

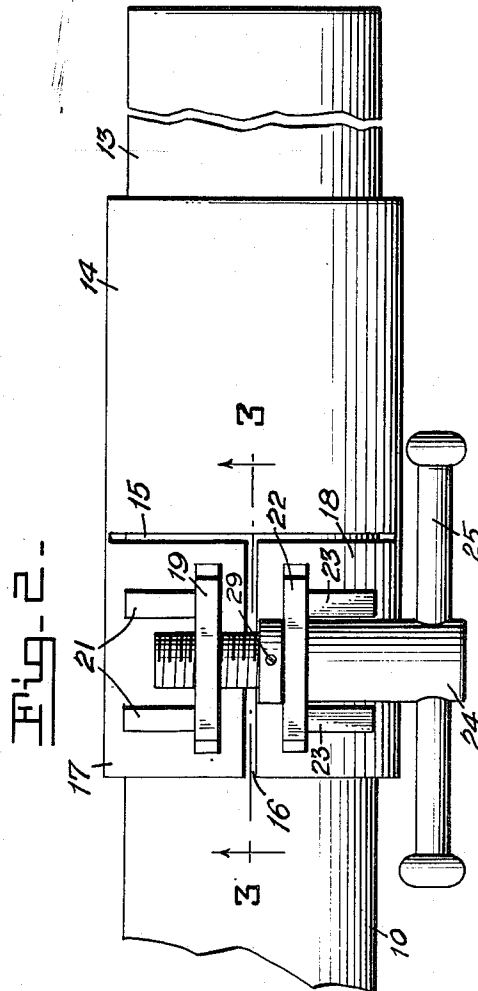
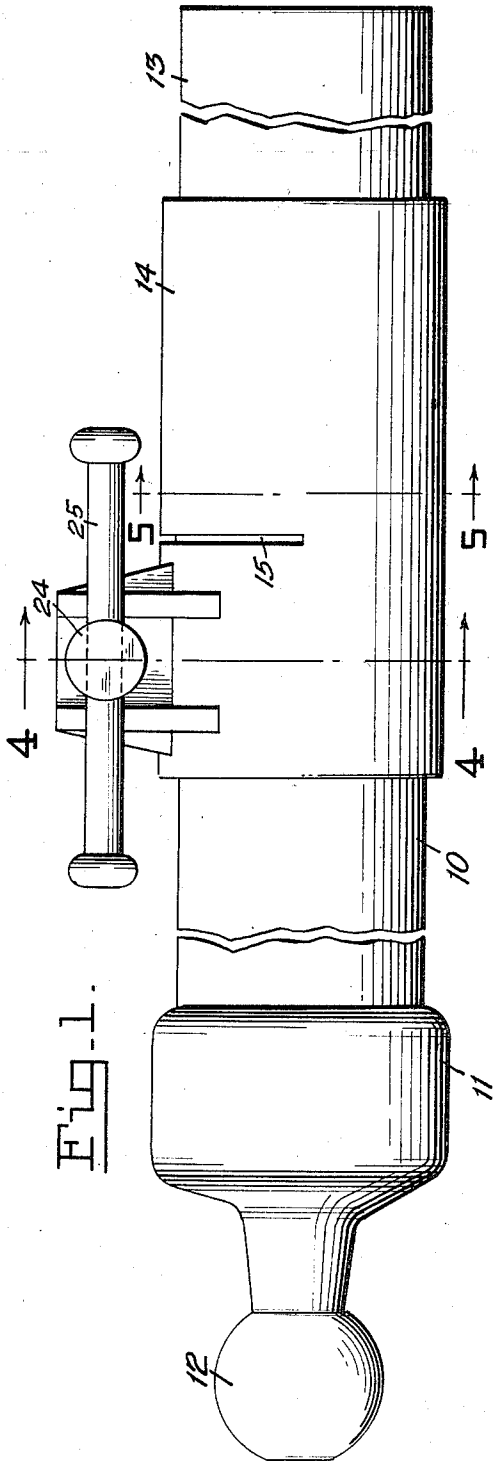
March 6, 1951

G. B. DAVIS, JR
BARREL EXTENSION AND COUPLING DEVICE
FOR ATTACHMENT TO GUN BARRELS

2,543,766

Filed Jan. 16, 1946

2 Sheets-Sheet 1



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Fig. 3.

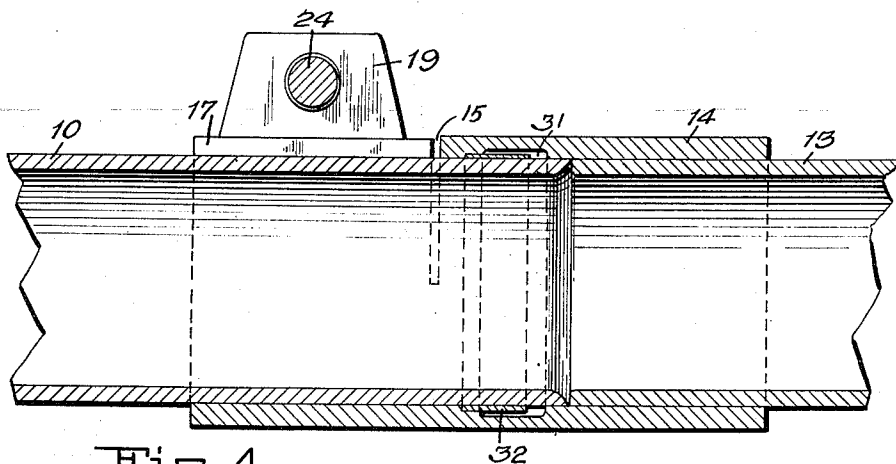


Fig. 4.

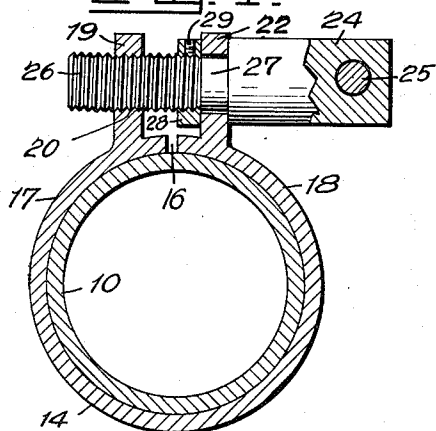


Fig. 5.

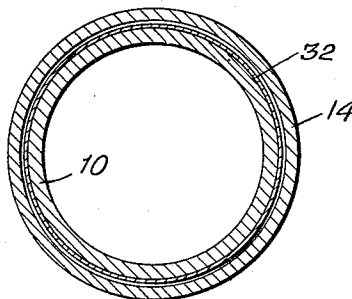
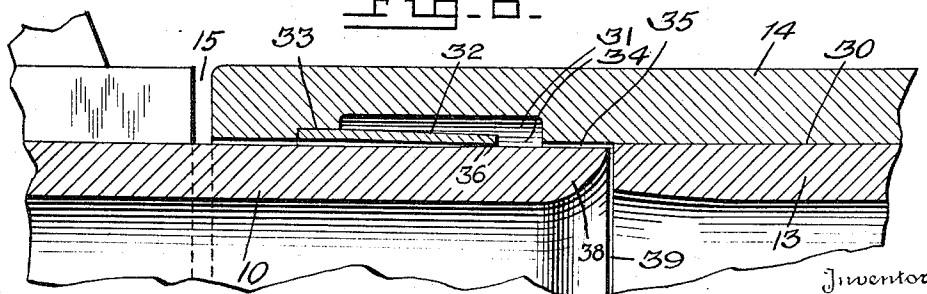


Fig. 6.



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UNITED STATES PATENT OFFICE

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BARREL EXTENSION AND COUPLING
DEVICE FOR ATTACHMENT TO GUN
BARRELS

George B. Davis, Jr., Green Acres, Md., assignor
to the United States of America as represented
by the Secretary of War

Application January 16, 1946, Serial No. 641,554

1 Claim. (Cl. 89—16)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

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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.

The present invention relates generally to a gun of the type known to the art as a mortar.

More particularly it relates to a coupling device for attaching a barrel extension to the main barrel of a mortar.

In the past attempts have been made to provide guns of the mortar type with an auxiliary barrel adapted to be attached to the normal barrel thereof in order to increase the firing range as well as for other reasons. Considerable difficulty has been experienced, however, in obtaining a coupling device for securing the main and auxiliary barrels together which would be capable of resisting the pulling force tending to separate the barrels during the passage of a projectile therethrough and which at the same time would effect satisfactory sealing to prevent the escape of the gases of propulsion at the joint between the barrels.

It is accordingly, an important object of the present invention to provide a gun of the mortar type having a novel coupling member for securing an auxiliary barrel thereto.

Another object of the invention resides in the provision of a novel coupling device wherein means is provided for securing the coupling device to a mortar barrel and additional means is provided for sealing said barrels against the escape of propulsion gases therebetween.

A still further object of the present invention resides in the provision of a novel sealing device of general utility for preventing the escape of pressure fluid between two concentric cylinders wherein a resilient sealing ring is secured to one of said cylinders having a portion overlying but spaced from the bottom of a groove formed therein and in engagement with the other cylinder.

The above as well as other and further objects and advantages of the invention together with a more exact understanding thereof will become more readily apparent to one skilled in the art from a consideration of the following detailed specification taken in conjunction with the accompanying drawings illustrating a preferred embodiment thereof wherein:

Figure 1 is a front elevational view of a mortar tube having a barrel extension and coupling member secured thereto;

Figure 2 is a plan view of the coupling member of Figure 1;

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Figure 3 is a longitudinal, cross sectional view taken along the line 3—3 of Figure 2;

Figure 4 is a transverse cross sectional view taken along the line 4—4 of Figure 1;

Figure 5 is a transverse cross sectional view taken along the line 5—5 of Figure 1; and

Figure 6 is a fragmentary longitudinal cross sectional view of the sealing device per se illustrated in Figure 3.

Referring now particularly to Figure 1 of the drawings there is illustrated a mortar comprising a conventional mortar tube 10 having a base cap 11 attached thereto and including a spherical member 12 adapted to engage in a base plate socket in a manner well known to the art. A barrel extension 13 is secured to the main barrel 10 by means of a generally cylindrical tubular coupling 14. Both the main barrel 10 and auxiliary barrel 13 are distorted in Figure 1 from their true length having been broken as indicated for accommodation on a single sheet. The coupling member 14 is provided intermediate its ends with a transverse saw-cut 15 extending approximately half way through the coupling. As illustrated most clearly in Figures 2 and 4 a similar cut away portion 16 is provided longitudinally of the collar 14 between one end thereof and the transverse cut 15 to provide a pair of slightly flexible clamping elements 17 and 18. The clamping element 17 is provided with an upstanding lug 19 having a threaded aperture 20 therein and suitable reinforcing webs 21 at opposite sides thereof. The member 18 is similarly provided with an upstanding lug 22 having reinforcing webs 23 attached thereto although the aperture in lug 22 is not threaded. A clamping bolt 24 having an operating handle 25 and a threaded portion 26 thereon is adapted to be inserted through the aperture in lug 22 the threaded portion 26 engaging with the internal threads formed in the aperture 20. It will be noted that the bolt 24 is provided with a smooth portion 27 journaled within the aperture in member 22 in such manner that rotation of the bolt 24 by means of the operating handle 25 will result through the engagement of the threaded portions 20 and 26 in pulling the lugs 19 and 22 towards each other which in turn pulls the members 17 and 18 together to securely clamp the coupling 14 to the outer surface of the main mortar barrel 10. A collar 28 is mounted on the threaded portion 26 of the bolt 24 and is normally secured in engagement therewith by means of a set screw 29 so that should the coupling 14 tend to freeze to the barrel 10 reverse rotation of the

bolt 24 will result in forceably sliding the lugs and 19 and 22 apart to release the coupling 14 from the barrel 10.

Referring now particularly to Figures 3, 5 and 6 the specific sealing or obturating device constituting an important part of the present invention is illustrated in detail. As will be noted particularly in Figure 6 the top portion of the main mortar barrel 10 is provided with an outwardly curved lip 38 for facilitating the insertion of a projectile therein when the mortar is used without the barrel extension attached thereto. The coupling 14 has been illustrated as comprising a separate sleeve secured in any suitable manner as, for example, by furnace brazing at the area 30 to the barrel extension 13. An internal, elongated, annular groove 31 is provided in the collar 14 and a generally cylindrical, resilient obturating or sealing ring 32, which may be made preferably of bronze, brass, or steel, is securely attached to a notch formed in the collar 14 adjacent to the groove 31 in any suitable manner such as, for example, by silver soldering or furnace brazing at the area designated generally by the reference numeral 33. An aperture 34 is provided between the end of the sealing ring 32 and the end of the groove 31 to provide for the admission of gases under pressure which may escape through the passage 39 adjacent to the abutting joint and passage 35 between the main barrel 10 and the barrel extension 13. It will be appreciated that the size of the passages 34 and 35 have been exaggerated in Figure 6 in order to more clearly illustrate the functioning of the seal. In any event it is assumed that a certain amount of gas under pressure will always leak through the passages 34 and 35 under the high pressures existing in the tube during firing of a projectile therefrom. As the gas under pressure passes through the passages 34 and 35 and through the aperture 34 into the groove 31 it tends to exert pressure upon the outer face of the sealing member 32 forcing the forward lip 36 of the latter into sealing engagement with the outer wall of the barrel 10. By this arrangement the sealing effect of the member 32 is increased in proportion to the increase of pressure caused by leakage of gases into

the groove 31 so that further leakage past the sealing lip 36 is substantially prevented.

Obviously, numerous other modifications, deviations and alterations from the specific structures disclosed herein for purposes of illustration will occur to one skilled in the art without departing from the spirit or scope of the invention as set forth in the appended claim.

I claim:

10 An extension for attachment to the end of a gun barrel comprising a barrel-engaging collar attached to one end of said extension and extending beyond said extension, said collar having an internal diameter substantially equal to the 15 external diameter of a gun barrel with which the extension may be used, said collar having a partial circumferential split and an axial split extending from the free end of the collar to the circumferential split to provide two curved clamping arms, radially upstanding lugs attached near 20 the ends of said clamping arms, and means for forcibly drawing said clamping arms toward each other, a circumferential groove on the internal surface of said collar between said circumferential split and the region of attachment of said 25 collar to said extension, and a resilient metal obturating ring attached internally at the end nearest to said split collar coaxially therewith and having its other end lying within said groove.

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