July 29, 1930. A. S. O'NEIL ET AL 1,771,897

CARTRIDGE WAD AND PROCESS OF MAKING THE SAME

Filed Nov. 21, 1925

Fig. 1.

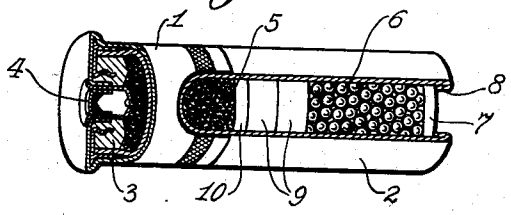


Fig. 2.

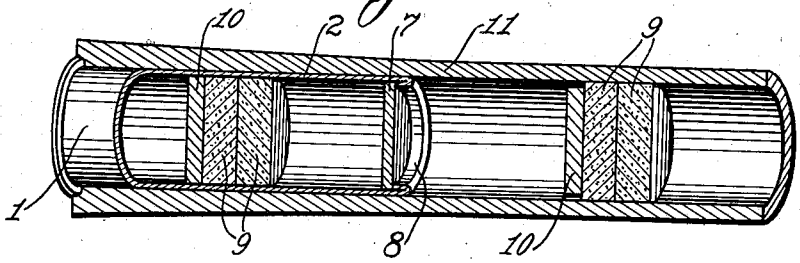


Fig. 3.

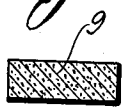


Fig. 4.



Inventor:
Arthur S. O'Neil and Alfons G. Schuricht,
By John N. Brunnga
Their Attorney.

Patented July 29, 1930 1,771,897

UNITED STATES PATENT OFFICE

ARTHUR S. O'NEIL AND ALFONS G. SCHURICHT, OF ALTON, ILLINOIS, ASSIGNORS TO WESTERN CARTRIDGE COMPANY, OF EAST ALTON, ILLINOIS, A CORPORATION OF DELAWARE

CARTRIDGE WAD AND PROCESS OF MAKING THE SAME

Application filed November 21, 1925. Serial No. 70,645.

This invention relates to cartridge wads, and more particularly to wads adapted for use in shot shells.

In a shot shell wadding is placed between the propellant and shot charges. The purpose of wadding is not only to separate the charges but to act also as a seal for the gun chamber in order to seal the same and cause the gases developed by ignition of the propellant charge to propel the shot charge out of the gun. In wads as heretofore constructed, the objective has been to produce a resilient wad which will distend under pressures developed in a gun and more or less fill the gun bore in order to seal the same against escape of gases around the wad.

In firing a shot gun using either a progressive or non-progressive burning powder, the greatest gas pressure is produced at or near the breech of the gun and in consequence the greatest expansion takes place in the wadding in these positions. As, however, the shot charge travels with the wadding along the barrel, the pressures fall off rapidly, and as a result the expansion of resilient wadding falls off so that the gas seal becomes less efficient as the charge travels along towards the muzzle of the gun, thereby allowing more or less of the gases to escape around the confining wadding. This escape of gases not only affects the seal but also passes into the shot column, thereby tending to disrupt the pattern and increasing the stringing of the shot.

One of the objects of this invention, therefore, is to provide a cartridge in which the wadding between the propellant and shot charges will be moved into effective sealing engagement with the gun barrel and so maintained.

Another object is to provide a cartridge wad whose sealing effect depends not only upon flexiblity and resiliency but also upon plasticity.

Another object is to provide a cartridge wad, the structure and nature of which is such that when exposed to the pressures developed in the gun, it will flow and seal the gun barrel and remain set in this condition during substantially the entire travel through the gun barrel.

Another object is to provide a shot shell in which the gases are sealed against escape around the wadding and into the shot column.

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 shell embodying this invention, part of the shell being broken away to expose the propellant and shot charges and the wad;

Figure 2 is a cross-sectional view of a gun barrel illustrating the action of the wad;

Figure 3 is a detail cross-sectional view of a wad embodying this invention; and

Figure 4 is a similar view showing another wad embodying this invention.

Referring to the accompanying drawing, and more particularly to Figure 1, 1 designates the base and 2 the tube of an ordinary shot shell which is also provided with a base-wad 3 and a primer 4. The base of this shell is provided with a propellant charge 5, while 6 indicates the shot charge confined by the usual wad 7 and retained by the usual crimp 8. The shell so far described may be of any usual and suitable construction well known to those skilled in the art.

In accordance with this invention interposed between the propellant and shot charges 5 and 6 is wadding which is plastic as distinguished from resilient, and more especially which becomes plastic under the pressures developed in a gun; accordingly the wadding becomes distended when the shell is fired so as to fill the bore of the gun and it sets or stays in such distended condition.

The wadding may be of a suitable material having the desired characteristics as hereinafter described. This material is preferably such that it will flow when subjected to pressures, either cold or at elevated temperatures, and distend and set in distended condition. In accordance with one embodiment of this invention the wad comprises a filler and a binder which are combined to form a plastic mass. The binder may be of a plastic nature and substances which

have been found suitable are plastic pitches (stearine, wood, coal or synthetic pitches); stearine pitch is especially suitable for this purpose. A satisfactory filler is wood flour, wool flock, cotton fibre, cork or any other cellular or granular material, the choice and proportion of a filler being dependent upon the degree of plasticity desired. A suitable mixture is stearine pitch 30%, wood flour 60% and wool flock 10%; these percentages may, however, vary from 20% to 40% stearine pitch, 70% to 50% wood flour, and 15% to 5% wool flock.

In preparing the mixture, the pitch is introduced into a jacketed mixer which may be heated. The material is caused to soften or melt through the application of heat and the filler selected is introduced in small proportions while the mixing proceeds. The mixing is then continued until the filler is thoroughly coated and impregnated with the plastic material. When thoroughly mixed the material is ready to be formed into the desired shape; this may be accomplished in any well known manner as: by rolling under pressure into sheets and punching the wads therefrom; extrusion from a die into rods and slicing the wads therefrom; or by separately pressing portions of the material in individual dies to form finished wads. Any waste material resulting from the cutting of the wads from the sheets or in any other manner may be returned to the mixture and reheated either alone or in connection with fresh material.

There is formed as a result a wad which is plastic in that it will flow and when distended will set and retain its shape. The manufacture of the wads is economical in that they are ready for use as soon as formed without any additional heating, cementing or other treating operations. The wad may be in various shapes, Figure 3 showing a plain wad while Figure 4 shows a wad whose cross-section is of I form. The wad may, however, be made in various other shapes.

The wad may be placed either as a single thick wad or as a series of wads 9 between the powder and shot charges and the usual rigid wad 10 may be placed next to the propellant charge if so desired. In Figure 2 the action of the plastic wadding is illustrated. Upon firing of the charge and when the wadding 9 has passed into the bore of the gun 11, the wadding will be distended radially in all directions so as to fill the gun, this being due to the fact that the wadding is subjected on one side by the pressure of gases in back thereof while the inertia of the wadding and of the shot charge acts as a counter-resistance. Accordingly the wadding will fill the gun barrel like a piston. However, as the pressure drops, the wadding will not contract, in view of the fact that it has set in any distended position to which it may be distended, so that the wadding will act as an efficient seal during the entire travel through the gun barrel. Accordingly an effective seal is provided against escape of gases passing the wadding and into the shot charge so that the pattern will not be disrupted while the stringing of the shot is kept at a minimum.

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 cartridge wad composed of stearine pitch and a filler.

2. A cartridge wad composed of a cellular material and a binder of stearine pitch.

3. A cartridge wad comprising wood flour, wool flock and stearine pitch.

In testimony whereof we affix our signatures this 16th day of October, 1925.

ARTHUR S. O'NEIL.
ALFONS G. SCHURICHT.