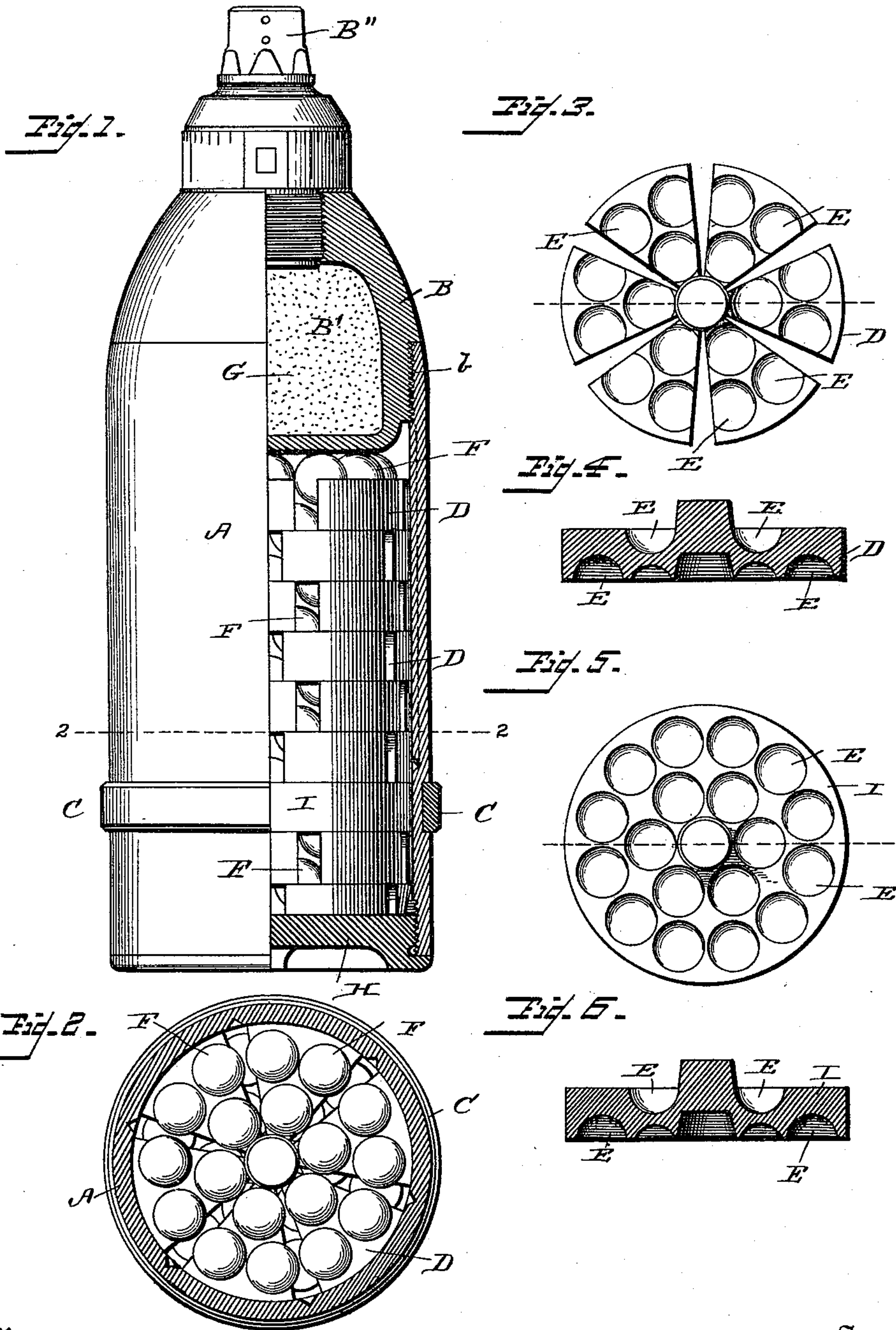


(No Model.)

L. V. BENÉT.  
PROJECTILE.

No. 477,492.

Patented June 21, 1892.



Witnesses  
*Wm. H. Reid*  
*Albert H. Johnson*

Inventor  
*Laurence V. Benét*  
By his Attorney *Wm. H. Reid*



# UNITED STATES PATENT OFFICE.

LAURENCE V. BENÉT, OF PARIS, FRANCE, ASSIGNOR TO THE HOTCHKISS  
ORDNANCE COMPANY, LIMITED, OF LONDON, ENGLAND.

## PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 477,492, dated June 21, 1892.

Application filed August 25, 1890. Serial No. 362,999. (No model.)

*To all whom it may concern:*

Be it known that I, LAURENCE V. BENÉT, a citizen of the United States, residing at Paris, in the Republic of France, have invented new and useful Improvements in Explosive Projectiles, of which the following is a specification.

My invention relates to the construction of explosive projectiles of the type shown in United States Letters Patent No. 374,874, granted to A. C. Koerner, dated December 13, 1887, which consists of a tubular or hollow shell packed with frangible stars or other missiles.

In guns for using fixed ammunition it is necessary to have the band sufficiently forward of the base to enable the projectile to be inserted and secured in the mouth of the cartridge-case. It is also desirable that the shrapnel to obtain the greatest efficiency should carry as high a percentage of its weight in missiles as possible, for which reason the location of the band about the base of the projectile is unavailable, while the thickening of the walls of the body, or an inward concave or solid extension of the base to allow the insertion of the projectile into the case and to protect the walls from radial crushing, both increases the weight of the body and at the same time reduces its interior capacity.

The object of my invention is to so adapt projectiles of the type described for use in breech-loading rifled ordnance as to permit of the locating of the band forward of the base in order to attain the maximum efficiency in firing the projectile, and at the same time prevent radial crushing of the walls of the projectile under the pressure caused by forcing the band through the rifled bore of the gun. This object I attain by providing the band, which is located forward of the base, with an interior annular brace or support sufficient to resist the radial compression described and in shrinking the body of the projectile upon the contained packing to such a degree as to prevent the independent rotation of the latter. I also provide an effective device for assembling the elements of the projectile together in order to prevent longitudinal movement of the packing. This I attain by making the grenade or chamber for containing the bursting charge in the butt of the nose-piece it-

self in place of in a separate receptacle, and I provide the nose-piece with a circumferential shouldered threaded recess, by means of which it is screwed home into the head of the tubular body of the shell until it abuts against the packing, and thus holds the latter secure against longitudinal motion between it and the base-plate.

In the accompanying drawings, which represent a projectile of the type described, Figure 1 is a longitudinal section, parts being shown in elevation, of an explosive projectile. Fig. 2 is a cross-section taken on the line 2 2 of Fig. 1. Fig. 3 is a plan view, and Fig. 4 is a cross-section, of the frangible missiles constituting a portion of the packing. Fig. 5 is a plan view, and Fig. 6 is a cross-section, of the annular brace or support.

A is the tubular body of the shell.

B is the nose-piece, in the butt of which is located the charge-chamber B'. The point of the nose-piece is tapped for the fuse B'', which is of the usual construction and communicates with the charge-chamber. The rear of the nose-piece has a circumferential recess at b to form a threaded and shouldered cap to receive the tubular body A of the shell when the parts are assembled.

C is the band of soft brass or copper which encircles the projectile near its base and serves to take the rifling of the gun to insure rotation.

D D are the frangible star-shaped pieces, having the cavities E to receive the balls F.

G is the bursting charge, and H is the base plate or plug.

I, Figs. 1 and 2, is a solid disk, preferably of cast-iron, which has been formed with recesses E to receive balls F, similar to the star-shaped pieces D. This disk I, which is of a form having great resistance to radial compression and presenting a continuous annular bearing-surface, is placed under the band C of the projectile in such wise that it supports the radial pressure resulting from forcing the projectile through the rifled bore of the gun. In order that there may be a perfect contact between this annular brace and the tubular body A of the projectile, the exterior diameter of the former is made slightly larger than the interior diameter of the latter.



The body of the projectile is then heated until it has expanded to such a degree that it may be slipped over the disk I. On cooling the body contracts, and that portion under the band C bears firmly against the periphery of the disk. In the same way the frangible missiles D D are made of exterior diameter, slightly greater than the interior diameter of the tubular body of the projectile, and the whole is assembled by the shrinking on of the body of the projectile. The friction set up by the contraction of the tubular body upon the packing thus prepared is amply sufficient to prevent the packing from rotating, and by tightly screwing down the nose-piece against the packing longitudinal motion is also prevented.

I do not limit myself to the frangible disk, although in the particular type of explosive projectile shown it is the form preferred.

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

1. In an explosive projectile, the combination, with a hollow tubular body, of a packing of frangible or other missiles, a band to receive the rifling located around the tubular chamber forward of the base, and a solid disk so located with respect to said band as to resist the radial pressure given the latter when forced through the rifled bore of the gun.

2. In a projectile having the bursting-charge in its head, the combination, with the tubular body having the base-plate, a packing of missiles, and a rifling band with its supporting-disk, of a nose-piece having an inclosed cavity in its butt to contain the bursting-charge, recessed to form a circumferentially threaded and shouldered cap to receive the tubular body, and a fuse at its point communicating with the charge-chamber, substantially as described.

3. In a projectile having the bursting-charge in its head, the combination, with a packing of missiles, of a tubular body shrunk over the packing, a base-plate, a rifling band and a nose-piece having an inclosed cavity in its butt to contain the bursting-charge, recessed to form a circumferentially threaded and shouldered cap to receive the tubular body, and a fuse at its point communicating with the charge-chamber, whereby when assembled the packing is secured against longitudinal and rotary motion, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LAURENCE V. BENÉT.

Witnesses:

CHARLES KURER,  
THEODORE FAVARGE.