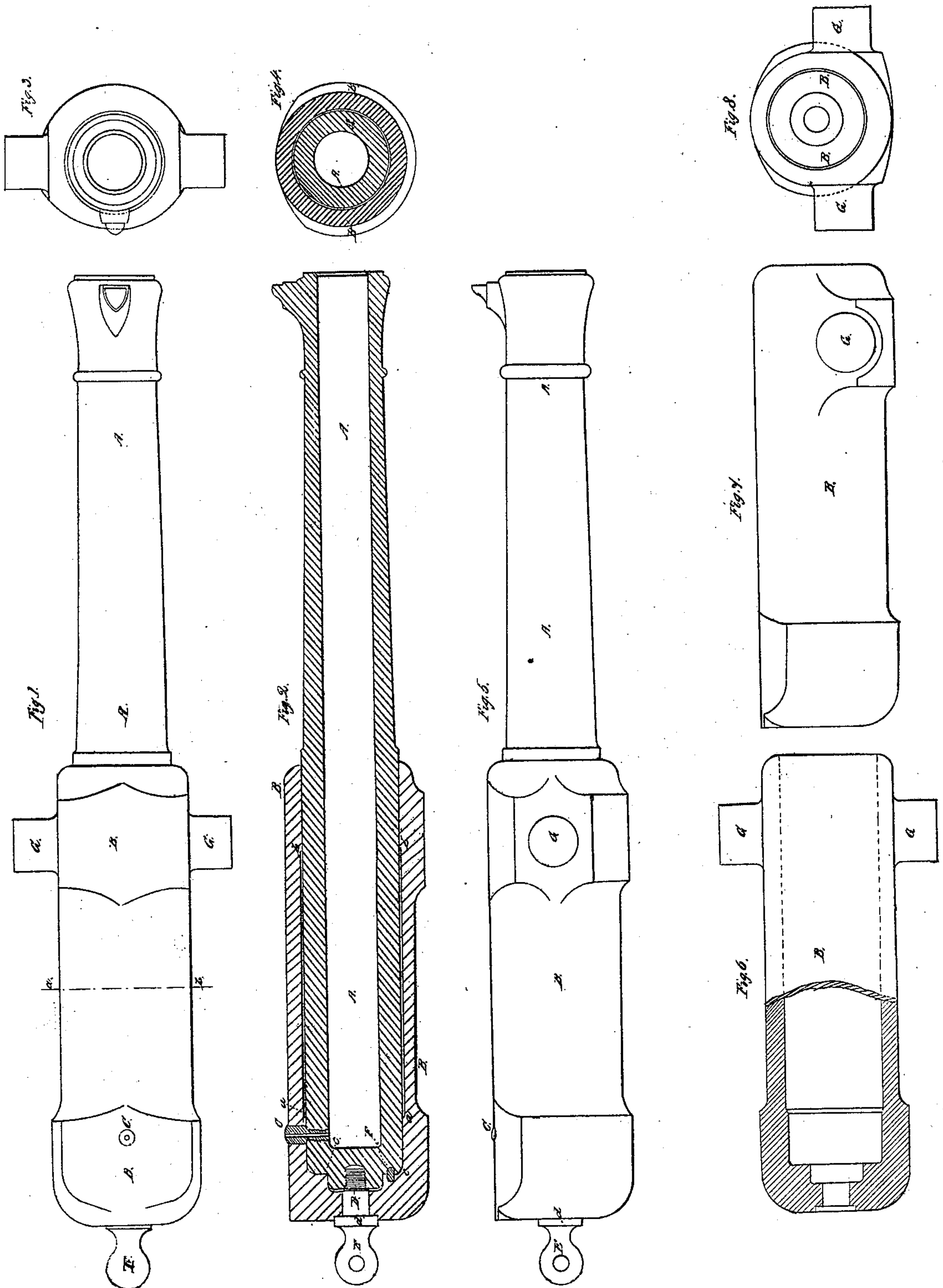


A. KRUPP.  
Muzzle-Loading Ordnance.

No. 13,851.

Patented Nov. 27, 1855.



# UNITED STATES PATENT OFFICE.

ALFRED KRUPP, OF ESSEN, PRUSSIA.

## IMPROVEMENT IN CANNON.

Specification forming part of Letters Patent No. 13,851, dated November 27, 1855.

*To all whom it may concern:*

Be it known that I, ALFRED KRUPP, of Essen, in the Kingdom of Prussia, have invented an Improvement in the Manufacture of Cannons; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists in the manufacture of cannons and other pieces of artillery from solid pieces of cast-steel, shaped on the outside under the hammer, and finished by being turned in a lathe or otherwise. The cannon is bored by placing it in a lathe in the usual manner; or I make the gun of cast-steel and surround it to about the end of the second "re-enforce" or commencement of the "chase" with a casing of cast-iron or gun-metal, so as to bring the weight up to that of common cannon.

The drawings hereunto annexed represent a cannon constructed according to my improvement, Figure 1 being a plan, and Fig. 2 a section, of the same. Fig. 3 is an end view; Fig. 4, a section on the line *a b* of Fig. 1, and Fig. 5 is an elevation. These figures show the manner in which the parts are combined.

A is the gun, which is forged from a solid piece of cast-steel, turned and bored out until it assumes the proper shape and caliber.

B B is the casing which surrounds the gun. This casing may be made of cast-iron, wrought-iron, or gun-metal.

For the purpose of allowing the gun to expand at the explosion-chamber during the explosion of the powder, I make the interior of the outer casing from the points *a* to *b*, Fig. 2, of a larger diameter. The interior end of the casing is also cast with a shoulder, *c*, against which the end of the vent-field of the gun abuts.

C is the vent, which is passed through the outer casing, B, and screwed into the gun A.

By this means should the vent become at all injured it can be unscrewed and a fresh one inserted.

D is a screw which is cut upon the end of the "cascabel" E, and serves to fasten the gun to the outer casing. It is provided with a collar, *d*, fitting into a recess in the end of the case B.

F is a pin passed through the outer casing and the gun for the purpose of preventing the gun from turning when once in its place.

When either the gun A or the casing B has become injured by accident or has become unfit for further use, the gun A can be taken out by removing the screw D, the pin F, and vent C, and the defective piece B replaced by a fresh one. Should it be necessary or requisite, the piece may be taken out and used for either field-pieces or for batteries by placing it in a different kind of casing in which the position of the trunnions G G is altered, as shown in the detached views of the casing in Figs. 6, 7, and 8, the trunnions being placed much lower down.

The casing B when used for batteries is made of a heavier weight than for field-pieces.

Having now described the nature of my said invention and the manner in which the same is to be performed, I declare that what I claim is—

1. The manufacture of cannons from solid pieces of cast-steel, as hereinbefore described.

2. The surrounding of cannons and other pieces of artillery, when made of cast-steel, with an outer casing of cast-iron, steel, wrought-iron, or gun-metal, in the manner and for the purposes hereinbefore described, and represented in the drawings hereunto annexed.

ALFRED KRUPP.

Witnesses:

THEODOR TOPP,

CARL GANTESWEILER.