July 5, 1949. K. R. FOWLER 2,475,384

VENTURI VISE

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Fig. 1.

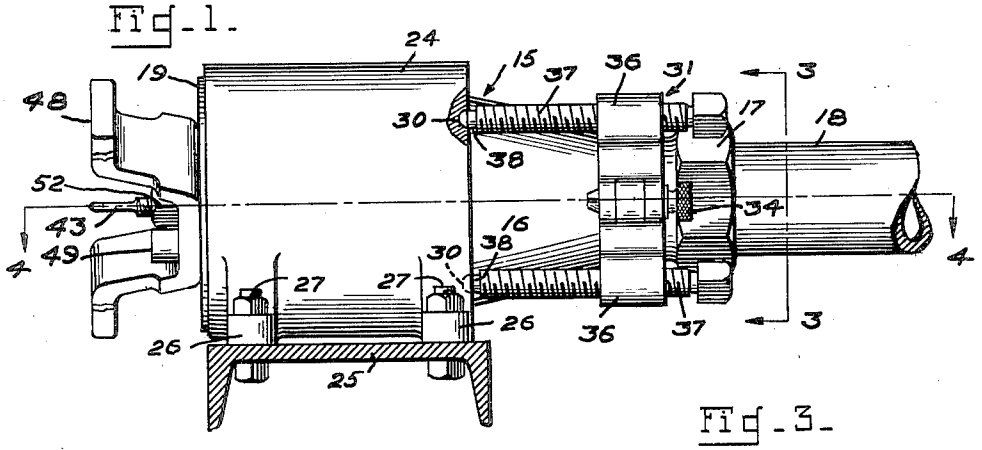

Fig. 3.

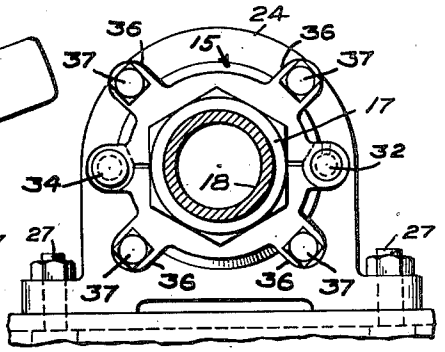

Fig. 2.

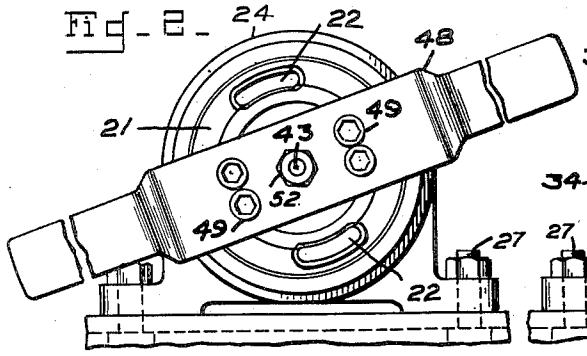

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Fig. 4.

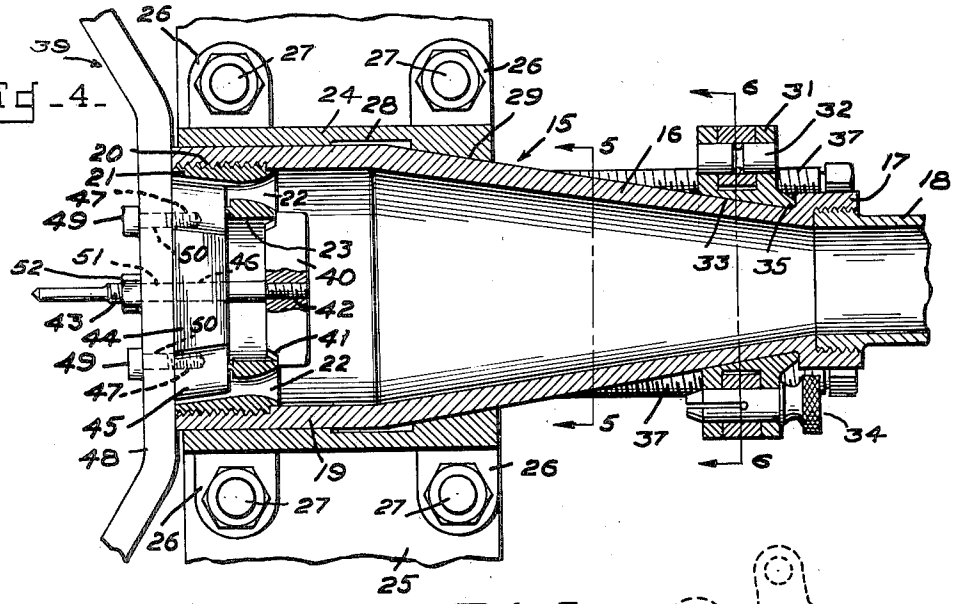


Fig. 5.

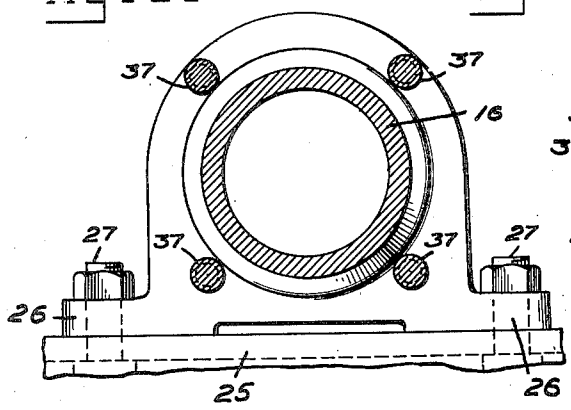
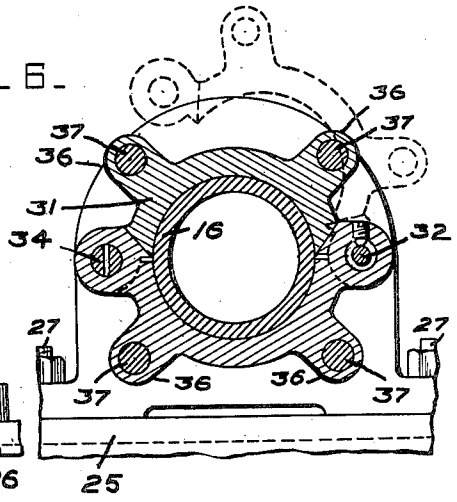


Fig. 6.



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VENTURI VISE

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Application September 20, 1946, Serial No. 698,179

1 Claim. (Cl. 279—1)

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My invention relates to vises, particularly to a vise to be used in combination with a Venturi wrench in unscrewing and removing the removable Venturi section in the servicing of the 75 mm. recoilless rifle Model T–21–E4, or other similar recoilless rifle.

Upon ignition of the propelling charge, equal and opposite reactions occur within the chamber of a rifle. In the standard rifle, the expanding gases of the burning propellant create a pressure which forces the projectile forward through the gun tube, and, at the same time, exerts a force to the rear against the breech block causing the gun to recoil. In the recoilless rifle, this force is neutralized by allowing the gases to escape through the breech block, and the ballistics of the gun and the gas escape orifices are designed to produce equal forward and rearward forces which nullify each other. These gas escape orifices are, in addition, designed to cause the gases escaping to the rear to exert a force equal and opposite to the torque induced by the projectile as it passes through the bore of the rifle, thus preventing the rifle from twisting and turning.

A recoilless rifle is provided with a generally conical chamber in which the firing mechanism of the piece and the Venturi section containing the above mentioned gas escape orifices are mounted. In the accompanying drawings, the firing mechanism is omitted since it forms no part of the invention and is well known in the art, and only the chamber and the removably attached Venturi member are shown.

The chamber section is a hollow, light-walled frusto-conical section having an extended straight cylindrical portion at the large end of the cone and a smaller cylindrical collar at the apex end for attaching the chamber to the gun tube. The Venturi section is screwed into the rear of the chamber, removably secured to the inner circumference of the cylindrical portion, with its rear end flush with the rear end of the chamber.

It is frequently necessary to remove this Venturi section, but after the gun has been fired a number of times the removal becomes a very difficult task. The outside of the chamber is smooth and without any flats or projections which would aid in holding it, and sideways pressure on the rear of the chamber tends to distort it and bind the Venturi threads.

My invention is designed to overcome these difficulties. It comprises, generally, a vise body to be mounted on a suitable base and having a

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guide bore in which the chamber fits loosely. A hinged clamping collar locks over the apex end of the conical section, shouldering against the collar which secures the chamber on the tube. The clamping collar is provided with a plurality of jack screws adapted to be tightened against the vise body, to force the taper section of the chamber into the tapered bore of the vise body, and holding the chamber solidly and without distortion while the venturi is being unscrewed by means of a wrench which engages within the Venturi member.

The principal object of my invention is to provide means which will hold the chamber of a recoilless rifle against rotation while the attached Venturi section is being removed.

An important object of my invention is to provide means which, while holding the chamber of a recoilless rifle against rotation, does not injure the said chamber or prevent removal of the attached venturi.

Another important object of my invention is to provide a vise which when used in combination with a wrench will cooperate in the removal of the venturi of a recoilless rifle without damaging the chamber.

A further object of my invention is to provide a vise for use in combination with a wrench for removing the Venturi section of recoilless rifle which is portable, novel in design, easy to manufacture, simple to use, and efficient in operation.

Other objects and advantages of my invention will become apparent to one skilled in the art during the course of the following specification, and accompanying drawings, forming part of the specification, wherein like numerals are used to designated like parts throughout the specification and drawings.

In these drawings:

Figure 1 is a side elevation of my invention combined with a Venturi wrench and attached to the chamber of a recoilless rifle,

Figure 2 is a front elevation of the same,

Figure 3 is a rear elevation of the same, taken on the line 3—3 of Figure 1,

Figure 4 is a longitudinal section taken substantially on the line 4—4 of Figure 1,

Figure 5 is a transverse section taken on the line 5—5 of Figure 4, and,

Figure 6 is a transverse section through the hinged clamping collar, taken on the line 6—6 of Figure 4, the dash lines indicating the manner of attaching it to the chamber.

Referring now to the drawings, particularly to

Figures 1 and 4, the numeral 15 designates generally the chamber of a 75 mm. Model T-21-E4 rifle, the firing mechanism usually associated with said chamber being omitted for clarity since the said mechanism is well known and forms no part of the invention. The said chamber has a frusto-conical front portion 16 provided with an internally flanged collar 17 at its apex end whereby the said chamber 15 is removably secured to the gun tube 18, and a cylindrical rear portion 19, internally threaded at its rear end to securely engage by screwing, as at 20, an externally threaded member 21 provided with a plurality of gas escape orifices 22, and a larger central orifice 23. The Venturi member 21 is screwed tightly into the cylindrical portion 19 until its rear end is flush with the rear end of the chamber 15.

My invention comprises a cylindrical vise body 24 adapted for mounting on any suitable base, such as the structure channel 25, bored lugs 26 being provided on said body to permit attachment to the base by means of bolts and nuts, as at 27.

The body 24 is provided with a longitudinal cylindrical bore 28 whose diameter is slightly larger than the outside diameter of the cylindrical portion 19 so that the said portion 19 may fit loosely therein. The bore 28 terminates at its front end in a relatively short taper bore 29 having the same angle of taper as the conical portion 16 so that the said conical portion 16 will fit tightly therein when forced into said taper bore 29 in a manner to be hereinafter described. The front face of the body 24 is also provided with four drilled recesses 30, for a purpose which will become apparent in the course of this specification.

A hinged clamping collar 31 having a hinge pin 32 is provided with a longitudinal tapered bore 33 which fits over the forward end of the chamber 15 and is locked on said chamber 15 adjacent in the flanged collar 17 by means of a lock pin 34. An annular flange shoulder 35 formed on the said collar 31 bears against collar 17. The said clamping collar 31 is arranged with four outwardly extending ears 36, the said ears being provided with internally threaded openings therethrough and spaced apart so that these openings may be aligned with the recess 30 in the body 24. Headed jack screws 37 are threadedly engaged in the said openings, the ends 38 of said screws being of reduced diameter to fit into the recesses 30 of the body 24 to prevent rotation of the clamping collar 31 when the jack screws are tightened.

The Venturi wrench, shown in the drawings and referred to generally by the numeral 39, is shown to illustrate the manner in which such a wrench is attached to a venturi, and the manner in which it cooperates with my invention. It comprises a keeper 40 provided with a boss 41 adapted to be held in tight engagement with the sides of the orifice 23 by means of a stud 43 threaded into a drilled and threaded opening 42 in the said keeper. A rectangular lock 44 provided with a concentrically tapered boss 45 and an opening 46 to permit passage therethrough of the stud 43 engages the rearward end of the venturi 21. A handle 48 for rotating the wrench 39 is secured to the lock 44 by a plurality of bolts 49 which pass through a plurality of holes 50 in the said handle to permit engagement of the said bolts in drilled and threaded recesses 47 in the said lock registering with the said holes 50. An opening 51 allows passage of the stud 43 through the handle 48, and a nut 52 is threaded on the said stud to tighten the entire wrench assembly within the venturi 21. In assembly, the keeper 40 is inserted through the orifice 23 and held with the boss 41 engaging the walls of the orifice 23 until the stud 43 is screwed in.

The operation of my invention is very simple. The chamber 15 is slipped through the mounted body 24 and the clamp collar 31 is locked on the apex end of the said chamber. The flanged shoulder 35 bears against the tube attaching collar 17 and the jack screws 37 are seated in the recesses 30 in the front face of the body 24. When the jack screws 37 are tightened the clamp collar is forced against the collar 17, and in turn the tapered section of the chamber 15 is forced into the tapered portion of the body 24 as continued pressure is applied. The chamber is thus held tightly and securely against rotation by friction, and solidly without distortion, while the venturi 21 is being unscrewed by means of the wrench 39.

It is to be understood that the embodiment of my invention herewith shown is a preferred one, and various changes in the construction, and substitution of parts, may be made without departing from the spirit of the invention or the scope of the subjoined claim.

Having thus described my invention, I claim:

Means for disengaging the Venturi section of a recoilless rifle from the conical chamber thereof, comprising a fixed base, a hollow cylindrical body mounted against rotation thereon and adapted to slidably engage the said chamber at its rearward end, means having an internal taper equal to the outside taper of said chamber carried by said body and adapted to grip said chamber in tight frictional engagement, a tapered collar member disposed on the forward end of said chamber, means carried by said collar member cooperating with said chamber to prevent forward translative movement of said collar member relative to said chamber, adjustable screw pressure means associated with said collar member adapted to press against said body member to force said body member rearward relative to said chamber whereby said tapered means carried by said body member is forced into tight frictional relation with said chamber to prevent rotation of the said chamber, and means carried by said body member cooperating with said screw pressure means to prevent rotation of said collar member relative to said chamber.

KENNETH R. FOWLER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
Re. 22,485	Otto	May 23, 1944
1,188,626	Cofsky	June 27, 1916
1,900,017	Kennedy	Mar. 7, 1933

FOREIGN PATENTS

Number	Country	Date
307,410	Germany	Oct. 24, 1918