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J. L. LOWRY.

Ordnance.

No. 47,740. Patented May 16, 1865.

Fig. 2

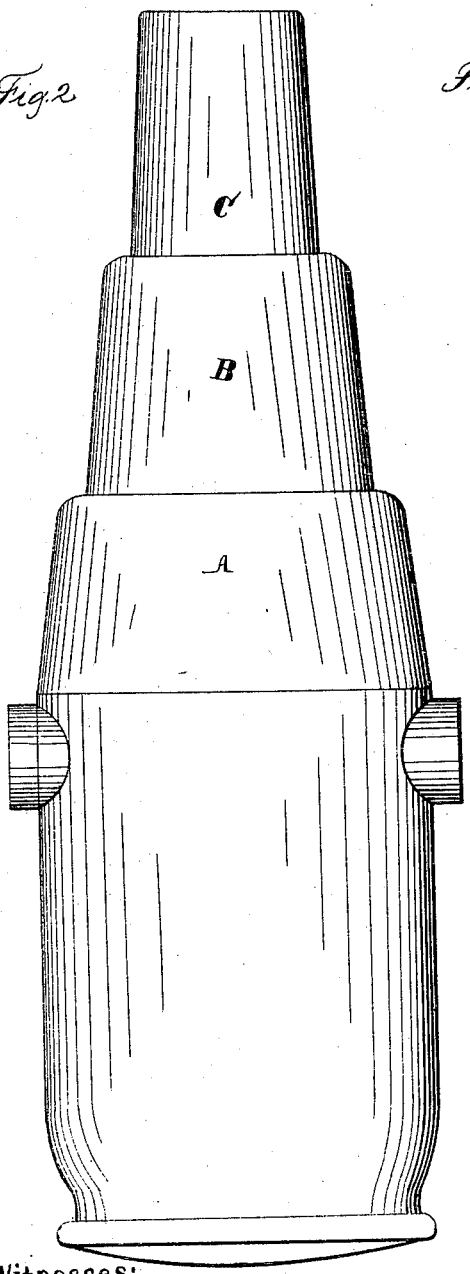
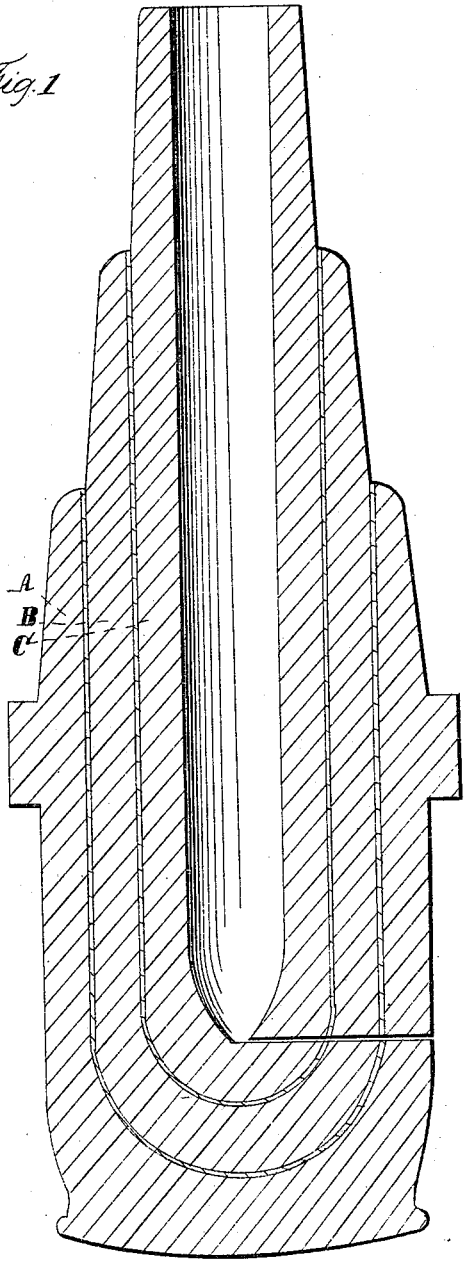


Fig. 1



Witnesses:

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R. A. Cameron

Inventor:

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2 Sheets—Sheet 2.

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Fig 4

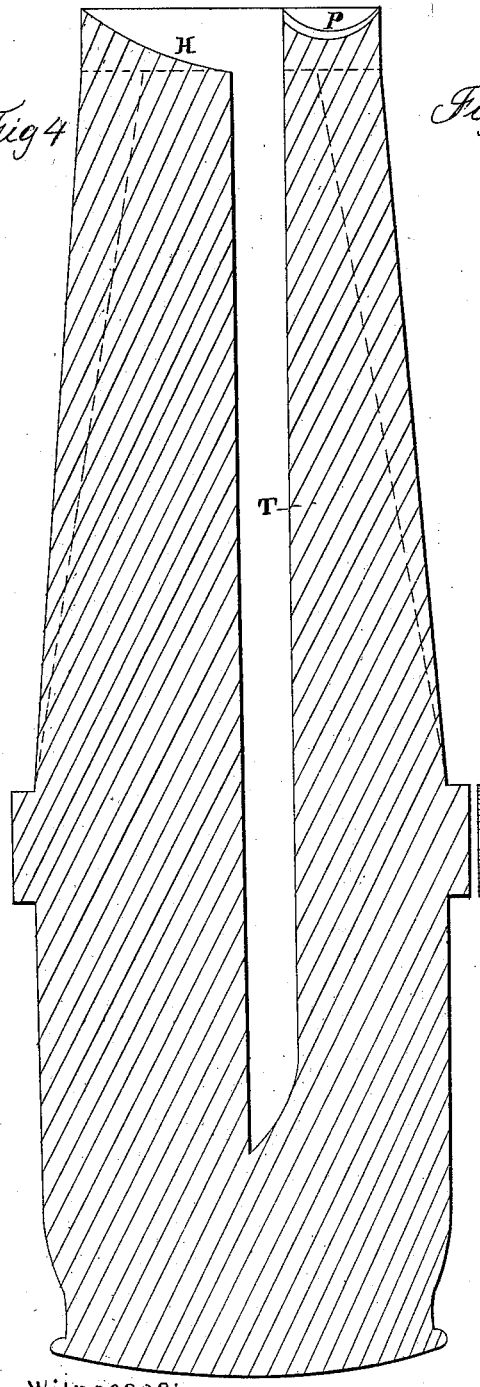
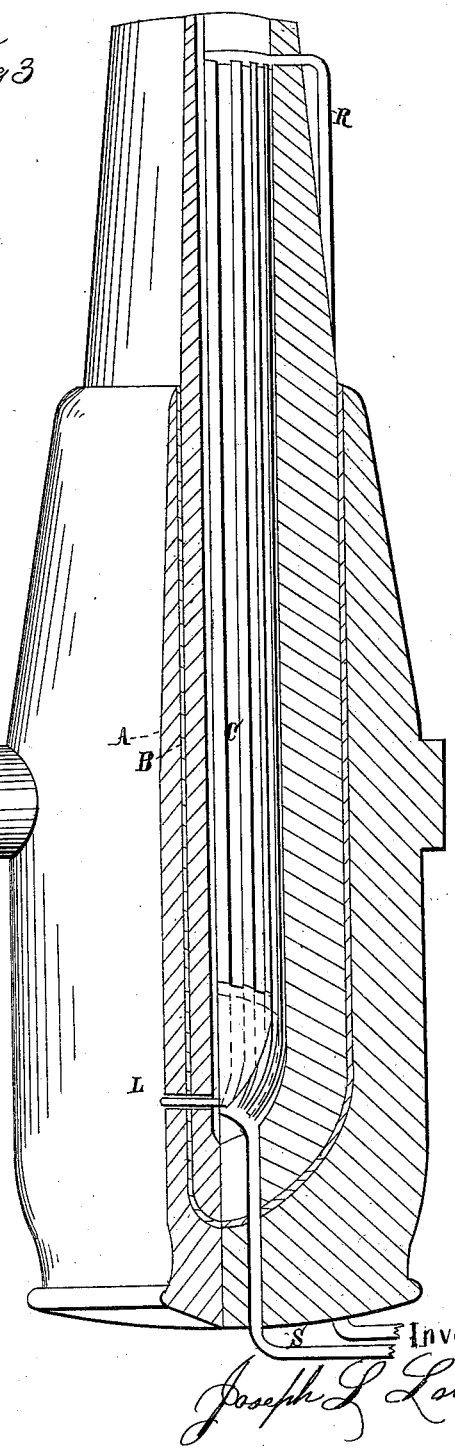


Fig 3



Witnesses:
Josiah W Ellis
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Joseph L Lowry

UNITED STATES PATENT OFFICE.

JOSEPH L. LOWRY, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN THE CONSTRUCTION OF ORDNANCE.

Specification forming part of Letters Patent No. **47,740**, dated May 16, 1865; antedated April 29, 1865.

To all whom it may concern:

Be it known that I, JOSEPH L. LOWRY, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Construction of Cannon; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification, and to the letters of reference marked thereon.

As the mode of casting and constructing large guns or cannon now in use is well known, it is deemed not necessary herein to say anything in relation thereto further than the fact (which is not so well known) that iron that will stand a greater strain than thirty-two thousand (32,000) pounds to the square inch must be reduced in strength by mixture to this standard, for the reason that the stronger the iron the more it will shrink in cooling. As all guns so cast are more or less on a strain, (many having actually cracked or burst in the flask,) it is impossible to ascertain what strain the gun has sustained in cooling, or what additional strain is required to burst it in firing.

The object of my improvement is to avoid, to a great extent, the bad effect in shrinking, and at the same time allow the very strongest iron to be used, (iron that will stand at least fifty thousand pounds to the square inch.)

For this purpose I cast the gun in either two or more parts, as shown in Figure 1, which represents a vertical transverse section of my improved gun when set on end; and it consists of a series of cast-iron cylinders, A B C, placed one within the other, leaving a sufficient space between each to admit of packing with a composition of sal-ammoniac and iron turnings, or any material or compound that will fill up the interstice and cause the outer cylinder to sustain its full share of strain when the gun is in service. The cylinders being of equal thickness, there is no more strain from shrinkage when cooling than is now in an ordinary "six-pounder," the inner cylinder, C, to be cast of the hardest iron, still leaving the gun when finished stronger than the best gun now in use. Fig. 2 is an exterior view of the same gun. Fig. 3 is a perspective view of the gun, one-quarter of which is represented as being cut away for the purpose of showing the exterior of the inner cylinder, which is grooved or fluted longitudinally. After the gun has been fired a number of times, the inside becomes so hot as to expand and throw an increased strain on the outer shell, A. To obviate this and make the strain equal and admit of the gun being used without stopping to cool, I propose to force a stream of water through the said grooves or channels on the inner cylinder passing in at the breech by means of the pipe S, Fig. 3, along the grooves to the chase or muzzle, and conducted from thence by the pipe R to the rear of the gun, as shown in the drawing Fig. 3.

In nearly every gun bursted it is found upon examination that it cracked or split through the vent, showing that the expansion of the iron around the vent was caused by the escaping gas heating that part, so that it acted like a wedge to split the gun at this point. To overcome this difficulty, I propose to drill a hole sufficiently large to admit of the insertion of a tube somewhat smaller in diameter, so as to form a chamber around the vent, to allow of its expansion without affecting the body of the gun. This tube L is secured in place and prevented from being blown out by having the lower end screwed in the chamber. The upper end is also enlarged so as to fill the space, to prevent the cavity from being choked up with dirt or the residuum of the powder.

Fig. 4 is a diagram showing the manner of casting guns as now practiced, the half of the gun on the right (marked T) representing the appearance when cast hollow, that on the left when cast solid, the dotted lines indicating the part turned off when finished. This diagram shows that the iron shrinks down in the middle when the gun is cast solid, as indicated by the sink-head H, when cast hollow, (as represented by the letter P.) Sometimes the sink-head is two or three inches lower on the outside of the casting, while at others on the inside, and very frequently, as shown by the sink-head P, illustrating the fact that where large guns are cast in one piece the strain on the metal when cooling is very considerable and cannot be estimated.

Having described the disadvantages arising in the old method of casting and constructing

large guns, and also my invention and improvement for the purpose of overcoming these difficulties, I am aware that cannon have been formed of two or more shells or cylinders of metal placed one within the other and cemented or otherwise secured together. Therefore I do not claim that mode of constructing guns.

I am also aware that guns have been made of two or more concentric tubes secured together, the inner one of metal more expansible than that conjoining, or the next outer one, and so throughout the series, as in the Blakely gun. This I do not claim; but

What I do claim is—

1. Forming cannon or heavy ordnance of two or more cast-iron cup-shaped shells of equal thickness and different qualities of iron, varying in degrees of density, placed one within the other, and secured in the manner shown, the inner and longest one being of very hard iron (to prevent cutting by the shot) and least expansible, while the exterior and shortest one is of softer and very tough expansible cast-iron, to support the inner one and aid in resisting the explosive force of the powder.

2. Forming a cavity or chamber around the vent-tube, so as to allow of its expansion without affecting the body of the gun.

JOSEPH L. LOWRY.

Witnesses:

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R. A. CAMERON.