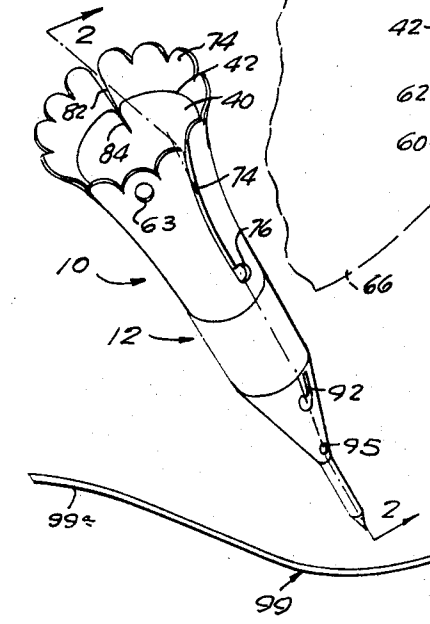
Nov. 19, 1968 R. M. BARRY 3,411,778

BALLOON TARGET MISSILE

Filed Nov. 16, 1965

FIG. 1.



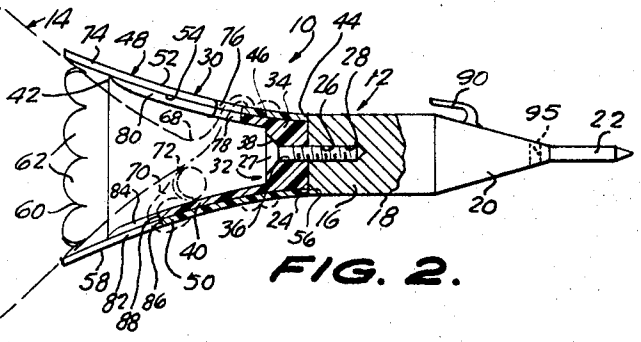


FIG. 2.

FIG. 3.

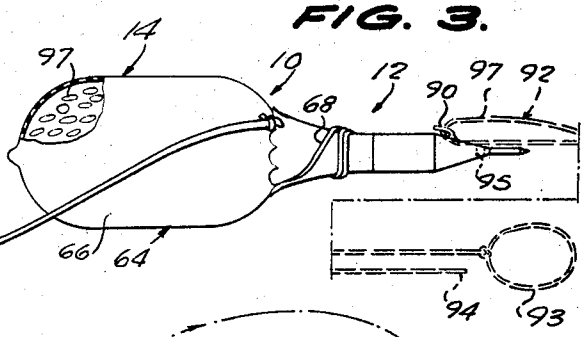


FIG. 4.

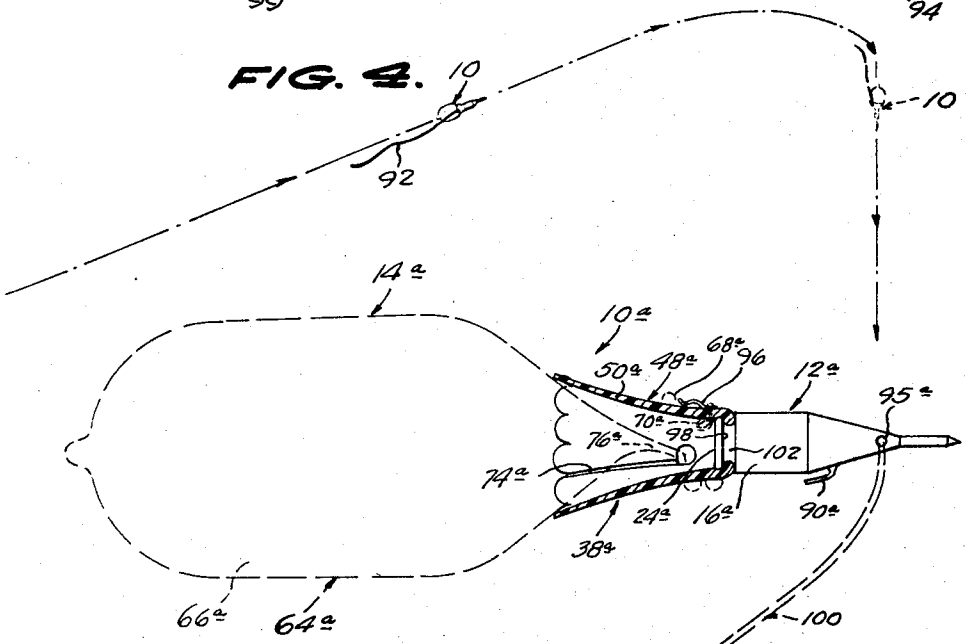


FIG. 5.

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BALLOON TARGET MISSILE

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ABSTRACT OF THE DISCLOSURE

A freely flying target having a body portion of appreciable weight for projection into a trajectory. The body has affixed thereto an inflatable balloon which serves as a target member and which is deflated when struck by projectiles. A brightly colored indicator ribbon is attached to the body portion to facilitate retrieving of the target body.

This invention relates to marksmanship targets of the missile type, and particularly to a balloon-equipped target missile, wherein the balloon component is replaceably interchangeable.

The primary object of the invention is the provision of a more practical, efficient, versatile, and economical device of the kind indicated, which is adapted to be projected into a ballistic arc, either manually, or by means of a mechanical device, such as a sling-shot or spring-operated catapult; and which is constructed so that the body component thereof is recoverable in an unimpaired condition, at the end of flight, the nose of the body component being provided with a spike which is adapted to enter the ground or other penetrable surface in advance of the body component, and hold the body component in an undamaged, upright and readily accessible position.

Another object of the invention is the provision of a device of the character indicated above, which is composed of a body component of substantial construction, and a balloon component which is attached to trail the body component, the body component having means, on the rear thereof, which acts both to align the balloon component longitudinally with respect to the body component, and to substantially reduce sidewise oscillation of the balloon component relative to the body component, so as to assure stabilized flight of the device, while at the same time preventing stresses on the balloon component which would otherwise tend to weaken the same and loosen its connection with the body component.

A further object of the invention is the provision in a device of the character indicated above, of simplified and easily used means for separably securing the balloon component to the body component, the said means utilizing the tension provided by a stretched condition of the neck of the balloon component for secure retentive effect, the said means affording quick and uncomplicated connection and disconnection of the balloon component.

In the drawings:

FIGURE 1 is a perspective view of the body component of a device of the invention;

FIGURE 2 is a longitudinal section, taken on the line 2—2 of FIGURE 1, a part of an associated balloon component, in phantom lines, being shown attached to the body component;

FIGURE 3 is a side elevation, on a reduced scale, showing the device in flight and trailed by a locater ribbon or tape, and showing, in phantom lines, a sling cord;

FIGURE 4 is a schematic view illustrating a trajectory of the device; and

FIGURE 5 is a view, like FIGURE 2, of another form of the device showing, in phantom lines, a trailing locater ribbon.

Referring in detail to the drawing, and first to FIGURES 1 to 4 thereof, the device **10** illustrated therein comprises an elongated body component **12**, and a balloon component **14**.

The body component **12** comprises a preferably solid cylindrical and longitudinally-elongated body **16**, of suitable weighty material, including plastic, having a uniformly cylindrical main or rear portion **18**, and a forwardly-tapered portion **20**, the latter terminating in an elongated reduced diameter pointed spike **22**. The body **16** has a squared or planar rear end **24**.

Fixed flush with the rear end **24** of the body **16**, as by means of an axially-disposed screw **26** having a head **27**, the screw **26** being threaded into an axial bore **28**, into the body **16**, is a replaceable rearwardly and outwardly-flaring hollow cylindrical balloon component stabilizer **30**, preferably composed of a plastic material such as, for example, rubber, and having sufficient resilience to be resistant to damage from shocks, such as falling contacts with the ground or other surfaces in the target area. The balloon component stabilizer **30** is formed of such resilient and elastic material to prevent the shattering thereof from impact with shot and to minimize the surface indentation thereof from shot while at the same time, providing a surface of such material as may be easily repairable from shot indentation and/or for economic replacement when desired or when it becomes so necessary.

The stabilizer **30** can be integrally constructed or, as shown, may be composed of a longitudinally-elongated cup **32** having a bottom wall **34** of substantial cross-section and formed therethrough with an axial bore **36** in which the related end of the screw **26** is suitably anchored. The inner end of the bottom wall **34** is formed with a counterbore **38** affording a seat for the set screw **27**. A relatively thin, cylindrical, tapered and rearwardly-flaring sidewall **40** extends rearwardly from the bottom wall **34** and has a squared or planar end **42** disposed substantially perpendicular to the longitudinal axis of the stabilizer **30**. As shown in FIGURE 2, the forward end of the cup **32** is smaller in diameter than the body **16**, so that an annular shoulder **44** is defined thereat. The outer surfaces of the cup sidewall **40** and the bottom wall **34** are flared into each other and having a continuous concave longitudinal curvature, as indicated at **46**.

The stabilizer **30** comprises a tubular bell **48** longer than the cup **32**, having a sidewall **50**, preferably of substantially uniform cross-section, which has the longitudinal curvature that provides the concave outer surface **52** and a convex inner surface **54**.

The inner surface **54** of the bell sidewall **50**, at the forward end thereof, conforms to the concave outer surface **46**, of the cup **32**, so that, with the stabilizer **30** detached from the body **16**, the bell **48** can be conformably telescoped into the cup **32**, from the forward end of the latter, for assembling the bell and the cup. In the assembled condition of the bell and the cup, the squared or planar forward end **56** of the bell **48** is flush with the forward end of the cup **32**, and abuts the shoulder **44**. The assembled cup and bell and the attached screw **26** are adapted to be together rotated for securing and detaching the stabilizer **30** from the body **16**.

The sidewall **50** of the bell **48** has a maximum diameter rear end portion **58** which extends rearwardly beyond the rear end of the sidewall of the cup **32**, the rear end **60** of the bell sidewall being formed with uniform flexible scallops **62**, and a transversely-extending opening **63** is formed in one of the scallops **62** to serve a function to be described. The edges of the scallops **62** serve to grip the balloon component **14** and reduce any tendency thereof to rotate relative to the stabilizer **30**. The scallops **62** also

provide a cushioning means to absorb shock and minimize rupture of the balloon component upon impact of the device **10** with the ground, so that if the balloon component **14** is not ruptured by impact of shot while in trajectory, it remains inflated upon ground impact to provide a stationary target for the marksman.

The length of the stabilizer **30**, relative to the length of the balloon component **14**, is such that the stabilizer protectively encloses a substantial portion of the forward end of the balloon component, including its neck, without encumbering any significant part of the main body target portion thereof.

The balloon component **14** is in the form of a cylindrical, longitudinally elongated balloon **64**, having a uniformly cylindrical main body portion **66**, having a forwardly-tapered substantially reduced diameter neck **68**, on its forward end. The neck **68** terminates, at its forward end, in a flared inflating nipple **70**, surrounded by a reinforcing bead **72**.

For releasably attaching the balloon **64** to the body component **12**, the sidewall **50**, of the bell **48**, is formed, from its rear end **60**, between an adjacent pair of scallops **62**, with a single longitudinal access slot **74**, which extends forwardly to a point slightly beyond its mid-length point, where the slot **74** enters one side of a laterally-offset, enlarged diameter hole **76**. The hole **76** is registered with a similar hole **78** formed in the sidewall **40** of the cup **32**, from which an access slot **80**, similar to and registered with the slot **74**, extends rearwardly to the rear end of the sidewall of the cup **32**. At a location diametrically-opposite the slots **74** and **80**, the walls of the bell **48** and the cup **32** are formed, from the rear ends thereof, with aligned and registered, forwardly-tapered, relatively narrow wedge slots **82** and **84**, which, at their forward ends **86** and **88**, respectively, stop at points spaced rearwardly relative to the forward ends of the access slots **74** and **80**.

The balloon **64** having been inflated, by connection of the nipple **70** with a source of air or other suitable gas (not shown) under pressure, the balloon neck is twisted upon itself so as to retain the air in the balloon, and the twisted neck **68** is then passed forwardly into the cup **32** through the access slots **74** and **80**, and is brought out through the holes **76** and **78**. The neck **68** is stretched lengthwise, wrapped around the outside of the stabilizer **30**, brought rearwardly along the outside thereof. The stretched neck is then jammed forwardly along the wedge slots **82** and **84**, with the nipple **70** inside the stabilizer **30**, as shown in FIGURE 2, so that the neck is squeezed shut against the escape of air from the balloon and the balloon is expanded against the interior of the stabilizer.

To detach the balloon **64** from the body component **12**, all that is necessary is to pull the neck **68** out of the wedge slots, let the neck unwrap itself from around the stabilizer, and then pull the neck out of the access holes **76** and **78**.

For projecting the device into a target trajectory, for target practice therewith, by means of a sling-shot or a cord sling, or a spring-operated catapult (not shown), a laterally-extending rearwardly-opening hook **90** is provided on the tapered forward end portion of the body component **16**. In manually-projecting the device into a trajectory, a cord **92** with a loop **93** on one end thereof, is provided, which is adapted to be secured around a wrist, with the free end **94** of the cord between the thumb and forefinger, so as to form a loop **97**, with which the hook **90** is engaged, and the device **10** then dangles therefrom. The device **10** is adapted to be slung upwardly and forwardly, and at the same time, the free end of the cord is released, so as to project the device into trajectory.

A flexible ribbon **99**, preferably having a bright color, has one of its ends threaded through and secured in the opening **63**, and has a free trailing end **99***a* which serves as means for clearly indicating the location of the body component of the device, at the end of its trajectory, assuming that the balloon had been successfully burst in flight, as in tall grass, or the like, where the body component would otherwise be difficult to locate.

In FIGURE 5 is shown another form of the device **10**, the new form bearing the general reference numeral **10***a*, composed of a body component **12***a* and a balloon component **14***a*. The balloon component **14***a* consists of a balloon **64***a*, similar to the balloon **64**, and having a neck **68***a*. The body component **12***a* has a body **16***a* similar in conformation to the body **16**, of the device of FIGURES 1 to 4, supplemented by a balloon neck-securing spring clip **96**, on one side of the forward end of the main portion of the stabilizer body. The body **16***a* has a squared or planar rear end **24***a*, and is formed in its outer surface, adjacent to this rear end, with an annular groove **98**.

A stabilizer **30***a* comprises a longitudinally-elongated bell **48***a* having at its forward end, an internal diameter not substantially greater than that of the body **16***a*. The forward end of the bell **48***a* is formed with an integral bead **102**, adapted to be passed over the rear end of the body **16***a* and to snap into the groove **98**, for releasably securing the stabilizer to the body **16***a*.

The sidewall **50***a* of the bell **48***a* is formed with an access slot **74***a*, an access hole **76***a*, like those FIGURES 1 to 4, and with a diametrically-extending ribbon port **95***a* through which the forward end of a combination sling cord and brightly-colored finder ribbon **100**, similar to the ribbon **99**, is extended and secured to comprise a permanent, but replaceable adjunct of the device **10***a*, eliminating the necessity of providing a separate sling cord.

In attaching the balloon **64***a* to the body component **12***a*, the procedure is the same as with the device of FIGURES 1 to 4, except that, once the balloon neck **68***a* has been wrapped around the exterior of the bell **48***a*, it is stretched to and jammed, behind its nipple **70***a*, under the spring clip **96**, instead of being jammed in the wedge slots absent from the bell **48***a*.

The device **10***a*, when serving its intended function as a marksman's target, is placed in trajectory by the operator who manually grasps the free end **100***a* of the ribbon **100**, and whirls the device **10***a* in any desired manner to create a centrifugal force on the device **10***a* which, upon release of the free end **100***a* of the ribbon **100**, places the device **10***a* in a desired trajectory. Thus, the ribbon **100** serves a dual purpose in that it serves (1) as a means for placing the device **10***a* in trajectory, and (2) it serves as means for clearly indicating the location of the body component of the device **10***a* at the end of its trajectory (assuming that the balloon has been successfully burst in flight) should the device **10***a* fall in tall grass or the like, where the body component would otherwise be difficult to locate.

It is to be observed that in cases where the balloon has not been hit and burst on the trajectories of the devices, the balloon can serve as an excellent stationary ground target.

The balloon as used in either modification can also contain bright-colored material, such as confetti, indicated at **97**, colored gas, irridescent paper strips, and the like, all of which could be introduced into the balloon at the time of its inflation. This added material is released, of course, upon the bursting of the balloon while in trajectory, and gives rise to a spectacular effect, and which also serves to dramatize a "hit" by the marksman as the filler material disburses in the air; it also serves as a momentary visual marker for the marksman indicating the general location in which the target, when hit, may be found.

Having described and illustrated two embodiments of this invention in detail, it will be understood that the same are offered merely by way of example, and that this invention is to be limited only by the scope of the appended claims.

I claim:

1. A device of the character described comprising an

elongated body of appreciable weight for projection into a trajectory, said body having forwardly and rearwardly-disposed opposed ends, and position-indicating means secured to and trailing said body for sighting said body on the ground at the end of its trajectory, target means for said body, said target means comprising an inflatable balloon, said position-indicating means comprising an elongated length of flexible material having a pair of opposed ends, and means for connecting one end of said material to said body intermediate the ends thereof, the other end of said material being free to trail said body, and means for releasably securing said balloon to said rear end of said body, and wherein said length of material is of a bright color for assistance in visually locating said body, said body being longitudinally elongated and having a hollow rearwardly-flaring stabilizer extending longitudinally from its rear end, said balloon having a main portion being conformably-engaged in the rear end of the stabilizer, said balloon having a reduced diameter neck extending forwardly within the stabilizer, and securing means on the stabilizer serving to compressively close and hold the balloon neck to the stabilizer, and an axial forwardly-extending pointed spike on the forward end of the body.

2. A device as defined in claim **1**, wherein said body comprises a uniformly cylindrical rear portion and a forwardly-tapering forward end portion.

3. A device as defined in claim **2**, wherein said stabilizer

has an internal bead at its forward end and said body is formed at the rear end thereof with an internal groove into which said bead is snapped.

4. A device as defined in claim **3**, wherein said stabilizer has a sidewall, said securing means comprising access slot means extending forwardly in said sidewall from the rear end thereof, the balloon neck being passed forwardly through said access slot means to the exterior of the stabilizer and wrapped around the stabilizer, said balloon neck terminating in a flared nipple, and jamming means on the body in which the balloon neck is jammed in a streached and compressed condition behind its nipple.

5. A device as defined in claim **4**, wherein said jamming means comprises a leaf spring clip on the exterior of the body.

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