Sept. 8, 1964 W. A. WERNER 3,147,709

SHOTGUN CARTRIDGE

Filed June 8, 1959 2 Sheets-Sheet 1

Fig. 1.

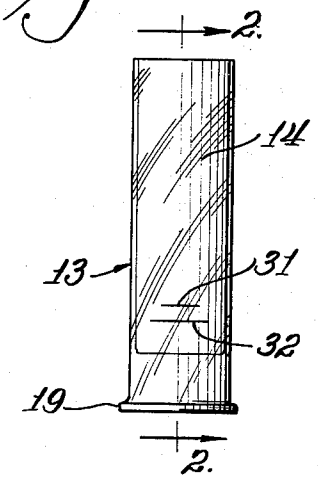


Fig. 5.

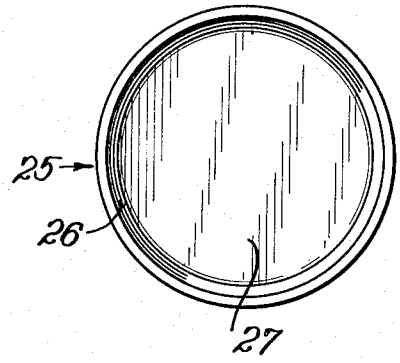


Fig. 7.

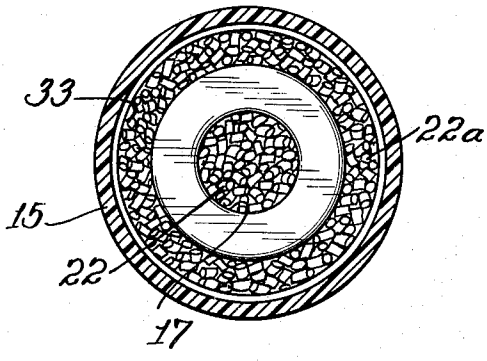


Fig. 4.

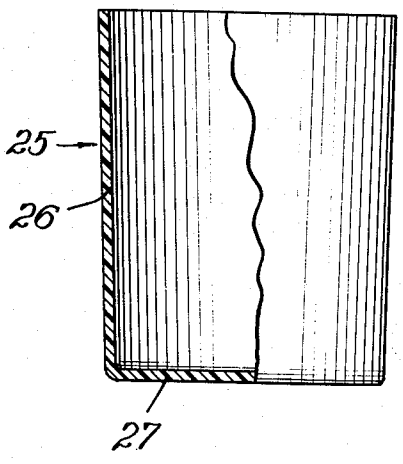
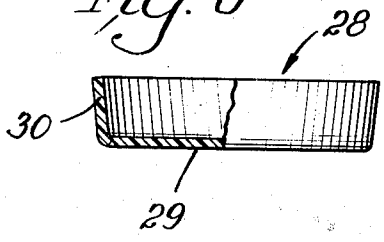


Fig. 6



Inventor
Wilbert A. Werner
By Eugene M. Giles
Atty.

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SHOTGUN CARTRIDGE

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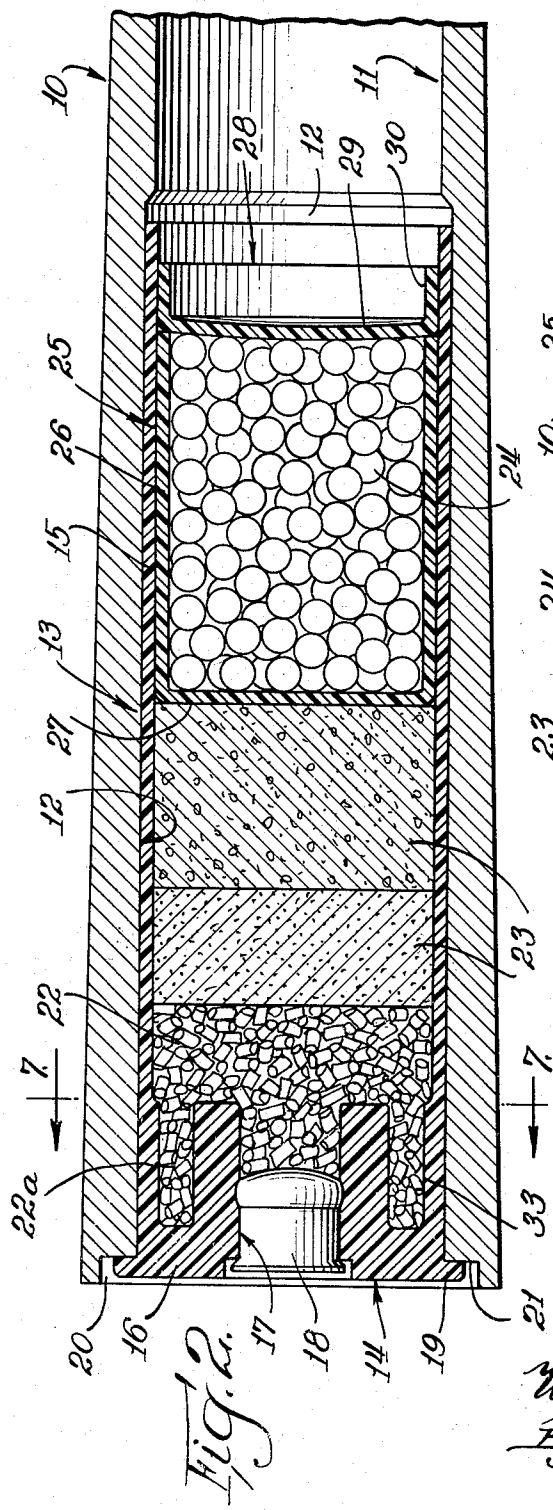


Fig. 2

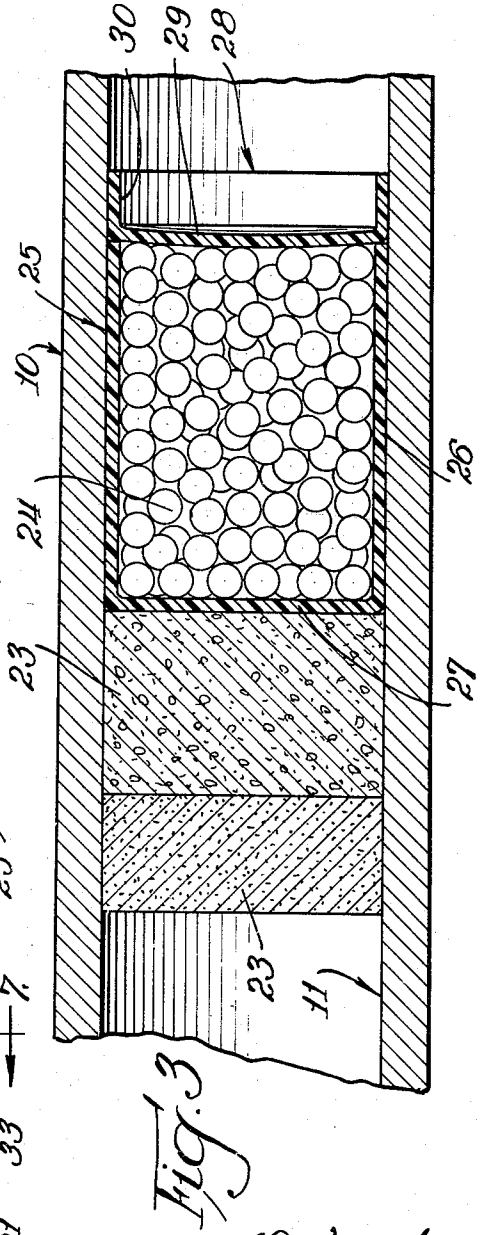


Fig. 3

Inventor
Wilbert A. Werner
By Eugene M. Giles
Atty.

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SHOTGUN CARTRIDGE

Wilbert A. Werner, 83rd St., near County Line Road, Hinsdale, Ill.

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2 Claims. (Cl. 102—42)

This invention relates to cartridges of the type used in shotguns wherein a load of shot is retained in an expellable manner in the discharge end portion of the cartridge case for propulsion therefrom through the gun barrel by firing of a powder charge in the bottom portion of the cartridge case, the invention having reference more particularly to the manner in which the charge of shot is incorporated in the cartridge case and propelled therefrom through the gun barrel, and to improved disposition of the powder charge in the cartridge case for propulsion of the shot, this application being a continuation-in-part of my copending application Serial No. 743,045, now abandoned, which was filed June 19, 1958.

In shotgun cartridges it is customary to provide wads over the powder to separate the shot therefrom and to load the shot directly into the cartridge case above these wads with a relatively thin disk over the shot to retain the shot in place in the cartridge case. Thus when the cartridge is fired and the shot expelled therefrom the shot is propelled through the gun barrel in direct contact therewith.

In accordance with the present invention, the cartridge case has a cup shaped shot container therein which is expelled from the cartridge case and through the gun barrel with the shot therein and this container has a sleeve portion which surrounds the load of shot and prevents contact of the shot with the gun barrel and provides a wiper for cleaning the barrel. This cup shaped container is stripped from the load of shot, by air resistance, soon after leaving the gun barrel whereupon the shot proceeds to spread therebeyond in an unusually uniform pattern.

The open end of the shot container faces forwardly and the shot is retained therein by a closure at the open end thereof which may be a thin card disk, such as commonly employed for retaining shot in a shotgun cartridge, but is preferably a shallow cup, such as disclosed in my aforesaid copending application, which is inserted in the open end of the cartridge case with a friction fit thereagainst by which it is safely retained in place. This shallow cup, and also the shot container, slide from the cartridge case without damaging the case and leaving the latter in desirable condition for reloading.

Because of the large diameter of the cartridge case employed for shot shells, and the relatively shallow depth of powder provided therein, combustion of the powder is oftentimes insufficiently sustained to insure the desired amount of follow through shove to the load of shot for good shooting, and for this purpose applicant has provided an elongated annular extension of the powder chamber around the primer opening to provide a distributive arrangement of the powder for enough prolongation of

The principal objects of the invention are, to provide an improved shotgun cartridge and method of propulsion of the shot through the gun barrel; to confine the shot in a compact mass and prevent disarrangement thereof as it is propelled through the gun barrel; to prevent contact of the shot with the gun barrel and avoid leading of the gun barrel and deforming of the shot when soft shot is used; to improve the shooting pattern; to provide additional sealing against gas escape and prevent leakage of gas into the shot chamber which may cause erratic shooting and poor pattern; to provide a method of shot propulsion which insures a clean barrel; to provide an improved distributive arrangement of the powder which insures adequate follow through shove; and to preserve the usefulness of the cartridge case and other parts for reloading, these and other objects being accomplished as pointed out more particularly hereinafter and as shown in the accompanying drawings, in which:

FIG. 1 is a side view of a shot gun cartridge made in accordance with the invention hereof;

FIG. 2 is an enlarged longitudinal sectional view of the cartridge taken on the line 2—2 of FIG. 1 and showing in section a rear end portion of the gun barrel with the cartridge in firing position therein;

FIG. 3 is a sectional view of a forward portion of the gun barrel showing in section the manner in which the shot is propelled through the gun barrel;

FIG. 4 is a side view of the shot container with part thereof in section;

FIG. 5 is a top view of the container of FIG. 4;

FIG. 6 is a side view, partly in section, of the shallow cup for retaining the shot in the cartridge; and

FIG. 7 is a cross sectional view of the cartridge taken on the line 7—7 of FIG. 2.

Referring to the drawings, in which I have shown a preferred form of the invention, the reference numeral 10 indicates a conventional shotgun barrel which has a normal bore 11 and is counterbored at the rear or breech end, as indicated at 12, to provide a cartridge chamber slightly larger than the bore 11.

The cartridge, which is indicated as a whole at 13, has a cartridge case 14 comprising a thin wall tube 15 which fits closely in a freely slidable manner in the cartridge chamber 12 and is closed at the rear end by a thick wall 16 having a central opening 17 to receive the primer 18. A rim 19 surrounds the rear end of the cartridge case and is receivable in an annular enlargement 20 of the counterbore 12 in clamping engagement against a stop face 21.

As is customary, the cartridge case 14 has a charge of powder 22 compressed within the rear end thereof and within the front end of the cartridge case and separated from the powder 22 by several over powder wads 23 is a load of shot 24 which is propellable from the cartridge case and through the gun barrel when the powder charge 22 is fired.

Heretofore it has been customary to load the shot directly in the cartirdge case over the wads 23 and merely apply a closure in the open end of the cartridge case to retain the shot therein, and when a cartridge which is thus loaded is fired, the load of shot is propelled through the bore 11 in direct contact with the gun barrel.

In accordance with the present invention, the load of shot is applied in a container 25 which fits snugly in the cartridge case and is expellable therefrom with the shot therein and when thus expelled therefrom by the firing of the cartridge the container slides through the gun barrel with the load of shot confined therein until after it leaves the gun barrel, whereupon the container is stripped from the load of shot by air resistance and the shot then proceeds to spread in the usual manner.

This container 25 has an annular substantially cylindrical wall 26 and is closed at one end by a bottom wall 27 which is seated against the outermost one of the over powder wads 23, and at the other end said container is open for reception of the shot therein and for exit of the shot therefrom in the aforesaid stripping of the container from the load of shot after it leaves the gun barrel.

Closure means is provided at the open end of the container 25 to retain the shot therein, and which is readily displaceable out of the way as soon as it leaves the gun barrel, and any appropriate shotgun closure means may be employed, such, for example, as a conventional top wad of card disk type which is secured in the cartridge case over the shot by crimping or folding the mouth end of the cartridge case thereover.

I prefer, however, to employ and accordingly have shown herein closure means 28 of shallow cup shape as disclosed in my aforesaid copending application Serial No. 743,045, which is held by friction within the mouth of the cartridge case and is expellable therefrom without causing any damage to the cartridge case which may impair its usefulness for reloading.

This shallow cup shaped closure member 28, as explained in my aforesaid copending application, is of a tough resilient molded plastic material, and made as light as possible to deflect readily from the path of the shot after discharge thereof from the gun, and has a bottom wall 29 which closes the open end of the shot container 25 and a forwardly extending annular side wall 30 which is slightly tapered for wedge reception in the cartridge case and provides frictional engagement therein which will safely retain the closure member in place until it is expelled by explosion of the powder charge.

When this occurs, the closure member 28 is shoved through the gun barrel by the load of shot, and without displacement by reason of the sliding fit of the annular wall 30 against the wall of the gun barrel, and as it is propelled forwardly the annular wall 30 is expanded by its inherent resiliency and also by air pressure developed ahead of the closure member, so that it has a positive wiping action against the gun barrel for cleaning the bore 11 thereof.

A variety of plastic materials are available from which the closure member 28 may be made, an example of which is the A.B.S. tripolymer acrylonitrile butadiene styrene which Borg Warner Corporation is marketing under the trade name "Cycolac," and the closure member may be made with the bottom wall 29 thereof about 20 to 30 thousandths of an inch thick and the annular side wall 30 about 40 thousandths of an inch thick and about a 5 degree taper.

The shot container 25 which is of a depth to contain the load of shot compactly therein, is also made of a tough resilient molded plastic material, like or similar to that of the closure member 28, and is of light weight for quick reduction of momentum and positive stripping from the load of shot upon exit from the gun barrel, the walls 26 and 27 thereof being preferably of approximately the same thickness and each slightly thicker than that of the wall 30 of the closure member 28 to safely withstand the pressure of the shot thereagainst without rupture and to provide cushioning of the load of shot therein.

The shot container 25 is also slightly tapered from end to end for wedging reception in the cartridge case and retention thereof by frictional engagement with the annular wall 15 of the cartridge case and to provide expansibility thereof to conform to the bore 11 of the gun barrel upon exit thereof from the cartridge case into the gun barrel. For this purpose an overall taper of approximately the same amount or slightly in excess of the overall amount of taper of the annular wall 30 of the closure member 28 is sufficient.

It is to be understood, however, that the closing member 28 is depended upon to retain the shot in the cartridge case and in the container 25 with the cartridge case need only be such as to provide the required cooperation of the container 25 with the gun barrel after it is expelled from the cartridge case.

When the cartridge, as above described, is placed in a shotgun and fired, the force of the explosition of the powder 22 is applied to the over powder wads 23 which are thereby forced outwardly from the cartridge case into and through the barrel, and these wads shove the container 25 with the load of shot 24 therein, and the closure member 28 from the cartridge case and through the barrel against the inertia of the shot and the pressure that is generated in the barrel ahead of the closure member 26 by the rapid propulsion thereof through the barrel.

This pressure retains the closing member 28 against the open end of the shot container 25 so that the shot remains confined in the shot container and at the same time said pressure ahead of the closure member 28 also holds the annular wall 30 thereof in close positive wiping engagement with the gun barrel to perform its cleaning function as it is propelled along the bore 11. During propulsion of the closing member 28 through the barrel, the engagement thereof with the open end of the shot container 25 avoids any tilting of the closing member.

The annular wall 26 of the container 25, by reason of its resiliency and compression within the cartridge case tends to expand with close wiping engagement with the gun barrel as it emerges from the cartridge case and is shoved through the barrel, and at the same time the inertia of the shot causes compression of the bottom wall 27 of the shot container between the foremost wad 23 and the shot 24 and the shot tends to spread in the container 25 and force the side wall 26 into closer wiping engagement with the gun barrel so that the container 25 has a positive and effective wiping action against the gun barrel as it is propelled therealong and performs a bore cleaning operation, additional to that of the closure member 28, as it is propelled through the barrel.

By reason of the confinement of the shot in the container 25 there is no contact of the shot with the gun barrel and accordingly no leading of the barrel or distortion of shot which oftentimes occurs when the shot is in contact with the barrel during propulsion thereof through the barrel.

Moreover, the container 26 and closure member 28 provide a gas sealing additional to that of the wads 23 and as the load of shot is completely enclosed no leakage of gas into the shot chamber can occur to cause erratic shooting or poor pattern.

In view of the foregoing it will be understood that the load of shot occupies the container 25 until it leaves the gun barrel, after which the closure member 28 drops or is thrown away and the container 26 is stripped from the shot, whereupon the shot is free to spread, and it has been found that when such container is employed, the shot spreads in an unusually uniform and perfect pattern.

Moreover, when the cartridge is loaded in the manner described above and a closing member 28 employed, no crimping or folding of the mouth portion of the cartridge case is required, and no damage to or tearing of the cartridge case occurs in shooting with the cartridge, and the cartridge case is reusable repeatedly for reloading.

Furthermore, the container 25, and also the closure member 28, usually drop to the ground in the vicinity of the shooting and may be used again for reloading.

The cartridge case 14 may be of one-piece molded plastic construction made of a tough flexible plastic, as explained in my aforesaid copending application, and if made of a sufficiently translucent plastic, markings may be provided on the cylindrical wall thereof as indicated at 31 and 32 in FIG. 1 for convenience in loading the cartridge, the marking 31 of which may indicate the level to which powder is to be poured in the cartridge case to provide the proper powder charge, and the marking 32 of which may indicate the extent to which that powder charge is to be compressed for proper firing thereof.

Thus, a simple plunger is all that is required for loading the powder charge in the cartridge case.

Usually the charge of powder in shotgun cartridges occupies a space of relating shallow depth and as a certain amount of cumulation of pressure is desirable for progressive increase in velocity or follow-up shove through the barrel, it has been difficult to provide a distribution of the powder to assure such follow-up shove.

To provide such distribution of the powder the cartridge case is provided, in accordance with the present invention, with a greatly thickened rear wall 16 having a relatively narrow deep annular channel 33 around the primer opening 17 to accommodate powder 22^a therein, and this channel 33 is of such depth and extends rearwardly from the peripheral portion of the main body of

the powder sufficiently remote from the place of initiation of combustion by the primer, that combustion of the powder 22[a] is delayed sufficiently to insure ample follow-through shove.

While I have shown and described my invention in a preferred form, I am aware that various changes and modifications may be made therein without departing from the principles of the invention, the scope of which is to be determined by the appended claims.

What is claimed is:

1. A shot gun cartridge comprising a tubular cartridge case having a closed rear end and open front end and an annular wall extending between the closed rear end and the open front end thereof, said case being filled throughout a portion of its length by wad means at the front of which said wad means the case is provided therein with a load of shot and at the rear of which said wad means the case is provided therein with a charge of explosive by which the load of shot is expellable from the case through the open end thereof, and a cup member of self sustaining cup shape slidably confined telescopically in the portion of the cartridge case at the front of the wad means and expellable with the load of shot from the cartridge case, said cup member being of a tough resiliently compressible plastic material which is expellable intact in the cup shape thereof from the cartridge case and formed with a sheetlike portion disposed substantially normal to the longitudinal axis of the cartridge case and providing the bottom of the cup shaped member and having an annular wall portion integral with and extending forwardly from said sheetlike portion in the direction of discharge from the cartridge case and providing the side wall of the cup shaped member, the side wall of the cup member and the annular wall of the cartridge case being provided respectively with outer and inner plain faces which are telescopically engaged with one another, and the annular wall of the cup member being resiliently compressed within

the annular wall of the cartridge case in secure frictional engagement thereagainst which is yieldable to the explosive force of the explosive for telescopical sliding of the cup member from the cartridge case, the annular wall of the cartridge case and the side wall of the cup member having terminal portions thereof at their forward ends projecting correspondingly forward in respective directions of parallelism with one another with the end edge of each said terminal portion presented forwardly.

2. A shotgun cartridge as defined in claim 1 in which the cartridge case has two cup shaped members therein at the front of the wad means and one of the cup shaped members is deeper than the other and has the load of shot therein and the other one of said cup shaped members is at the front of and closes the open end of the deeper cup shaped member to retain the shot therein, and both cup shaped members are of self-sustaining cup shape and of a tough resiliently compressible plastic material which is expellable intact in the cup shape thereof from the cartridge case.

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