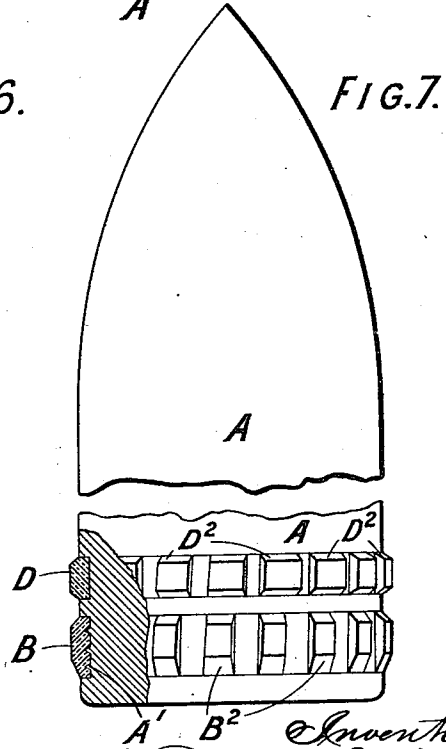
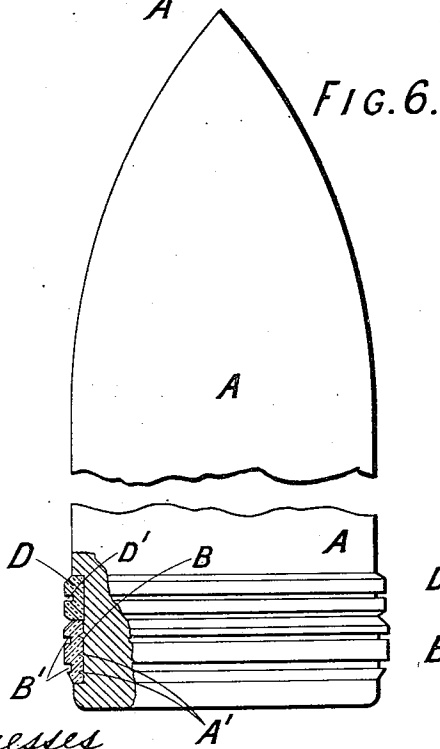
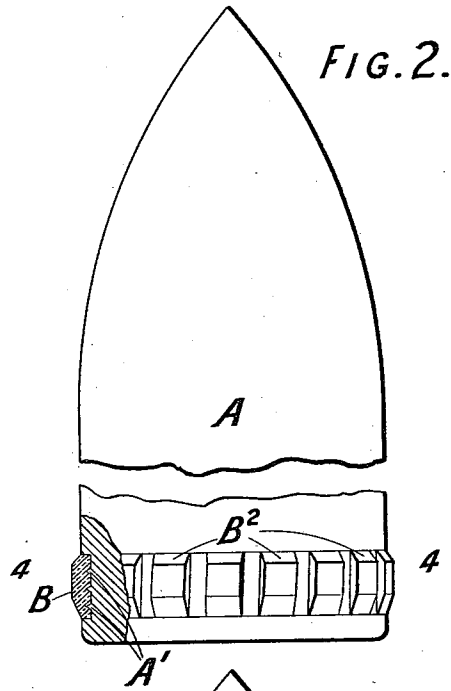
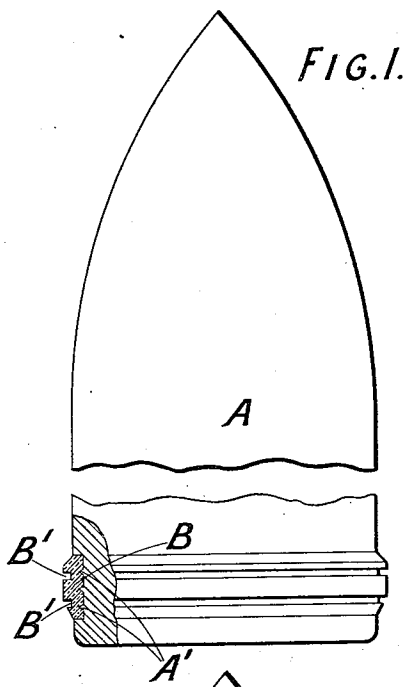


F. STUBBS & L. BURROWS.
PROJECTILE FOR RIFLED GUNS.

(Application filed Nov. 7, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
 H. K. Prindle
 C. M. Stimp

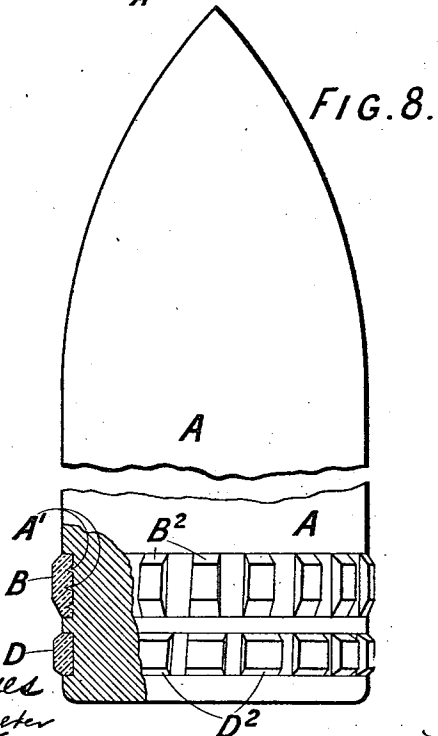
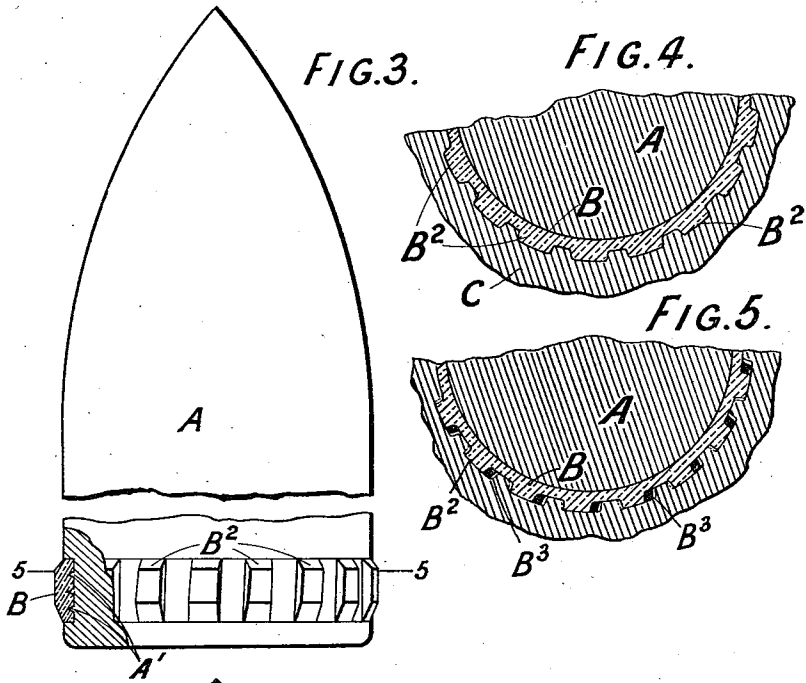
Inventors
 Frederic Stubbs
 Lucius Burrows
 By O. M. C. Boulder, attorney

F. STUBBS & L. BURROWS.
PROJECTILE FOR RIFLED GUNS.

(Application filed Nov. 7, 1899.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses
 W. K. Pomeroy
[Signature]

Inventors
 Frederic Stubbs
 Lycurgus Burrows
 Prof. J. M. Coulter, Attorney

UNITED STATES PATENT OFFICE.

FREDERIC STUBBS AND LYCURGUS BURROWS, OF SHEFFIELD, ENGLAND.

PROJECTILE FOR RIFLED GUNS.

SPECIFICATION forming part of Letters Patent No. 642,762, dated February 6, 1900.

Application filed November 7, 1899. Serial No. 736,157. (No model.)

To all whom it may concern:

Be it known that we, FREDERIC STUBBS and LYCURGUS BURROWS, residing at Sheffield, England, have invented certain new and useful Improvements in or Relating to Projectiles for Rifled Guns, (for which we have made application for Letters Patent in Great Britain under No. 4,020, dated February 23, 1899,) of which the following is a specification.

10 This invention relates to improvements in projectiles for rifled guns, its object being the provision upon a projectile of means to prevent the passage of powder-gases past it, so that loss of muzzle velocity and the occurrence
15 of erosion in the weapon, which has hitherto resulted from such passage of the gases, will be greatly reduced.

Hitherto projectiles for rifled ordnance, for example, have been provided with a fixed
20 driving-band sufficiently ductile to enable the rifling to form projections upon the band, which fits gas-tight therein, as the projectile commences its movement away from the breech; but as the projectile moves toward
25 the muzzle the "driving" sides of the projections into the rifling are worn away by friction, so as to leave a clearance between the idle side of each projection and the surface of the rifling. The powder-gases consequently
30 escape past the driving-band projections through each of the numerous clearances thus produced, eroding the barrel and reducing the pressure of the powder-gases behind the projectile to such an extent as to materially
35 lessen the muzzle velocity.

According to the present invention we employ, in addition to the driving-band or other
40 device which imparts rotation to the projectile, a sealing device or gas-check supplemental thereto, which, while it makes a gas-tight joint with the contiguous surfaces of the barrel, exerts no rotative effort upon the projectile, and therefore remains gas-tight throughout the whole of its transit through the bore.
45 This supplemental device consists of one or more bands retained in any suitable position on the projectile—say in a groove therein—so as to be free to turn upon it in order that the additional rotation acquired by the projectile
50 by reason of the wearing away of the driving projections may occur within the supplemental band or bands, which receive only such ro-

tation as corresponds with the twist of the rifling. The sealing-bands may be placed in grooves upon the projectile, which may receive also, if desired, a driving-band, or the
55 sealing-band may be in a separate groove.

In the accompanying drawings, Figure 1 is an elevation, partly in section, showing a projectile having a fixed driving-band of ordinary construction, the figure representing
60 the projectile before firing. Fig. 2 is a similar view just after the driving-band has entered the rifling. Fig. 3 is a similar view just as the projectile leaves the muzzle. Figs. 4
65 and 5 are part transverse sections on the lines 4 4 and 5 5 of Figs. 2 and 3, respectively, a portion of the gun-tube being also shown. Fig. 6 is an elevation, partly in section, showing a projectile having a rotatable gas-check,
70 according to this invention, the view being taken before firing; and Figs. 7 and 8 are similar views, but are taken after firing, the position of the gas-check being different in each case.
75

Like letters indicate like parts throughout the drawings.

The following description as far as it relates to Figs. 1, 2, 3, 4, and 5 is by way of explanation only, the various details forming no part
80 of the present invention.

A is a projectile having near its base a driving-band B of suitable material—copper, for instance—fastened, say, by pressing the band into a recess in the projectile by
85 means of a hydraulic or other press. Beadings A' are formed upon the projectile, and these are not continuous, but are cut across, say, by a chisel, so that the band B is prevented from rotating. Cannelures B', Fig. 90
1, are formed upon the driving-band, and when the projectile is fired the material forming the band is forced to enter the rifling of the bore, as at B², the flow of the material filling up the cannelures B' wholly or partially.
95 As soon as the projectile has fairly entered the rifled portion of the bore the projections B² completely fill the rifling. This is clearly shown in Fig. 4, where C represents a portion of the muzzle.
100

Figs. 3 and 5 show the effect of the friction between the driving-band B and the rifling during the passage of the projectile through the bore. The projections B² are worn away

considerably, a space B^3 , Fig. 5, being left between one face of each projection and the adjacent edge of the rifled groove. These spaces permit the escape of the powder-gases and are disadvantageous in all respects.

The projectiles illustrated in Figs. 6, 7, and 8 are furnished with the ordinary driving-band B, as hereinbefore described with reference to Figs. 1 to 5, and in addition are provided according to this invention with another band D, which acts as a gas-check and serves to prevent the passage of gas through the spaces caused by the wearing of the driving-band. The gas-check D is preferably furnished with one or more cannelures D' and may be pressed into its place around the projectile. When the projectile is fired, the material forming this gas-check is formed by the action of the rifling into projections D^2 , similar to the projections B^2 on the driving-band. The essential difference between the two bands B and D is that the former is fixed relatively to the projectile A, and consequently acts as a driving-band and wears, while the gas-check D merely follows, the rifling and will turn relatively to the projectile rather than wear. To insure this, it will be noticed that no cross-cut beads or similar devices are formed on the projectile at the spot where it receives the band B.

Fig. 6 shows the driving-band B and the gas-check D both placed in one groove in the projectile, the groove being slightly deeper where it accommodates the gas-check.

In the constructions illustrated in Figs. 7 and 8 the bands are in separate grooves, the gas-check D being in the one case in front of the driving-band B and in the other behind it.

Although it is preferred to employ an automatic gas-check in the form of a rotatable band, as hereinbefore described, yet obvi-

ously other forms may be used without departing from the spirit of this invention. For instance, a disk of copper or other material may be attached to the rear of the projectile, being free to rotate thereon during the discharge, such disk acting in a similar way to that described with reference to the band D.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination with a projectile for rifled guns, of a driving device fixedly secured to the projectile and a gas-check carried by the projectile and rotatable relatively to it during its discharge through the bore.

2. The combination with a projectile for rifled guns, of a driving device fixedly secured to the projectile and an annular rotatable gas-check which encircles the projectile and is free to rotate thereon, substantially as set forth.

3. The combination with a projectile for rifled guns, of a driving-band B, an annular rotatable gas-check D, and a groove in the projectile to contain the driving-band and the gas-check, substantially as set forth.

4. The combination with a projectile for rifled guns, of a driving-band fixedly secured to the projectile, and a gas-check carried by the projectile and rotatable relatively to it during its discharge through the bore, said gas-check having an encircling cannelure for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

FREDERIC STUBBS.
LYCURGUS BURROWS.

Witnesses:

JOHN ALBERT WILSON,
THOMAS HARVEY.