

# UNITED STATES PATENT OFFICE.

PATRICK S. DEVLAN, OF JERSEY CITY, NEW JERSEY.

## IMPROVED COMPOSITION FOR PACKING PROJECTILES.

Specification forming part of Letters Patent No. **39,897**, dated September 15, 1863; antedated October 15, 1862.

*To all whom it may concern:*

Be it known that I, PATRICK S. DEVLAN, of Jersey City, in the State of New Jersey, have invented a new and useful Composition Expansible Packing for Projectiles; and I do hereby declare that the following is a full and exact description thereof.

My invention relates to a new material or composition to be applied to projectiles for rifled cannon to form what is well known as the "expansible packing-ring" in that class of projectiles which are so constructed as to have the force of the discharge passing into the base of the shot expand a surrounding packing into the bore and grooves of the cannon.

I need not here explain the construction of the shot and mode of applying the expansible packing in this class of projectiles, since my present invention relates only to the packing material, and is equally applicable to all the different forms of projectiles embodying the "expansible principle." The chief practical difficulties in applying the expansible principle to projectiles for cannon have been encountered in the "expansible packing," which is combined with the shot or shell. This packing medium has, in order to make the projectile work well, to possess certain and peculiar characteristics, and very many materials and compositions have been suggested and employed in the progress of the art, with the view of adopting the one which should be found in all respects most desirable.

My invention consists in a new composition, which is made and applied as hereinafter fully described.

To enable those skilled in the art to make and use my invention, I will now describe it as I have practiced it.

To make my composition I take about eight pounds of paper-pulp or any fibrous pulp, and after running or squeezing the water out of it I add to it about five pounds of plaster-of-paris or any other fine earthy substance and about half a pound of caoutchouc (or other elastic gum) dissolved in rosin-oil. These ingredients I mix well together and complete the composition. I then take this composition while in a plastic state, or soft, and cast or mold it around the projectile to form any design of packing that is required, leaving a sur-

plus of the material. After the composition is perfectly dried, either by natural or artificial heat, I submit it to severe compression by hydraulic or other pressure and force the surplus of composition into the proper form on the projectile, when it is ready for use.

It will be understood that the composition is rendered more suitable to the purpose for which it is intended by submitting it to heavy pressure, as just mentioned. The surplus allowed for compression will be determined in each case by the judgment of the mechanic or manufacturer from experiment and experience.

I propose to use any kind of fibrous pulp (either animal or vegetable) or stock, since the nature of the pulp is not important so long as it is fibrous, the fiber operating, when mingled with the plaster-of-paris or any fine earthy substance possessing about the same character, to hold the particles together and make the mass exceedingly tenacious and tough. The caoutchouc or other elastic gum, dissolved in rosin or other oil, is intended to impart to the composition greater elasticity.

The proportions of the several elements or ingredients of the compound are not of vital importance in producing my invention, though I prefer to use about the proportion hereinbefore mentioned.

I have found great advantage to arise from the employment of a small quantity of plumbago in the compound or applied to the surface of the composition packing where it comes in contact with the metal of the gun. The functions of the expansible projectile-packing are such that the material or composition of which said packing is made must, in order to work perfectly, possess the following characteristics, viz: It must possess sufficient elasticity to be freely and perfectly expanded or distended outward against the bore of the cannon and into the grooves, if rifled, to cut off windage and be rotated by the grooves or rifles of the gun. It must also be sufficiently tenacious to hold and carry with it in its rotation the heavy projectile; it must also be solid enough to withstand the crushing tendency of the strain on it at the gun-grooves and where it grips the projectile; and it must be of such a nature that it will not cut or clog the grooves of the gun, and will offer the least possible amount of friction during its passage through



or along the bore of the gun, and very light, so that after leaving the gun and the projectile it will not fly off with much force or liability to injure those in the immediate neighborhood of the gun. Now, as I have already said, various materials and combinations of materials have been suggested, experimented with, and applied to practice in the different kinds of projectiles which embrace the expansible principle of construction, with the view to produce a packing which should possess to the greatest extent these requisite peculiarities. The different soft metals and alloys, even when covered over with canvas, as in the "James" projectile, will lead up and injure the grooves of the gun. India-rubber and other similar materials do not possess sufficient tenacity and hardness in combination with proper amount of elasticity. The papier-maché packing does not possess enough elasticity with the other requisites.

I have found that my new packing compound, substantially as described, and pressed as before set forth, embodies to a greater degree of perfection the combination of characteristics requisite for a perfect packing than any heretofore known to me. It is sufficiently elastic to be distended freely into the grooves and bore of the gun. It will follow the twist of the

rifles or grooves, and firmly hold and carry around with it the projectile to which it is connected. It cleans and polishes the bore of the gun, and wears it very little. It is exceedingly light, and its cost is very little, and its application to the projectile easily effected.

I have explained the nature of my improved composition packing, and I wish it to be understood that the spirit of my invention covers the combination of any kind of fibrous pulp or disintegrated fibrous substance mixed with fine earthy matter and any elastic gum, and the whole dried and compressed.

I do not wish to limit myself to any exact proportions of ingredients in the compound; but

What I desire to secure by Letters Patent, and claim as my invention, is—

The within-described composition packing, produced substantially as hereinbefore set forth.

In testimony whereof I have hereunto set my hand and affixed my seal this 4th day of March, 1862.

P. S. DEVLAN. [L. S.]

In presence of—

J. N. McINTIRE,  
EDWIN BAKER.