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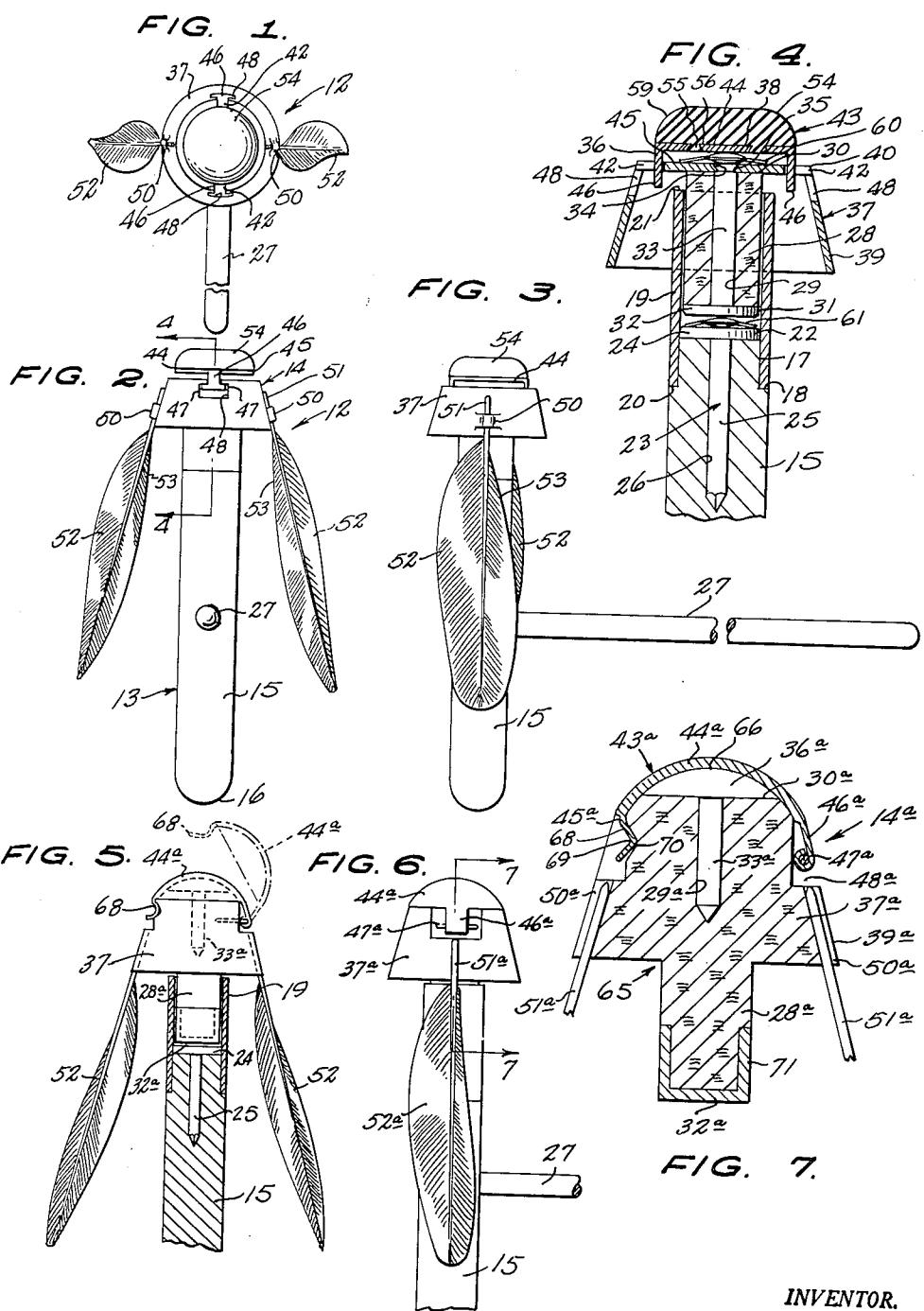
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## EXPLOSIVE ROCKET TOY AND LAUNCHER

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2 Sheets-Sheet 1



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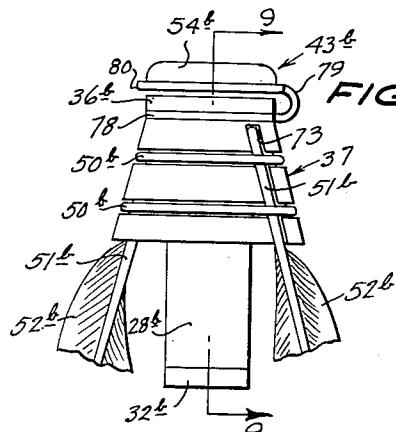
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79 FIG. 8.

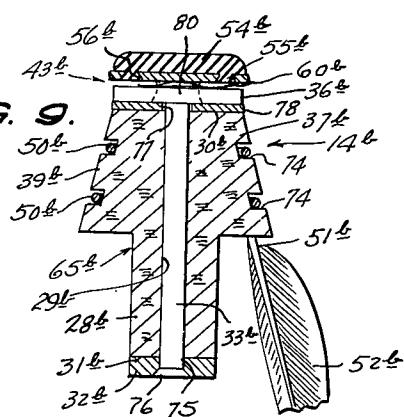
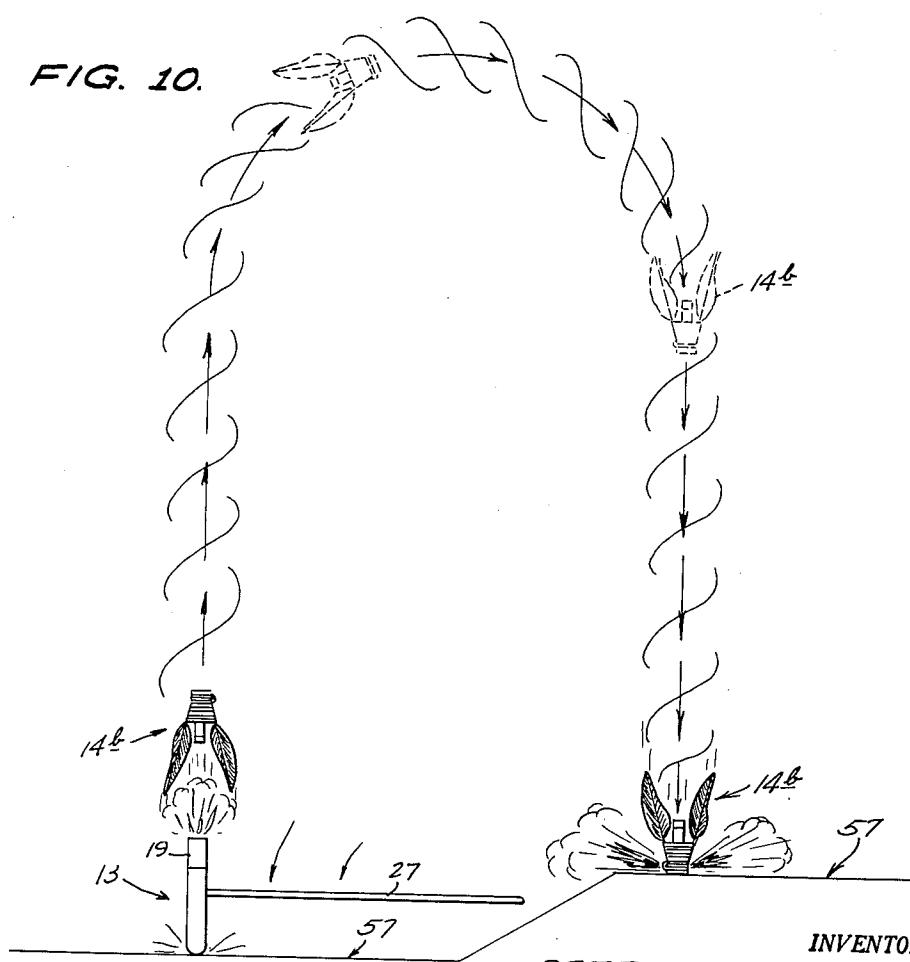


FIG. 9



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## EXPLOSIVE ROCKET TOY AND LAUNCHER

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11 Claims. (Cl. 46—200)

This invention relates to a novel rocket toy of the explosive type and which includes an explosive cap detonating launcher and an explosive cap detonating rocket, the primary object of the invention being to provide a combination of launcher and rocket of this kind which produces a two-stage visual and audible performance which is highly diverting and amusing, and wherein detonation of the rocket, as the rocket returns to the ground from flight launched by the launcher, serves also to indicate to an operator of the launcher the location of the rocket.

Another important object of the invention is to provide, in a combination of the character above, a more efficient explosive launcher which is arranged to be detonated by being struck upon the ground by an operator, and which has a handle by means of which an operator strikes the launcher upon the ground and which is of sufficient length to place the operator at a safe distance away from the launcher proper.

A further important object of the invention is to provide more amusing and diverting explosive rockets for use with a launcher of the character indicated above, which are more efficient, more reliable in action, and are capable of being made in rugged, serviceable, and attractive forms at relatively low cost, and which exhibit more dynamic and diverting actions while in flight.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration rather than limitation, specific embodiments of the invention are set forth in detail.

In the drawings:

Figure 1 is a contracted top plan view of the combination of Figure 2;

Figure 2 is a rear elevation of the combination of Figure 1;

Figure 3 is a contracted left hand side elevation of Figure 2;

Figure 4 is an enlarged fragmentary transverse vertical section taken on the line 4—4 of Figure 2;

Figure 5 is a fragmentary side elevation, partly in transverse section, showing another form of rocket, the detonator being shown in closer or operative position in full lines and in open or inoperative position in phantom lines;

Figure 6 is a fragmentary side elevation of Figure 5;

Figure 7 is an enlarged fragmentary transverse vertical section taken on the line 7—7 of Figure 6;

Figure 8 is a fragmentary side elevation of a further form of rocket;

Figure 9 is a fragmentary transverse vertical section taken on the line 9—9 of Figure 8; and

Figure 10 is a schematic view showing launching, flight, and detonation of a rocket, in accordance with the present invention.

Referring in detail to the drawings, wherein like or related numerals designate like or related parts throughout the several views, and first to Figures 1 through 4 there-

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of, the numeral 12 generally designates the combined launcher and rocket toy therein shown. The toy 12 comprises the launcher 13 and the rocket 14.

The illustrated launcher 13 comprises a vertically elongated, preferably cylindrical body 15, preferably made of wood or of plastic material, and having a rounded lower end 16. The upper part of the body 15 is radially reduced, as indicated at 17, and this defines a shoulder 18.

Snugly fitted on or otherwise suitably secured on the reduced portion 17 of the body 15 is a hollow cylinder 19 having a lower end 20 engaged with the shoulder 18, and an upper end 21 which is located above the upper end 22 of the body 15. The interior of the cylinder 19 above the upper end 22 of the body 15 is a detonating chamber.

A firing anvil 23 has a flat disc head 24 engaging the upper end 22 of the body 15 and an axial shank 25 pressed into an axial bore 26 provided in the body 15.

A handle 27, of sufficient length to put an operator of the toy at a safe distance from the launcher 13, is fixed at one end to a side of the body 15 at a point intermediate the upper and lower ends 22 and 16, respectively, of the body 15 and projects at a right angle to the body 15.

The form of rocket 14 shown in Figures 1 through 4 of the drawings comprises a cylindrical piston body 28, preferably made of cork or of other suitable compressible sealing material. The piston or body 28 is slightly longer than the detonating chamber of the launcher 13, and is of a diameter to have a close fit in the cylinder 19. The piston 28 is provided with an axial bore 29 which opens through the upper and lower ends 30 and 31, respectively, of the piston 28.

A cap firing detonator head 32, in the form of a disc of the same diameter as the piston 28 engages the lower end 30 of the piston 28 and has an axial pin 33 fitting and extending upwardly through the bore 29. The pin 33 has a reduced portion 34 on its upper end which rises above the upper end 30 of the piston 28 and extends upwardly through a central hole 35 in the circular top wall or web 36 of a feather mount 37. The reduced pin portion 34 is peened or riveted against the top of the web 36 as indicated at 38, so as to hold the feather mount 37 secured against the upper end 30 of the piston 28.

The feather mount 37 is in the form of an inverted cup having a downwardly flaring side wall 39 depending from the peripheral edge 40 of the web 36 of the feather mount. At two diametrically opposite points, the peripheral edge 40 of the web 36 and the upper part of the side wall 39 are cut away to provide two radially elongated parallel sided slots 42, 42.

A rocket cap detonator 43 comprises a disc 44 having a larger diameter than the cylinder 19 and smaller in diameter than the feather mount web 36. On its peripheral edge 45 the disc 44 has two diametrically opposed depending lugs 46, 46 which loosely engages through the slots 42, 42 so that the disc 44 of the detonator 43 is axially superimposed upon the web 36 and the rocket detonator 43 is free to move toward and away from the top of the web 36. Laterally projecting ears 47, 47 on lower parts of the lugs 46, 46 are engageable with the under side of the web 36 to prevent separation of the detonator 43 from operative relation to the mount web 36. As shown in Figure 2, the portions 48 of the slots which are in the feather mount side wall 39 are sufficiently wider than remaining portions of the slots 42, 42 so as to permit the lugs 46, 46 and their ears 47, 47 to be withdrawn through the slot portions 48 when it is desired to remove the detonator 43 from the feather mount 37. The detonator lugs 46, 46 are spaced from each other to engage the inner ends 49 of the slots 42, 42 so as to center the detonator 43 relative to the web.

At points midway between the slots 42, 42 the feather

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mount side wall 39 has punched out retaining means 50, 50 for the stems or quills 51, 51 of feathers 52, 52, the quills 51 being forcibly inserted upwardly between the retainers 50, 50 and the outer side of the side wall 39 so as to be secured to the feather mount 37 in depending, outwardly flared relation thereto. The free edge of one side of each feather 52 is curvedly reduced in width at its upper part, as indicated at 53, so that the feathers 52 act as vanes or propeller blades, while the rocket 14 is in either upward or downward flight, and cause the rocket 14 to rotate on its axis.

A resilient and compressible pad 54, of the same diameter as the detonator disc 44, is secured concentrically on the top of the disc 44 by means of wedge lugs 55 extending through holes 56 provided in the disc 44. The rocket 14 on its return to the ground 57, as shown in Figure 10, lands with the pad 54 downwardly, so that upon striking the ground 57 the pad reduces the shock of the contact. The upper surface 58 of the pad 54 is flat, and has a rounded edge 59, so that on most occasions the rocket 14 will remain upright on the ground 57 after landing.

A launching explosive cap 61, of available form is, as shown in Figure 4, positioned in the launcher detonating chamber, between the firing anvil head 24 and the rocket detonator head 32; and another explosive cap 60 is positioned between the rocket detonator disc 44 and the top of the feather mount web 36.

To operate the toy 12, the launcher handle 27 is held in the hand and swung downwardly so as to strike the lower end 16 of the launcher 13 upon the ground 57. This causes the piston 28 to move downwardly in the cylinder 19 and explode or detonate the launching cap 61 and drive the rocket 14 upwardly from the launcher 13. The feathers 52, 52

As the rocket 14 moves upwardly, the feathers 52, 52 cause the rocket 14 to rotate on its axis, and, as the rocket 14 reaches the top of its trajectory and falls the same rotation is produced, so that the rocket 14 makes an exciting show of gyrations, especially if, as contemplated, the rocket 14 is highly colored as well as its feathers 52, 52.

As the pad 54 on the rocket 14 strikes the ground 57, the rocket cap 60 is detonated, thereby affording the operator of the toy 12 and any spectators a second audible thrill, the sound of which serving also to orientate the grounded rocket with respect to the operator of the toy.

The form of rocket, generally designated 14a, shown in Figures 5 through 7 of the drawings, comprises a body 65, preferably made of cork or of other compressible sealing material. The body 65 has a reduced axial cylindrical portion 28a, serving as a piston for insertion into the cylinder 19 of the launcher 13. The body 65 has on the upper end of the piston 28a an enlarged frusto-conical feather mounting portion 37a whose side wall 39a flares downwardly. A pair of vertical diametrically opposed feather retaining elements 50a, in the form of slots, are provided in the side wall 39a and open through the lower end of the mount portion 37a and the quills 51a, 51a of feathers 52a, 52a are jammed in the slots 50a, 50a and secure the feathers 52a, 52a in depending outwardly flaring relation to the rocket 14a.

On the upper end 36a of the body 65 is an anvil disc 36a having a rounded top 66 and a shank 33a depending in and secured in an axial bore 29a provided in the body 65.

A rocket cap detonator 43a is in the form of a concavo-convex disc 44a which has depending from its peripheral edge 45a a hinge lug 46a which is engaged around a hinge pin 47a which extends across a notch 48a provided in the upper part of the side wall 39a of the feather mount portion 37a. The ends of the hinge pin 47a are secured in the side walls of the notch 48a. At a point diametrically opposite the hinge lug 46a there depends from the peripheral edge 45a of the detonator disc 44a a spring detent 68 having a projection 69 which is re-

movably engageable in a depression 70 provided in the side wall 39a of the feather mount portion 37a.

The lower end of the piston portion 28a of the body 65 is encased in a metal ferrule 71 having a bottom wall 5 32a which serves the launcher cap detonating head. It is evident that the rocket 14a is set by placing an explosive cap between the rocket detonator disc 44a and the anvil disc 36a, and that another explosive cap is placed between the detonating head 32a and the launcher 10 firing anvil head 24, and that the operation of the launcher 13 and the performance of the rocket 14a, including detonation upon returning to the ground 57, are as hereinabove described.

Referring now to Figures 8 and 9 of the drawings, the form of rocket shown therein, and generally designated 14b, comprises a compressible body 65b comprising a lower piston portion 28b and an enlarged upper feather mount portion 37b. Feathers 52b, 52b having quills 51b, 51b are mounted on the downwardly flaring side wall 39b of the mounting portion 37b, the upper portions of the quills 51b, 51b being positioned in vertical slots 73, 73 provided in the side wall 39b and are retained therein by spring rings 50b, 50b circumposed on the mounting portion 37b and seated in vertically spaced grooves 74, 74 formed in the side wall 39b and extending across the slots 73, 73.

A launcher cap detonating head 32b is in the form of a disc engaged with the lower end 31b of the piston portion 28b. A pin 33b extends through an axial bore 29b provided in the body 65b and through a center hole 75 in the head 32b and is riveted against the under side of the head 32b, as indicated at 76.

The pin 33b extends at its upper end through a center hole 77 provided in the lower arm 78 of a rocket cap detonator 43b. Fixed on the upper end of the pin 33b is a disc 36b which serves as an anvil, and holds the lower arm 78 of the detonator 43b upon the upper end 30b of the body 65b.

The detonator 43b is made of flat spring stock, is U-shaped, and includes the bight portion 79 and the upper arm 80 which overlies the lower arm 78 and is normally yieldably maintained spaced above the lower arm 78. The upper and lower arms 80 and 78, respectively, are of disc form, and a resilient and compressible pad 54b is secured to the upper side of the upper arm 80 by means of wedge lugs 55b engaged through holes 56b provided in the upper arm 80.

50 A rocket explosive cap 60b is adapted to be placed between the upper arm 80 of the detonator 43b and the anvil disc 36b. A launcher cap is adapted to be placed between the detonating disc 32b on the lower end of the piston portion 28b and the anvil 24 of the launcher 13, as hereinabove described. The launching and performance of the rocket 14b are as hereinabove described for the rockets 14 and 14a, it being obvious, in the case 55 of the rocket 14b that the detonator upper arm is deflected toward the lower arm 78 so as to detonate the cap 60b when the pad 54b hits the ground 57.

What is claimed is:

60 1. In a rocket toy, a rocket body comprising an elongated piston portion having upper and lower ends, a feather mount on the upper end of said piston portion, said mount having an upper end and a side wall, diametrically opposed feathers secured to said side wall and depending from said mount, a rocket cap detonator head on the upper end of said rocket body portion, a rocket cap detonator overlying said detonator head, and flexible means mounting said detonator on said rocket body for movement toward said detonator head for detonating an explosive rocket cap located between the detonator head and said detonator as said detonator strikes the ground as the rocket returns to the ground after being launched.

2. In a rocket toy, a rocket comprising a rocket body comprising an elongated piston portion having upper and lower ends, a rocket cap detonator head on the upper end

of said body, a rocket cap detonator overlying said rocket cap detonator head, and means flexibly mounting said detonator on said rocket body for movement toward said detonator head as the detonator strikes the ground as the rocket returns to the ground from flight.

3. In a rocket toy, a rocket comprising a rocket body comprising an elongated piston portion having upper and lower ends, a rocket cap detonator head on the upper end of said body, a rocket cap detonator overlying said rocket cap detonator head, and means flexibly mounting said detonator on said rocket body for movement toward said detonator head as the detonator strikes the ground as the rocket returns to the ground from flight, a feather mount fixed on the upper end of said piston portion, said mount being larger in diameter than said piston portion and having a side wall, inverted feathers having quills, and retaining means securing the feather quills in circumferentially spaced relation on said side wall with the feathers depending below said feather mount.

4. A rocket toy according to claim 2 wherein said detonator comprises a disc having depending lugs retainably engaged in slots provided in a portion of said body.

5. A rocket toy according to claim 4 wherein said disc has an upper side, and a resilient and compressible pad secured on said upper side of the disc.

6. A rocket toy according to claim 2 wherein said detonator head has a convex upper surface, and the detonator disc is concavo-convex for conformance with said convex upper surface, said detonator disc being hinged at one side to a portion on the rocket body and has a spring detent on its other side releasably engageable with a part of said body portion.

7. A rocket toy according to claim 2 wherein said detonator comprises a U-shaped spring member having normally spaced upper and lower arms projecting from a

5 bight portion, said arms being superimposed and registered with each other, and wherein said detonator head comprises a disc located between said upper and lower arms, said disc being retainably engaged with said lower

5 arm and said upper arm is normally spaced above said disc, said mounting means having a portion secured to said disc.

8. A rocket toy according to claim 3 wherein said feather mount is hollow and its side wall spacedly surrounds said piston portion.

9. A rocket toy according to claim 3 wherein said feather mount is solid and is located entirely above the upper end of said piston portion.

10 15 15. A rocket toy according to claim 9, wherein said retaining means comprises vertical slots provided in the feather mount side wall into which the feather quills are retainably jammed.

10. A rocket toy according to claim 9, wherein said retaining means further comprises spring rings surrounding said mount side wall and crossing said vertical slots and retaining the quills in the vertical slots.

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