

UNITED STATES PATENT OFFICE.

JOHN F. CLEU, OF NEW YORK, N. Y.

IMPROVED ENAMELED PROJECTILES.

Specification forming part of Letters Patent No. **45,022**, dated November 15, 1864; antedated October 30, 1864.

To all whom it may concern:

Be it known that I, JOHN F. CLEU, of the city, county, and State of New York, have invented a new and useful Improvement in Projectiles for Ordnance and Fire-Arms; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same.

This invention consists in the glazing of the exterior of projectiles for ordnance and fire-arms with a glaze of substantially similar character to those used in the glazing of pottery and porcelain, the object being to obtain a smooth and comparatively frictionless surface, which will cause their length of range to be increased, more especially in their projection through water from guns placed below the surface of the water, and the prevention of rust.

The invention is not applicable to projectiles made of lead and its alloys, but is intended more especially for those made of iron. These are first prepared by any of the usual methods of cleaning castings, as by scouring them with sand and diluted sulphuric acid, then washing them in the acid and drying in an oven. They are afterward allowed to cool.

The glaze may be made and applied in various ways, but I prefer generally to make and apply it as follows: Take of broken glass one hundred and thirty parts, by weight; calcined soda, twenty parts, by weight; borax, twelve parts, by weight; oxide of zinc, eight parts, by weight; minium, two parts, by weight. Mix and finely pulverize these substances and place the mixture in a pot or muffle in a suitable fur-

nace, and after they are melted, and while the projectile is in a cold state, apply the melted mixture over the surface of the projectile with a suitable implement. Then place the projectile in a suitable supporting-frame in an oven and subject to a high red heat by which the glaze will be caused to flow over its surface, and when this is effected remove the projectile from the oven and allow it to cool. As it is not practicable to obtain a smooth even surface by one coating of the glaze, a second coating of the melted glaze should be applied and the projectile a second time placed in the oven and heated to a high red heat, which produces a perfectly smooth surface. The projectile, on being removed from the oven and allowed to cool, is now ready for use.

A suitable quantity of coloring material may be added to the glazing mixture to give the finishing glaze a desirable color. I generally add to the mixture hereinabove specified for this purpose about six parts, by weight, of oxide of manganese or plumbago.

I do not confine myself to the use of the particular glazing materials or the mode of glazing hereinabove described; but

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

The glazing of the exterior surfaces of projectiles for ordnance and fire-arms, substantially as and for the purpose herein set forth.

JOHN F. CLEU.

Witnesses:

HENRY T. BROWN,
GEO. W. REED.