Jan. 26, 1932. R. G. CLYNE 1,842,445

SHOT SHELL

Filed May 25, 1929

Fig. 1.

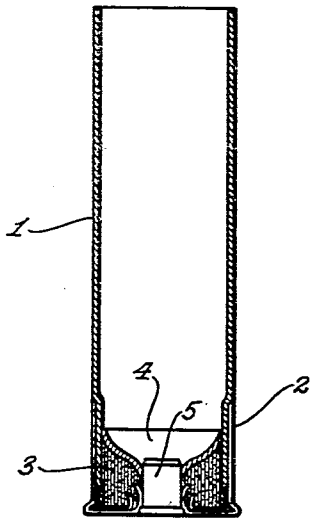


Fig. 2.

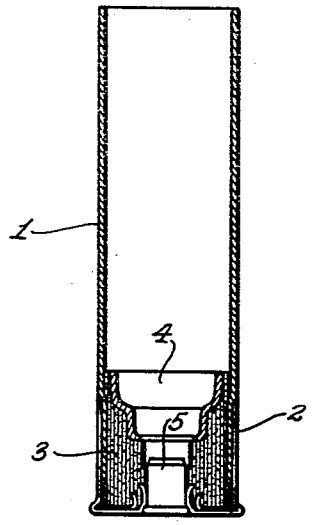


Fig. 3.

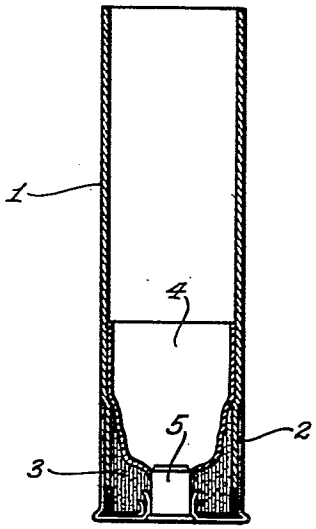
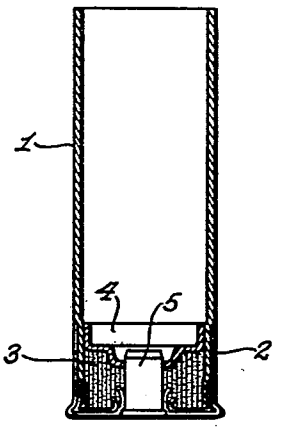


Fig. 4.



Inventor:
ROBERT G. CLYNE,
By John N. Bruninga
His Attorney.

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UNITED STATES PATENT OFFICE

ROBERT G. CLYNE, OF ST. LOUIS, MISSOURI, ASSIGNOR TO WESTERN CARTRIDGE COMPANY, OF EAST ALTON, ILLINOIS, A CORPORATION OF DELAWARE

SHOT SHELL

Application filed May 25, 1929. Serial No. 365,890.

This invention pertains to cartridge shells and more particularly to shot gun shells.

In the usual construction of shot gun shells, the shell tube, which is ordinarily of wrapped paper, is fixed in a metallic base and a base wad is inserted within the base of the shell. The purpose of this wad is to provide a seal against the escape of powder gases from the rear end of the shell upon discharge of the cartridge and also to somewhat cushion the shock of the discharge. Such base wads have ordinarily been made by wrapping convolutions of paper to build up a wad of the desired diameter. When such a wad is placed in the shell the laminations thereof run parallel to the walls of the shell. This construction, therefore, provides a series of crevices between layers of paper, and even though the wad is highly compressed, under the enormous pressure, the gases often find their way through these crevices, causing leaks. This is, of course, disagreeable as well as dangerous to the user of the shell. Moreover, the gases penetrating the base wad are liable to expand the shell base to such an extent as to cause the shell to stick in the gun.

One of the objects of this invention is to provide means for effectively sealing the base of a shell against possible leaks of gases.

Another object is to provide means for sealing the crevices between the layers of paper in a base wad such as above described.

Another object is to provide means which will effectively prevent the gases from escaping and from penetrating the base wad.

Further objects will appear from the following description, taken in connection with the accompannying drawings, in which—

Figures 1, 2, 3, and 4 are sectional views of shot shells embodying this invention, the views showing various embodiments of this invention.

Generally stated, in accordance with this invention, the base wad has seated against its inner end an impervious plastic overlay, which is readily yieldable to the gas pressures in order to act as a gas check. Where the base wad is recessed or cupped, the overlay is also cupped to conform. This overlay not only seats against the base wad facially but also circumferentially so as to hug the tube as well as the base wad in order to complete the gas seal. In accordance with one embodiment of this invention, the overlay is in the form of a disc provided with a flange, which hugs either the tube wall or the wall of a recessed or cupped base wad.

The overlay should be of a material which is not only impervious to the gases under the pressure and conditions encountered in the shell when fired, but should also be plastic under those conditions; for if these conditions are not met, then the objects of this invention are not attained. This is particularly true in a shot shell, consisting as it does of a wrapped paper tube in a metal base and provided with a wrapped paper base wad. If the overlay is porous or has crevices, then penetration and leakage of the gases is not prevented. If, on the other hand, the overlay is of a hard, stiff or non-plastic material, such as steel, then the gases will act on the paper tube and base wad rather than on the overlay, so as to leak between the overlay and the tube and base wad; therefore, the overlay will serve no useful purpose in attaining the desired result. A material which is particularly suitable is paper, although even the latter should be sufficiently soft and plastic that it will not crack when it is formed or when it is forced against the base wad when the shell is fired. Felted materials, other than what is technically known as paper, may, however, be employed; suitable impregnated fabrics, gums, waxes and even overlays of suitable cellulose and nitro-cellulose bases may be employed.

Referring now to the drawings, 1 designates the shell tube which is usually of wrapped paper. This tube is fixed at one end in a metallic base 2. A base wad 3 of wrapped paper or of any suitable construction or material may be provided; this base wad may be recessed or plain at its inner end. The usual battery cap is shown at 5.

The overlay is shown at 4 as in the form of a disc which is flanged to form a cup. Where the overlay is made of paper, it is formed in any suitable manner as by forming dies; where dies are employed, the cup is pro-

duced by a series of operations from a flat disc so that the folds normally produced at the edge of the flange are ironed out. The overlay is so formed as to conform to and seat on the base wad.

In Figure 1 the overlay 4 is shown as a shallow cup of somewhat frusto-conical form conforming to the inner end of the base wad 3 and bearing at its circumference against the shell tube 1. In Figure 2 the overlay 4 forms a somewhat deeper cup, which is offset so as to fit the stepped contour of the base wad 3. In Figure 3 the overlay 4 is formed into a rather deep cup conforming to the base wad 3 and having its flange in contact with and hugging the shell tube 1 through a considerable distance. In Figure 4 the overlay 4 is a shallow cup formed to seat on a plain base wad and with the flange of the cup again hugging the shell tube. It will be understood that the overlay is in each case perforated to expose the flash hole of the battery cup. In Figures 1, 3, and 4, the bottom of the overlay cup engages and surrounds the battery cup and makes contact therewith, while in Figure 2 the cup terminates at the step in the base wad above the battery cup. In Figure 4 the bottom of the overlay cup is depressed to conform to the depression in the base wad around the battery cup.

Where the overlay is of a felted material such as paper which has no definite grain, but forms a continuous impervious sheet, it is effective to withstand the pressure of the gases so as to prevent the same from penetrating between layers of the base wad 3. This also holds true where the overlay is of another impervious but plastic material. In Figures 1, 3, and 4, the flange of the overlay is pressed against and hugs the walls of the tube 1 by the pressure of the gases, so as to prevent leakage around the outer edge of the overlay as well as into the base wad. In Figure 2 the same action takes place, the flange of the overlay being pressed against and hugging the rim of the base wad 3 so as to hold the latter firmly in contact with the shell tube and prevent leakage.

It will therefore be seen that this invention accomplishes its objects in providing an effective gas check or seal over the base wad. The overlay can readily be made and of cheap material; and as the depth of the base wad can be reduced, the cost is not increased by the employment of the overlay.

It is obvious that various changes may be made in details of construction, within the scope of the appended claims, without departing from the spirit of this invention. It is understood, therefore, that the invention is not limited to the specific details shown and/or described.

Having thus described the invention, what is claimed is:

1. A shot shell having a base wad and an impervious plastic overlay seated against and contacting with the inner end of said wad adapted to seal the base of the shell against escape of the powder gases.

2. A shot shell having a base wad and an impervious cupped plastic overlay seated against the inner end of said wad.

3. A shot shell having a tube, a base wad and an impervious cupped plastic overlay seated against and contacting with the inner end of said wad and with its flange seated against the tube.

4. A shot shell having a recessed base wad and an impervious plastic overlay seated against contacting with, and conforming to the inner end of said wad.

5. A shot shell having a recessed base wad and an impervious plastic cupped gas-sealing overlay seated in and contacting with said wad.

6. A shot shell having a base wad and a plastic felted overlay disc seated against the inner end of said wad.

7. A shot shell having a base wad composed of wound layers and a plastic overlay seated against the inner end of said wad.

8. A shot shell having a base wad composed of wound layers of paper and a plastic paper disc seated against the inner end of said wad.

In testimony whereof I affix my signature this 25th day of April, 1929.

ROBERT G. CLYNE.

CERTIFICATE OF CORRECTION.

Patent No. 1,842,445. Granted January 26, 1932, to

ROBERT G. CLYNE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 72, claim 2, after the word "against" insert the words and contacting with, and in the same claim and line, after "wad" insert the words adapted to seal the base of the shell against escape of the powder gases; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22nd day of March, A. D. 1932.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)