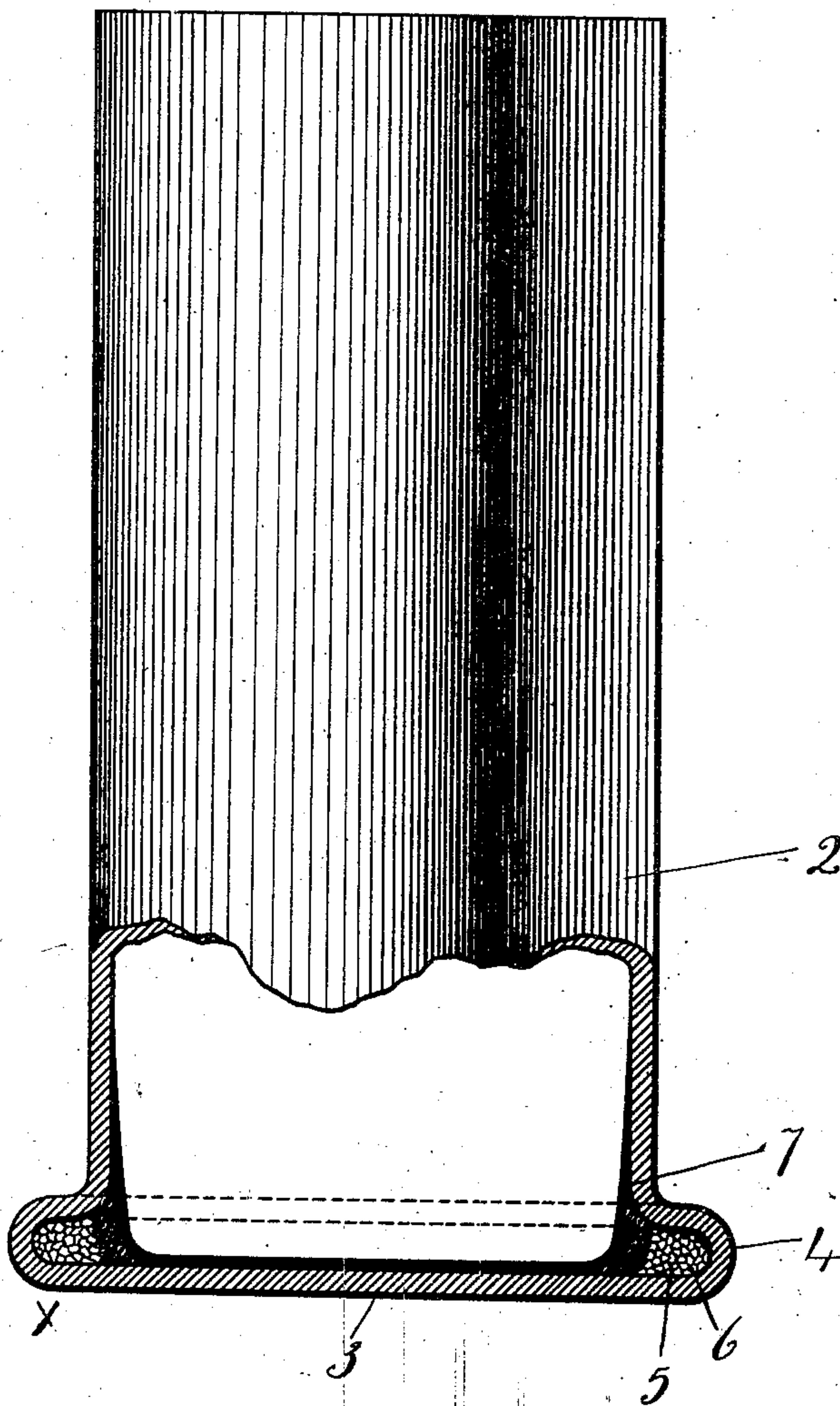


W. H. BUELL.
RIM FIRE AMMUNITION FOR SMALL ARMS.
APPLICATION FILED JUNE 20, 1910.

966,163.

Patented Aug. 2, 1910.



WITNESSES:—

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UNITED STATES PATENT OFFICE

WILLIAM H. BUELL, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO WINCHESTER
REPEATING ARMS CO., OF NEW HAVEN, CONNECTICUT, A CORPORATION.

RIM-FIRE AMMUNITION FOR SMALL-ARMS.

966,163.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed June 20, 1910. Serial No. 567,948.

To all whom it may concern:

Be it known that I, WILLIAM H. BUELL, 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 Rim-Fire Ammunition for Small-Arms; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent a view partly in elevation and partly in section of a rim-fire cartridge constructed in accordance with my invention.

My invention relates to an improvement in rim-fire cartridges for small arms, the object being to provide improved means for confining the primer-mixture in place in the annular cavity of the rim of a rim-fire cartridge and to heighten the igniting and detonating force of the primer-mixture without decreasing its sensitiveness to the blow of the hammer of the arm.

With these ends in view my invention consists in a rim-fire cartridge having certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claim.

In carrying out my invention as herein shown, I employ a drawn sheet-metal cartridge shell 2 having its head 3 formed with an outwardly projecting annular hollow rim 4, the inwardly opening cavity 5 of which receives the primer-mixture 6. For the retention of the primer-mixture 6 in place in the cavity 5, I employ a binder 7 explosive by virtue of its chemical composition rather than on account of its being a mechanical mixture. After the primer-mixture 6 has been introduced into the cavity 5, the binder 7 in the form of a viscous fluid is applied to the exposed surface of the mixture, to the inner face of the head 3 and to the inner faces of those portions of the side walls of the shell which are adjacent to the said head 3 the said fluid being applied in sufficient amount to form a continuous film completely covering the exposed portions of the primer-mixture 6, the inner face of the head 3 and the adjacent portions of the inner faces of the side walls of the shell 2, so as to form a complete and perfect seal of cup-like form with thin edges. In other

words, although the binder 7 is applied in the form of a viscous fluid, when it is dry it has the form of a cup firmly seated within the head of the cartridge-shell and extending forward from the said head into the body of the shell. This cup has not only sufficient strength and body to firmly confine the primer-mixture in place within the cavity 5 of the hollow rim 4 of the head 3 under ordinary conditions of handling the cartridges, but also to prevent the primer-mixture from being displaced when the hammer of the arm strikes the rim at the time of firing the cartridge at about the point X on the drawings. The said cup, furthermore, has sufficient body and strength to hold and confine the primer-mixture during the interval required for the fire to spread throughout the circumference of the rim after it has been ignited at one point by the falling of the hammer upon it. The binder 7 when hardened, has smooth and continuous surfaces except where it makes contact with the primer-mixture, at which points its surfaces will be somewhat incorporated with the primer-mixture since the binder when applied is sufficiently fluid to find its way, as shown in the drawing, into the interstices of the outer layers of the particles forming the primer-mixture.

In preparing the binder, I preferably employ an explosive nitrate in a suitable liquid solvent. I may, for instance, employ any of the nitrates of cellulose, starch or sugar in a suitable solvent or any of the explosive nitro-derivatives of petroleum products in a suitable solvent. These explosive nitrates may be dissolved in any solvents which may be found suitable for the purpose, such as amyl acetate, wood alcohol, acetone, various forms of denatured alcohol, nitro benzole, nitro toluol or mixtures of these solvents with each other, or with benzine or gasoline. The proportions of explosive nitrate and solvent will depend upon the character and strength of the materials employed as well as the specific requirements of use in each instance, it only being essential that the explosive binder shall at the time of use have that degree of viscosity which will permit the penetration of the binder into the outer layer of the particles forming the primer-mixture. It is impossible to state exact proportions for the reason that very slight differences in the methods of the manufacture

of the nitrates in question, produce products which even when used in the same proportion, give different viscosities. But I have secured satisfactory results with a solution
5 of a viscosity of 122 seconds plus or minus 10 seconds at 90 degrees Fahrenheit as taken by a Saybolt viscometer.

My improved product is not merely a varnish for the condensation and confinement
10 of the primer-mixture, but it is an explosive binder, and being explosive in its own character heightens the igniting and detonating force of the primer-mixture instead of impairing it as is the case with the expedients
15 before used. In my co-pending application filed May 23, 1910, Serial No. 563,002, I have shown and described the construction on a similar plan, of a primer for center-fire cartridges.

20 I claim:—

In a rim-fire cartridge for small arms, the combination with a drawn sheet-metal cartridge-shell having its head extended out-

wardly to form an annular rim having an inwardly opening annular cavity, of a
25 primer-mixture located within the said annular cavity of the rim, and an explosive binder covering the inner face of the head of the said shell, the exposed portions of the primer-mixture in the cavity of the rim of
30 the shell and the inner faces of the adjacent portions of the side walls of the cartridge-shell, the said binder forming when hard, a retaining-cup located within the head of the
35 cartridge-shell and extending forward into the body thereof, those portions of the said cup coming in contact with the primer mixture being incorporated with the outer layers thereof.

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

WILLIAM H. BUELI.

Witnesses:

THOMAS C. JOHNSON,
DANIEL H. VEADER.