

C. H. STEVENSON.
PAPER SHELL CARTRIDGE.
APPLICATION FILED JUNE 21, 1912.

1,039,839.

Patented Oct. 1, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

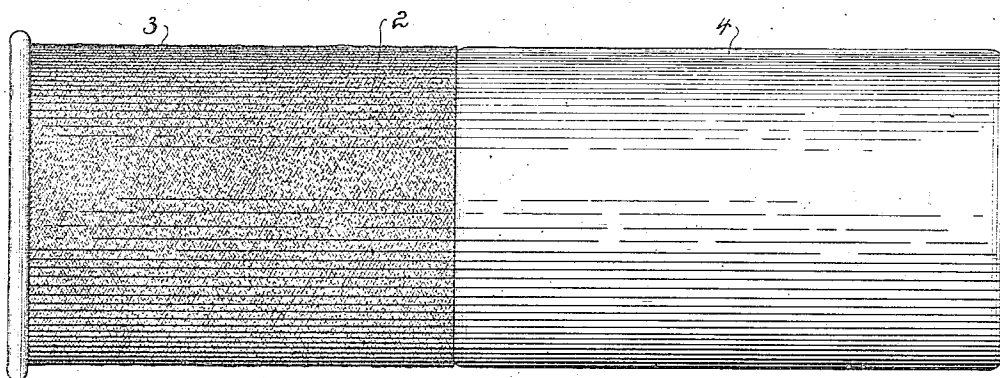
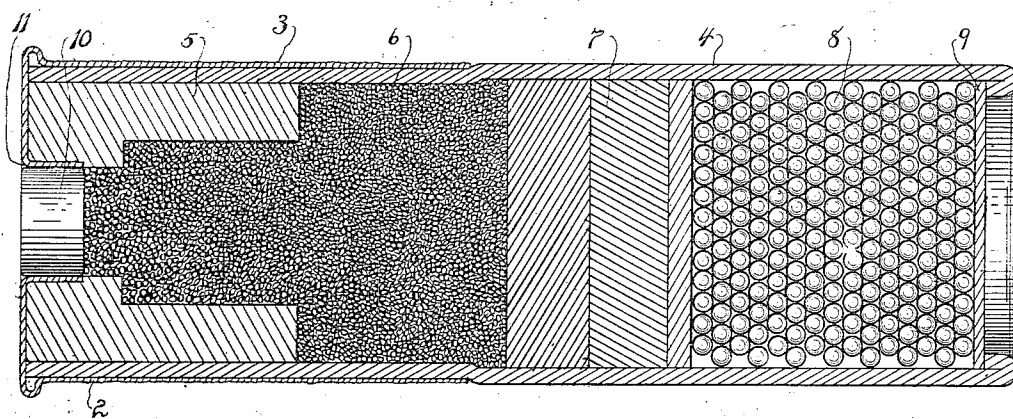


Fig. 2.



Witnesses
M. P. Nichols
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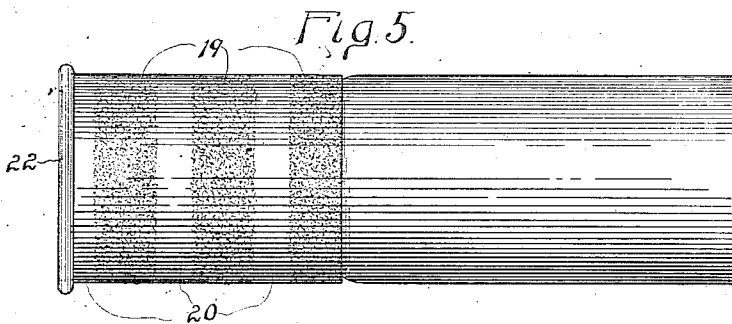
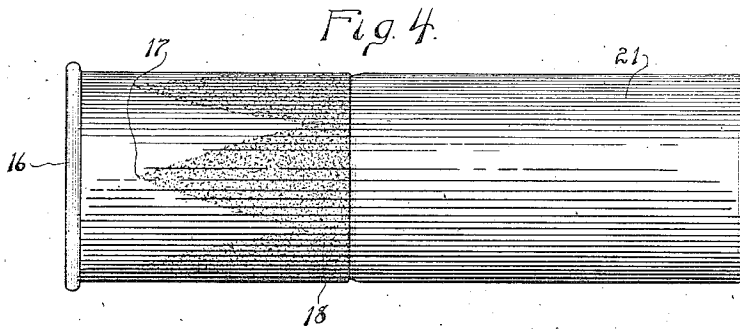
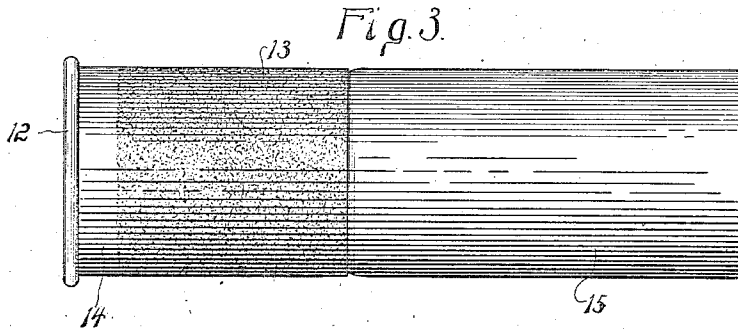
Charles H. Stevenson
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Att'y

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CHARLES H. STEVENSON, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO WINCHESTER REPEATING ARMS CO., OF NEW HAVEN, CONNECTICUT, A CORPORATION.

PAPER-SHELL CARTRIDGE.

1,039,839.

Specification of Letters Patent.

Patented Oct. 1, 1912.

Application filed June 21, 1912. Serial No. 704,971.

To all whom it may concern:

Be it known that I, CHARLES H. STEVENSON, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Paper-Shell Cartridges; and I do hereby declare the following, when taken in connection with the accompanying drawings and the characters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this application, and represent, in—

Figure 1 a view in side elevation of a cartridge constructed in accordance with my invention. Fig. 2 a view thereof in central longitudinal section. Figs. 3, 4 and 5 are views in side elevation on a smaller scale, but still above actual size, of modified forms which my improved non-cutting-off paper cartridge shell may assume.

My invention relates to an improvement in paper-shell cartridges, by which I mean cartridges consisting of a tube of paper inserted at one end into a drawn sheet-metal cup provided with a central pocket for the reception of a primer containing fulminate.

When paper-shell cartridges were first invented and put upon the market, only black powders were used. On ignition these powders produce relatively low pressures and consequently "cut-offs", so called, were so rare as to be practically negligible. By "cut-offs" I mean the shearing in the cartridge-chamber of the gun-barrel of the paper tube of a paper-shell cartridge at the instant of firing the same, from the sheet-metal cup of the cartridge, along the line of the edge of the cup where the paper and metal come together. When a "cut-off" occurs, the sheet-metal cup is extracted from the gun-barrel in the usual manner, but the largest portion of the paper tube remains, stuck in the cartridge-chamber of the gun-barrel and can be extracted only with difficulty and often not without the expenditure of precious time. Frequently the tube left in the cartridge-chamber is so firmly adhered to the walls thereof that it can be removed only by a hook. With the advent of smokeless powders which produce higher pressures than black powders, cut-offs became so frequent as to be a source of great annoyance. Consequently the problem of avoiding cut-offs became one of the most se-

rious problems connected with the manufacture and use of what the trade knows as "paper shell ammunition".

A variety of expedients have been resorted to to prevent cut-offs. I may refer in this connection to United States Patent No. 543,157 granted June 30, 1896, to the Winchester Repeating Arms Company on the application of John Gardner, whose invention, as shown and described, consisted in forming the cup of a paper-shell cartridge with concentric grooves or corrugations located adjacent to the open end or mouth of the cup at or near the point where the paper tube enters it. The theory of the Gardner invention which has gone into extensive use, was that these grooves or corrugations permitted the cup to yield at the moment of firing, and so prevented the paper from being cut off. United States Patent No. 1,028,358 granted June 4th, 1912, to the Winchester Repeating Arms Company on the application of Thomas C. Johnson, discloses the prevention of cut-offs by roughening the cartridge-chamber of the gun-barrel, the theory of this invention being that the cup is expanded at the moment of firing, with the effect of being anchored by the roughened walls of the chamber against being set back and torn away from the paper tube by the effort of the gases of explosion to escape rearward out of the gun-barrel. The roughening of the walls of the cartridge-chamber of the gun-barrel as described in this patent, has been found to be remarkably effective in preventing cut-offs, but of course the advantages of this invention are only present in guns having their cartridge-chambers roughened in accordance with it. Another invention operating on substantially the same theory, is disclosed in United States Patent No. 1,028,430 granted June 4, 1912, to the Winchester Repeating Arms Company on the application of Frank F. Burton, who made the discovery that cutting off could be prevented by the formation of a plurality of anchoring-pockets in the walls of the cartridge-chamber of a gun-barrel, whereby the sheet-metal cups of paper-shell cartridges are anchored at the instant of firing and thus prevented from rearward longitudinal movement and separation from the paper tubes of the shells. The invention last referred to is efficacious, but its advantages are, of course, only obtained with guns

constructed in accordance with the disclosure of its patent.

The object of my present invention is to prevent cutting off by a suitable construction of the cartridge which is adapted to be used in any ordinary gun and which need not have its cup grooved or corrugated in order to be immune against cutting off.

With these ends in view, my invention consists in a paper-shell cartridge the periphery of the band of the sheet-metal cup of which is roughened for biting into the walls of the cartridge-chamber of the gun so as to hold the said cup against rearward movement at the instant of firing the cartridge.

In carrying out my invention as shown in Figs. 1 and 2, the periphery of the band of the sheet-metal cup 2 is roughened all over as at 3 to produce an almost infinite number of minute-radial anchoring-points or surfaces the collective action of which at the instant of firing is sufficient to anchor the cup against rearward movement in the cartridge-chamber of the gun-barrel even though the walls of the said chamber are of glassy smoothness, whereby the cup is prevented from longitudinal rearward movement away from the paper-tube 4 forming a part of the cartridge and expanded and momentarily adhered to the smooth walls of the cartridge-chamber at the same time that the sheet-metal cup of the cartridge is expanded and adhered by the said anchoring-points to the said walls as described. I do not limit myself to any one way of treating the periphery of the band of the sheet-metal cup 2 so as to produce upon it an infinitesimal number of anchoring-points or surfaces, but have secured excellent results by subjecting the said surface to the action of a whip-wire brush wheel, to the use of which I do not, however, limit myself as other means may be resorted to for producing the required exterior surface upon the sheet-metal cups of paper-shell cartridges. As shown in section in Fig. 2 of the drawings, the shell is loaded in the usual manner, the load consisting of a base-wad 5, powder 6, wadding 7, shot 8, and top-wad 9. A primer 10 of ordinary construction is seated in a pocket 11 struck inward from the center of the sheet-metal cup 2.

In the modification shown in Fig. 3 of the drawings, the main portion of the periphery of the band of the sheet-metal cup 12 of the shell is roughened as at 13 so as to produce an infinite number of radial anchoring-points, the extreme rear portion 14 of the band being left smooth so as to form, as it were, a fillet between the roughened portion

13 of the band and the flange of the cup which receives in the usual manner an ordinary paper tube 15.

In the modification shown by Fig. 4, the periphery of the band of the cup 16 is roughened in a design of points 17 extending rearward from a roughened circle 18 at the forward end of the cup, the rear end of which is left smooth. This shell is provided with an ordinary paper tube 21.

In the modified construction shown by Fig. 5, the periphery of the band of the cup 22 is roughened so as to form three bands of radial anchoring-points 19 separated by three smooth bands 20.

From the foregoing it will be seen that the particular disposition of the radial anchoring-points is not essential as long as the roughened area is large enough to provide the number of anchoring-points required for anchoring the cup against rearward movement at the instant of firing in the cartridge-chamber of the gun-barrel, notwithstanding the glassy smoothness of the walls of the chamber thereof. Nor do I limit myself to any one way of roughening the bands of the sheet-metal cups. I may, as suggested, employ a whip-wire brush wheel, or I may resort to etching the surface by means of acids or to the use of a sand blast.

My improved paper cartridge shells, but for the roughening of the peripheries of the bands of their sheet-metal cups for the purpose of producing surfaces composed of radial anchoring-points, are of ordinary construction and used in the ordinary way, the only difference in their behavior from ordinary paper cartridge shells being that at the instant of firing, their cups are firmly anchored against any possibility of rearward movement, whereby my shells are rendered immune against what is known as "cutting off."

I claim:—

As a new article of manufacture, a paper-shell cartridge consisting of a sheet-metal cup and a paper-tube which is inserted at one end into the said cup, the outer surfaces of the band of the cup being formed with radial anchoring-points adapted to bite into the smooth walls of the cartridge-chamber of the gun-barrel at the instant of firing and so firmly anchor the cup against longitudinal movement in the said chamber.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

CHARLES H. STEVENSON.

Witnesses:

DANIEL H. VEADER,
THOMAS C. JOHNSON.