

(No Model.)

S. H. EMMENS.
PROJECTILE FOR SMOOTH BORE GUNS.

No. 407,648.

Patented July 23, 1889.

Fig. 1.

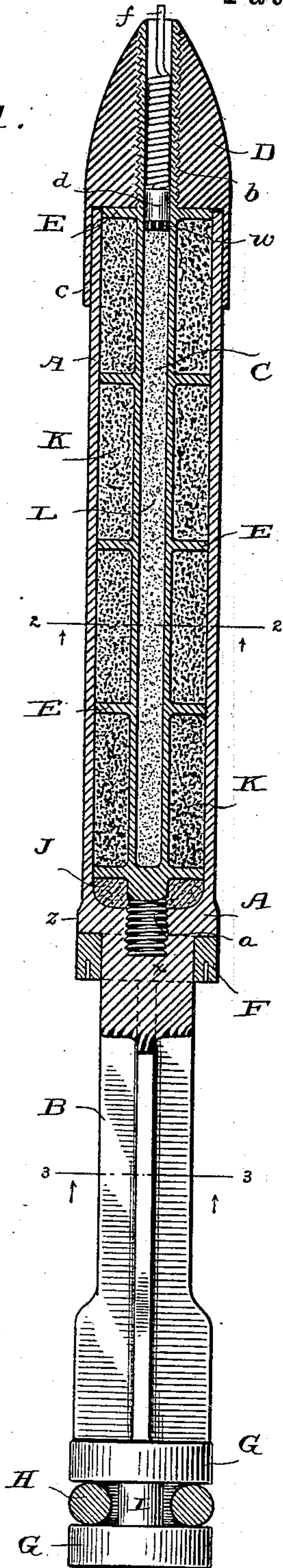


Fig. 2.

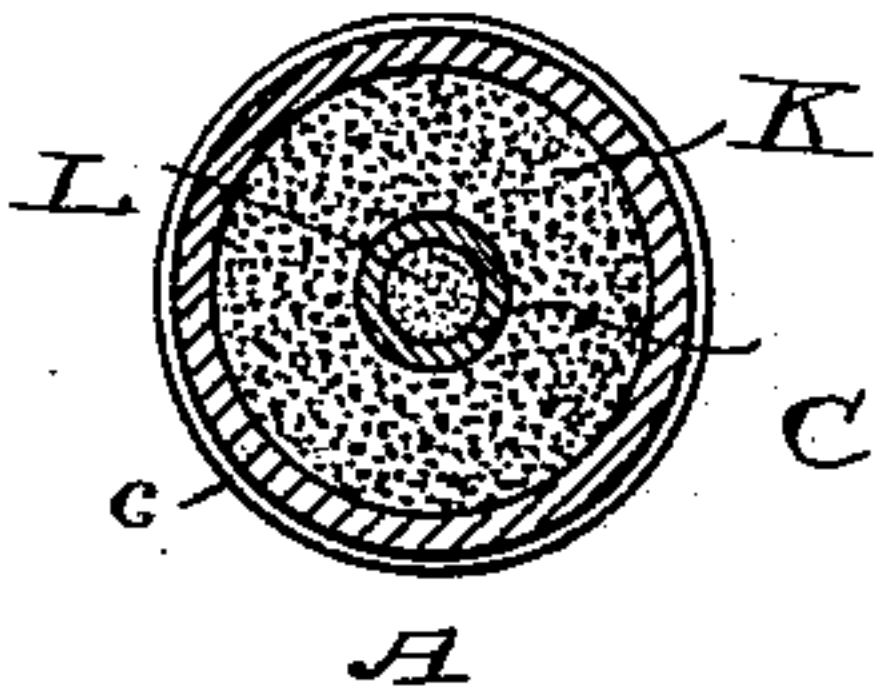


Fig. 3.

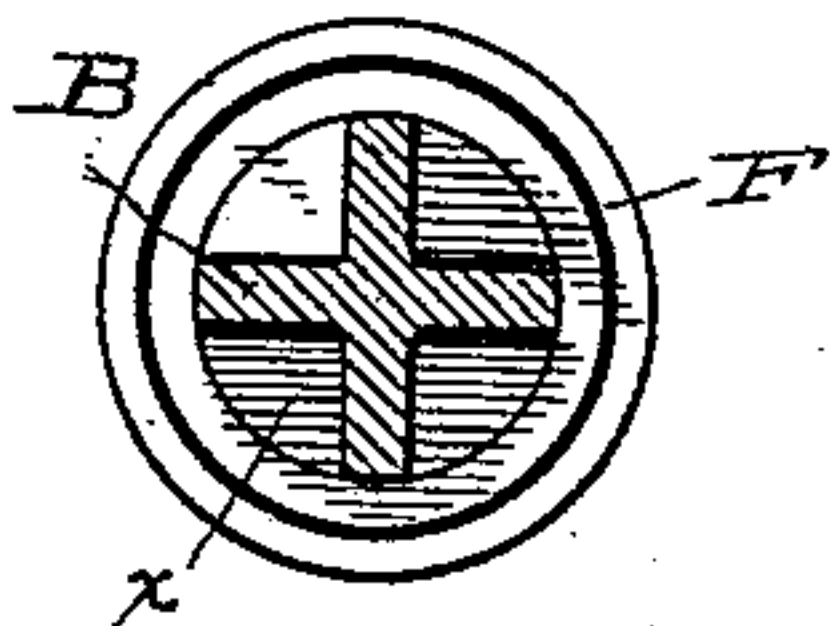


Fig. 5.

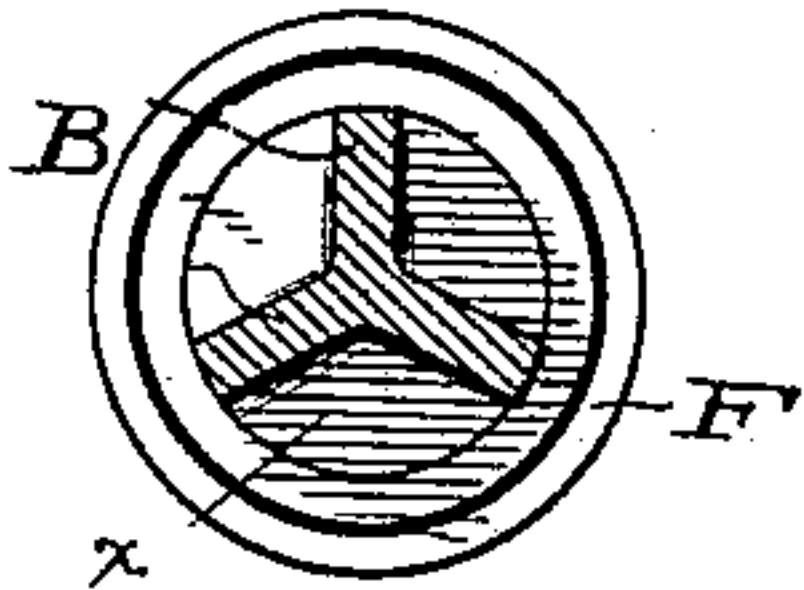


Fig. 4.

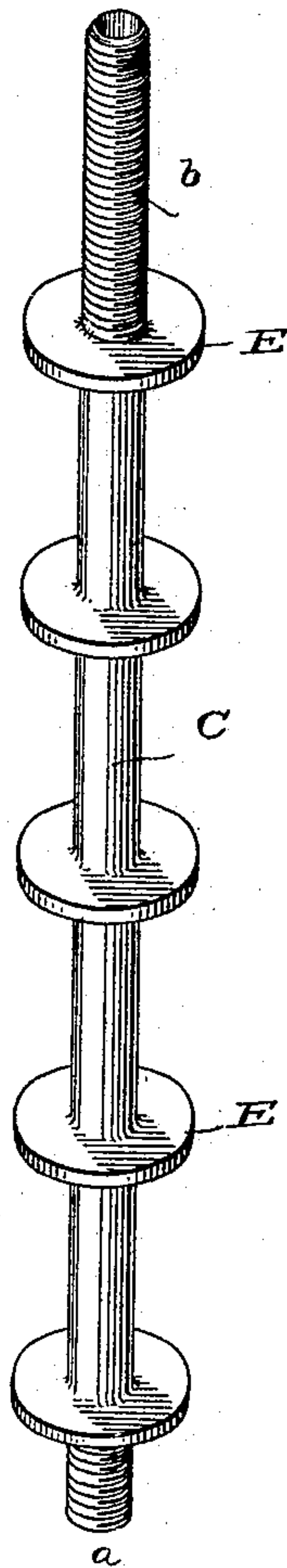
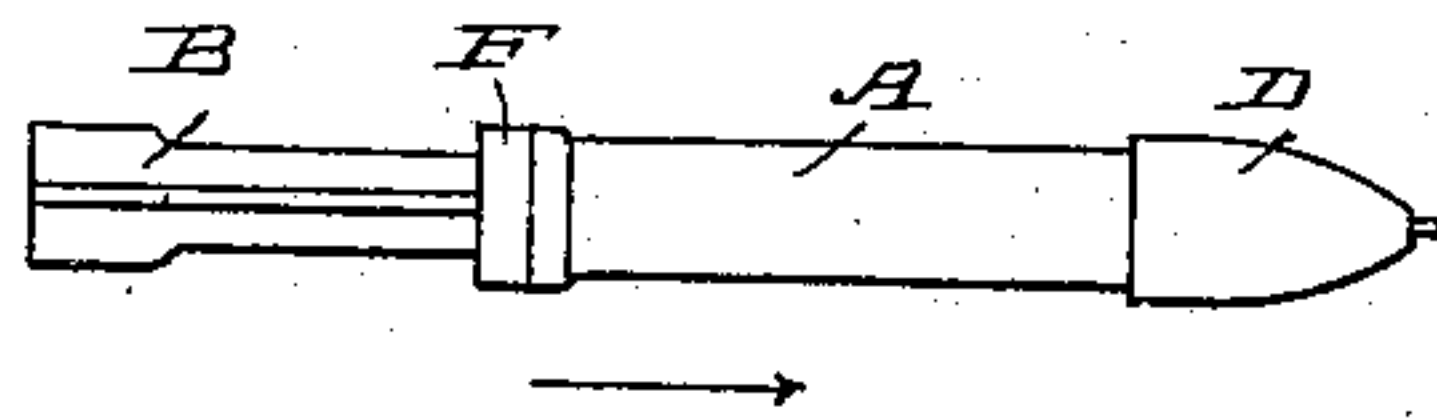


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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PROJECTILE FOR SMOOTH-BORE GUNS.

SPECIFICATION forming part of Letters Patent No. 407,648, dated July 23, 1889.

Application filed July 3, 1888. Serial No. 278,893. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN HENRY EMMENS, a subject of the Queen of Great Britain and Ireland, and a resident of London, in England, temporarily residing at Harrison, in the State of New York, have invented a new and useful Improvement in Projectiles for Smooth-Bore Artillery, of which the following is a specification.

The objects of this invention are, first, to adapt elongated projectiles to be efficiently employed in smooth-bore artillery, with charges in the projectiles of Emmensite or other high explosive; and, secondly, to augment the charge-space, as compared with the diameter of the projectile, beyond the usual ratio.

The invention consists in certain novel combinations of parts, as hereinafter set forth and claimed.

A sheet of drawings accompanies this specification as part thereof. Figure 1 of these drawings represents an axial longitudinal section of an explosive projectile illustrating this invention. Figs. 2 and 3 represent cross-sections at 2 2 and at 3 3, Fig. 1, respectively. Fig. 4 represents a perspective view of the combined strut and charge-holder detached. Fig. 5 represents a cross-section like Fig. 3 of a modified projectile, and Fig. 6 represents a small-scale elevation of the projectile proper in flight.

Like letters of reference indicate corresponding parts in the several figures.

The body A A of the hollow projectile containing the charge-chamber is of cylindrical shape and somewhat smaller than the bore of the gun, to avoid friction against the walls of the bore, back to the rear end of the charge-chamber, where a narrow "base" portion *z*, of larger diameter, with a concentric boss *x*, of smaller diameter, behind it, unites the hollow body A with a rigidly-projecting tail B, which is of cruciform or other "ribbed" shape in cross-section and open-ended at its rear extremity, as illustrated by Figs. 3, 5, and 6.

The walls of the charge-chamber are made very thin and are protected against strain by an axial hollow strut C. (Shown detached in Fig. 4, and in section in Figs. 1 and 2.) The ends of this strut project in the form of axial

screws *a b*, which are screwed, respectively, into the base of the body A and into the head D of the projectile. The strut C is, moreover, furnished with projecting circular webs E for the purpose of protecting the thin walls of the charge-chamber against buckling and vibration, and the head D is provided with a deep lip *c*, fitting closely over the top of the body A and forming at once a supplemental support for the latter and the front guide of the projectile, the same being fitted to the bore of the gun.

Immediately behind the base portion *z* of the body A, and surrounding said boss *x*, I locate a gas-check F of ordinary construction, and at the rear of the tail B there is an elastic sabot, which may be of any approved construction. I prefer, however, to make the latter as shown in Fig. 1—namely, with two paraffined wooden wads G, separated by a ring H and a central pad I of greased asbestos. A packing of this latter material or some equivalent substance—as paraffine wax—is also placed in the space J, between the lowermost web E of the strut and the rear end of the charge-chamber.

The main charge of explosive is packed in annular sections K, between the webs E, before the strut C is inserted.

Within the axial bore of the strut an initial bursting-charge L, of Emmensite or other high explosive, is confined by a perforated wad *w*, and in front of the latter a suitable firing device is arranged within the same bore—as, for example, a time-fuse *f* in connection with a suitable detonator *d*.

By means of the rigidly-projecting tail B, having a ribbed section and an open rear end, as aforesaid, in combination with a sabot or wad interposed between the same and the propelling-charge, the center of gravity of the projectile is located well forward, the tendency of long projectiles to overturn is effectively counteracted, and wobbling or oscillating is prevented without complication of parts. The propelling-pressure acts on the sabot or wad and the projectile is pushed forth by the tail.

By the combination, with a suitable elastic sabot, of the hollow cylindrical body A, having a base portion which fits the bore of the gun behind the charge-chamber, a charge-

chamber portion of reduced diameter, and an open front end, together with the head D, having a rearwardly-projecting lip, which fits the bore of the gun and a charge-holder 5 screwed down upon a suitable packing within the charge-chamber, the use of Emmensite and other suitable high explosives in such projectiles is rendered quite safe; and by the combined strut and charge-holder C, with its 10 axial-screw ends *a b* and circular webs E, in combination with the thin-walled body A, having an open front end, and the head D, screwed upon the front end of said strut and charge-holder, and having the deep rear- 15 wardly-projecting lip *c* to overlap the said body end, the possible capacity of a projectile of given weight is materially increased as compared with previous constructions known to me.

20 Having thus described my said improvement in projectiles for smooth-bore artillery, I claim as my invention and desire to patent under this specification—

1. In combination with an elastic sabot, a projectile having a hollow cylindrical body 25 constructed with a base portion which fits the bore of the gun behind the charge-chamber, a charge-chamber portion of reduced diameter and an open front end, a head having a rearwardly-projecting lip which fits 30 the bore of the gun, and a charge-holder screwed down upon a suitable packing within the charge-chamber, substantially as hereinbefore specified.

2. A combined strut and charge-holder hav- 35 ing axial screw ends and circular webs, in combination with a thin-walled body having an open front end, and a head screwed upon the front end of said strut and charge-holder and having a deep rearwardly-projecting lip, 40 which overlaps said front end, substantially as hereinbefore specified.

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Witnesses:

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