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A. L. RUTHVEN

2,439,989

TOY PARACHUTE

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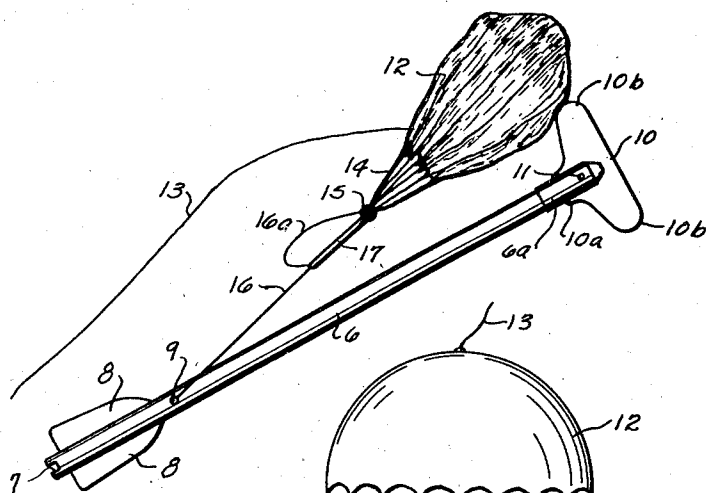


Fig. 2

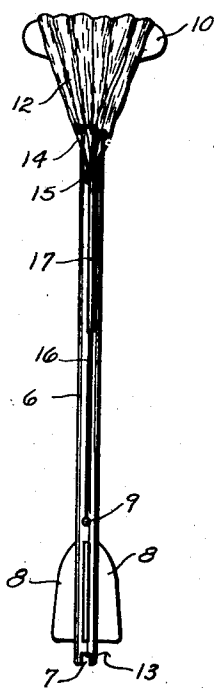


Fig. 1

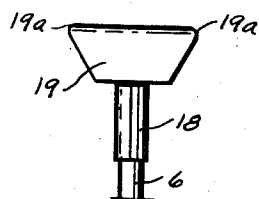


Fig. 4



Fig. 5

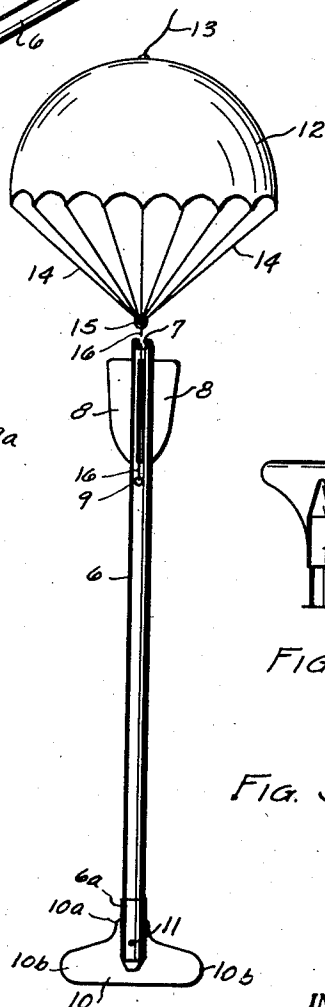


Fig. 3

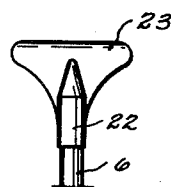


Fig. 6

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TOY PARACHUTE

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Application September 19, 1946, Serial No. 697,949

6 Claims. (Cl. 46—86)

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This invention relates to toy parachutes and especially to means of projecting the same into the air and securing them to and releasing them from the projectile.

The present invention is an improvement upon the parachute, securing and release means disclosed in my pending application Serial Number 641,198, filed January 15, 1946.

An object of the present invention is to provide a simpler, more substantial and more economical structure of the class disclosed in my said pending application and one which will accomplish the objects thereof in a more efficient manner.

A further object is to provide a projectile for an article of the class described which shall have a fixed parachute-holding tip, of substantially like shape and area on both sides of the projectile and, therefore, be symmetrical in itself and relative to the balance of the projectile combined with novel means for retaining the parachute on the tip while desired and efficiently releasing the parachute from the tip at the desired time.

With these and other objects in view, all of which will more fully hereinafter appear, the invention comprises certain novel constructions, combinations and arrangements of parts as hereinafter described and as defined in the appended claims and as illustrated in the accompanying drawing in which

Figure 1 is an elevation of the projectile with parachute secured thereto in condition for projection.

Figure 2 is a view illustrating the relative positions of the projectile and parachute and associated parts immediately upon release of the parachute from the tip during reversal of direction of the projectile at the end of the projected flight and before the opening of the parachute.

Figure 3 is a view of the projectile and parachute after the latter has opened and the apparatus is in downward flight.

Figure 4 is a broadside elevation of a modified form of tip structure.

Figure 5 is an edge view of the structure illustrated at Figure 4.

Figure 6 is a detail view of a further modified form of projectile tip.

The projectile is here illustrated as an arrow adapted to be projected from a bow and it will be herein described in terms appropriate to such illustration but it will be understood that any suitable projection means may be employed and that such modification of the projectile, as may be desirable to adapt the projectile for projection by such other means, may be made without

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affecting that part of the structure of the projectile which is material to the present invention.

The projectile comprises a shaft 6 having a notch 7 at its rear end for engagement with a bow string or other suitable projecting means, not shown. Suitable guiding fins 8 are provided near the rear end of the projectile. Means indicated at 9 are provided for attachment of the shrouds cord of the parachute as hereinafter described.

10 The front end of the projectile is provided with a tip 10 of metal or other suitable material and this may be conveniently secured to the projectile by slotting the end of the projectile and positioning the base-lug 10a of the tip in the slot and securing it by pin 11. The tip end of the shaft is preferably reinforced with a sleeve 6a. It will be understood that the tip is substantially equal in size, weight, and contour on both sides of the projectile for steadying the projectile in flight, increasing the distance of flight and purposes of general efficiency in operation. The particular shape of the tip may be varied as desired provided there be maintained a straight forward edge perpendicular to the longitudinal axis of the projectile and that the ends of the tip are sufficiently rounded, as indicated at 10b, so as not to impede the parachute in sliding off one end or the other, as later described.

The parachute 12 is of any suitable material and structure and has a crown-cord 13 and shrouds 14 converging to a ring 15, or other suitable fastening, to which is attached one end of the shrouds cord 16 whose other end is secured to the rear portion of shaft 6 by any suitable means indicated at 9.

It will be understood that the parachute 12 is collapsed and folded over the tip 10 as illustrated at Figure 1 and to hold the parachute in this position, the crown cord 13 is drawn downwardly and through the slot 7 where it is held by the bow string until the device is projected. Thereafter, during the projected flight, the air resistance holds the parachute in folded position over the tip 10. When the force of the projection is spent, and the projectile is in course of reversing its direction from upward to downward flight, it is desired that the parachute be immediately separated from the tip so that it may open and float the projectile to earth in the position illustrated in Figure 3.

In the form of apparatus disclosed in my said co-pending application, the parachute-holding tip is either pivoted or the front edge thereof is inclined or the major portion of the tip is to one side of the projectile shaft, these elements in

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structure being provided to assist in the sliding of the parachute from the tip.

The present invention, however, provides a tip which is stationary and which is also symmetrical in itself and relative to the shaft of the projectile, so that when the parachute is folded over the tip and is secured thereto by the cords 13 and 16, the tension of the parachute on the forward edge of the tip will be substantially equal at the center and on both sides of the projectile shaft tip and this equality in tension tends to impede a sliding of the parachute endwise from the tip and in order to obviate this impedence and facilitate the separation of the parachute from the tip, I have provided a resilient link 17, preferably of rubber, in the shrouds cord 16 which link, when normally contracted as illustrated at Figure 2, will shorten cord 16 and cause a portion of it to loop as at 16a. When, however, the parachute is folded on tip 10, and tension is applied to the crown cord 13, the link 17 will be thereby stretched as illustrated at Figure 1, until the fastening 15 is drawn away from the fastening 9 to the full length of cord 16, in which position there will be no loop 16a, the portion of cord 16, which normally constitutes said loop, being drawn out to substantial coincidence with the stretched link 17.

When the projectile, carrying the parachute, is projected, the air resistance will hold the parachute tightly over tip 10 and overcome the tendency of link 17 to contract and draw the parachute from the tip 10, but when the air resistance lessens at the end of the projected flight, the contracting force of the link 17 will be sufficient to draw the parachute over the edge of the tip and flip the crown portion of the parachute off of the tip 10. The separation of the parachute from the tip 10 is aided by the side-wise pressure of the air on the parachute as the projectile reverses its position from projected flight to downward flight, it being understood that as the tip 10 turns from the upward flight to the downward flight, the tip and projectile will encounter exceedingly small air resistance, whereas the parachute, when freed of the air resistance encountered during the projected flight, being of soft and light material, will fluff up and encounter a relatively large air resistance or pressure which will aid in restraining the parachute while the tip and shaft drop and thus separate the parachute from the tip. The contracting of the link 17 initiates the action of freeing the parachute from the tip and the air resistance aids in the completion of such freeing action.

At Figures 4 and 5, I have illustrated a modified tip structure comprising a metal sleeve 18 adapted to fit over the end of the shaft 6, the sleeve carrying on its outer end a fin 19 bent inwardly toward the axis of the shaft as at 20 and bent upon itself as at 21, thus forming a tip generally indicated at 19 and illustrated in broadside at Figure 4 which, while it varies in

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detail from tip 10, is still uniform and equal on both sides of the shaft 6. This tip also has the rounded ends indicated at 19a similar to the rounded ends 10b of the tip 10 and serving the same purpose. Such a tip may be placed on the end of any shaft without the necessity of slotting the shaft as hereinabove described with reference to the embodiment illustrated at Figures 1, 2 and 3.

At Figure 6 I have illustrated still another form of tip namely a molded plastic unit comprising a sleeve or ferrule 22 adapted to snugly fit on the end of shaft 6 and a tip 23, like tip 10 except that it is molded of plastic integral with ferrule 22. Such a molded plastic tip may be readily fitted on the end of any shaft 6 whereupon the projectile is ready for use.

While I have illustrated and described many details of construction, it will be understood that equivalents and alternatives will occur to those skilled in the art, and such equivalents and alternatives are within the scope and spirit of my invention and I do not wish to be limited in my protection to the details shown and described.

I claim:

1. A toy parachute device comprising, in combination, a projectile comprising a shaft and a tip on the front end of the shaft which is substantially the same on both sides of the shaft and has a straight forward edge lying perpendicular to the longitudinal axis of the shaft, and a parachute having a shrouds cord secured to the shaft and adapted to be folded over said edge when the shrouds cord is thus secured and elastic means associated with the parachute and adapted to exert a pull on the parachute in the direction of the rear end of the projectile.

2. In a device as defined in claim 1, said elastic means comprising an elastic link connecting a portion of the shrouds cord with the shrouds.

3. In a device as defined in claim 1, said elastic means comprising an elastic link in the shrouds cord.

4. In a device as defined in claim 1, said elastic means being too weak to overcome the air pressure which holds the parachute against the tip during projected flight but of sufficient strength to move the parachute on the tip when the parachute is not subjected to such air pressure.

5. In a device as defined in claim 1, a pre-formed single-piece tip comprising a ferrule adapted to securely fit on the end of the shaft and a fin projecting forwardly of the ferrule and provided with said straight edge and projecting laterally of the ferrule equally on both sides.

6. In a device as defined in claim 1, a crown cord on said parachute adapted to be releasably held in association with the projectile prior to projection but to be automatically released coincident with projection of the projectile.

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