in FIGURE 4, namely, to a position wherein the bushing 26 is retained inside the tube 18 although it is allowed to travel almost to the top end of said tube.

As will be readily apparent, to reset the device it is necessary to place the simulated rocket on the launching

device 16 with the tube 18 received in the annular space between the hollow launching shaft 14 and the main outer wall 12 of the toy rocket 11, the ball 29 being pulled downwardly to allow the bottom ends of the guide vanes 15 to rest on the flange 19. Ordinarily, the rocket 11 is of sufficient weight so that when it is placed on the tube 18 with the top portion of the tube received between the main wall 12 and the guide tube 14, the rocket will engage sufficiently on said tube 18 to be retained thereon particularly, since the bottom end of the inner tube 14 is spaced above the bottom end of the main outer wall 12 of the toy rocket.

Referring now to the form of the invention illustrated in FIGURES 5 to 9, 31 generally designates a launching device which may be employed with the toy rocket 11 in a manner whereby the toy rocket will be launched responsive to the depression of a control button 32 provided on the launching device. Thus, the launching device comprises a generally cylindrical hollow main body 33 having a horizontal top wall 34 which is integrally formed centrally with the upstanding vertical guide tube 35 having a centrally apertured top wall 36. As shown in FIGURE 6, the central aperture of the top wall 36 is of sufficient size to receive the hollow launching tube 14 of the toy projectile 11 with the tube 35 received in the space between the launching tube 14 and the main outer wall 12 of the toy projectile. As in the previously described form of the invention, the toy projectile 11 is thus slidably engaged on the guide tube and will be directed thereby when it is launched.

The device 31 is integrally formed with the central hollow sleeve member 37 which is axially aligned with and defines a downward extension of the tube 35, said sleeve 37 being integrally formed at its bottom end with a reduced tubular element 38 axially aligned with the sleeve and defining an annular shoulder 39 between the element 38 and the depending sleeve 37. A coiled spring 25 is provided in the sleeve 37, similar to the coiled spring previously described in connection with the form of the invention shown in FIGURES 1 to 4. The coiled spring 25 bears at its lower end on the annular shoulder 39 and at its upper end on a plunger element 40 secured to the top end of a depending rod 41 which extends downwardly into the lower tube portion 38 and which is provided at its bottom end with a downwardly directed, substantially conical detent head 42.

Integrally formed with the upper portion of the lower tubular element 38 is a horizontally extending tubular member 43 which is integrally formed with an outwardly projecting, generally triangular hollow housing portion 44 integrally formed with the generally cylindrical member 33, as is clearly shown in FIGURES 6 and 8. The generally triangular housing portion 44 is provided with a horizontal top wall 45, said top wall being integrally formed at its outer portion with a depending boss 46 through which slidably extends the vertical shaft 47 of the release button 32.

Slidably engaged in the horizontal tubular member 43 is a latch bolt 48 having an upwardly beveled end 49, said end 49 being lockingly engageable with the downwardly directed, generally conical detent head 42 in the manner illustrated in FIGURE 6. The locking bolt 48 is formed with a collar 50 which is disposed in a recess 51 provided in the inner end portion of housing member 44 and is biased against the inner wall 52 of said recess by a coiled spring 53 which surrounds the member 48 and bears between the collar 50 and the intermediate wall 54 of the recess 51. A flexible string 55 is connected between the outer end of the locking bolt 48 and a lug 56 integrally formed with the outer end wall portion 57 of the housing member 44, the string 55 being substantially taut when the spring 53 causes the collar 50 to engage against the inner recess wall 52, as illustrated in FIGURE 6. The string 55 extends slidably through an aperture 58 provided in the lower portion of the vertical shaft element 47, so that when the button 32 is depressed, for example, as shown in FIGURE 8, the intermediate portion of the string 55 is deflected downwardly and the locking bolt 48 is retracted from the position shown in FIGURE 6 to the position shown in FIGURE 8, whereby to allow the detent element 42 to move freely upwardly and to allow the spring 25 to expand. Therefore, when a toy projectile is set in the launching device 31 in the manner illustrated in FIGURE 6, namely, by engaging the sleeve 35 in the space between the tube 14 and the main outer wall 12 of the toy projectile 11, with the plunger element 40 depressed by the engagement of the bottom end of tube 14 therewith, and with the detent element 42 lockingly engaged beneath the beveled end 49 of the locking bolt 48, the projectile may be launched by merely depressing the button 32, which releases the detent element 42 and which allows the spring 25 to expand, whereby to transmit upward force through the piston 40 to the tube 14. Thus, as shown in FIGURE 8, the projectile is propelled upwardly and the plunger 40 is moved upwardly by the expansion of spring 25 until it engages the top wall 36, which limits further upward movement of said plunger element. The upward force transmitted from the plunger member 40 to the tube 14 causes the projectile to rise from the launching device 31 and to be projected upwardly a substantial distance, simulating the flight of an actual rocket.

The locking bolt 48 is preferably of rectangular cross section, and the bore of tube 43 is of the same shape so that the locking bolt 48 is slidably but non-rotatably received in the tube 43, whereby to prevent the bolt 48 from rotating. Thus, the beveled face of the end of the bolt 48 is always directed upwardly so that it will be cammingly cooperable with the detent element 42 when said detent element is moved downwardly responsive to the placement of a rocket 11 on the launching device 31 and the downward movement of the rocket to a position wherein the bottom end of the rocket rests on top wall 34. Thus, in order to reset the device, the rocket is placed thereon with the tube 35 received in the space between the tube 14 and the main outer wall 12 of the rocket, and the rocket is forced downwardly until the detent element 42 slips beneath the beveled end 49 of the locking bolt 48. This places the rocket substantially in the position shown in FIGURE 6. To launch the rocket it is merely necessary to depress the release button 32 in the manner above described, whereby to retract the locking bolt 48 and to release detent element 42. This allows the spring 25 to expand in the manner above explained and propels the rocket upwardly.

While certain specific embodiments of an improved projectile toy device have been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claim.

What is claimed is:

A projectile toy of the character described comprising a base, an upstanding sleeve rigidly secured on said base perpendicularly thereto, a tubular extension depending from said base in axial alignment with said sleeve, a toy projectile having a hollow elongated main body portion slidably engageable over said sleeve and having an axially extending inner propulsion rod receivable inside said sleeve, a first coiled spring mounted in said tubular extension, a plunger member movably disposed in said sleeve and engaging the top end of said coiled spring, said plunger member being engageable with the end of said propulsion rod to deliver propulsive force thereto, an axially extending tension member connected to said plunger member and being movable downwardly with the plunger member when the spring is compressed, said tension member being provided with a downwardly taper-

ing conical detent head, a latch member slidably mounted in said base perpendicular to said plunger member and being lockingly engageable with said detent head when the coiled spring is stressed to store propulsion energy therein, a second coiled spring surrounding said latch member and bearing between the latch member and said base and biasing said latch member toward locking position, a flexible horizontal tension member connecting said latch member to the base and opposing the force of said second coiled spring, a release shaft member mounted vertically and slidably on the base and projecting above the base so that it can be manually depressed, and means connecting said release shaft member to the intermediate portion of said flexible tension member, said release shaft

member being downwardly movable to deflect the intermediate portion of said flexible tension member sufficiently to retract said latch member from locking position and to release the plunger member.

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