(No Model.)

D. M. MEFFORD.

ORDNANCE.

No. 335,607. Patented Feb. 9, 1886.

Fig. 1.

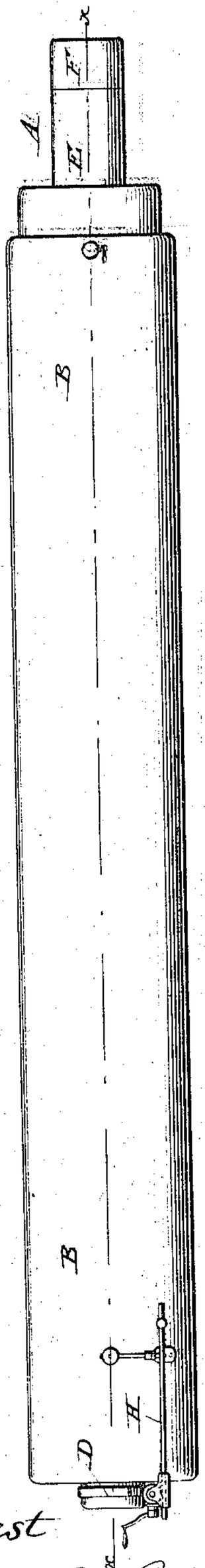


Fig. 2.

Section on line x--x

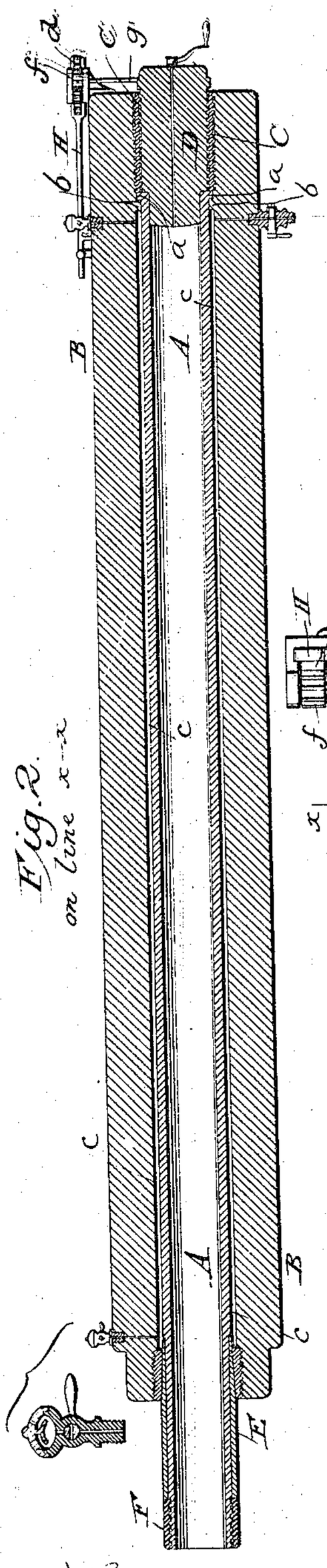
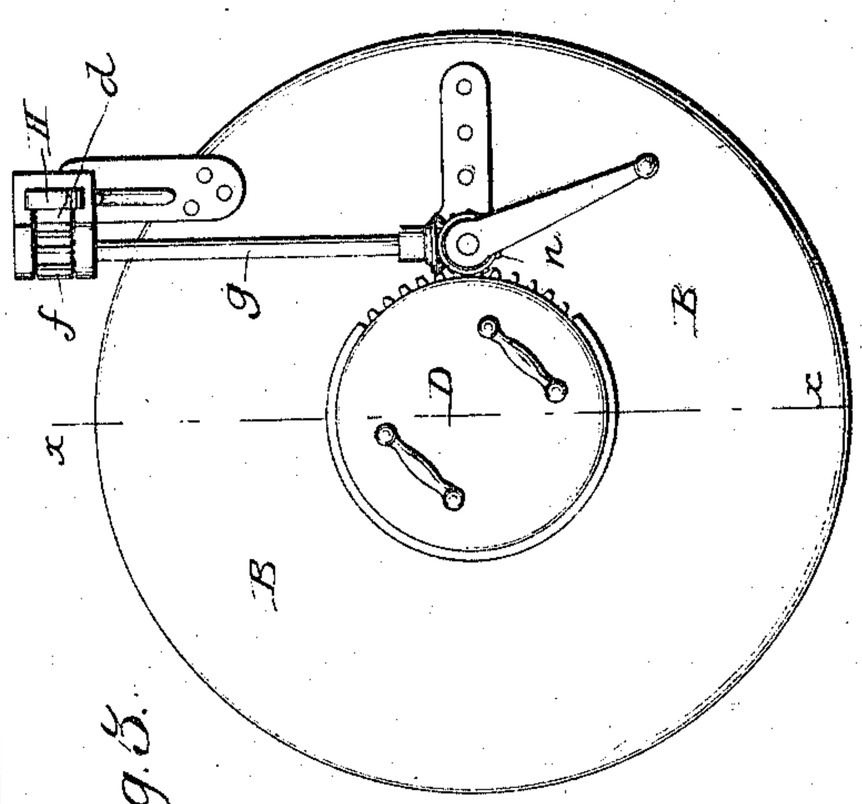


Fig. 3.



Attest

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UNITED STATES PATENT OFFICE.

DAVID M. MEFFORD, OF TOLEDO, OHIO, ASSIGNOR TO THE NATIONAL HEAVY ORDNANCE COMPANY.

ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 335,607, dated February 9, 1886.

Application filed October 9, 1885. Serial No. 179,429. (No model.)

To all whom it may concern:

Be it known that I, DAVID M. MEFFORD, of Toledo, in the county of Lucas and State of Ohio, have invented certain Improvements in Ordnance, of which the following is a specification.

This invention has reference to cannon such as represented in my application for Letters Patent of the United States filed May 9, 1885, No. 164,930, wherein a fluid medium is confined between the barrel-tube and a jacket or re-enforce surrounding the same.

The invention consists in an improved manner of uniting the re-enforce and barrel, also in uniting the relieving-cock with the breech-plug by devices through which the breech is caused to open the cock, and vice versa, and also in combining with the relieving-cock a fluid-receiving vessel or chamber, from which the fluid may return automatically to the internal space as the latter is increased by the cooling of the gun.

In the accompanying drawings, Figure 1 represents a top plan view of my improved gun. Fig. 2 is a longitudinal vertical section through the center of the same. Fig. 3 is a rear elevation showing the connection between the breech-plug and the relieving-cock.

Referring to the drawings, A represents the barrel or gun-tube, which may be of uniform diameter both internally and externally from end to end, except the usual enlargement at the rear end for a powder-bed, and its bore smooth or rifled, as circumstances may demand. At its rear end this tube is provided with a circumferential flange, *a*.

B represents the external jacket or re-enforce, of cast-iron, steel, wrought metal, or other appropriate material, with a central opening from end to end to receive the gun-tube. Near its breech end the re-enforce is formed with an internal annular flange, *b*, against the rear face of which the flange *a* of the barrel is firmly seated. In rear of the barrel the opening in the breech of the re-enforce is provided with a screw-thread and with a bushing or thimble, C, which is screwed tightly in place against the rear face of the flange of the barrel, which is thus forced and held securely against the flange *b*. The bushing C is also threaded internally to receive a breech-plug, D, which may be of any appropriate form. The threads may be mutilated or interrupted in the manner commonly practiced in the construction of breech-loading ordnance, or may be otherwise constructed, as preferred. At the forward end the re-enforce has its opening of flaring or conical form with the larger end toward the muzzle. The rear or smaller end of the opening has a diameter identical with or slightly greater than the external diameter of the barrel.

In order to properly support the barrel within the re-enforce and produce within them a close joint, which will admit of their sliding longitudinally with respect to each other in consequence of their unequal expansion and contraction, I insert within the flaring mouth of the re-enforce a ring, E, which encircles the barrel. The whole interior surface of this ring fits closely upon the barrel, while its exterior surface is made of a tapered or conical form and fits snugly within the conical mouth of the re-enforce. This ring is held in place by means of an external tube, F, shrunk tightly upon the forward end of the barrel, and bearing at its rear end against the forward edge of the ring.

For various reasons, unnecessary to enumerate, it is preferred to construct the ring E and tube F separate; but good results may be secured when the rear end of the tube F is tapered to fit within the mouth of the re-enforce, or, in other words, when the ring and tube are formed in one piece.

The tube and the ring may be of wrought-iron, steel, or other appropriate material.

The barrel will be commonly constructed of steel or wrought-iron, and, as shown in the drawings, and described in my former application, will be of a thickness and strength much less than that of the re-enforce. Between its points of connection with the barrel the re-enforce has its internal diameter increased, in order to produce, as in my original gun, an annular fluid-chamber, *c*, surrounding the barrel.

I propose to provide, as in the original gun, cocks or valves to permit the introduction and removal of the fluid and to confine it within the chamber at the instant of discharging the gun.

In order that the gunner may instantly open the rear cock after the discharge of the gun, I connect therewith a rod, H, or equivalent operating device extending to the rear. I propose to connect this rod in any appropriate manner with the breech-plug or its operating devices, so that the opening and closing of the breech will also open and close the cock.

In the drawings I have shown the rod with a rack, *d*, operated by a pinion, *f*, on a vertical shaft, *g*, mounted in bearings on the gun and connected at the lower end by miter-gear with the pinion *n*, which gears into the breech-plug to turn the same in the ordinary manner.

I am aware that in small arms an auxiliary detachable barrel of small caliber has been placed within a larger barrel and confined at the front by an encircling-nut forcing a shouldered collar against and within the outer barrel, the construction being such that any elongation of the inner barrel would open the joint, and this I do not claim.

An important feature of my invention resides in the use on the inner barrel of a collar tapered downward toward the breech and confined by the sleeve in the peculiar manner shown.

Having thus described my invention, what I claim is—

1. As an improvement in cannon having a fluid-space between the barrel and re-enforce, the internally flanged and threaded re-enforce, in combination with the externally-flanged barrel and the externally-threaded tube seated in the re-enforce against the breech end of the barrel, as described.

2. As an improvement in cannon having a reenforced or jacketed barrel and an intermediate fluid-confining chamber, the combination of the central barrel, the surrounding jacket having at the forward end a conical mouth increasing in diameter toward the front, the conical ring E, fitted tightly to the exterior of the barrel and to the interior of the conical mouth, and the ring or collar F, applied to the barrel, as shown, whereby a tight joint is maintained as the barrel expands and contracts.

3. In a cannon having its barrel surrounded by a fluid-confining jacket, the combination of a movable breech-closing mechanism, a cock communicating with the fluid-chamber, and devices, substantially as shown, connecting the breech mechanism and the cock to cause them to open and close in unison.

4. In combination with a cannon having a fluid-confining chamber between its barrel and a re-enforce, the fluid-receiving vessel connected with said chamber, and the intermediate cock, whereby the fluid may be confined within the chamber or permitted to pass into the vessel and return thence into the chamber.

In testimony whereof I hereunto set my hand this 2d day of October, 1885, in the presence of two attesting witnesses.

DAVID M. MEFFORD.

Witnesses:
JOHN T. ARMS,
W. C. ALVORD.