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CARTRIDGE CASE EXTERIOR AS INNER SURFACE OF ARCUATE GUN NOZZLES

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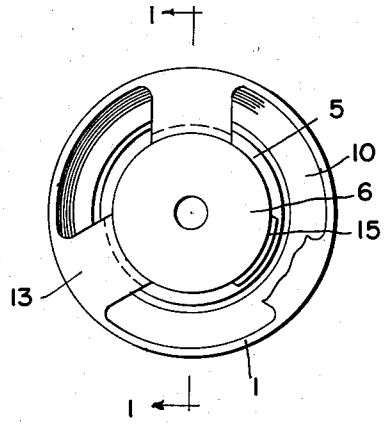


FIG. 2.

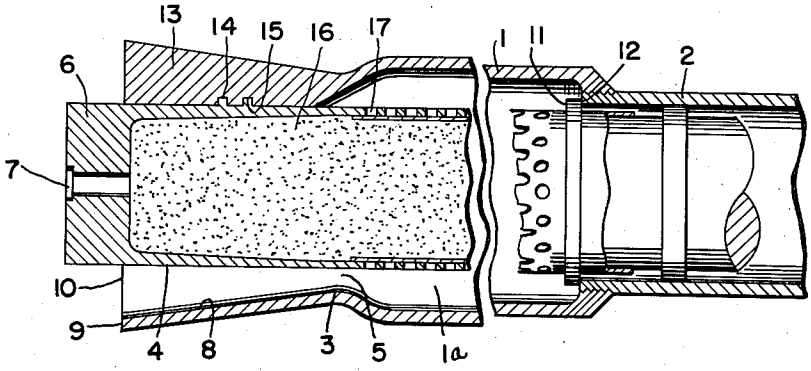


FIG. 1.

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CARTRIDGE CASE EXTERIOR AS INNER SURFACE OF ARCUATE GUN NOZZLES

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1 Claim. (Cl. 89—1.7)

(Granted under Title 35, U.S. Code (1952), sec. 266)

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

This invention relates to a recoilless gun in combination with a cartridge case for fixed ammunition and has for an object to provide a lighter weight recoilless type gun by having such a case for recoilless rifles in which the rear exterior surface of the case forms wall portions of arcuate venturi gun nozzles.

A further object is to provide a rifle of shorter length due to the absence of the breechblock and breech mechanism.

A still further object is to facilitate manufacture of rifles by reducing the complexity of machining problems inherent in producing conventional nozzles heretofore either machined from solid bar stock or assembled from several carefully fitted pieces machined from forgings or bar stock whereby the inner surface of the annular nozzle was, of necessity in either case, larger than the case diameter. This is caused by the requirement of breech loading and consequently the cartridge case is inserted through a hole in the breech whose outer surface forms the inner portion of the annular nozzle. This increases the overall diameter of the weapon with an attendant increase in weight. For example, a 105 mm. rifle with the hitherto conventional annular nozzle is about ten and one-half (10½) inches in diameter at the breech, while a rifle utilizing the cartridge case as the inner surface of the annular nozzle is only six and three-quarters (6¾) inches in diameter, resulting in an appreciable reduction in weight of the gun.

A preferred embodiment of the invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is a vertical cross section of Fig. 2 taken along line 1—1 showing the cartridge case exterior as the inner surface of an annular venturi.

Fig. 2 is an end view of the recoilless rifle with the cartridge case in place.

Similar numerals refer to similar parts throughout the several views.

As illustrated in Fig. 1, chamber 1 of the rifle has a barrel 2 screwed to its forward end, the opposite end having a locally reduced diameter 3 which, in conjunction with the outside rear diameter 4 of the cartridge case, constitutes the annular venturi 5. From this point rearward the chamber wall 8 expands in diameter to 9 while the case continues rearward at essentially a uniform outside diameter forming the exit 10 of the venturi section.

Actuation of the primer 7 causes the powder 16 in the cartridge case 6 to ignite, the gases resulting therefrom moving radially outward through the case openings 17 into the chamber area 1A in which they change their direction and flow rearwardly through the annular venturi openings 5 between the inwardly extending projections 13, radial spiders making their final exit at 10.

The cartridge case is inserted into the chamber of the rifle until shoulder 11 on the case abuts the chamber end 12 of the barrel. The shoulder 11 being interrupted so that it can pass the spider 13. In this position the lugs 15 or interrupted threads on the case are adjacent the grooves 14 cut in the spiders 13 that extend radially inward being integral with the expanding walls of the chamber. Rotation of the case in either clockwise or counterclockwise direction a predetermined angular distance results in the cartridge case threads becoming engaged with the grooves in the spider, thereby preventing rearward ejection of the projectile during firing.

Fig. 2 is a full end view of Fig. 1 showing the segmented annular venturi 5 between the radially inward projecting spiders 13 and the engaged lugs or threads 15 on the cartridge case whereby the cartridge case is securely held in place during firing.

It will be apparent from the foregoing detailed description that many variations, modifications and deviations from the specific embodiment disclosed will occur to one skilled in the art without departing from the spirit and scope of the present invention and I therefore intend to be limited only in accordance with the following claim. The outer walls of chambers 1 and 8, and the generally radial walls of the spider 13 constitute an enlargement secured to the barrel 2 as illustrated.

I claim:

In a recoilless type gun having a barrel, a projectile receiving chamber in a rear portion of said barrel, a cartridge case secured to a projectile, the side walls of said cartridge case being perforate for radial emission of the products of combustion of propellant, and an enlargement forming venturi passageways at least in part and secured to said barrel around said projectile receiving chamber, the combination therewith of the improvement enabling the length and weight of said gun to be substantially reduced by having a rear cylindrical wall surface of said cartridge case serve as venturi inner wall portions, said improvement including a spider forming a support for a rear portion of said cartridge case behind its perforate portion, said spider being integral with said enlargement and forming a plurality of generally radial walls separating said venturi passageways, the cartridge supporting radially inner end surfaces of at least some of said walls being provided at least one lug receiving groove, and lugs on said cartridge case for reception in said grooves on rotation of said cartridge case with respect to said gun and its enlargement, said walls being angularly spaced to leave portions of the cartridge case cylindrical surface exposed to products of combustion and whereby such surface portions of the cartridge case may serve as radially inner walls of said venturi passageways and the total weight of the recoilless gun greatly reduced.

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