2 Sheets—Sheet 1.

S. CRISPIN.

ORDNANCE.

No. 186,308. Patented Jan. 16, 1877.

Fig. 1.

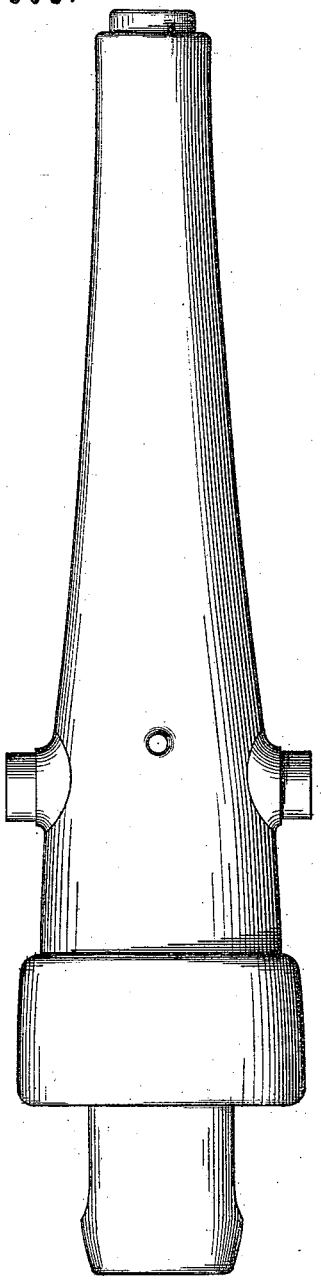


Fig. 2.

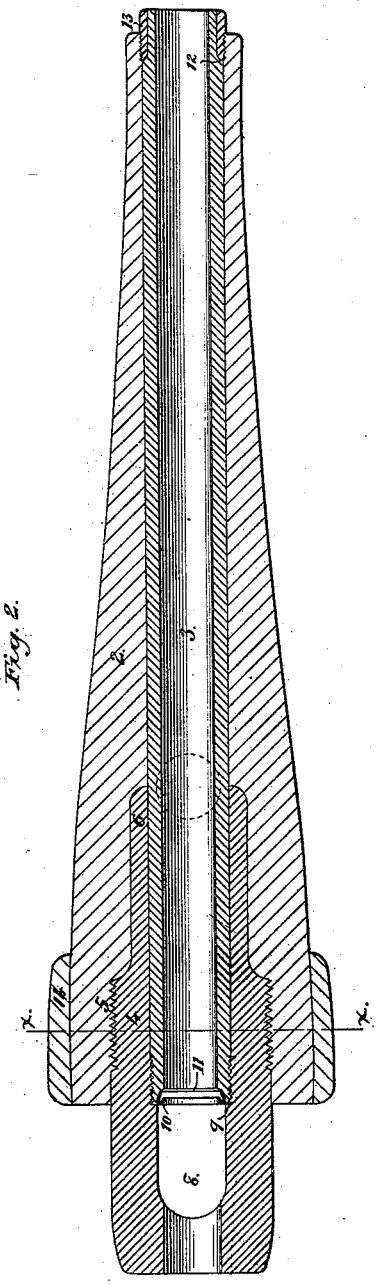


Fig. 3.

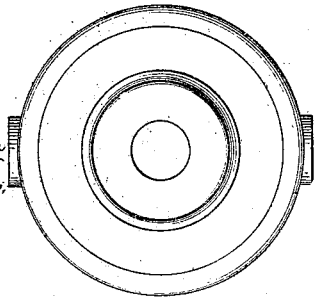
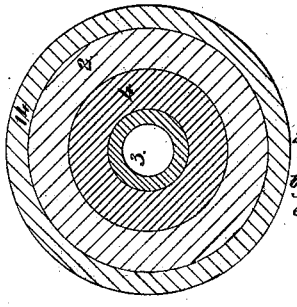


Fig. 4.



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2 Sheets—Sheet 2.

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Fig. 5.

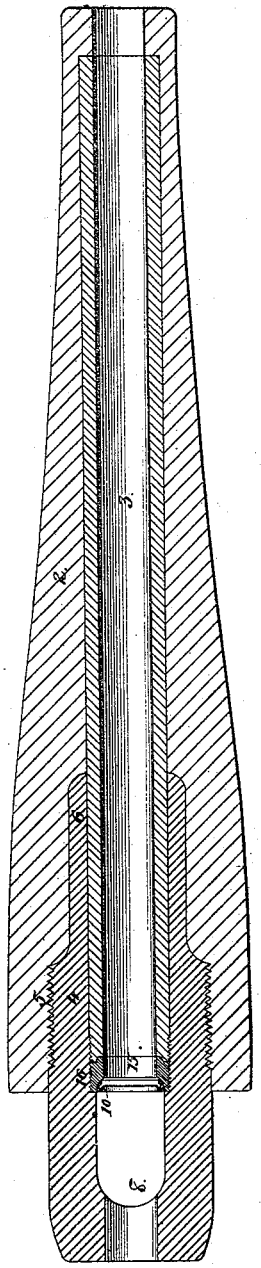
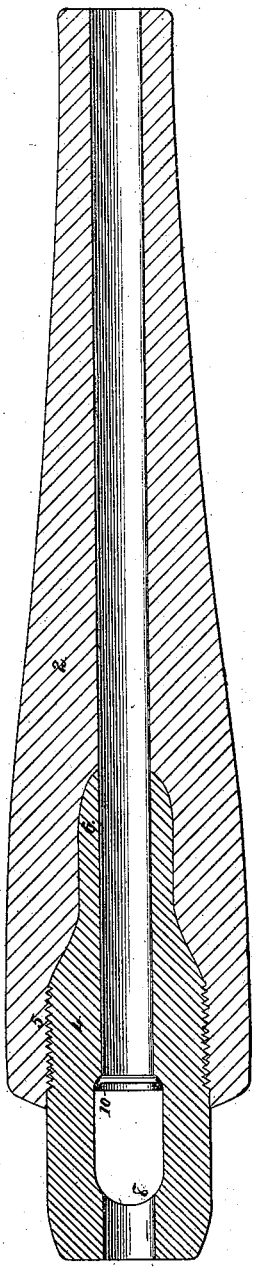


Fig. 6.



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UNITED STATES PATENT OFFICE.

SILAS CRISPIN, OF NEW YORK, N. Y.

IMPROVEMENT IN ORDNANCE.

Specification forming part of Letters Patent No. **186,308**, dated January 16, 1877; application filed December 1, 1876.

To all whom it may concern:

Be it known that I, SILAS CRISPIN, of the city, county, and State of New York, have invented an Improvement in Ordnance, of which the following is a specification:

In the accompanying drawings, illustrating this invention, Figure 1 represents a plan view of a dismounted cannon; Fig. 2, a longitudinal section thereof; Fig. 3, an elevation as seen from the breech; Fig. 4, a transverse section in the plane *x x*, of Fig. 2; and Figs. 5 and 6, longitudinal sections of modifications.

This invention relates to improvements in breech-loading ordnance, and consists in a construction which combines, with the body of a cannon, an inserted breech-piece extending sufficiently rearward therefrom to be provided with an aperture for a breech-block or fermeture, and afford a proper support for the same. It also consists in a mode of converting cast metal muzzle-loading ordnance into breech-loaders, and in details of construction too fully hereinafter set forth to need preliminary description.

In carrying out this invention, the gun is built up of different parts, so disposed as to bring the metal composing them into the most favorable positions to resist the strain to which they are to be exposed. The invention differs, however, from the common built-up constructions of guns, in that the body of the gun is first constructed, after which the interior re-enforcing parts are secured therein.

As herein illustrated, the body 2 of the gun is to be formed of any suitable metal by the common modes of producing ordnance. It is bored through and through, with an aperture of a diameter sufficient to receive a bore-tube, 3, which aperture is enlarged at its breech end to such dimensions as will receive a cylindrical breech-piece, 4. This breech-piece, preferably formed of hammered low or mild cast-steel, though it may be forged out of any homogeneous and tenacious metal, or formed of copper alloys, extends into the body of the gun, and protrudes from its breech a sufficient length to form the "receiver" and support for a breech-block and its appurtenances. It is fixed in place by means of screw-threads, as 5, and is bored through and through, so as to provide a central longitudinal aperture. Its diameter is such as will form thick walls, extending far enough into the breech of the gun to nearly or quite envelop the charge-chamber and seat of the shot, thus affording an adequate resistance to the great strains which must be sustained by this portion of the gun, and also providing the minimum body of metal which is required to resist the longitudinal strain to which its protruding walls are subjected at the point where it protrudes from the breech.

At its forward end, where this breech-piece forms a jacket, 6, the thickness and consequent strength of its walls is reduced somewhat, though dimensions must be preserved which are sufficient to impart a strength capable of resisting the strain exerted along this portion of the gun. The diameter and length of this breech-piece may, of course, be varied as practice may suggest or test require, it being essential only that its structure shall be such as will strengthen the gun along that portion which is subjected to the greater strain, and yet provide against the rupture of its protruding or receiver portion at the point where it leaves the breech of the gun.

The protruding or receiver portion of the breech-piece is pierced transversely by an opening, 8, adapted in size and shape, to receive a sliding breech-block. The diameter of its longitudinal aperture at the rear of the opening 8 must be at least equal to that of the bore of the gun, though in practice, it will be considerably greater, to facilitate the operation of loading. This longitudinal aperture in the forward end of the breech-piece provides a shoulder, 9, and adapts the breech-piece to receive the bore-tube 3, the end of which will rest against said shoulder. This bore-tube 3 is preferably formed of coiled wrought-iron, for the reason that such construction provides great tangential strength and extensibility, but, as is obvious, other constructions and different metal may be advantageously employed.

As shown in Fig. 1, the breech-piece is screw-threaded in front of its shoulder 9, to secure the bore-tube therein and prevent its longitudinal forward movement. The breech-piece may be introduced into the body of the gun by sim-

ply screwing it in place, or the body 2 may be first heated, so that it will shrink upon the breech-piece and securely embrace it. The bore-tube will then be screwed up to its seat in the breech-piece, and, though the parts thus secured together will operate efficiently, it is preferable, in order to insure greater resistance to a longitudinal movement of the bore-tube, to furnish it with an additional fastening at the muzzle end of the gun, where it is reduced in diameter, or so cut away as to form a shoulder, 12, against which abuts a nut, 13, which is screwed into the mouth of the gun.

If it is found to be desirable to shrink the body 2 upon the bore-tube, the latter may be secured in the breech-piece before it is inserted into the body 2 when expanded by heating. One or more bands, 14, preferably of soft steel, may be shrunk or screwed onto the breech end of the gun, to impart additional strength to it.

Since the bore-tube 3 will generally be formed of a metal which will receive a permanent set from the powerful movements of the gas-check against it, it is sometimes desirable to provide a solid steel ring for the gas-check to bear upon. This ring 15 is shown in Fig. 5 as provided with a recess, 10, for the support of the gas-check, and is held in place by the screw-threads 16, which secure the bore-tube in the breech-piece. In this modification, however, the abutting ends of the ring 15 and the bore-tube 3 are shouldered, so as to form a secure joint. This figure also shows a modification of the mode of securing the bore-tube in place, the muzzle end of the gun being so constructed as to form a seat for said tube, which must be introduced from the breech end.

As illustrated in Fig. 6, the gun is modified by the omission of the bore-tube, in which construction, as well as that heretofore explained, the bore of the gun may be rifled or left smooth. The bore-tube, when used, may be held in place solely by the fastening device, at either the muzzle or breech end, or by both.

In converting cast-metal muzzle-loading ordnance, such as the Rodman gun, into breech-loaders, the face of the breech is cut away and the bore of the gun is extended through the same. The bore is enlarged so as to adapt it to receive the breech-piece 6, either with or without the bore-tube 3, as before explained. Enough of the metal is thus removed from the breech and bore of the gun to compensate for the weight added by the protruding breech-piece and the bore-tube. The center of gravity is thereby preserved in the axis of trunnions, or, by slight variation in the size of either the removed or added parts, the preponderance of weight may be transferred to a suitable point in the rear of the trunnions, and, if the breech end is not cut off, the superabundant weight at the breech end may be compensated for by placing eccentric rings upon the trunnions, so as to restore the center of gravity to the axis of the trunnions.

The breech-piece may obviously be fastened in place by other means than screw-threads, and it may be furnished with any of the approved constructions of breech mechanisms, none being shown, as this part of the gun, being subsidiary to and forming no part of this invention, may be varied at will.

What, therefore, is claimed is—

1. A cannon, bored through and through, in the rear end of which is secured a breech-piece which strengthens the charge-chamber and extends from the breech to form the receiver and support for the fermeture or breech-block, substantially as described.

2. A cannon provided with a breech-piece inserted into its rear end and extending therefrom as a support for the fermeture or breech-block, and with a bore-tube or lining, substantially as described.

3. The method of converting cast-metal muzzle-loading ordnance into breech-loaders—that is to say, by extending the bore of the gun axially through its breech, and enlarging the rear portion of the same and inserting therein a breech-piece, which protrudes from the gun-body as a support for the fermeture, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

S. CRISPIN.

Witnesses:
CHAS. I. MCGOWAN,
H. T. MUNSON.