Oct. 5, 1965 G. L. HERTER 3,209,691

RIFLE CARTRIDGE CASE

Filed Feb. 14, 1964

FIG. 1

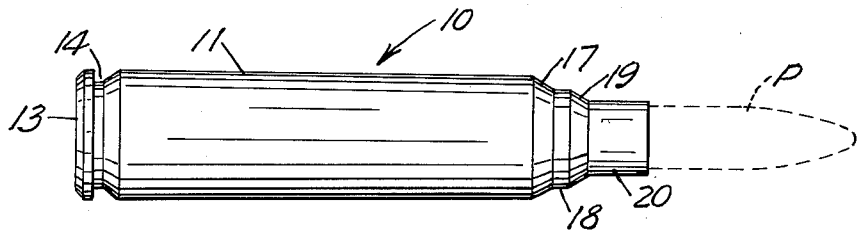
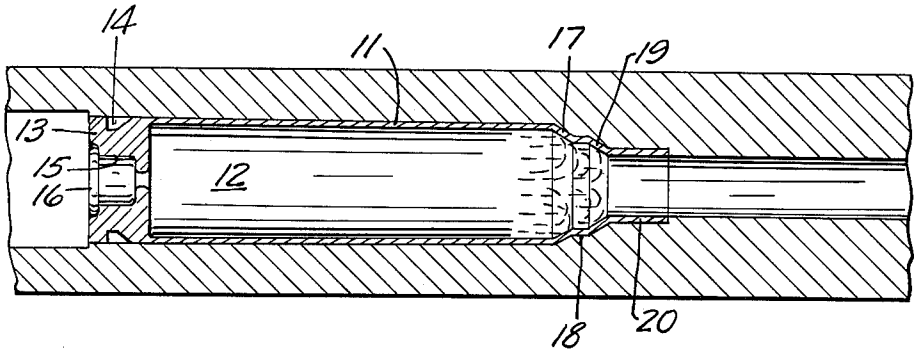


FIG. 2



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RIFLE CARTRIDGE CASE

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This application is a continuation-in-part of application No. 216,202, filed August 10, 1962, now abandoned.

This invention relates to a cartridge case for use with firearms.

The general object of this invention is to provide a novel cartridge case, of simple and inexpensive construction, for use with firearms and having a double shoulder structure adjacent the projectile-receiving neck of the case, the double shoulder structure causing maximum burning of the charge within the case so that a greater muzzle velocity is produced without requiring an increase in the amount or type of the powder charge.

Another object of this invention is to provide a novel and improved cartridge case, preferably constructed of metal such as brass or the like, and having a pair of tapered shoulders interposed between the neck and body of the case, the shoulders cooperating with each other to prevent forward flowing of the brass during firing of the cartridge thereby obviating the necessity of resizing or trimming of the neck of the cartridge when the cartridge case is reloaded.

A further object of this invention is to provide a novel and improved cartridge case including a cylindrical body and projectile-receiving neck joined by a pair of spaced-apart tapered shoulders, the latter serving to produce rearward turbulence of the burning gases during firing of the cartridge, so that substantially all of the powder charge is burned within the cartridge case whereby the energy of the combustion gases is applied to the projectile with greater efficiency to thereby increase the muzzle velocity of the projectile.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like character references refer to the same or similar parts throughout the several views, and in which:

FIG. 1 is a side elevational view of the novel cartridge case with the projectile therefor illustrated in dotted line configuration;

FIG. 2 is a longitudinal cross sectional view of a conventional rifle chamber and barrel with the novel cartridge case positioned therein.

Referring now to the drawing, it will be seen that my novel cartridge case, designated in its entirety by the reference numeral **10** is there shown. This cartridge casing **10** is preferably constructed of a metallic material such as brass or the like and includes an elongate generally cylindrical body **11** which defines a charge receiving chamber **12** therewithin. The rear end of the body **11** is closed by base element **13**, the latter being secured in place in a well known manner. It will be seen that an annular groove **15** is formed just forwardly of the base element **13** for the purpose of facilitating extraction of the spent cartridge case after firing.

The base element **13** has a centrally located aperture or opening **15** formed therein for receiving the conventional primer cup **16** therein. The primer cup **16** is forced into snug fitting relation through the opening or aperture **15** in the base element in a well known manner and carries a primer charge therein.

It has been found in firing cartridges having the conventionally constructed cartridge case that a portion of the powder charge is actually blown out through the neck of the casing during detonation of the charge. Since a portion of the powder is not burned within the casing,

this condition results in an inefficient generation and application of the combustion gases to the projectile.

The conventional cartridge case includes a body portion having a projectile receiving neck of slightly smaller diameter which is joined to the body portion by single inclined surface. In this type of cartridge case, a part of the powder is left unburned during detonation of the charge and is blown out through the neck. My novel cartridge case is arranged and constructed to overcome this problem and to thereby produce more efficient and complete combustion than was heretofore possible with cartridges having conventional cartiridge cases.

To this end it will be seen that the forward end of the body **10** is tapered to define a first annular tapered shoulder **17**. The angle defined by the tapered shoulder **17** and the general longitudinal axis of the body **11** is approximately thirty degrees in the embodiment illustrated herein. Integrally formed with the front end of the first tapered shoulder **17** is an intermediate shoulder connecting portion **18** which is of substantially cylindrical construction and which is disposed in coaxial relation with the body **11**. It will be seen that the internal diameter of the intermediate shoulder connecting portion **18** is of a diameter substantially less than the diameter of the body **11**.

Integrally formed with the front end of the intermediate shoulder-connecting portion **18** is a second annular tapered shoulder **19** which converges slightly forwardly. It will be seen that the tapered shoulder **17** and the tapered shoulder **19** are of frustro-conical configuration. The angle defined by the shoulder **19** and the general longitudinal axis of the body **11** is also substantially thirty degrees in the embodiment shown and it will also be seen that the shoulders **17** and **19** have axial dimensions which are of substantially the same size. The axial dimension of the shoulders **17** and **19**, as best seen in FIG. 2, while generally approximating the axial dimension of the shoulder-connecting portion **18** have axial dimensions which are slightly larger than the axial dimension of the shoulder-connecting portion **18**. Further, the longitudinal dimension of the faces defined by the shoulders **17** and **19** are slightly greater than the axial dimension of the shoulder-connecting portion **18**. Integrally formed with the forward end of the shoulder **19** is a substantially cylindrical projectile-receiving neck **20** which is disposed in coaxial relation with respect to the body **11** and which receives a projectile T therein. It will be noted that the longitudinal dimension of the neck **20** is substantially greater than the longitudinal dimension of either of the shoulders **17** or **19**, or the shoulder-connecting portion **18**.

When my novel cartridge case is loaded into the chamber of a rifle or other type firearm, the cartridge case body **11** will be in position within the chamber of the gun with the projectile projecting forwardly into the barrel. The charge-receiving chamber **12** of the cartridge case **10** will be charged with a predetermined powder charge and the primer cup will also be supplied with a primer charge. When the powder is detonated, the powder charge within the charge-receiving chamber **12** of the cartridge case will also be detonated.

The powder will burn upon ignition or detonation of the primer charge forwardly towards the neck **20** of the cartridge case. When the burning powder and gases produced thereby engages the first shoulder **17**, the burning powder and gas will be forced convergingly forwardly. Thereafter when the burning powder engages the second shoulder **19**, the turbulence produced by the double shoulder at the neck of the cartridge case is sufficient to prevent any unburned powder from escaping through the neck. Therefore, more complete combustion is accomplished so that a more efficient generation and application of gases is produced. The overall result of this efficient combustion is that the muzzle velocity of

the cartridge is increased over that of a conventionally constructed cartridge of the same size and having the same powder charge.

An example of the increased muzzle velocity was conducted with the novel double shoulder cartridge case and a conventional single shoulder cartridge case. A conventional 30 caliber 30–06 rifle having a 26 inch barrel was used to fire the respective cartridges. These cartridges were charged with 180 grains of a similar powder charge and the velocity was measured by a chronograph. The increased velocity at the muzzle through the use of the double shoulder cartridge case was approximately 30 to 90 feet per second. The increased velocity is attributable presumably to the faster burning of the powder within the cartridge case due to the turbulence created by the double shoulder arrangement so that more of the powder is burned and substantial pressures are created between the time of firing or detonation and the time at which the bullet passes from the forward end of the barrel. This faster burning is accomplished when using the slower burning type powders in my novel double shouldered cartridge case. It was also found that there were no extraction problems involved in the removal of the spent cases from the rifle even when used with the ordinary bolt action type rifle. It is therefore pointed out that the pressures created by the efficient combustion of the gases were not so excessive as to cause expansion of the cartridge case.

It has also been found that the double shouldered construction of the novel cartridge case also prevents forward flowing of the brass during firing of the cartridge so that there is no lengthening of the cartridge case. It has been found that in the conventional cartridge case with one shoulder, the brass tends to stretch or flow forwardly after the case has been fired a number of times. With this condition, the case must be trimmed or resized when the case is reloaded. However, through the use of my double shoulder cartridge case, this forward flowing or stretching of the brass is completely prevented so that no resizing or trimming is required during the reloading operation.

It will therefore be seen that I have provided a novel cartridge case having double shoulder construction which permits more efficient combustion of the powder charge within the case whereby resulting in an increase in the muzzle velocity of the cartridge projectile. It will be seen from the foregoing that the double shouldered construction of my novel cartridge case produces a turbulence adjacent the neck of the cartridge case so that faster and more complete burning of the powder charge is accomplished thereby preventing little if any of the powder charge to be blown from the cartridge case in an unburned condition.

It will also be seen from the foregoing description that I have provided a novel cartridge case having a double shouldered structure interconnecting the cartridge body and neck and which serves to prevent forward flowing of the brass and stretching of the neck of the cartridge case even after the case has been fired a number of times. With this arrangement it will be seen that the necessity of resizing or trimming of the neck of the cartridge case is eliminated through the use of my novel double shouldered construction.

It will therefore be seen that I have provided a novel cartridge case, which is not only of simple and inexpensive construction, but one which functions in a more efficient manner than any heretofore known comparable cartridge cases.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What is claimed is:

1. A cartridge case having an elongate, generally cylindrical body defining a charge-receiving chamber therewithin,
- a first generally frusto-conically shaped shoulder integrally formed with the forward end of said body and projecting axially forwardly therefrom,
- an intermediate generally cylindrical shoulder-connecting portion of smaller diameter than said body and being integrally formed with said first shoulder and projecting coaxially forwardly therefrom,
- a second generally frustro-conically shaped shoulder integrally formed with said shoulder-connecting portion and disposed in coaxial relation therewith and projecting forwardly therefrom,
- said shoulders having an axial dimension of approximately the same size and slightly larger than the axial dimension of said shoulder-connecting portions, said shoulders cooperating with each other when a charge is detonated within said chamber to produce turbulence of the burning charge adjacent the forward end of the chamber and to thereby cause more complete burning of the charge within the chamber.
- and an elongate, generally cylindrically shaped projectile-receiving neck of smaller diameter than said shoulder-connecting portion and integrally formed with said second shoulder and projecting axially forwardly therefrom.

2. The cartridge case as defined in claim 1 wherein said projectile-receiving neck has an axial dimension substantially greater than the axial dimension of said shoulders.

3. The cartridge case as defined in claim 1 wherein the angle defined by said first shoulder and the longitudinal axis of said body is substantially equal to the angle defined by said second shoulder and the longitudinal axis of said body.

4. The cartridge case as defined in claim 3 wherein the respective angles defined by said first and second shoulders are each approximately thirty degrees.

5. A cartridge case comprising an elongate, generally cylindrically shaped body defining a chamber therewithin and having a closed rear end,
- an annular groove formed in said body to define an annular rim at the closed end thereof,
- a firing cup carried by said closed rear end,
- a first generally frustro-conically shaped shoulder integrally formed with the forward end of said body and projecting axially forwardly therefrom,
- an intermediate generally cylindrical shoulder-connecting portion of smaller diameter than said body and being integrally formed with said first shoulder and projecting coaxially forwardly therefrom,
- a second generally frustro-conically shaped shoulder integrally formed with said shoulder-connecting portion and disposed in coaxial relation therewith and projecting forwardly therefrom,
- said shoulders having an axial dimension of approximately the same size and slightly larger than the axial dimension of said shoulder-connecting portions, said shoulders cooperating with each other when a charge is detonated within said chamber to produce turbulence of the burning charge adjacent the forward end of the chamber and to thereby cause more complete burning of the charge within the chamber,
- and an elongate, generally cylindrically shaped projectile-receiving neck of smaller diameter than said shoulder-connecting portion and integrally formed with said second shoulder and projecting axially forwardly therefrom.

No references cited.

SAMUEL FEINBERG, *Primary Examiner.*