

E. A. DANA.

Improvement in Sub-Caliber Projectiles.

No. 132,903.

Patented Nov. 12, 1872.

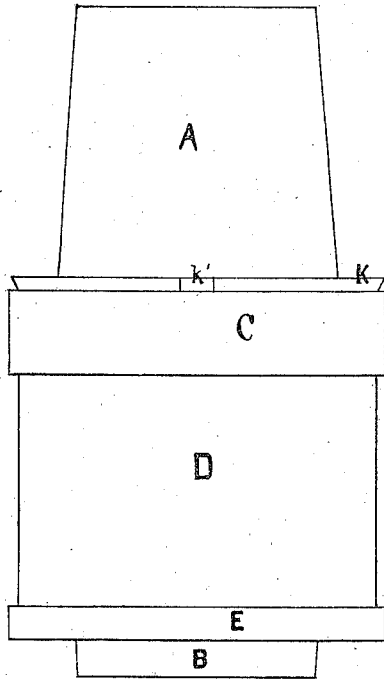


Fig. 1

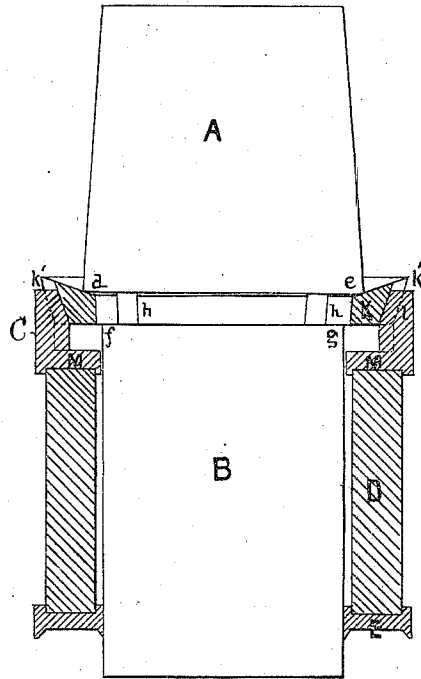


Fig. 2

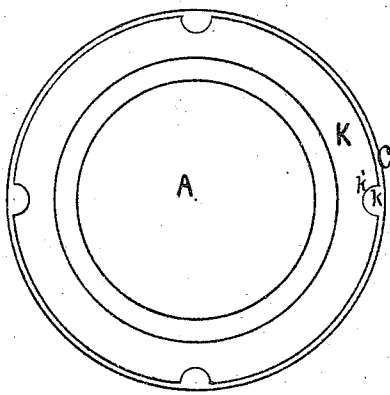


Fig. 3

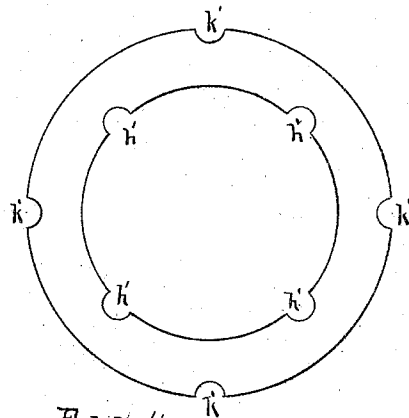


Fig. 4

WITNESSES

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EDWARD A. DANA, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SUB-CALIBER PROJECTILES.

Specification forming part of Letters Patent No. 132,903, dated November 12, 1872; antedated November 8, 1872.

To all whom it may concern:

Be it known that I, EDWARD A. DANA, of Boston, in the county of Suffolk and State of Massachusetts, have invented a certain new and useful Sub-Caliber Projectile, of which the following is a specification:

Nature and Object of the Invention.

The nature of my invention consists in combining with the projectile proper a hard-metal collar, the outer periphery of the collar being coned so as to serve as an anvil, upon which the expanding ring of soft metal is driven and enlarged to fill the grooves. The anvil-collar fits upon a fluted shoulder of the projectile, and though it cannot turn or be driven forward onto the projectile it is free to drift off after leaving the gun. In combination with the above I use a cylinder consisting wholly of wood or some like material; or, if deemed desirable, the cylinder may be made partly of light material, as above, and partly of metal, the metallic part serving to protect the cylinder. The cylinder serves to support the projectile centrally in the gun and to communicate the force of the explosion to the expanding ring C; also to diminish windage; the object of my device being to insure the drifting off from the projectile proper of all of the parts that are added for the purpose of fitting it to the caliber and grooves of the gun.

Description of the Accompanying Drawing.

Figure 1 is an elevation, showing the projectile complete. Fig. 2 is a vertical section of the same. Fig. 3 is a plan of the whole. Fig. 4 is a plan, showing the hard-metal or anvil-collar.

General Description.

Let A B represent the projectile proper. This consists of the forward part A and the rear part B, connected by a shoulder, *d e f f*, having fluting *h h*, substantially as shown. K, Figs. 1, 2, and 4, is an anvil-collar, made of hard unyielding metal, and is provided with grooves or flutings *h' h' h' h'* on the inside, and similar ones, *h' h' h' h'*, on the out-

side. (See Fig. 4.) This ring fits loosely on the shoulder *d e f g*, Fig. 2, so that it may drift off together with the other detachable parts after leaving the gun. The grooves *h' h'* fit onto the flutings *h h* so as to prevent the ring from turning on the projectile. The outer periphery of the anvil-ring K is conical, as shown in Fig. 2, and forms a seat for the soft-metal expanding ring C. The two rings K and C have, respectively, channels *K' K'* and ribs *k k*, which fit into each other, so that both must revolve together. D is a cylinder, made of wood, compressed pulp, or some like material, and serves, when the parts are arranged as shown in the drawing, to communicate the force of the explosion, exerted by the powder gases on the gas-check E, to the soft-metal ring C. E is a ring of metal, surrounding the projectile and abutting against the rear end of the cylinder D, as shown in Figs. 1 and 2, and serving as a centering-ring as well as a gas-check or cap to protect the end of the cylinder D from the injurious effect of the powder gases.

When the cylinder D is provided with the ring E it may be made considerably smaller than the caliber of the gun, as the ring will serve to keep it in the center.

If desirable to dispense with the ring E, the cylinder D may be made somewhat larger, so as to fit the gun with more accuracy. In this case the cylinder should be sufficiently strong to resist the action of the powder.

The expanding ring C consists of two members—the cylinder part *l* that fits upon the anvil-ring K and is expanded to fill the grooves in the gun, and the part M that forms an annular disk or buttress to receive the end of the cylinder D. (See Fig. 2.)

I claim as my invention—

The combination of the projectile A with the loose anvil-collar K and the expanding collar C, operating together substantially as described, and for the purpose set forth.

EDWARD A. DANA.

Witnesses:

FRANK G. PARKER,
H. FLOYD FAULKNER.