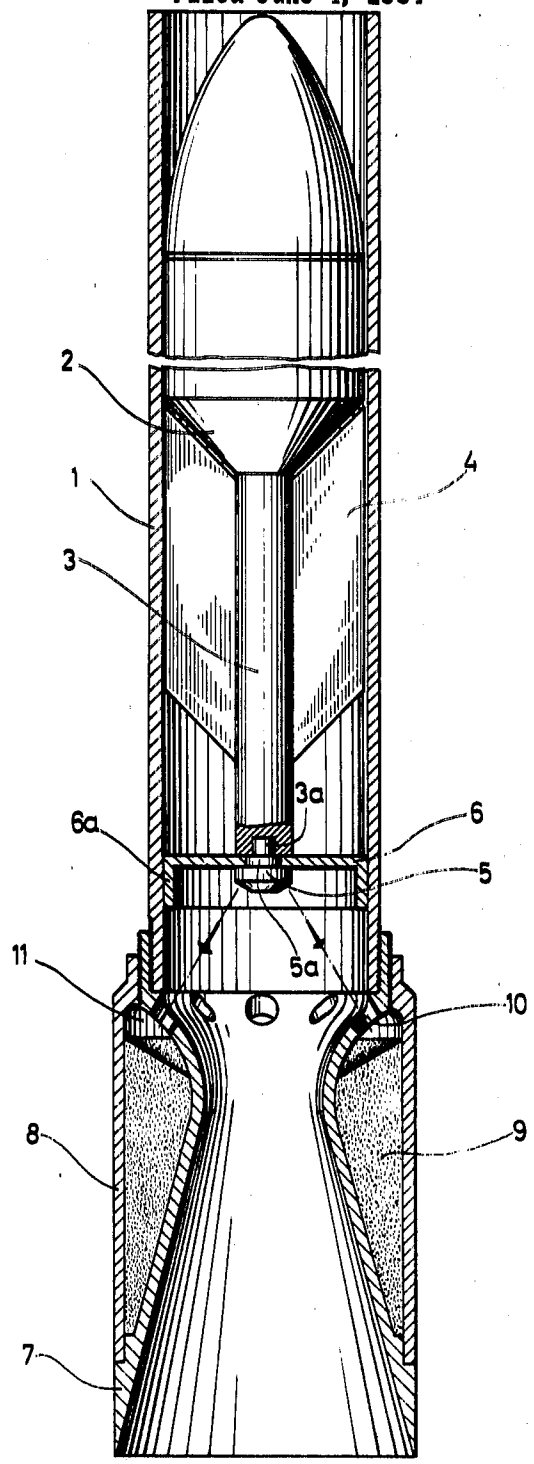
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RECOILLESS GUN

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RECOILLESS GUN

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U.S. Cl. 89—1.7 1 Claim

The invention relates to a recoilless gun, and more particularly to an arrangement of the propellant charge for a recoilless gun through which a rocket-projectile may be fired.

It is a general object of my invention to arrange the propellant charge in such a way that the gas-pressure forces becoming effective on front and aft of the nozzle-throat cross-section essentially balance each other in the axial direction of the launching tube.

Still another primary object of my invention is to provide a new and improved recoilless gun which has a sturdy and short construction and has a diameter which is but slightly greater than the diameter of the projectile to be launched.

The invention will be better understood from the following description when considered in connection with the accompanying drawing and its scope is indicated by the appended claim.

The single figure of the drawing is a longitudinal cross-sectional view of an embodiment of the invention. In this figure the projectile **2** is positioned within the tube-shaped portion of the launching device, indicated as **1**. At the rear part of the projectile a stud **3** has been designed for flight stabilisation and wings **4** being arranged at said stud unfolding backwards after leaving the tube.

The free end of stud **3** of the projectile has a hole **3***a* into which a fuse **5** is inserted. Said fuse has a spigot **5***a* supporting itself against the frontal area of the stud and carrying a cartridge-case base **6**. Said cartridge-case base has a collar-shaped part **6***a* essentially resting against the internal circumference of tube **1** and falling off from the stud of the projectile as soon as the projectile has left the tube.

Part **7** is a nozzle screwed to the rear end of the tube and being faired on its outside with a jacket **8**. According to the invention the propellant charge **9** is accommodated in the annular space **11** which is formed by jacket **8** and by outer wall of the nozzle. It can moreover be seen in the figure that the nozzle **7** is provided at the beginning of the convergent part with holes **10** or one or several slot-shaped openings respectively, which are not shown in detail and which are so designed and arranged that after the ignition of ignition charge **5** its explosive flames leak into the annular space **11** through said holes or openings, respectively, and ignite the propellant charge. The combustion gases of the propellant charge leave the annular space through the same openings **10** and impinge upon cartridge-case base **6**.

As compared with the conventional arrangements of propellant charges the arrangement of the charge according to the invention has the advantage that the diameter of the rear part of the launching device is consideraby reduced due to the fact that the annular space **11** surrounding the nozzle throat is used for housing the propellant charge and that the tube length is reduced due to the arrangement of the cartridge-case base at the end of the stud of the projectile, the distance of acceleration remaining the same.

Hence the weight of the whole launching device is reduced and its handling is improved due to these two measures. The combustion of the propellant charge, already imparts the combustion gases an impulse in launching direction, and for launchings for which maximum flatness is desired said combustion allows a further reduction of the time required for propulsion of the projectile as compared to hitherto known arrangements, since for feeding the nozzle only one more or less considerable however definite portion of the combustion gases is necessary depending on the terminal speed of the projectile, while the portion of the combustion gases that follow the projectile increases with increasing speed of the projectile and reversing the direction of flow of said portion of the combustion gases is not necessary with the arrangement according to the invention.

In launching devices as described that desired leak of recoil can only be guaranteed in a certain point of this process which is inherently unsteady, however the force of recoil which in any case acts forward first and then backward can be influenced to the effect of minimizing the resulting impulse by choosing properly the ratio of nozzle area ratio to calibre of the launching tube under consideration of restricting conditions.

I claim:

1. A recoilless gun including a launching tube from which a rocket-projectile can be fired, an expansion nozzle at the rear end of the tube, said nozzle being rigidly connected with the tube, a cylindrical jacket surrounding said nozzle, said jacket being rigidly connected to the nozble, a solid-propellant charge for expelling the rocket-projectile out of the launching tube, said solid-propellant charge being accommodated in the annular space between the nozzle wall and the jacket surrounding the nozzle, discharge openings for the combustion gases of the solid-propellant charge, said openings being arranged in the wall of the nozzle at the beginning of the convergent part equidistant to each other and on a circumference, the axes of said discharge openings lying on a lateral area of a cone and intersecting the longitudinal axis of the launching tube, a cartridge-case base being arranged in the launching tube behind the rocket-projectile, and a fuse located at the centre of said cartridge-case base for igniting said solid-propellant charge, said cartridge-case base with said fuse being arranged in the launching tube at such a distance from the discharge openings that, when igniting the ignition charge, the explosion flames of said ignition charge leak through said discharge openings and ignite said solid-propellant charge.

No references cited.

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