(No Model.) 2 Sheets—Sheet 1.

L. HOPSON.

PROJECTILE.

No. 313,075. Patented Mar. 3, 1885.

Fig 1

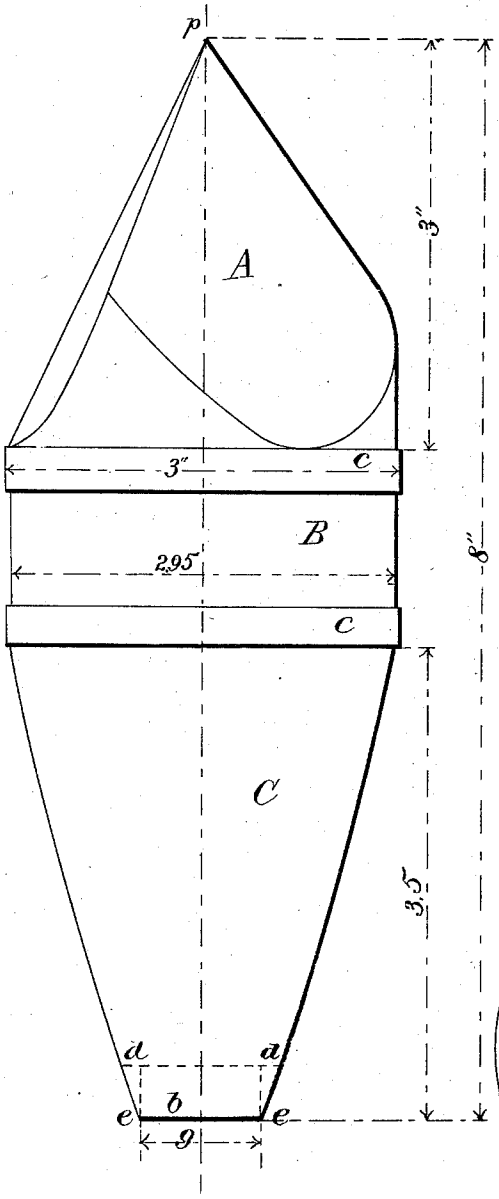


Fig. 2.

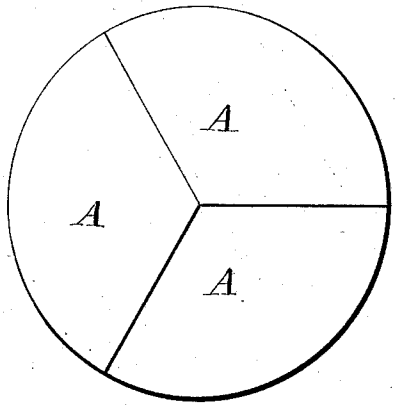


Fig 3

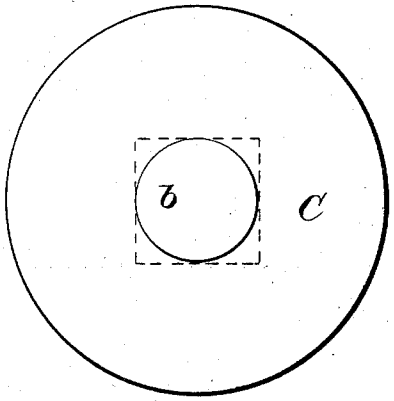
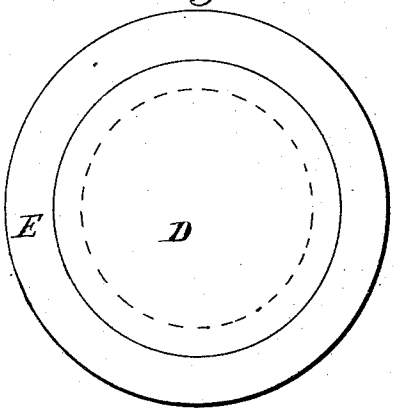


Fig. 4.



Witnesses:
Frank C. Doty.
P. F. Dagle

Inventor.
Lucien Hopson

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 5.

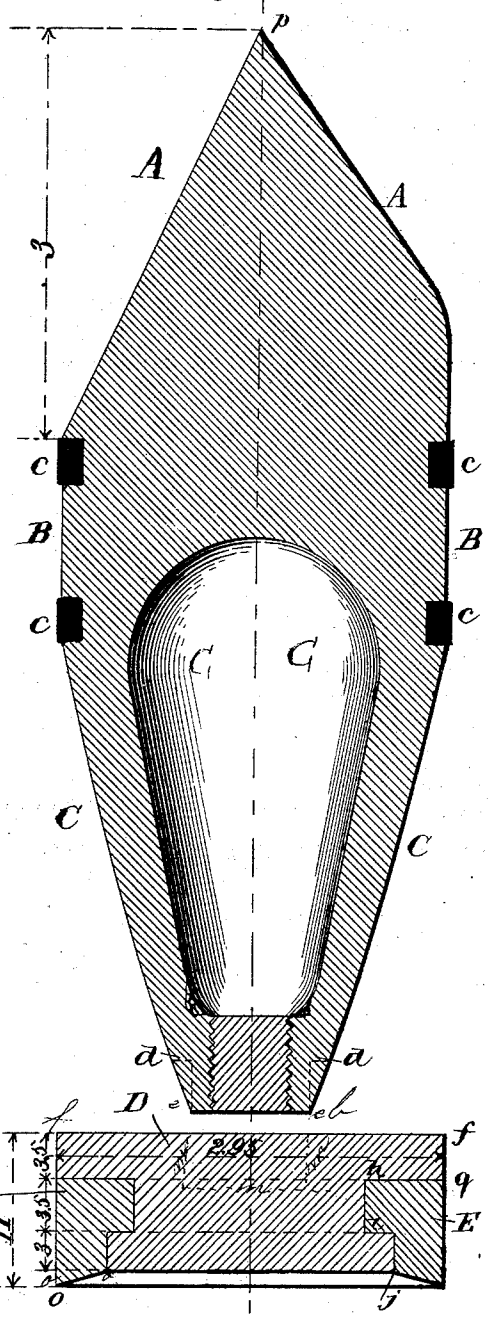


Fig. 6.

Witnesses:
Frank E. Doty.
P. F. Dugh

Inventor.
Lucien B. Hopson

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

LUCIEN HOPSON, OF LAMPASAS, TEXAS.

PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 313,075, dated March 3, 1885.

Application filed September 6, 1884. (No model.)

To all whom it may concern:

Be it known that I, LUCIEN HOPSON, a citizen of the United States of America, and of Lampasas, in the county of Lampasas and State of Texas, have made a new and useful improvement in explosive projectiles for the purpose of penetrating iron or steel clad ships at very long range, and also to operate as a shell to blow them up; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the shell; Fig. 5, a longitudinal section of the same; Fig. 2, a top view of the shell; Fig. 3, the upper or the plan view of the sabot or driver; Fig. 4, the bottom or concave end view of the driver. Fig. 6 is a longitudinal section of the driver.

The shell, Fig. 1, is a cylinder terminating in a triangular pyramid at the top and in an ellipsoidal cone at the bottom, with a quadrangular termination at the base of the shell.

A, Fig. 1, represents one of the faces of the triangular pyramid, terminating in a point at *p*.

B represents the cylindrical portion of the shell.

c c represent two bands, one on each end of the cylindrical portion. These bands project beyond the circumference of the cylindrical portion sufficiently to fill the rifles of the gun from which the shell is designed to be projected. These bands are countersunk into the body of the shell to a sufficient depth to prevent them from being blown or forced off. The width and thickness of these bands may vary according to the diameter of the shell.

C represents the conoidal portion from the band *c* to the squared portion of the base of the shell at *d d*. The base of the shell is squared by cutting away the metal from the four opposite sides from the dotted lines *d d* to the base of the shell at *e e*. The length of the shell for a three-inch-caliber gun should be eight inches; but this proportion may be varied according to the purpose for which the shell is designed. The length of the head of the shell from the front band should be three inches. The length of the conoidal portion of the shell from the rear band, *c*, to the base at *b* should be from three to four inches. These proportions may vary according to the size of the shell and strength of the gun.

A A, Fig. 5, represent two faces of the triangular pyramid, terminating in a point at *p*.

c c c c represent the bands cast around the body of the shell to prevent windage and fill the rifles of the gun. These bands should be of brass or some other soft metal capable of being compressed into the grooves of the gun, in order to give the shell the spiral motion.

C C represent the rear end of the shell from the rear band; *c c*, the base of the shell at *b*.

The dotted lines *d e d e* represent the square tenon on the base of the shell, fitted to enter a square mortise in the upper surface of the driver for the purpose of giving the spiral motion to the shell.

G G represent the cavity in the rear end of the shell for the purpose of containing the explosive motive material. The cavity may be greater or smaller, according to the purpose for which the shell is designed.

A A A, Fig. 2, represent the three faces of the triangular head of the shell. The head of the shell should be of the best of cast-steel welded onto the wrought-iron body of the shell, either in slabs or by being jumped on solid.

C, Fig. 3, represents a top view of the flat or plane surface of the driver or sabot.

The dotted lines on the upper surface of the driver represent the square mortise to receive the square tenon of the shell.

E, Fig. 4, represents the expanding rim of the driver. The purpose of this flange or rim on the driver is to close the windage in the bore of the gun and to cause the driver to take the grooves of the rifles.

D represents the flat surface of the driver within the circumference of the metallic expansive rim.

D, Fig. 6, represents a longitudinal section of the wrought-iron body of the driver turned to its proper dimensions in a lathe. The diameter of the driver is .05 of an inch less than the bore of the gun, in order to facilitate loading and prevent cramping in the bore of the gun when loaded from the muzzle. The whole thickness of the driver is one inch for a three-inch bore. The diameter of the driver for a three-inch gun is 2.95 inches. The upper por-

tion of the driver should be of soft wrought-iron extending across its whole diameter from *f* to *f*. The thickness of this portion from *f* to *g* is .35 of an inch. In the middle portion a groove is turned .35 of an inch in width, and of sufficient depth to prevent the rim from being detached from the body of the driver by the force of the charge.

g h represent the depth of this groove, and *h i* the width.

i j represent the thickness of the remaining portion of the body of the driver—.3 of an inch in thickness.

E E represent the metallic expansive rim, of brass or other expansive metal capable of being expanded by the force of the charge, so as to close the windage in the bore of the gun, and also to fill the rifles to communicate the spiral motion to the shell. The inner face of the rim or flange is slightly beveled to facilitate expansion, giving the driver a slightly-concave surface in the rear. This bevel on the inner surface of the rim is seen at *o o*.

The dotted lines *m m n* represent the square mortise in the center of the front surface of the driver, to receive the corresponding square tenon on the rear end of the shell, to aid the driver in giving the shell the spiral motion. This mortise may vary in depth and width according to the size of the shell and the spiral motion required.

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

1. A projectile with a solid triangular head and conoidal-shaped rear end, in combination with an expansible driver attached at the rear, substantially as set forth.

2. A projectile having a solid triangular head and hollow rear end conoidal in form, in combination with an expansible metallic driver, substantially as described.

3. A projectile having a solid triangular steel-faced head and conoidal rear extremity united by a cylindrical section, substantially as described.

LUCIEN HOPSON.

Witnesses:
D. P. LOWE,
M. J. MOORE.