

Dec. 30, 1958

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CYLINDRICAL OBTURATING CARTRIDGE

2,866,412

Filed March 14, 1956

2 Sheets-Sheet 1

Fig. 1

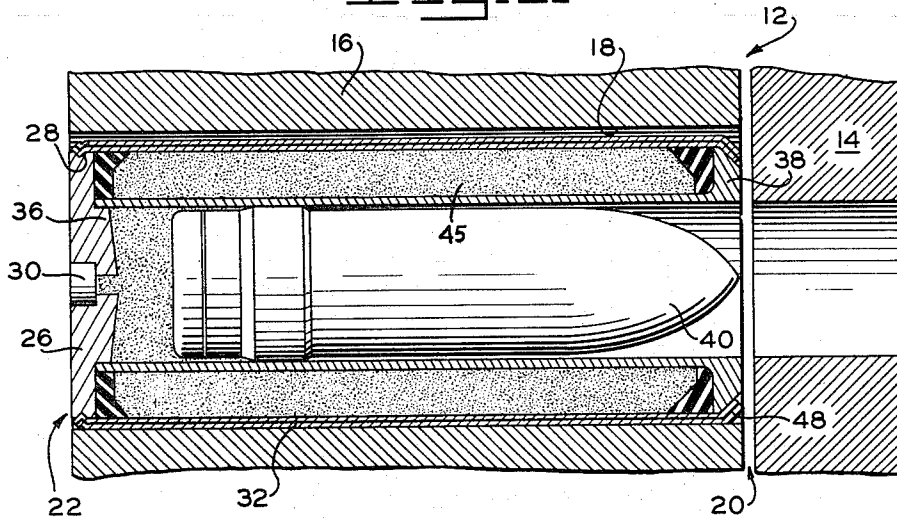
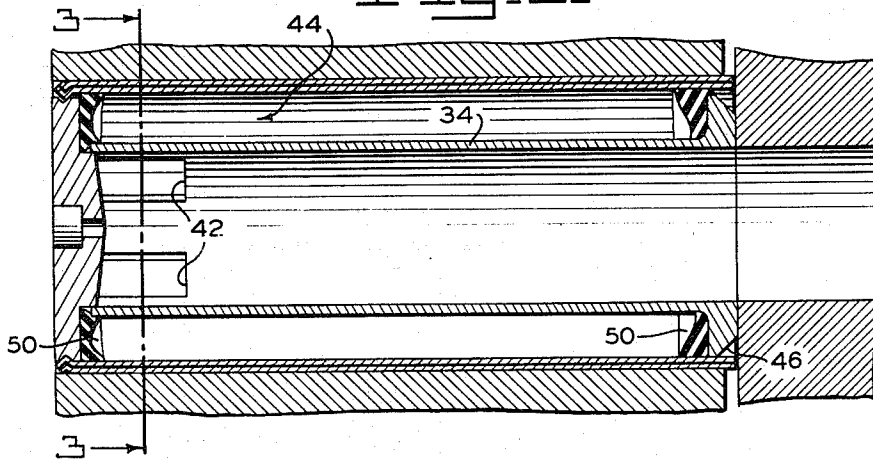


Fig. 2



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Fig. 3.

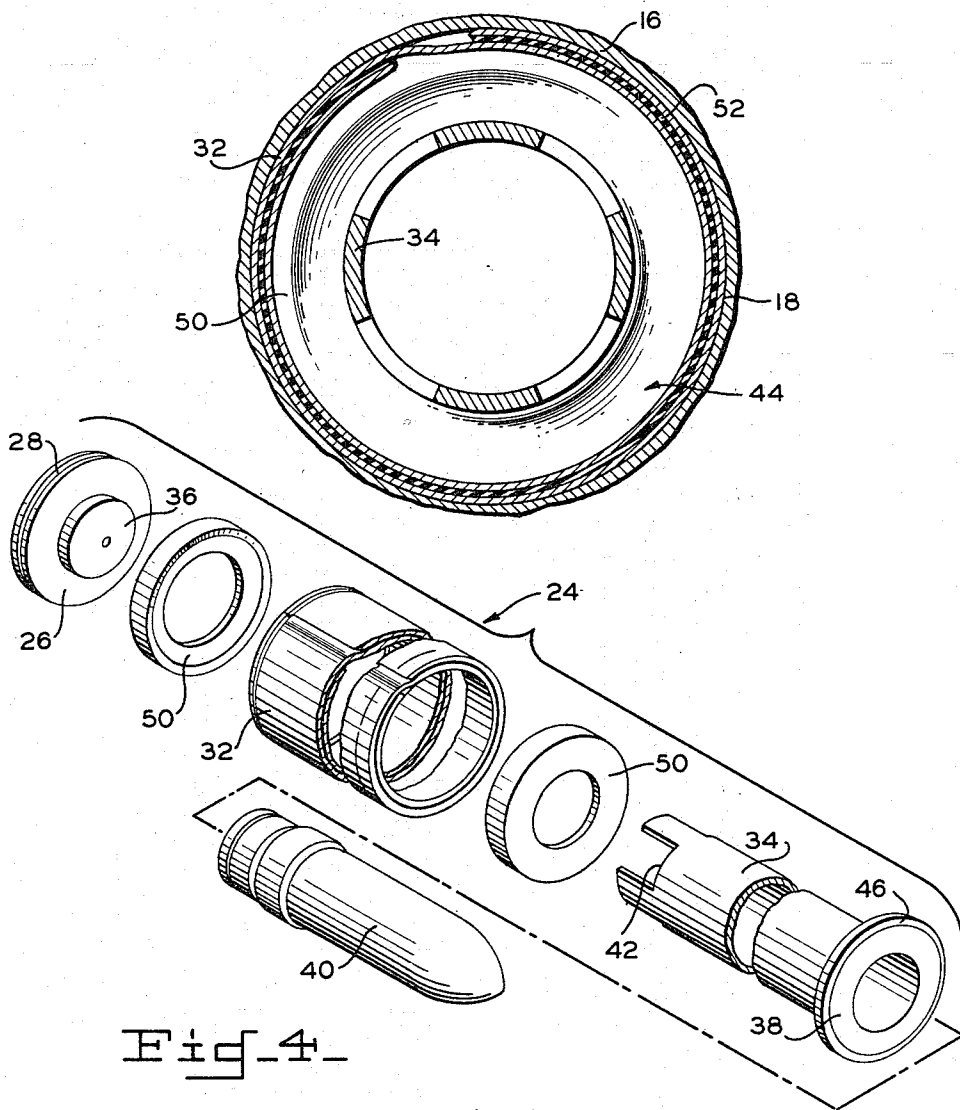


Fig. 4.

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CYLINDRICAL OBTURATING CARTRIDGE

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Application March 14, 1956, Serial No. 571,581

2 Claims. (Cl. 102—38)

(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.

Our invention relates to cartridges for guns and more particularly to such cartridges having cases with wrapped cylindrical outer members and members slidable therein for obturation responsive to discharge.

A revolver-type automatic gun of conventional design includes a barrel, a drum having chambers for rotating cartridges from a charging station to a firing station into alignment with the barrel and for chambering the cartridges for the discharge thereof. In such guns the temperature of the drum must be maintained below the cook-off temperature of the cartridges to prevent premature explosion in the drum.

A conventional gun of this type employs tapered cartridges and includes devices for loading the cartridges into the drum and for withdrawing the cases of the cartridges from the drum at respective stations of the chambers responsive to the discharge. Such gun, too, requires obturating means mounted to the drum for sealing the chambers when at the firing station to the breech of the barrel to prevent leakage therebetween and, consequently, reduces the temperature of the drum. A late model of the revolver-type automatic gun is provided with cylindrical chambers and a charging device for unidirectional loading and unloading thereof for operation at a rate substantially greater than that of the conventional gun. Cartridges with substantially cylindrical cases have been employed in such a gun, but it was found that cylindrical cartridge cases were stretched beyond the elastic limit upon discharge to render extraction thereof from the chambers extremely difficult, if not impossible. In such type of gun, too, separate obturating means cannot be used and, therefore, the cartridges must be self-obturing.

It is an object of our invention, therefore, to provide cylindrical ammunition for such a gun.

Another object of our invention is to provide a cylindrical cartridge having a case including a base and a wrapped cylinder axially secured thereto.

A further object of our invention is to provide a cylindrical cartridge having an outer case of continuously wrapped two-ply material.

A still further object of our invention is to provide a cylindrical cartridge having an outer case of continuously wrapped two-ply material with heat insulation disposed between the plies.

Yet another object of our invention is to provide a cartridge having a wrapped cylindrical member and a member slidable therein for obturation responsive to discharge of the cartridge.

Other aims and objects of our invention will appear from the following explanation.

In carrying out our invention, a cartridge receivable for axial coextension in a chamber of a gun includes a cylinder having radial clearance in the chamber, a base peripherally secured to the cylinder, and a member including a flange for retaining a projectile. The member is

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restrained in engagement with the base by engagement of a lip portion of the cylinder with the flange to enclose the propellant of the cartridge. The cylinder is wrapped and provided with overlapping portions for substantially equal expansion and contraction, and the member is axially slidable in the cylinder for obturation responsive to discharge of the cartridge in the chamber. The cylinder may be continuously wrapped in double layers with heat insulation disposed between the layers to resist the transfer of heat from the cartridge to the drum.

A pair of washers is disposed within the cylinder to respectively engage the base and the member and provided with facing lips engaging the cylinder for expansion therewith to seal the cartridge against escape of gases responsive to discharge of the cartridge.

For a more complete understanding of our invention, reference is made to the following description and the accompanying drawings in which:

Fig. 1 is an elevation of a gun with a cartridge incorporating our invention disposed in a chamber of the gun with the obturating member in the normal position thereof;

Fig. 2 is a view similar to Fig. 1 with the obturating member in the extended position;

Fig. 3 is an enlarged view along line 3—3 of Fig. 2; and

Fig. 4 is an exploded view of the cartridge.

Accordingly, a gun 12 is provided with a barrel 14 and a drum 16 having chambers 18 separated from barrel 14 by a clearance space 20 of the order of 0.015 inch. Chambers 18 are cylindrical for simultaneous loading and unloading by ramming cartridges 22 therein as more fully described in the application for "A Chambering Mechanism for an Automatic Gun," Serial No. 604,219, filed December 20, 1956, by John F. O'Brien. Drum 16 is rotatable to convey cartridges 22 from a charging to a firing station for axial alignment with barrel 14. A chamber 18 is shown in the firing station in Fig. 1 with one of the cartridges therein.

Cartridge 22 comprises a case 24 with a base 26 having a peripheral groove 28 and including a primer 30. A cylinder 32 is crimped into engagement with groove 28 to secure the rear end of cylinder 32 to base 26 and a hollow, cylindrical member 34 is inserted into such cylinder. A cylindrical boss 36 extends forwardly from base 26 to be engageably received by the rear end of member 24 to provide support therefor. Member 34 includes a flange 38 at the forward end thereof for engagement with cylinder 32. A projectile 40 is slidably retained in the front portion of member 34 and the space in member 34 rearwardly of projectile 40 and that portion circumferentially about member 34 forms a reservoir 44 for a propellant 45. Communication is provided between the portions of reservoir 44 which are inside and outside of member 34 by a plurality of apertures 42 therethrough.

Flange 38 is beveled at 46 and cylinder 32 includes a lip portion 48 matingly engaged therewith for coextension of cartridge 22 with chamber 18.

Cylinder 32 is constructed of sheet metal continuously wrapped in double ply, as shown in the drawing, for bending within the elastic limit thereof to provide substantially equal expansion and contraction of the cylinder responsive to the discharge. The radial clearance may, therefore, be greater than the conventional radial clearance to aid push-through extraction of case 24 from chamber 18.

Mounted inside cylinder 32 at the front and rear ends thereof is a pair of resilient washers 50 which are dished inwardly to expand responsive to the discharge of propellant 45 and thereby engage cylinder 32, also expanded

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by the discharge, to prevent peripheral escape of the gases of the discharge. Washers 50 also engageably receive member 34 therethrough to maintain the axial alignment thereof with barrel 14 during the discharge.

Lip 48 aids in the alignment of cartridge 22 with chamber 18 during ramming, and the material of such lip yields forwardly under pressure from member 34 into engagement with the breech of barrel 14 to permit the forward projection of such member 34 from cylinder 32 also into engagement with the barrel and thereby prevents the leakage of the hot gases from the discharge between the barrel and drum.

Air between the layers of cylinder 32 reduces transmission of heat to drum 16 and the addition of insulation 52 between the plies further reduces the quantity of heat transmitted to the drum.

Although a particular embodiment of the invention has been described in detail herein, it is evident that many variations may be devised within the spirit and scope thereof and the following claims are intended to include such variations.

We claim:

1. A cartridge for a gun having a barrel and a chamber with a clearance space therebetween, comprising a propellant charge, a projectile, and an enclosing case for substantial axial coextension within the chamber and radial clearance therefrom including a cylinder, a base peripherally secured thereto and provided with a

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primer to ignite said propellant and discharge said cartridge, and a member within said cylinder for retaining said projectile and being provided with a flange, said cylinder including a forward lip portion extending inwardly for engagement with said flange to retain said member in engagement with said base and provide an enclosure for said propellant, said cylinder being wrapped continuously in double layers to provide substantially equal expansion and contraction and oppose heat transfer to said chamber, and said member being slidable in said cylinder to project therefrom into engagement with the barrel to bridge said clearance space responsive to said discharge.

2. A cartridge as described in claim 1 with said cylinder including heat insulation material disposed between said layers to oppose transfer of heat to said chamber.

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