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LAUNCHING APPARATUS

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Fig.1

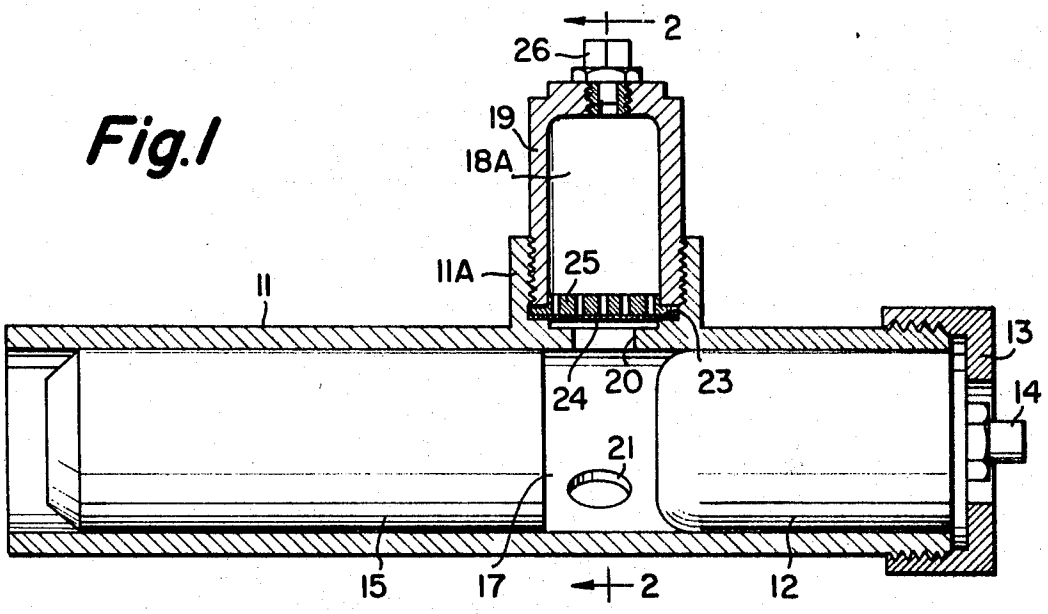
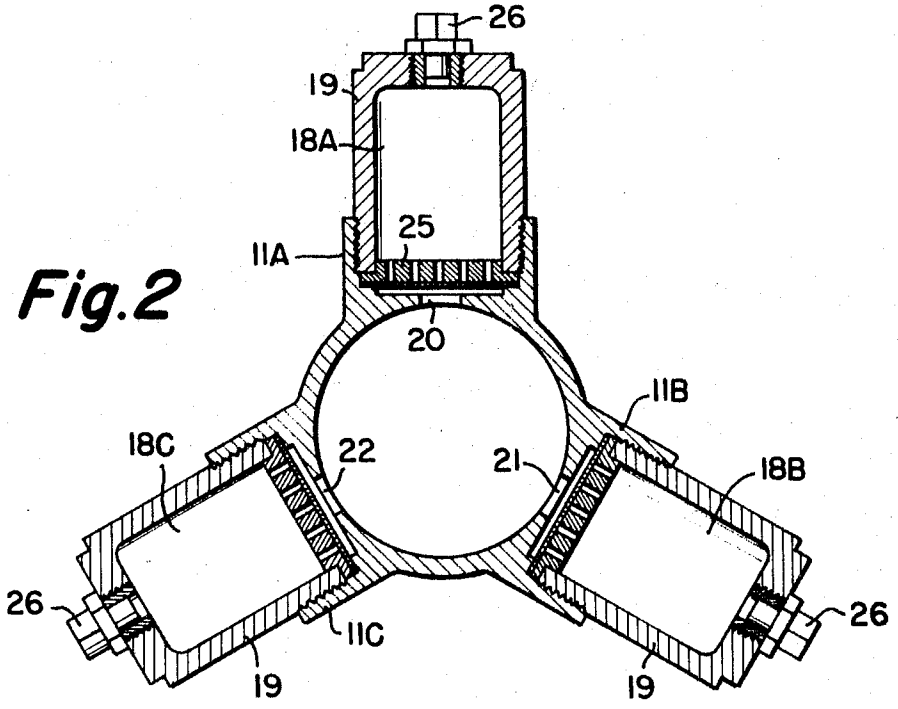


Fig.2



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LAUNCHING APPARATUS

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U.S. Cl. 89—1 3 Claims

ABSTRACT OF THE DISCLOSURE

This invention is directed to a launching arrangement having means for selectively providing one of a predetermined variety of projected mass velocities. This is obtained by selectively varying the effective volume of a pressure gas developing chamber that normally is provided intermediate a mass to be launched and a pressure gas producing cartridge. Prior to firing of the main ignition element, selected auxiliary ignition means associated with one or more auxiliary chambers are actuated to rupture a particularly supported diaphragm that normally precludes fluid communication between its corresponding auxiliary chamber and the main pressure gas developing chamber.

The invention described herein may be manufactured, used, and licensed by or for the Government for governmental purposes without the payment to me of any royalty thereon.

This invention relates to a launching arrangement and, more particularly, to a variable velocity launcher.

A requirement has existed for means to launch a mass at selected one of a predetermined variety of projected mass velocities.

It is an object of the invention to provide a predetermined selective velocity mass launching media that does not require alteration of developmental energy.

Another object of the invention is to provide such variable velocity launching media which can be controllably operated at a remote location.

A further object of the invention is to provide such launching media which utilizes an auxiliary shock effect to produce a predetermined incremental velocity change for a given projected mass.

These and other objects, advantages and features will become more apparent from the following description and accompanying drawings in which:

FIG. 1 is a longitudinal sectional view of a launching arrangement embodying the principles of the invention.

FIG. 2 is a sectional view taken along line 2—2 of the FIG. 1 arrangement.

The variable velocity launcher has a barrel tube **11** (FIG. 1) that normally seats therein a propellant cartridge **12** adjacent a rearward end cap **13** which is threadedly secured to barrel **11** and centrally apertured to receive a main ignition element **14** that preferably is electrically activated. The mass **15** to be launched is normally seated in the barrel forwardly of and in longitudinally spaced relationship to the cartridge **12**, thereby defining an intermediate initial pressure gas developing chamber **17**.

Preferably, the ancillary or auxiliary void volume chambers **18A**, **18B**, **18C** (FIGS. 1, 2) within similarly constructed cylinders **19** are adapted to be placed in fluid communication with main chamber **17** via barrel openings **20**, **21**, **22**. Each chamber **19** is threadedly secured to a corresponding internally threaded circular boss **11A**, **11B**, **11C** on barrel **11**. Each boss interior has an appropriate annular shoulder **23** for seating a rupturable diaphragm **24** and its plural apertured or perforated supporting plate **25** which is secured in place by the inward open end face of the corresponding chamber shell **19**.

The outer end of chamber shells **19** are each provided with a threadedly attached electrical ignition element **26** which is selectively detonated in response to the corresponding electric signal actuating command. The detonation of selected elements **26** is performed prior to the main ignition element detonation and cartridge ignition. Those diaphragms **24** not selected for rupturing will be supported by their corresponding plates **25** to withstand the gas pressure developed by the main charge. However, those selected auxiliary void volumes or chambers, whose unsupported diaphragms are ruptured via their apertured support plate by the shock wave effect of a respectively detonated auxiliary ignition element **26**, are thus in fluid communication with the main pressure chamber when the main cartridge is ignited. Thus, by rendering selected ones of the normally interrupting diaphragms ineffective, the initail and final volumes of the respective expansion ratios may be selectively increased to thereby reduce the final launched mass velocity.

Various modifications, changes or alterations may be resorted to without departing from the scope of the invention as defined in the appended claims.

I claim:

1. In a launching arrangement having a tubular member, pressure gas producing means positioned in a rearward portion of said tubular member, a launchable mass in the forward portion of said tubular member, said mass and gas producing means being longitudinally spaced and defining a pressure gas developing chamber therebetween, and main ignition means supported on the rearward end of said tubular member for actuating said gas producing means,

a plurality of auxiliary closed chambers positioned laterally of said gas developing chamber,

said tubular member having a plurality of apertures correspondingly aligned with said chambers for fluidly communicating said gas developing chamber with said auxiliary chambers,

means normally interrupting fluid communication between said gas developing chamber and said auxiliary chambers, and

means including a plurality of selective ignition elements for rendering said normally interrupting means ineffective.

2. The arrangement of claim **1** in which each auxiliary chamber has a diaphragm extending thereacross adjacent its corresponding aperture, a perforated plate for supporting the respective diaphragm against bursting in a direction away from said tubular member, and a corresponding one of said ignition elements for selectively bursting the respective diaphragm toward said gas developing chamber.

3. In a launching arrangement having a tubular member, pressure gas producing means positioned in a rearward portion of said tubular member, a launchable mass in the forward portion of said tubular member, said mass and gas producing means being longitudinally spaced and defining a pressure gas developing chamber therebetween,

and main ignition means supported on the rearward end of said tubular member for actuating said gas producing means,

auxiliary chamber means positioned laterally of said gas developing chamber and having diaphragm means extending thereacross,

said tubular member having apertured means adjacent said diaphragm means for fluidly communicating said gas developing chamber with said auxiliary chamber means,

means including perforated plate means and said diaphragm means for normally interrupting fluid communication between said gas developing chamber and said auxiliary chamber means, said plate means supporting said diaphragm means against bursting

in a direction away from said tubular member, and ignition means for bursting said diaphragm means toward said gas developing chamber and rendering said normally interrupting means ineffective.

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