I. KINNEY.

CARTRIDGE-SHELLS.

No. 185,548. Patented Dec. 19, 1876.

Fig. 1.

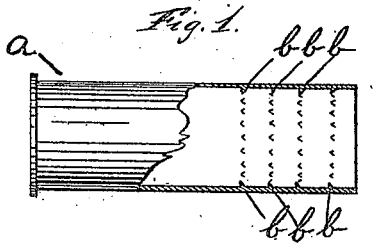


Fig. 2.

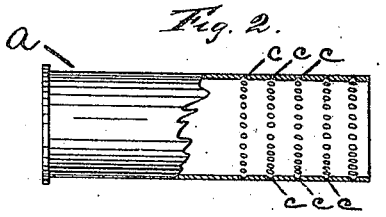


Fig. 3.

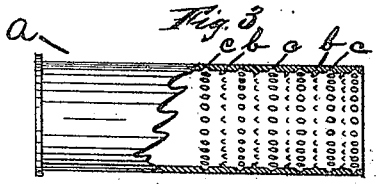
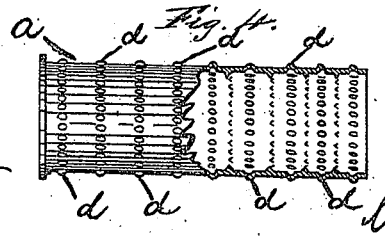


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN CARTRIDGE-SHELLS.

Specification forming part of Letters Patent No. 185,548, dated December 19, 1876; application filed October 23, 1876.

To all whom it may concern:

Be it known that I, ISRAEL KINNEY, of London, Province of Ontario, Dominion of Canada, have invented a new and useful Improvement in Cartridges; and I declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a diametrical section of my improved shell, showing internal projections. Fig. 2 is a diametrical section of my improved shell, showing internal depressions. Fig. 3 shows a diametrical section, showing part depression, part projections. Fig. 4 shows external protuberances.

Like letters indicate like parts in all figures.

My invention relates to an improvement in cartridges; and consists in so making the cartridge-shells that they shall have small depressions, or small protuberances, or both, on the inner surface of the shell, by which the wad of the shell shall be caught and held firmly down upon, and be prevented from changing its position with reference to, the charge of powder and shot or ball, irrespective of the size of the charge.

Prior to my invention cartridge-shells have generally been made with their inner sides perfectly smooth, and the continued shooting of one barrel of a double gun, by the recoil, produced the gradual loosening and working out of the wad in the undischarged cartridge, until finally the charge in that cartridge would run out at the muzzle of the piece. The same difficulty was experienced in transportation of such shells, the shocks and jars contingent upon transportation having the same effect.

I am aware that attempts have been made, by bending over the body of the shell at its mouth, and by corrugating its sides by continuous circumferential rings or ridges, to obviate the shifting of the wad, but all such attempts have proved ineffectual; but I do not claim, broadly, confining the wad, but only by the means herein set forth.

In the accompanying drawings, *a* represents a cartridge-shell made of any suitable material. From the mouth or muzzle of the shell, and extending down into it, thickly dotting its inner surface, I produce by pressure, or in any other suitable manner, a number of small protuberances, *b b b*, or small depressions *c c c*.

I can produce the protuberances or points by burring up the inner surface of the shell by any suitable means; and the depressions I can produce by introducing into the shell a hardened expansible die, made in any of the known ways, having on its sides that come in contact with the shell numerous small projections, which shall puncture the shell internally when the die is forcibly expanded against it. During this operation the shell must be firmly held in a tightly-fitting holder or jaws to prevent the bursting of the shell, and to secure the outer surface from being roughened by the action of the expanding-die.

When a perfectly-smooth external surface is not required, the internal projections can be best made by applying a punch action to the external surface of the shell, which shall force the metal or other substance of the shell to protrude on the inside, the shell being meantime held in any suitable mandrel, or any other support.

Another manner in which I make my improved shell is, to produce projections on both the inside and the outside of the shell, those on the outside roughening the external surface. The object of this is to render the shell more easily withdrawn from the chamber of the gun by decreasing the amount of friction, the contact being less between the sides of the chamber and numerous projections or knobs protruding from the shell than against the entire external surface of the shell. When the shell is made in this manner of course the external points must cover the entire circumference of the shell. Otherwise it would not be supported in the chamber throughout its entire length. The protuberances are shown at *d d d* of Fig. 4.

In practice the operation of my invention is

this: The wad, tightly filling the inside of the shell, is forced down upon the charge of powder and shot or ball until arrested by it. Then, the pressure being removed, the edges or rim of the wad expand into, and are held by, the internal depressions in the one instance, and are caught and firmly held by the internal burrs or projections in the other. The wads ordinarily used for such purposes can be used with my shell, but the harder kinds I find to work best.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A cartridge-shell made with depressions in its inner surface, as described, as a new article of manufacture.

2. A cartridge-shell made with protuberances on its circumferential exterior surface.

ISRAEL KINNEY.

Witnesses:
PHILLIPS ABBOTT,
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