June 5, 1956 C. R. SWAN 2,748,529

TOY ROCKET AND PARACHUTE

Filed July 6, 1953

Fig. 1.

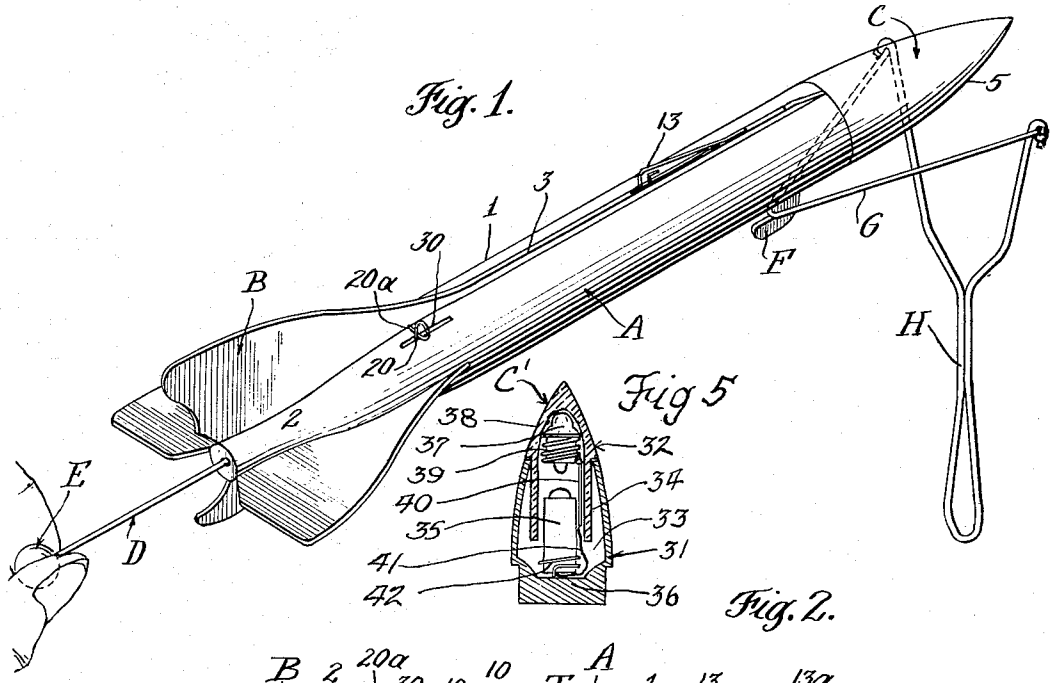


Fig 5

Fig. 2.

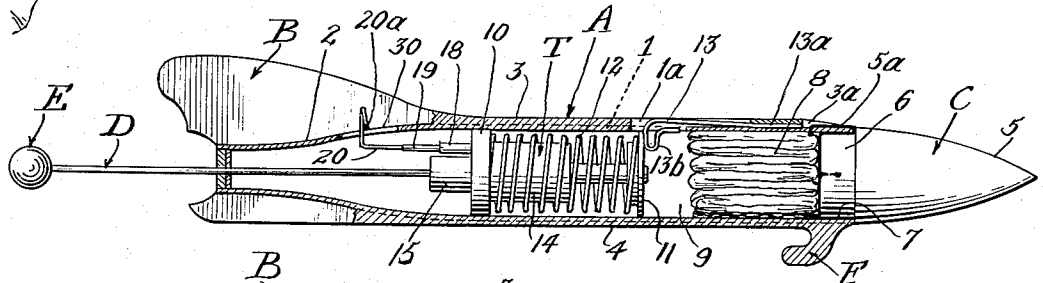


Fig. 3.

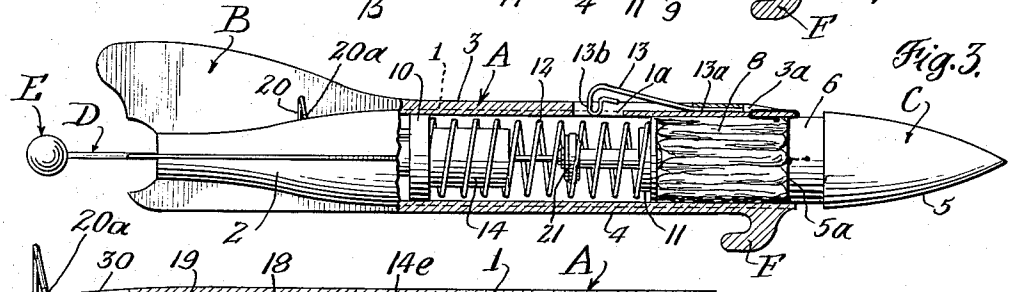
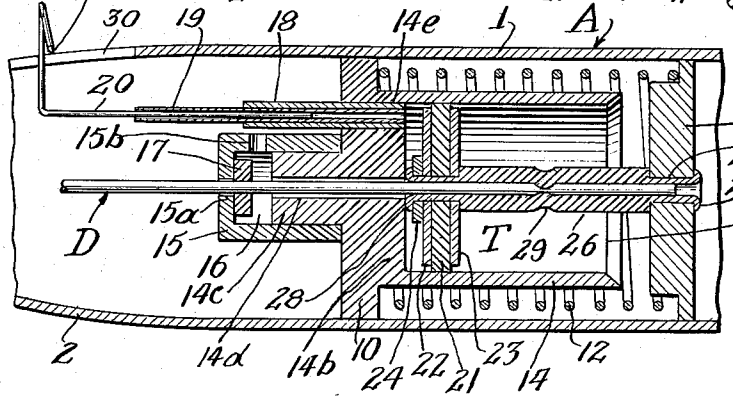


Fig. 4.



Charles R. Swan

Synnestvedt & Lechner

United States Patent Office

2,748,529

Patented June 5, 1956

2,748,529

TOY ROCKET AND PARACHUTE

Charles R. Swan, Tarzana, Calif.

Application July 6, 1953, Serial No. 366,090

9 Claims. (Cl. 46—86)

This invention relates to a toy, particularly a toy adapted to be impelled or catapulted into the air and having a parachute which is ejected at a predetermined time during flight so as to gradually return the toy to the ground.

The toy is constructed to generally resemble a rocket having a long, slender hollow body with a fin and rudder at the tail end. On the front end is a soft rubber-like nose, which is detachable from the body. Within the body just under the nose is a space adapted to receive a folded parachute. The under side of the body is equipped with a hook, to which is attached an elastic band of a slingshot or the like, which is used to catapult the device into the air. An operating rod adapted to move along the axis of the body, has one end extending from the tail, to which is attached a gripping or launching knob, while the other end inside the body carries a disk for ejecting the parachute. A spring within the body urges the disk and rod toward the nose end.

To launch the device, the knob is gripped in one hand and pulled rearwardly, while the slingshot is held in the other hand. When the knob is released, the spring urges the disk toward the nose end so that both the nose and the chute are ejected.

The movement of the disk is controlled so that the disk first moves very slowly and then finally with a very rapid or snap action, the force of which ejects the chute and nose. The initial restraining is accomplished by means of a timing device, the effect of which is to permit the rocket to rise a good distance in the air before the parachute is ejected.

In the embodiment shown, the timing device comprises a cylinder having a closed end and an open end. A piston secured to the rod is adapted to move from the closed end (at the start of flight) along the cylinder and out of the open end, at which point the restraining action ceases and the ejecting spring takes over to rapidly push the disk along the cylinder.

The retraining action is accomplished by the action of two air passages, one of which permits the flow of air out of the cylinder when the piston is moved from the open end back to the closed end (by pulling the knob fully to the rear), and the other permits a controllable amount of air to flow into the cylinder and behind the piston when the knob is released and the spring forces the rod and the piston toward the open end.

The manner in which the device is constructed and operated and certain of the advantages associated therewith will be apparent from the following description and drawings wherein:

Figure 1 is a perspective view showing the rocket about to be launched;

Figure 2 is a view partially in section illustrating the location of certain of the components when the mechanism is in condition for loading;

Figure 3 is a view partially in section illustrating the location of certain of the components at the time the nose and chute are about to be ejected from the rocket body;

Figure 4 is an enlarged fragmentary sectional view with the parts in condition for launching; and

Figure 5 is a view partially in section showing how the toy may be adapted to simulate the appearance of a night flare.

Referring first to Figure 1, the rocket body is designated by the reference character A, the tail fins by B, the nose by C, the operating rod by D, and the gripping or launching knob by E. The launching hook is designated by F; the elastic band G of the slingshot H is shown engaged with the hook.

As will be apparent, Figure 1 illustrates the manner in which the rocket is launched. One hand grips the slingshot while the other hand pulls back on the knob so that the elastic band G is stretched and put under tension. When the knob is released, the rocket is catapulted into the air and moves upwardly until such time as the nose and parachute are ejected from the body.

As seen in Figures 2 and 3, the body comprises a generally cylindrical-shaped portion **1**, which tapers back into a tail section **2**. Along the top of portion **1** extends a ridge **3**, which tapers into the tail B. Along the bottom of portion **1** extends a ridge **4**, which tapers into the bottom portion of the tail B.

The nose C comprises a streamlined front portion **5** and a shoulder **6**, which fits into the mouth **7** of the body. As shown, the folded parachute **8** is disposed within the parachute section **9** just to the rear of the nose.

The timing device is generally designated by the reference character T. The details of the timing device will be explained hereinafter. Suffice it to say at this point that it is supported within the body by its flange **10**. As will be apparent, the plunger or ejection disk **11** is secured to the operating rod D (the manner of mounting will be explained hereinafter) and a spring **12** is disposed between the flange and the disk, the disk being urged toward the nose end by the action of the spring. When the knob E is pulled back, the spring **12** is compressed and when the knob is released, the spring forces the disk in the forward direction to eject the chute and nose.

In loading the parachute into the body, the knob E is pulled rearwardly until the disk is just to the rear of the spring-like latch **13**, which is secured on the body by the portion **13***a* disposed within a slot **3***a* of ridge **3**, the portion **13***b* extending through a slot **1***a* in the body. When the latch is pushed downwardly, the portion **13***b* extends through the slot **1***a* into the interior of the body. Thus, the disk **11** is pulled back, the latch pushed downwardly as shown in Figure 2, and then the knob eased forward so that the spring **12** pushes the disk against the latch. The disk is then locked in position.

The parachute is then folded and inserted into the body as shown and then the nose positioned in place. It it mentioned that the parachute and nose are attached to the body by cords **5***a*.

After the loading operation is completed, the hook F is secured to the elastic band and the knob pulled rearwardly. The portion **13***b* of the latch **13** then moves out of the interior of the body when the pressure of the disk is released, as shown in Figure 3.

Pulling the knob rearwardly as far as it will go sets up the timer for operation. As will be explained following, the timer begins to operate when the knob E is released to launch the toy.

In the embodiment shown, the timer comprises a cylinder **14** having an open end **14***a* and a closed end **14***b*. The closed end carries a flange **10** and a boss **14***c* extending rearward. The boss **14***c* has an aperture **14***d* through which extends the rod D. A cap **15** is secured over the boss and has an aperture **15***a* through which ex-

tends the rod D. It will be observed that the cap is arranged with relation to the boss so as to provide a space **16**. A washer **17** made of rubber or the like is mounted on the rod and is adapted to move backward and forward in the space. The purpose of the washer will be explained hereinafter. The cap is also provided with an air passage **15***b*.

Another air passage is provided in the closed end of the cylinder by means of the tube **18**, which extends rearward through an aperture **14***e* in the cylinder. Disposed within tube **18** is a smaller tube **19**, which is adapted to receive the wire **20**, which is adjustable to and fro along the tube.

The piston comprises a rubber washer **21** having approximately the same diameter as the bore of the cylinder. Two fiber washers **22** and **23** are mounted on either side of the rubber washer, each having a diameter somewhat smaller than that of the rubber washer. A small metal washer **24** is mounted adjacent the washer **22**. Each of the foregoing washers is mounted on a member **25**. As will be apparent, the disk **11** is also mounted on this member **25**, being positioned away from the piston by the portion **26**. Each end of the member **25** is staked over as at **27** and **28**. The member **25** is held on the rod D by being pressed at **29**.

While I have described the timer as a pneumatic device, it will be apparent that it may take other forms such as a mechanical escapement or friction type delay.

The timer operates in the manner described following. When the piston is pulled toward the rear end of the cylinder, air exits through the passage **14***d* into the space **16** and then out through the passage **15***b* in the cap. As the rod is pulled back, the washer **17** is moved rearwardly until it is positioned at the end of the cap as shown in Figure 4. When the knob is released, the piston and rod move forward, the rod carrying with it the washer **17**, which acts to close off the passage **14***d*. Thus, no air can enter the cylinder through this passage. Clearly, as the passage **14***d* is closed off, the piston will tend to draw a vacuum. Thus, the piston will not move until the air pressure behind the cylinder is increased. Air for controlling the pressure in the cylinder is supplied through the tube **19**. The diameter of tube **19** is very small and the amount of air flowing therethrough may be controlled by moving the wire **20** back and forth.

The wire **20** extends through the slot **30** in the body so that it may be manipulated from the outside. On the outside of the body the wire is bent over so that the portion **20***a* frictionally engages the body so that when the wire is positioned in the tube **19**, it is held fast. By adjusting the wire **20** the parachute may be ejected at various altitudes.

The piston moves along the cylinder until such time as it reaches the open end. At this point, the pressure on both sides of the piston is equal and the spring **12** takes over to give the assembly a snap action, the force of which ejects the chute and nose as illustrated in Figure 3.

It will be apparent that the effect of the timer is to control the velocity at which the ejector disk moves along the body. Thus, the disk first moves very slowly and then suddenly moves very fast, gathering enough momentum to quickly eject the chute and nose.

In Figure 5 I have shown one way in which the toy may be adapted to simulate the appearance of a night flare. In this embodiment the nose C′ consists of a lower section **31** and an upper section **32**, the upper section being made of transparent or translucent material. The lower section has a cavity **33** in which extends the cylindrically-shaped portion **34** of the upper sections **32**. A dry cell **35** rests on the bottom **36** of the lower section **31** and extends into the cylindrically-shaped portion **34**. A light bulb **37** fits snugly into the cavity **38** of the upper section **32** and wire **39** is wound around the threads of the bulb and has a downwardly extending leg **40**. A

flexible conductor **41** is attached to the leg **40** and also to the wire **42** which is wound around the battery casing.

As will be apparent, when the nose C′ is in the condition shown (as would be the general condition during flight) no contact is made between the battery and the bulb. However, when the nose is ejected and the toy begins to descend, the nose C′ is in the reverse position and the battery slides into the cylindrically-shaped portion and makes contact with the bulk to energize the same. With the nose lighted up, the toy simulates the appearance of a flare.

I claim:

1. A toy to be impelled into the air comprising: a cylindrically-shaped body; a folded parachute disposed in said body near one end thereof; a cylinder in said body and a piston adapted to move therein, the cylinder having a closed end and an open end disposed adjacent said one end of the body; a spring to urge the piston toward and then out of said open end while the toy is in flight, the piston being adapted to eject the parachute from the body when the piston has moved out of and away from said open end; and means including a restricted air passage in communication with the closed end to control the air pressure in the cylinder while the piston moves toward said open end so that the rate of movement of the piston while in the cylinder is substantially less than when the piston is out of the cylinder.

2. A construction in accordance with claim 1 wherein said means further includes a second air passage and mechanism to close off the second passage while the piston moves toward the open end.

3. In a toy to be impelled into the air and having a folded parachute attached thereto, mechanism for releasing said parachute at a predetermined time during the flight of the toy comprising: a cylinder and a piston adapted to move therein, the cylinder having a closed end and an open end; two passages at said closed end of the cylinder, one being restricted and adapted for the admitting of air to the cylinder and the other being adapted for the exhausting of air from the cylinder; spring means to urge said piston away from said closed end; holding means to position said piston adjacent said closed end against the tension of said spring; and means to close off said other passage when said holding means is inoperative.

4. A construction in accordance with claim 3 further including means to vary the flow of air through said one passage.

5. A toy to be impelled into the air comprising: a long slender, tubular body; a section in the body accommodating a folded parachute; a piston adapted to move at a low velocity in one section and at a relatively high velocity in another section of the body, the piston having means to eject the chute when it is in the high velocity section; a spring to move said piston through said sections, said low velocity section comprising a cylinder having an open and a closed end in which the piston is adapted to move and means including a restricted air passage in communication with said closed end to control the pressure in said cylinder when the piston moves away from said closed end.

6. A toy comprising: a body; a removable nose at one end of the body; a section in the body adjacent said nose carrying a folded parachute; mechanism for ejecting the parachute and the nose including a rod and a spring-loaded ejection disk at one end thereof, the rod extending through the tail of the body and the rod and disk being adapted to move from a first point in said body to a second point located in said body section under the action of said spring to cause said ejection; and means to vary the velocity of the rod and disk from the first to the second point, including a cylinder in said body having an open end and a closed end, a piston secured to said rod and movable with the rod in and out of said cylinder, an air passage in said closed end through which said rod extends, a washer on said rod adapted to close off said pas-

sage when the rod moves toward said second point, and a restricted air conduit in said closed end controlling the flow of air to said cylinder when the rod moves toward said second point.

7. A toy comprising: a body having tail fins located at the rear thereof; a soft nose detachable from the body; a section within the body holding a folded parachute; a cylinder having a closed end secured within the body by means of a flange, the closed end having a restricted air passage to control the air pressure in said cylinder and the other end being open; a piston adapted to move from a point adjacent said closed end to a point adjacent said parachute section; a rod secured to said piston having a parachute and nose ejection disk at one end and the other end projecting through an aperture in the closed end of the cylinder and through the tail of said body, said aperture forming a second air passage the disk being adapted to eject said parachute and said nose when the piston has moved to said parachute section; a spring mounted between said disk and said flange; a cap secured to said

closed end, the head of the cap having an aperture accommodating movement of said rod; and a washer mounted on said rod for forward and rearward travel within said cap and adapted to close off said second air passage when the rod moves forward.

8. A construction in accordance with claim 7 further including means to vary the volume of air flowing through first said air passage.

9. A construction in accordance with claim 7 further including a latch whereby the disk may be locked in a predetermined position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,723,343	Ferrill	Aug. 6, 1929
2,277,882	Quady	Mar. 31, 1942
2,309,105	Dircksen	Jan. 26, 1943
2,376,330	Dircksen et al.	May 22, 1945
2,607,159	Hunt et al.	Aug. 19, 1952
2,675,642	Coleman et al.	Apr. 20, 1954