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SPRING-STARTED GENERATOR

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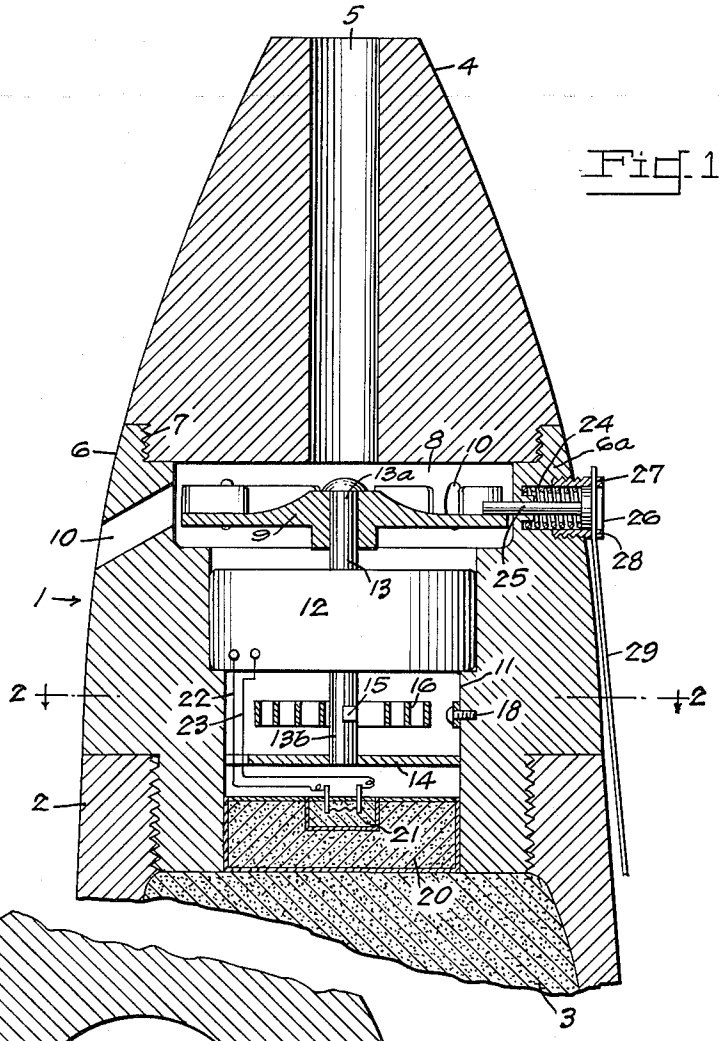


Fig. 1.

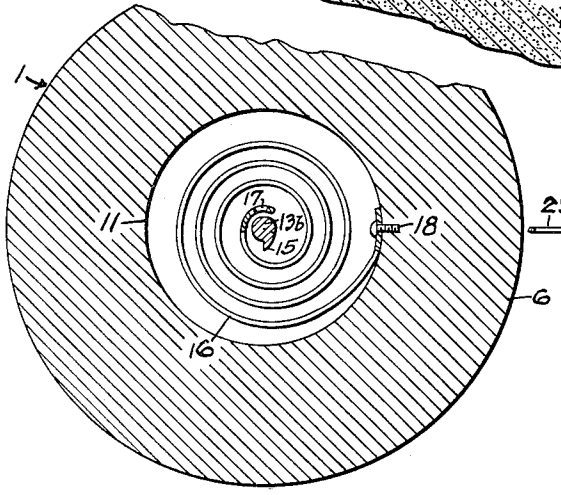


Fig. 2.

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SPRING-STARTED GENERATOR

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2 Claims. (Cl. 102—70.2)

This invention relates to electronic proximity fuses for explosive missiles and more particularly to means for instant starting of air driven turbo-generators incorporated in the fuses.

In fuses of the class referred to it is essential that the generator be brought up to operating speed as quickly as possible. In view thereof, an object of the invention is a new and novel means for instantly bringing the generator speed up to operating condition upon firing or launching of the missile.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from the following description and drawings in which:

FIGURE 1 is a longitudinal sectional view of a fuse incorporating the invention.

FIGURE 2 is a cross sectional view taken along line 2—2 of FIGURE 1.

Referring to the drawings where 1 indicates an electric generator powered proximity fuse affixed to an explosive projectile having a body 2 and an explosive charge 3 therein. The ogive 4 of the fuse is provided with an air duct 5 therethrough along its longitudinal axis through which air passes while the missile is in flight to drive a turbine coupled to an electric generator. The ogive may be assembled to body 6 of the fuse in a conventional manner as indicated by the reference numeral 7. An air chamber 8 is formed in the forward end of the body and in which is positioned an air turbine 9. Radially spaced exhaust ports 10 formed in the body extend from the air chamber 8 to the peripheral surface of the body. A longitudinal bore 11 extending from the base end of the body to the air chamber has a housing 12, containing an electric generator and electronic components of the fuse, positioned therein adjacent the air chamber. One end 13*a* of generator shaft 13 extends into the air chamber and rotatably supports therein the air turbine 9. The opposite end 13*b* of shaft 13 extends exteriorly of the housing 12 into bore 11 wherein it is supported by means of plate 14. Integral with shaft 13, adjacent end 13*b*, is a prong 15 adapted to engage a slot 17 formed in the free end of a spiral spring 16 positioned concentric with shaft 13 and having its opposite end fastened by means of screw 18 in the wall of bore 11. A booster 20 and detonator 21 are fixed in the rearmost part of bore 11. The detonator 21 is connected to the output of the electronic means by leads 22—23.

The wall 6*a* of air chamber 8 is provided with a radially disposed aperture 24 in which is inserted a spring loaded detent 25. A threaded sleeve 26 in the aperture

24 has one end extending exteriorly thereof in which are two diametrically disposed holes 27 and 28 through which is threaded an arming wire 29 for the purpose of holding the detent in engagement with the turbine 9 and thereby prevent its rotation until the missile is launched or fired.

In operation the ogive is removed and the turbine rotated manually or otherwise to wind the spring. When the turbine is rotated, prong 15 engages slot 17 to wind the spring about shaft 13. The detent is then inserted in aperture 24 and engages turbine 9. Arming wire 29 is then inserted in the holes formed in sleeve 26 to hold the detent in releasable engagement with the turbine. Upon launching or firing the missile, the arming wire is withdrawn and the detent ejected from the aperture permitting the turbine to spin due to the action of the spring. After the initial rotation has been imparted to the turbine by spring 16, the air stream through duct 5 assumes the task of causing the turbine to continue rotation.

I claim:

1. An electronic proximity fuse for explosive missiles comprising an ogive having an air duct therethrough along its longitudinal axis, a hollow body member affixed to the ogive and having a turbine chamber therein in communication with the duct, an electric generator provided with forwardly and rearwardly extending portions exteriorly of the generator, the forwardly extending portion supporting a turbine in said chamber, the rearwardly extending portion supported in said hollow body by a plate affixed therein, a tongue formed on said shaft intermediate said generator and said plate, a helical spring concentric with said shaft, the outer end of said spring affixed to the interior wall of said body, the inner end of said spring disposed adjacent said tongue and provided with a slot adapted to engage said tongue upon rotation of said turbine and thereby wind said spring, locking means in said body adapted to engage and lock said turbine against rotation after said spring has been wound, said locking means disengaging said turbine upon firing of said missile to permit said spring to impart initial rotation to said turbo-generator and disengage said tongue.

2. The invention of claim 1 wherein said locking means comprises a spring loaded pin slidably positioned in a radial perforation in the wall of said turbine chamber, the end of said pin being in releasable contact with the turbine, a sleeve in said perforation having one end exteriorly of the body, diametrically opposed holes in said one end, and an arming wire threaded through said hole and in restraining contact with the head of said pin.

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