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Grosswendt

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[54] **LAUNCHABLE MISSILE HAVING A TAIL UNIT**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.** **244/3.28**

[51] **Int. Cl.**[2] **F42B 13/32**

[58] **Field of Search** 244/3.27, 3.28, 3.29

[56] **References Cited**

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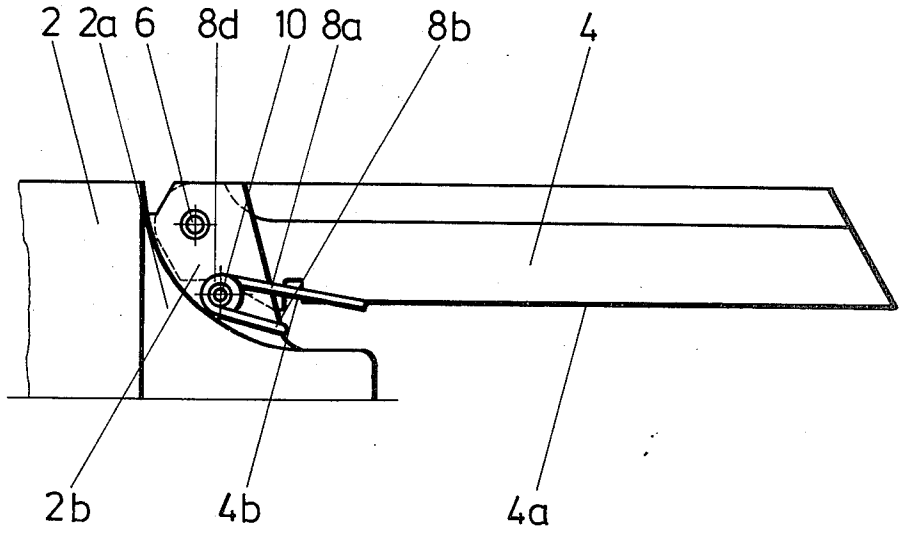
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[57] **ABSTRACT**

The invention relates to a launchable missile having a tail unit and including at least two guidewings symmetrically disposed with respect to the longitudinal axis of the missile which are unfoldable upon launching, locked into an unfolded position by means of a torsion spring and pivoted on an axle located on the rear part of the missile, the torsion spring having a coil and two arms, one arm of the torsion spring abutting the body of the missile and the other arm abutting the guidewings.

2 Claims, 3 Drawing Figures



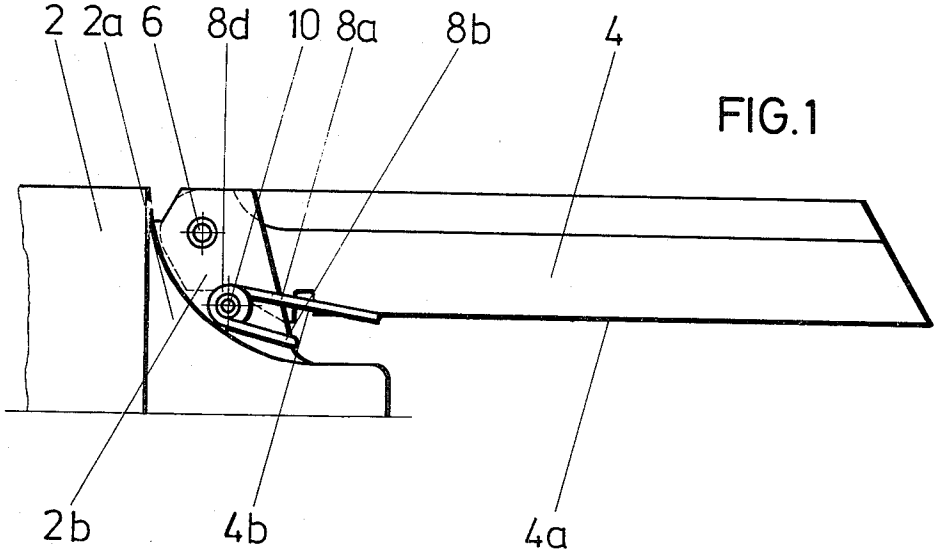


FIG.1

FIG.2

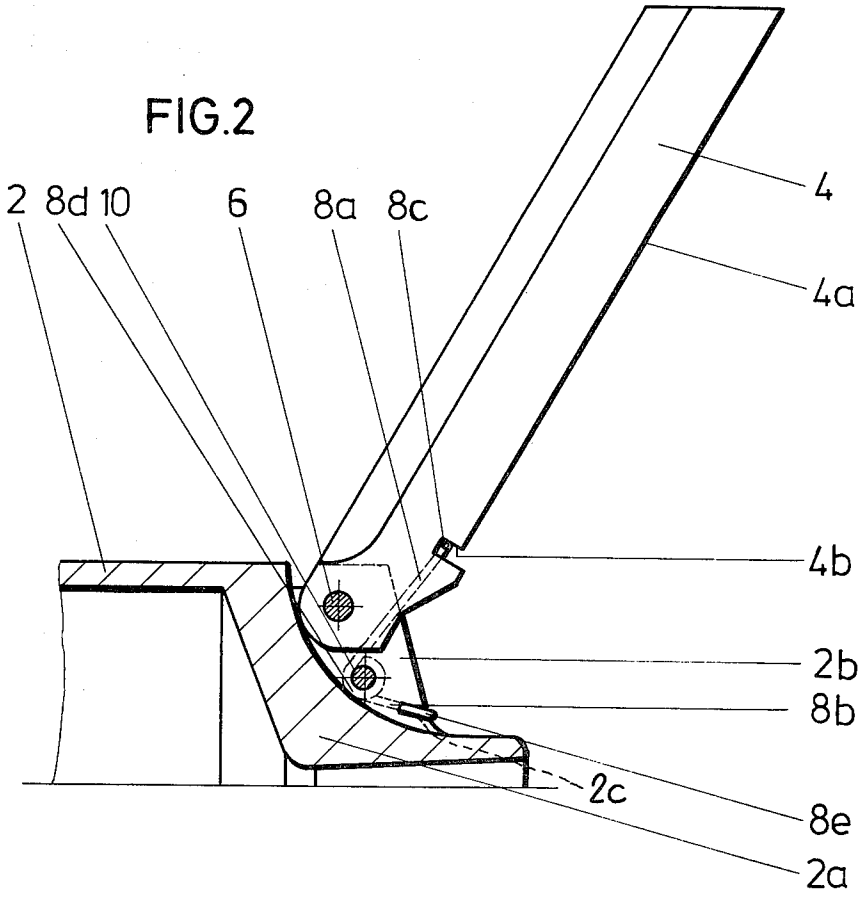
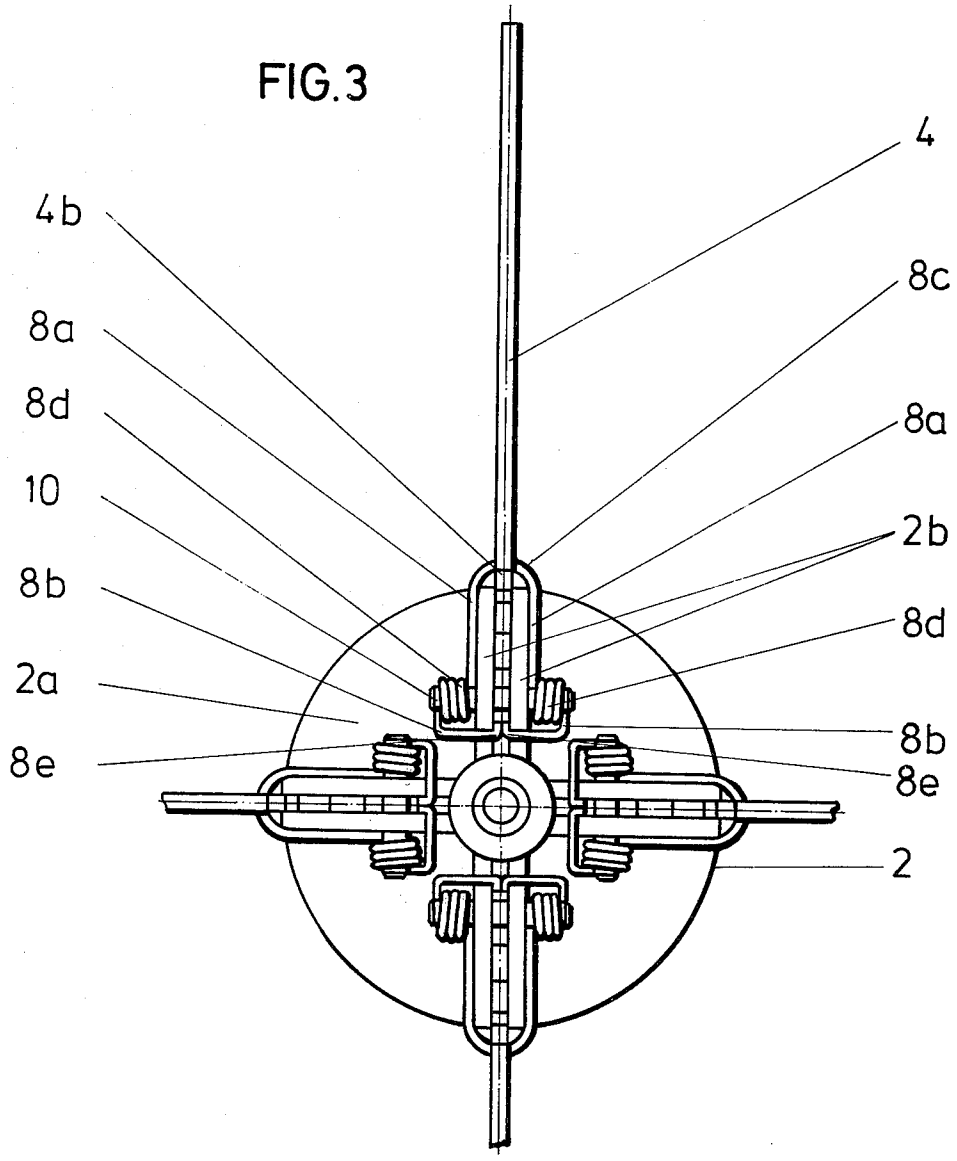


FIG.3



LAUNCHABLE MISSILE HAVING A TAIL UNIT

SPECIFICATION

1. Field of the Invention

My invention relates to a launchable missile having a tail unit and at least two unfoldable guidewings for locking the latter into an unfolded position upon launching.

2. Background of the Invention

Missiles of known types use either guidewings which are not locked in the unfolded position and are therefore easily manufacturable as, for example, described in DT-OS 2 .059.951, or else have a tail unit constructed with complicated opening and locking systems of a type actuated by spring or gas pressure and using additional locking sliders, members or the like, and which are therefore costly to manufacture.

3. Object of the Invention

It is therefore an object of my invention to obtain a missile of low manufacturing cost having a tail unit which combines the simple construction features of known missiles not provided with locking means for unfoldable guidewings and the functional features of missiles having such locking means.

4. Summary of the Invention

My invention discloses a launchable missile having a tail unit including at least two guidewings symmetrically disposed with respect to the longitudinal axis of the missile and unfoldable upon launching, the rear part of the missile being provided with a pivot axle in the form of a bolt. The guidewings are pivotable around that pivot axle, brought into an unfolded position and locked therein by means of a torsion spring wound around a torsion-spring axle formed with a coil and two bent arms, one arm abutting the body of the missile, the other arm abutting the guidewings. Each of the latter has a guidewing edge formed with a recess, one arm being locked into the recess upon unfolding of the guidewings. In an additional refinement two parallel crosspieces formed with a groove extend from the rear part of the missile, one arm of the torsion spring resting in that groove.

5. Brief Description of the Drawing

These and other features of my invention will be better understood from the accompanying drawing in which:

FIG. 1 shows a fragmentary side-elevational view of the rear part of the missile with one guidewing in a folded position;

FIG. 2 shows a fragmentary cross-sectional in side elevation of the rear part of the missile with one guidewing in an unfolded position; and

FIG. 3 shows a fragmentary elevational rear-view of part of the tail unit of the missile with the guidewings in an unfolded position.

6. Specific Description

It will be seen from the drawings that the missile, which may be a self-propelled rocket or a wing-stabilized missile, consists of a missile body **2** having a missile rear-portion **2***a*, to which there are attached crosspieces **2***b*, on which guidewing **4** of a tail unit only shown partially in FIG. **3** are pivotable around a bolt **6**. Guidewings **4** are unfolded by means of double-armed torsion springs **8**; one arm **8***a* of the latter abuts in its folded position against a guidewing edge **4**, while the other arm **8***b* abuts against crosspieces **2***b* of missile rear portion **2***a*. Coils **8***d* of torsion springs **8** are wrapped around an axle **10** which is spaced apart from bolt **6**, the latter forming a pivotable axis for guidewings **4**. By means of this arrangement a beat end **8***c* of arm **8***a* slides along a guidewing edge **4***a* during unfolding of guidewings **4** until beat end **8***c* slides into a recess **4***b* and thus keeps guidewings **4** firmly in an unfolded position.

To prevent any sliding off of torsion springs **8** when mounted on the missile, ends **8***e* of arms **8***b* are bent to fit into a groove **2***c* formed between crosspieces **2***b*.

The unfolding and locking system described according to my invention permits a particularly simple form of construction of either a rocket or wing-stabilized missile, and is equally applicable for guidewings unfoldable from front to rear or from rear to front, as well as for guidewings unfoldable in a raidal direction or within a plane, such as a plane tangential to the missile body.

I claim:

1. A launchable missile having a longitudinal axis and a tail unit including at least two guidewings symmetrically disposed with respect to said longitudinal axis and unfoldable upon launching, said missile having a body and a rear part provided with a pivot axle including at least one double-armed torsion spring, said guidewings being pivotable around said pivot axle, guided into an unfolded position and locked therein by means of said torsion spring, one arm of said torsion spring abutting said body of said missile, the other arm of said torsion spring abutting said guidewings, comprising a torsion-spring axle mounted on said missile and spaced from said pivot axle, and wherein said torsion spring is formed with a coil mounted on said torsion-spring axle and each of said guidewings has a guidewing edge formed with a recess, said other arm having a bent end locked in said recess when said guidewings are unfolded.

2. A missile as defined in claim **1** further comprising two parallel crosspieces extending from said rear part and formed with a groove, and wherein said pivot axle is a bolt and said arms of said torsion spring are disposed beyond said cross-pieces, said coil being wound around said torsion-spring axle, and wherein said one arm has a doubly bent end resting in said groove.

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