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[54] **ROCKET WITH SPREADABLE EMPENNAGE**
5 Claims, 2 Drawing Figs.

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-3.29

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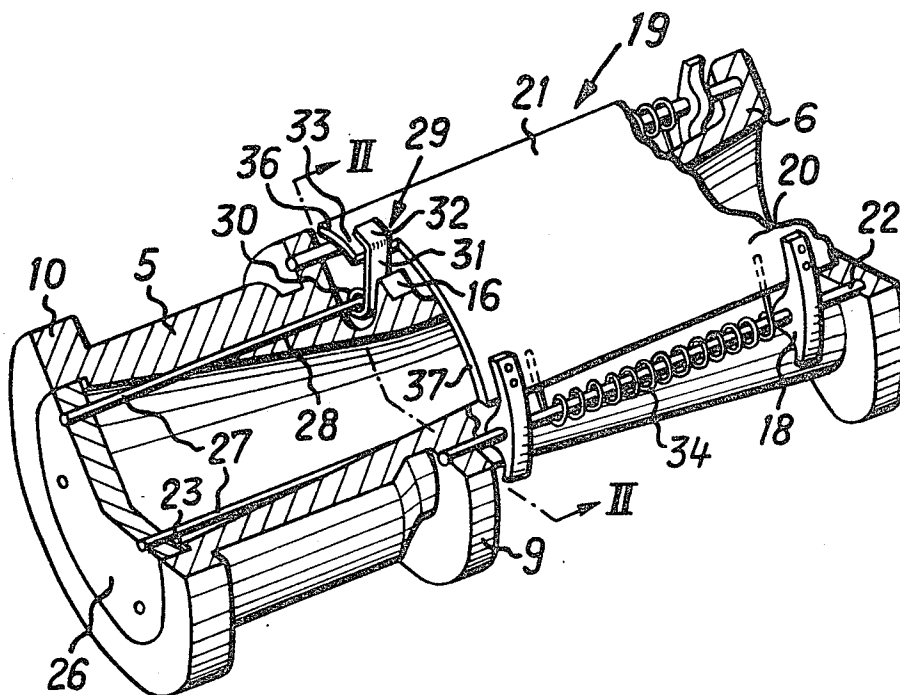
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ABSTRACT: Rocket with spreadable empennage comprising a nozzle body with pivotally mounted individual fins located around said body. Holding means releasable by gas pressure holding the fins in their folded-in position. The holding means for each fin comprising a holding member removable from said nozzle body supported in said nozzle body. A locking member cooperating with the holding member locks the fin and when the holding member is removed, releases the fin. The holding member extends inside the external surface of the nozzle body behind each fin.



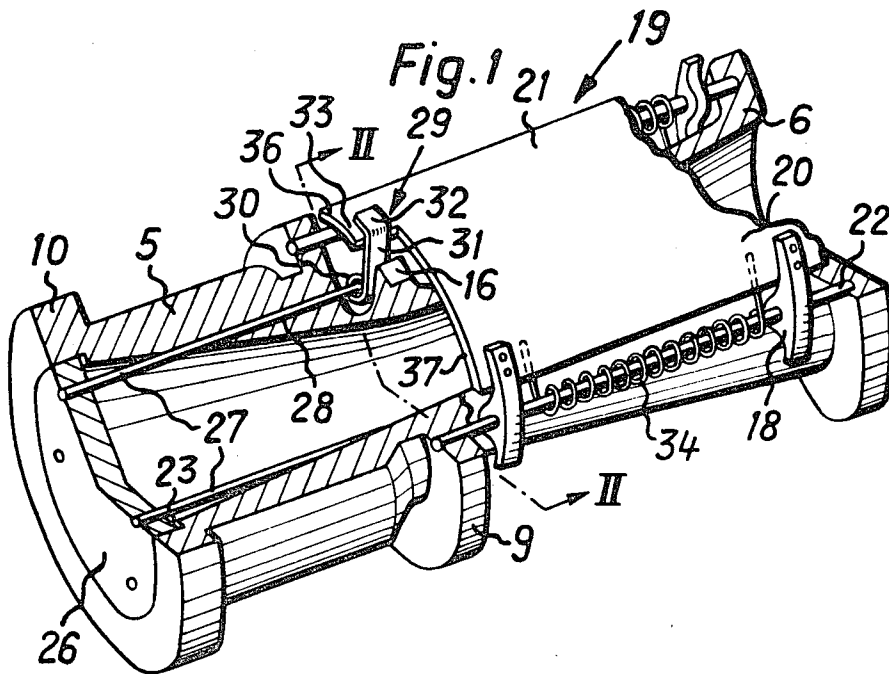
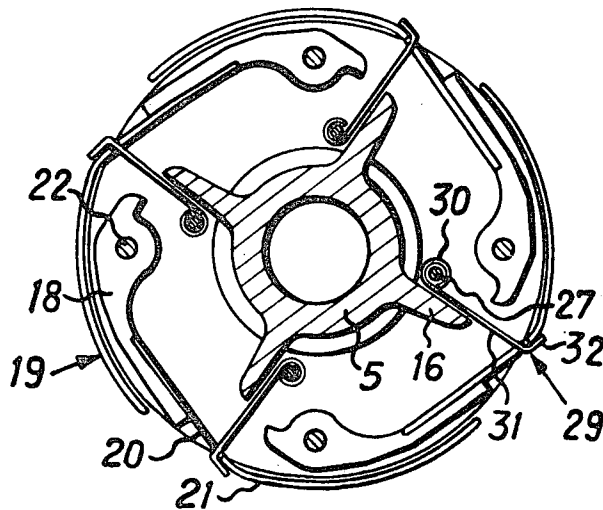


Fig. 2



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ROCKET WITH SPREADABLE EMPENNAGE

The invention relates to a rocket with spreadable empennage arranged around a nozzle body and consisting of individual fins which are held firm in their folded-in position by a holding device which can be released by the gas pressure.

In a known rocket of this kind the fins are held in the folded-in position by a bracket-shaped clamp, pushed over the end of the nozzle and the fins. This clamp slipped over the end of the nozzle body has the drawback that the outer surface of the end of the nozzle body is partially overlapped by the holding device. This is particularly undesirable, for example, if adjustable parts are arranged on this surface of the nozzle body, since the clamps prevent the adjustment of such parts.

It is an object of the present invention to avoid this disadvantage. The rocket according to the invention is characterized in this, that the holding device for each fin has a holding member supported in the nozzle body, but adapted to be removed therefrom, and which is assembled with a locking member holding the fin and said locking member releases the fin when the holding member is removed and the holding member extends inside the external surface of the nozzle body behind the fin.

With the above and other objects in view which will become apparent from the detailed description below and shown in the drawings, a preferred embodiment of the invention is shown in the drawings in which:

FIG. 1 is a diagrammatic perspective view of the rear end of a rocket partly in cross section and partly in elevation with the fins folded in and held by the holding device; and

FIG. 2 shows a cross section at the narrowest part of the nozzle.

A nozzle body 5 has in front a flange 6, a second flange 9 in the middle and a flange 10 at the rear end. There are supported in the two flanges 6 and 9 of the nozzle body 5 four axes 22 (FIG. 2) on which hub portions 18 of the fins 19 are pivoted.

The fins 19 have a flat portion 20 and a cylindrical portion 21. The hubs 19 are fixed on the flat part 20 of the fins 19. The cylindrical parts 21 of the four fins 19, in the folded-in position, form an almost uninterrupted cylindrical surface of the same diameter as the external diameter of the rocket. The trailing edge of the fin 19 is situated in the region of the narrowest cross section of the nozzle, the trailing edge 36 of the cylindrical part 21 being further behind than the edge 37 of the flat part 20, so that an offset 33 is formed.

The nozzle is closed by a disc 26, which protects the propellant charge (not shown) from atmospheric influences. The disc 26 is inserted and firmly stuck in a groove 23 on the rear end of the nozzle body 5. Four acicular holding members 27, parallel to the axis of the nozzle are fixed to the disc 26, and the holding members project forwardly through boreholes 28 in the nozzle body 5 into the space between the nozzle body 5 and the fins 19. Locking members 29 with their lugs 30 are put

on these holding members 27. The members consist of rectangularly bent-back strips. The back 31 of each hook-shaped locking member 29 is supported on a projection 16 of the nozzle body 5 and the trailing edge rests on the leading edge of flange 9. Moreover, each locking member 29 is supported by the leading edge on the edge 37 of the fin, and by its hooked part 32 on the offset 33 of a fin 19. The hooked parts 32 of the locking members 29 are substantially the same width as the offsets 33 on the trailing edge of each fin 19. Spiral springs 34 are arranged around the axes 22 of the fins 19, and said springs endeavor to swing up the fins 19.

The device described operates in the following manner: When a rocket is launched from a launcher tube (not shown), after the ignition of the propellant charge the disc 26 is flung away by the pressure (forming in the combustion chamber) of the combustion gases. The holding members 27 fixed to the disc 26 are thereupon withdrawn from the lugs 30 of the locking members 29 and release the latter. As soon as the rocket emerges from the launcher tube, the fins can be swung up under the force of the springs 34, so that they are substantially to the nozzle body 5. The locking members 29, since they are no longer held by the holding members 27, are thereupon drawn out from the fins 19 and blown away rearwardly by the airflow.

I claim:

1. Rocket with spreadable empennage comprising a nozzle body, a plurality of pivots arranged parallel to the rocket axis, a plurality of fins mounted on said pivots located around said nozzle body, holding means releasable by propellant gas pressure holding said fins in their folded-in position, said holding means for each fin comprising a holding member extending inside the external surface of said nozzle body behind said fin, said holding member supported in said nozzle body removable from said nozzle body by said propellant gas pressure, a locking member holding said fin cooperating with said holding member, said locking member, when said holding member is removed, releasing said fin.

2. Rocket according to claim 1 wherein each of said locking members is formed from a strip bent back in the shape of a hook having a lug placed on said holding member.

3. Rocket according to claim 1 wherein a disc is located on the end of said nozzle body to which said holding members are fixed and said nozzle body has boreholes parallel to the axis of said nozzle body through which said holding members project in the space between said nozzle body and fins.

4. Rocket according to claim 2 wherein said fins have on their trailing edge an offset in engagement with said hook of said locking members when said fins are folded.

5. Rocket according to claim 2 wherein a flange is provided on said body and said strip forming the locking member has two edges and one rear side, one of said edges being supported on said flange and the other edge being supported on the trailing edge of each fin and said rear side being supported on a stationary surface of said nozzle body.