Feb. 7, 1961 A. J. GRANDY 2,970,520

RECOILLESS RIFLE BREECH

Filed July 10, 1959 2 Sheets-Sheet 1

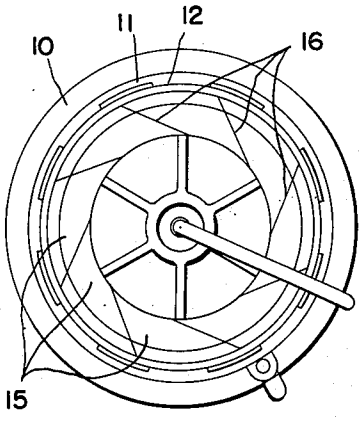


FIG. 1.

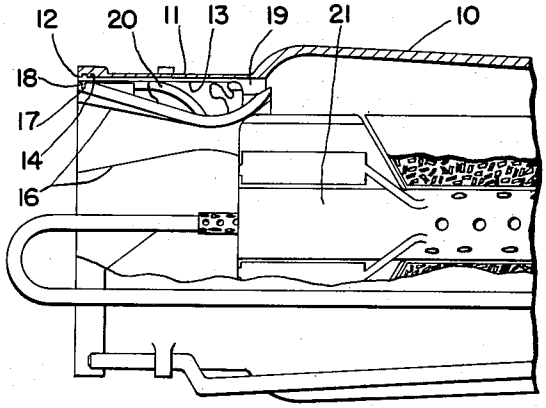


FIG. 2.

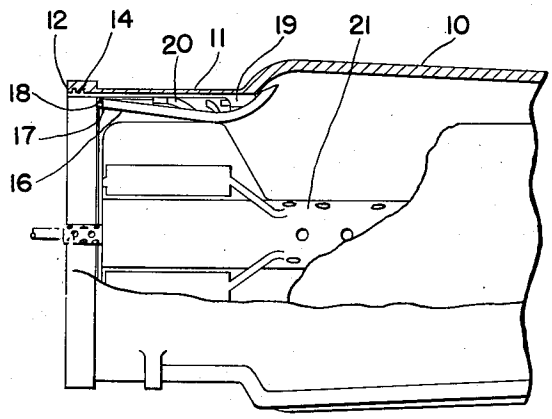


FIG. 3.

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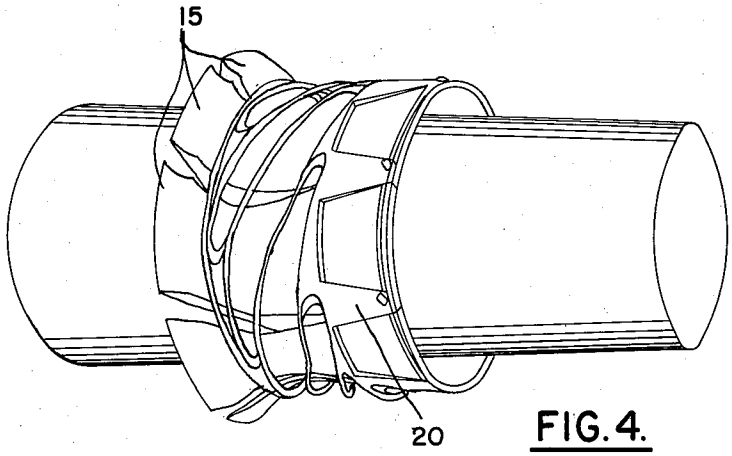


FIG. 4.

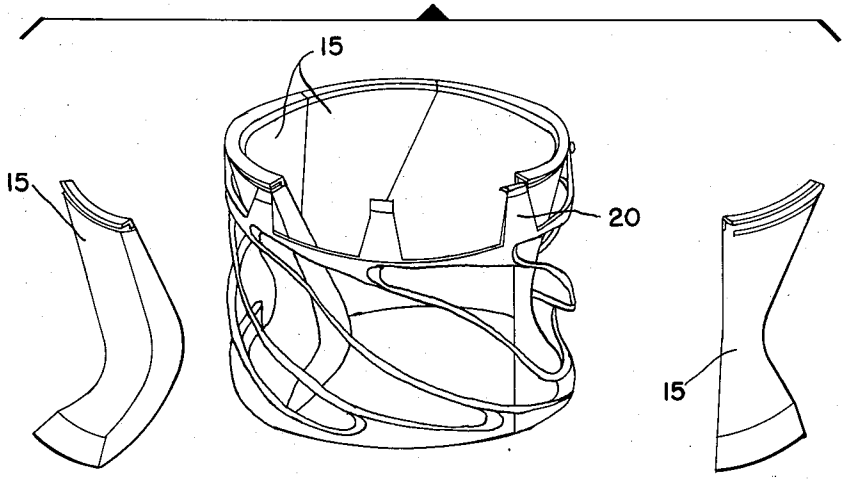


FIG. 5.

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RECOILLESS RIFLE BREECH

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4 Claims. (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 to me of any royalty thereon.

This invention relates to recoilless rifles, and more particularly to an improved segmented recoilless rifle nozzle wherein the segments are so formed and arranged as to minimize gas leakage therebetween.

It has been proposed to form a recoilless rifle nozzle of a plurality of segments which are spring biased to one position to form a nozzle or venturi opening out of the chamber and are extensible into the chamber to enlarge this opening upon compression of the spring. As heretofore constructed, the segments of such nozzles have engaged one another along surfaces which are parallel with the diametrical dimensions of the rifle chamber. While this type of nozzle has the advantage that the opening through it is readily enlarged to permit the insertion of a cartridge, it is found that the gas pressure incident to the firing of the cartridge tends to force the segments apart. As a result of this gas leakage, the segments and their associated parts are eroded, the rifle is unbalanced and the useful life of the nozzle is shortened.

In accordance with the present invention, this difficulty is minimized by so forming the venturi segments that they engage one another along surfaces which are angularly disposed with respect to the diametrical and axial dimensions of the chamber. Under these conditions, the segments overlap one another in their closed position, and the gas pressure incident to the firing of the rifle tends to tighten the seams between the segments. As a result, leakage of gas between the segments is minimized or altogether avoided.

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

Referring to the drawings:

Fig. 1 is a breech end view of the improved nozzle,

Fig. 2 is a transverse section of Fig 1 with the nozzle segments engaged with one another,

Fig. 3 differs from Fig. 2 in that the nozzle is held open by a partially inserted cartridge,

Fig. 4 illustrates the nozzle as held open by a piece of tubing, and

Fig. 5 shows the nozzle as partially disassembled.

The recoilless rifle of Figs. 1 and 2 includes a chamber **10** which is attached at one end to a barrel (not shown) and at the other end to a cylindrical extension **11**. At the breech end of this extension is a series of interrupted lugs **12**. Fitted within the extension **11** is a support **13** which has a series of interrupted lugs **14** adapted to engage the lugs **12** for locking the nozzle and its support in the extension **11**. With this arrangement, the support **13** may be rotated until the lugs are disengaged thus permitting the nozzle and its support to be removed as a single unit.

The nozzle includes a plurality of segments **15**. As clearly shown in Fig. 1, the meeting surfaces **16** of these segments are angularly disposed with respect to the diametrical dimensions of the chamber **10** and the extension **11**. They are also angularly disposed with respect to the axis of the chamber and extension. As a result, the adjacent sides of the segments overlap when they are in the position illustrated and the outward gas pressure incident to the firing of a cartridge tends to tighten the seam between them.

Anchored in grooves **17** near the breech ends of the segments **15** is a flange **18** which is a part of a spring **20**. The other end of this spring rests against a flange **19** near the inner end of the support **13**. It can be seen that the flange **19** provides a bearing surface for the inner ends of the segments **15**.

In the operation of the nozzle, the spring is compressed by the insertion of a cartridge **21** and the inner ends of the segments ride along the flange **19** into the position indicated by Figs. 3 and 4. When the cartridge is fully inserted, the segments are automatically returned by the spring **20** to the position indicated by Fig. 2.

Fig. 5 indicates somewhat more clearly the contour of the segments **15** and their relation with the spring **20**. While the segments are disclosed as having their meeting surfaces angularly disposed with respect to both the diametrical and axial dimensions of the chamber, it will be apparent to those skilled in the art that the gas leakage is materially reduced if these surfaces are angularly disposed only with respect to the diametrical dimensions of the chamber.

I claim:

1. In a recoilless rifle having a chamber attached at one end to a barrel and at the other end to a tubular extension, the combination therewith of means including a plurality of segmental members supported in said extension and formed with their adjacent edges angularly disposed with respect to the diametrical dimension of said extension, and means including a spring arranged between the breech end of said chamber and the breech ends of said members to bias said members to a position where they form a venturi opening out of said chamber with their adjacent edges overlapping one another, said members being extensible into said chamber to enlarge said opening upon compression of said spring.

2. A recoilless rifle according to claim 1 wherein the sides of said segmental members are angularly disposed with respect to the axis of said extension.

3. A recoilless rifle according to claim 1 wherein said segmental members are mounted within a support which is removable from said extension.

4. A recoilless rifle according to claim 3 wherein said support and said extension are intercoupled by interrupted lugs.

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