N. P. LEACH.

LOADED SHOT SHELL.

APPLICATION FILED SEPT. 29, 1910.

997,566. Patented July 11, 1911.

Fig. 6.

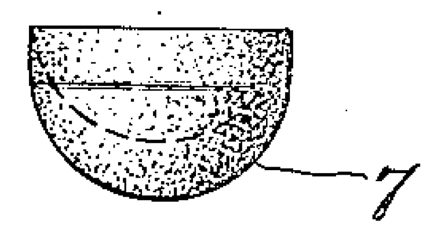


Fig. 1.

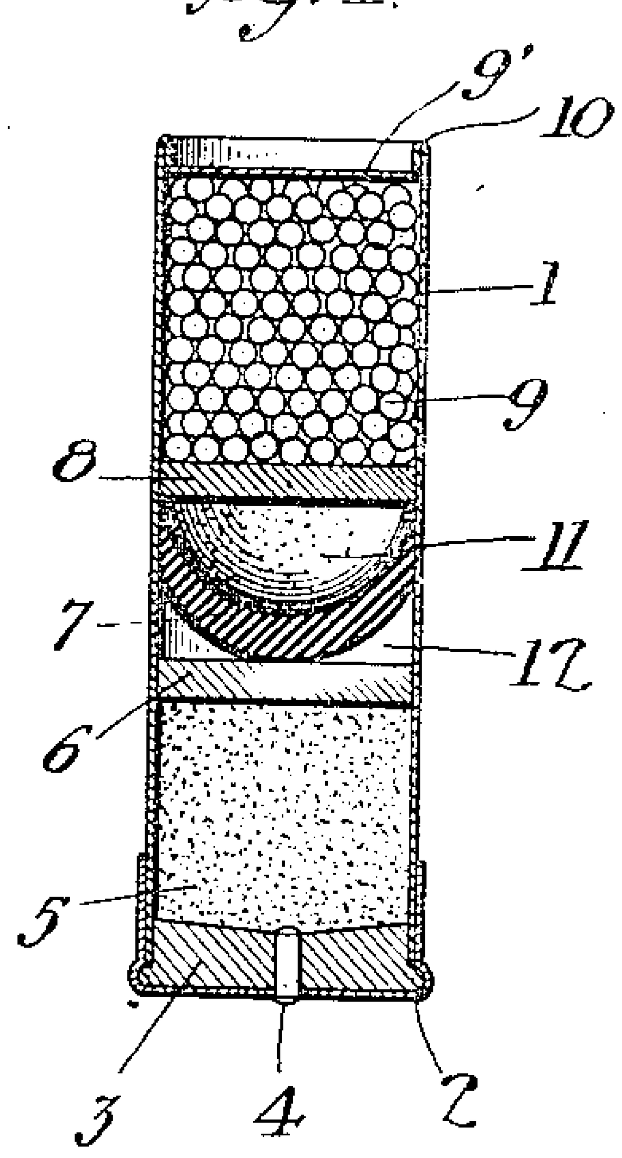


Fig. 2.

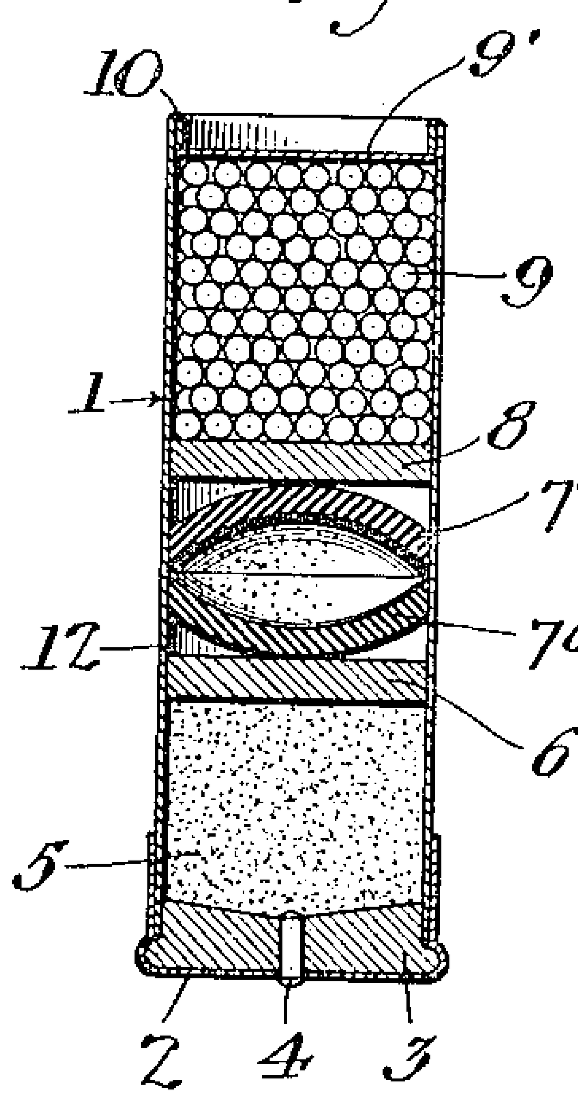


Fig. 3.

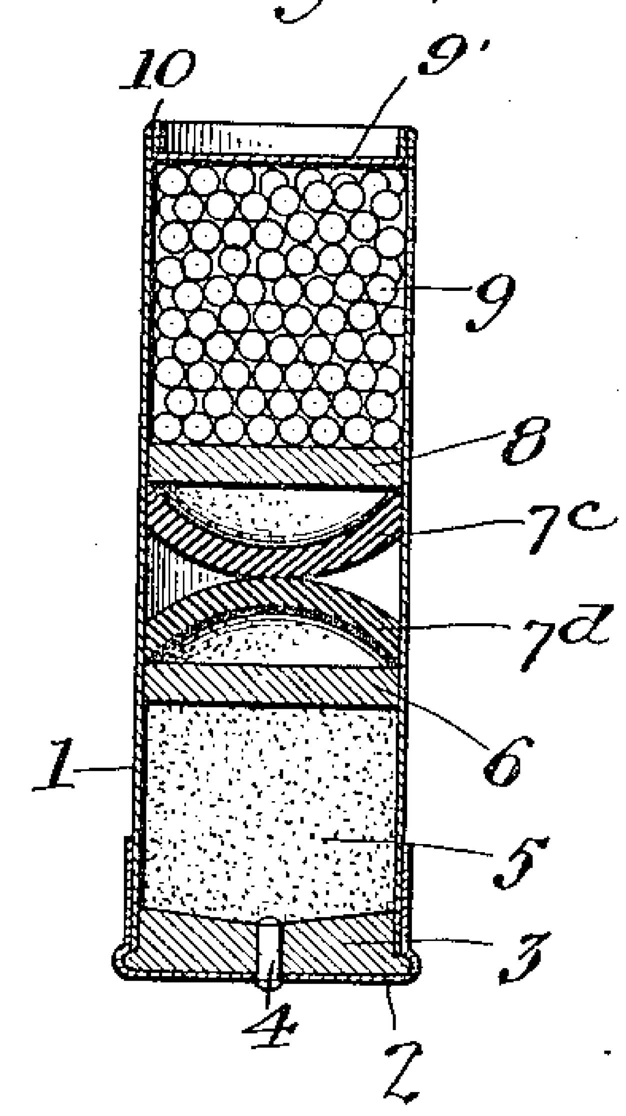


Fig. 4.

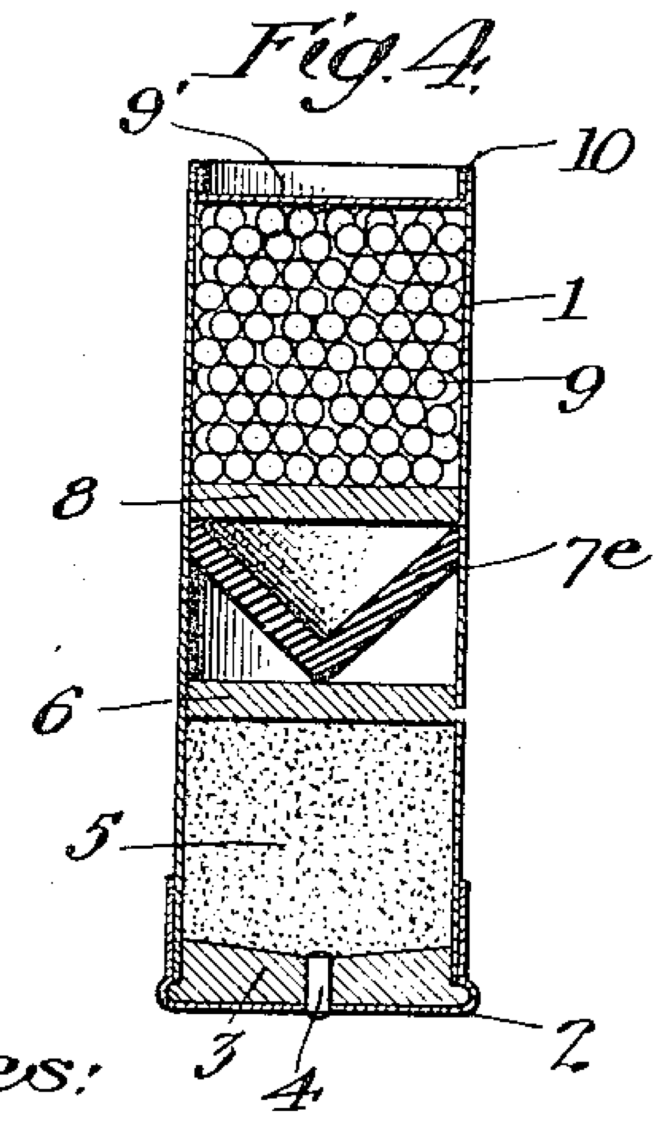
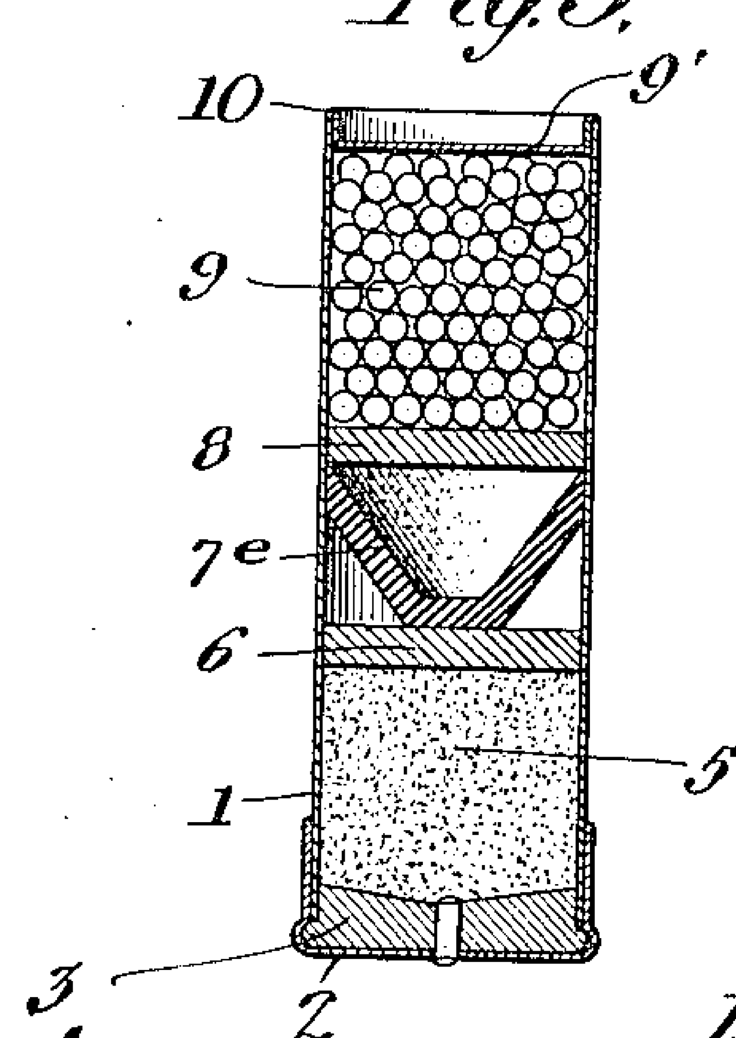


Fig. 5.



Witnesses:
Lute S. Alter
I. D. Thornburgh.

Inventor:
Noah Parker Leach,
by [illegible] attys.

UNITED STATES PATENT OFFICE.

NOAH PARKER LEACH, OF PASADENA, CALIFORNIA.

LOADED SHOT-SHELL.

997,566. Specification of Letters Patent. Patented July 11, 1911.

Application filed September 29, 1910. Serial No. 584,578.

To all whom it may concern:

Be it known that I, NOAH PARKER LEACH, a citizen of the United States, residing at Pasadena, in the county of Los Angeles and State of California, have invented a new and useful Loaded Shot-Shell, of which the following is a specification.

This invention relates particularly to a loaded shot shell, and has for its object to prevent the escape of gas, which, in the ordinary loaded shot shell, takes place upon the expansion of the shell when fired, and by preventing the escape of this gas to secure a much greater velocity.

A further object is to provide an air chamber which will assist as a gas-check to prevent the escape of gas and to also serve as an elastic cushion taking the violent shock from the shot when fired.

In the ordinary loaded shot shell the violent shock is such that unless chilled shot are used they will be more or less mashed, and one great advantage of the invention is that the use of chilled shot may be dispensed with and soft shot used, thereby securing considerable economy.

A further advantage is that the chamber pressure is lessened and recoil is reduced. The air cushion which prevents the violent shock against the shot when the loaded shot shell is fired, gives a much closer pattern, with less chamber pressure in the gun, than obtained by loaded shot shells heretofore.

In carrying out my invention, I accomplish these results by the employment of a deeply dished or conical wad, which for convenience I term a gas-check wad. This wad may be deeply dished in various forms, as concavo-convex, with rounded surfaces using only a single dished wad or a plurality of dished wads, or it may be conical with straight sides. The essential feature, however, is that the face area of the gas-check wad should be much greater than the cross sectional diameter of the shell internally, whereby the gas-check wad will be flattened out when the shell is fired in such a manner that the circumference of the gas-check wad will tend to be increased to a greater extent than the expansion of the shell, and the edges of the gas-check wad will thereby be forced into most intimate contact with the wall of the shell and thereby prevent escape of gas.

Referring to the drawings: Figure 1 is a longitudinal, sectional view through one form of loaded shot shell constructed in accordance with my invention. Fig. 2 is a similar view showing a slightly modified form. Fig. 3 is a similar view showing another modified form. Fig. 4 is a similar view showing another modified form. Fig. 5 is a similar view showing another modified form. Fig. 6 is a perspective view, in detail, of the gas-check wad used in the form shown in Fig. 1.

The shell comprises the body 1 with head 2 and usual base 3 and primer 4. 5 designates the powder and 6 is a powder wad, all of which elements may be of the usual construction or any other preferred form.

7 designates the gas-check wad which, as shown in Fig. 1, is deeply dished in concavo-convex form and arranged with its convex face against the powder wad 6. The gas-check wad is preferably tapered to a thin edge, as shown. The gas-check wad 7 may be formed of any desired material, such, for example, as closely woven felt. A wad 8 is arranged next to the gas-check wad 7, the edges of the gas-check wad 7 touching the wad 8. The shot 9 are arranged next to the wad 8 and are confined by a shot wad 9′, the edge of the body 1 being crimped at 10 to retain the shot wad 9′. An air chamber 11 is formed on the concave side of the gas-check wad, and an annular air chamber 12 is formed on the convex side of the gas-check wad by reason of the dished shape of the gas-check wad. The dished shape of the gas-check wad produces a greater face area of the gas-check wad than the interior cross sectional area of the shell, and when the shell is fired the pressure behind the gas-check wad flattens it, thereby increasing its diameter and forcing its edges into the most intimate contact with the walls of the body 1 of the shell, which prevents the escape of gas. When the shell is fired the walls of the body 1 expand, and in shells of the usual construction, as the walls of the shell expand, they move the walls slightly away from the edge of the ordinary flat wad, the ordinary flat wad not expanding proportionately, which permits the gas to escape past the edges of the flat wad; but with the deeply dished wad which I employ this expansion of the shell does not leave any space at the edge of the gas-check wad because the edge of the latter is wedged out tightly against the wall of the shell by

reason of the flattening of the gas-check wad. This flattening action of the dished wad increases its cross sectional diameter.

In addition to the tight fit produced at the time of firing between the edge of the gas-check wad and the shell to prevent the escape of gas, this escape of gas is further checked by the air compressed in chambers 11 and 12. The air chambers 11 and 12 also serve as an elastic cushion to prevent a shock to the shot so violent as when the ordinary flat wad, without air chambers, is employed. This prevents mashing of the shot and enables soft shot to be employed. The air cushions result in less chamber pressure in the gun and give a much closer pattern than with loaded shot shells of the ordinary construction.

In practice with exhaustive tests, I have found that a full choke bore gun at thirty-five yards at a target 8x9½ inches in size, shows an average of 94 and ⅘ better pattern and 32 and ⅓ greater velocity than the best factory loaded shell with the same powder and shot charge. I have also found that as this distance is increased it gives better results with a more perfect uniformity in velocity.

Fig. 2 shows a modification in which two gas-check wads 7^a and 7^b are employed between the wads 6 and 8, the wads 7^a and 7^b both being concavo-convex and arranged with their edges together and with their convex faces against wads 6 and 8 respectively. In this form it is obvious that upon firing the pressure will flatten both wads 7^a and 7^b and cause them to tightly fit the wall of the shell.

In Fig. 3 wads 7^c and 7^d are shown similar in construction to those in Fig. 2, but arranged with their convex faces against each other and with their edges respectively against wads 6 and 8. In this form also it is obvious that upon firing, the dished wads will be flattened and their edges wedged tightly against the shell and check the escape of gas.

Fig. 4 shows another form in which the gas-check wad 7^e is made conical, and in Fig. 5 it is made frusto-conical. In either of the two latter forms the dished wad will be flattened as in the preceding form and caused to tightly fit the shell and prevent the escape of gas.

What I claim is:

1. A shell, an explosive therein, a projectile element therein, a wad against the projectile element, a wad against the explosive, a dished wad with its center portion against one wad and its rim portion against the other wad forming a central air chamber on the concave side of the dished wad, and an annular air chamber on the convex side of the dished wad.

2. A shell, an explosive therein, a projectile element therein, wads between the projectile element and explosive, a dished wad with its center portion against one of said wads and its rim portion against another of said wads forming a central air chamber on the concave side of the dished wad, and an annular air chamber on the convex side of the dished wad.

In testimony whereof, I have hereunto set my hand at Los Angeles Cal. this 23 day of September 1910.

NOAH PARKER LEACH.

In presence of—

G. F. Hackley,

Frank L. A. Graham.