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H. ERNST ET AL

WAD FOR SHOT SHELLS

Filed July 30, 1923

Fig. 1.

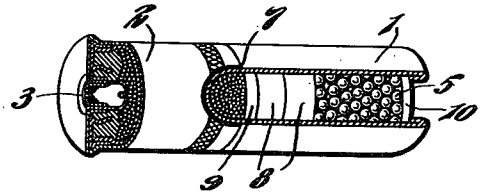


Fig. 2.

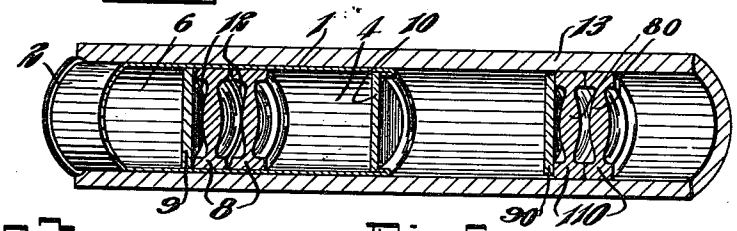


Fig. 3.

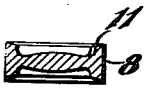


Fig. 4.



Fig. 5.



Fig. 6.



Fig. 7.



Fig. 8.



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UNITED STATES PATENT OFFICE.

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WAD FOR SHOT SHELLS.

Application filed July 30, 1923. Serial No. 654,692.

This invention relates to shot gun wads.

One of the objects of this invention is to provide a wad which may be placed between the powder and shot of a shot gun shell and which will be capable, upon discharge, of making close contact with the gun barrel so as to provide an improved gas check.

Another object of this invention is to provide a wad in which the pressure of the discharged gases may be effective in forcing the wad against the walls of the gun barrel.

Further objects will appear from the detail description taken in connection with the accompanying drawing, in which:

Figure 1 is a perspective view of a shot gun shell embodying this invention, showing parts cut away to expose the interior thereof;

Figure 2 is a sectional view of a part of a gun barrel with a dummy shell in place so as to show the position of the wad in the shell and showing also the position of the wad as it moves along the barrel after discharge; and

Figures 3 to 8 inclusive are sectional views showing several forms of gun wads embodying this invention.

Referring to the accompanying drawing 1 designates the shell of a shot gun cartridge having a base 2 which is usually constructed of metal and has a priming cap 3. The space within the shell 1 is ordinarily divided into a space 4 at the forward end thereof adapted to accommodate the charge of shot 5 and a rearward space 6 adapted to accommodate the powder charge 7. The division is effected by means of a wad or wads 8 and 9. Ordinarily an end wad or closure 10 closes the mouth of the shell 1 after the charge of shot 5 has been inserted so as to retain said charge and seal the shell.

The wads 8, which may have any one of the shapes illustrated in Figures 3 to 8 inclusive, are constructed of pliable material. A material particularly suited for this purpose is compounded of granulated cork and a suitable binder, such as polymerized Chinawood oil. Such a compound is described in Patent No. 1,485,337, patented February 26, 1924. This material is rigid enough to be suitable for wads of this kind and is yet pliable so that it may be deformed under pressure.

It will be noted that the shape of the wad is such as to provide dished faces. The opposite faces are equally dished and similarly formed so as to provide symmetrical faces on opposite sides of the wad. These dished faces provide at the edges thereof a rim 11 surrounding said faces. This rim is of substantial thickness both axially and radially. The wads 8 may be assembled in the shell 1 in a series of one, two or more, as desired, and between them and the powder charge 7, the comparatively rigid wad 9 is placed. The wads 8 bear against one another at their rims and the wad 9 also bears against the rim of the rear-most wad 8. As will be clear from Figure 2, there is thus provided an air space 12 between adjacent wads.

When the cartridge is discharged in the gun barrel 13, the pressure of the gases in the space 6 forces the wads 8 and 9 outwardly so as to force the charge of shot 5 and the wad 10 out of the end of the shell 1. Under the expansion of these gases, the wads 8 and 9 move out of the shell and along the barrel 13 in a manner similar to that of a piston moving along a cylinder. (See Figure 2.) The charge of shot 5 fills the barrel ahead of the wads 8 and 9 and by its inertia exerts a rearward pressure against these wads. This, together with the forward pressure exerted by the explosion gases, puts a considerable axial pressure on the wads 8 and 9. As these wads bear against each other at their rims and are centrally spaced from one another, the pressure will be entirely taken up by the rims 11. As these rims are pliable, they will be deformed under this pressure and expanded circumferentially as illustrated at 110 so as to bear against the interior of the barrel 13. The greater the pressure on the wad combination, the greater will be the pressure with which the wads bear against the barrel and the more complete a gas check will be formed thereby. It will be noted that the inner-most wad in the position shown at 90, being comparatively rigid, will transmit the gas pressure to the rim of the inner-most wad 80, which will in turn transmit that pressure to the rim of the succeeding wad 80. Each of these rims will thus be circumferentially expanded into intimate contact with the barrel so that in effect a series of seals is provided so as to improve the effectiveness of the gas check. In accordance with this invention the shot shell wad is not only of pliable material but

of a thickness small compared to its diameter. This with the fact that the facial bearing surface of the wad is less than the area of the shell bore causes the wad to be compressed axially at its bearing surface so that it expands circumferentially upon such compression to form an effective seal.

The pliable wads 8 may also be made of the shape shown in Figure 4, in which case they will bear against one another both at the rim and at the center, but owing to the fact that the surfaces then in contact are of relatively small area, the wads will readily be compressed axially and the pliable rims expanded circumferentially thus acting in the manner described above to provide a more effective gas check.

In accordance with this invention, therefore, a pliable wadding is provided between the powder charge and the shot which upon discharge is adapted to be expanded circumferentially to form an effective gas check. A series of pliable wads is provided with a rigid wad in rear thereof and bearing against the rim, the wads being spaced centrally from one another and adapted, when pressure is exerted thereon, to deform their rims so as to make close contact with the barrel. The fact that there is a series of wads, each making such contact, provides a thoroughly efficient gas check, which is adapted by providing a more uniform and positive acceleration of the charge of shot to improve the ballistics thereof.

It is obvious that various changes may be made in details of construction without departing from the spirit of this invention; it is, therefore, to be understood that this invention is not to be limited to the specific details shown and described.

Having thus described the invention, what is claimed is:

1. A shot shell wad whose thickness is small compared to its diameter and facially recessed to provide a web surrounded by a rim adapted to engage another wad and provide an interior space, the rim of said wad being pliable axially and circumferentially under the pressure developed when the shell is fired whereby the rim will compress axially and expand circumferentially upon such compression to provide a seal.

2. A shot shell wad whose thickness is small compared to its diameter, the opposite faces of the wad being recessed to provide a web surrounded by a rim adapted to engage another wad or wads and provide an interior space or spaces, the rim of said wad being pliable axially and circumferentially under the pressure developed when the shell is fired whereby the rim will compress axially and expand circumferentially upon such compression to provide a seal.

3. A shot shell wad whose thickness is small compared to its diameter and facially recessed to provide a web surrounded by a rim adapted to engage another wad and provide an interior space, said wad being composed of a compressed mixture of granular material and polymerized oil which is pliable under the pressure developed when the shell is fired whereby the rim will compress axially and expand circumferentially upon such compression.

4. A shot shell wad whose thickness is small compared to its diameter and facially recessed to provide a web surrounded by a rim adapted to engage another wad and provide an interior space, said wad being composed of a compressed mixture of granular cork and polymerized China-wood oil which is pliable under the pressure developed when the shell is fired whereby the rim will compress axially and expand circumferentially upon such compression.

In testimony whereof we affix our signatures this 16th day of July, 1923.

HANS ERNST.
ALFONS GUSTAVE SCHURICHT.