2 Sheets--Sheet 1.

E. SCHULTZ.

Breech-Loading Ordnance.

No. 168,346. Patented Oct. 5, 1875.

Fig. I.

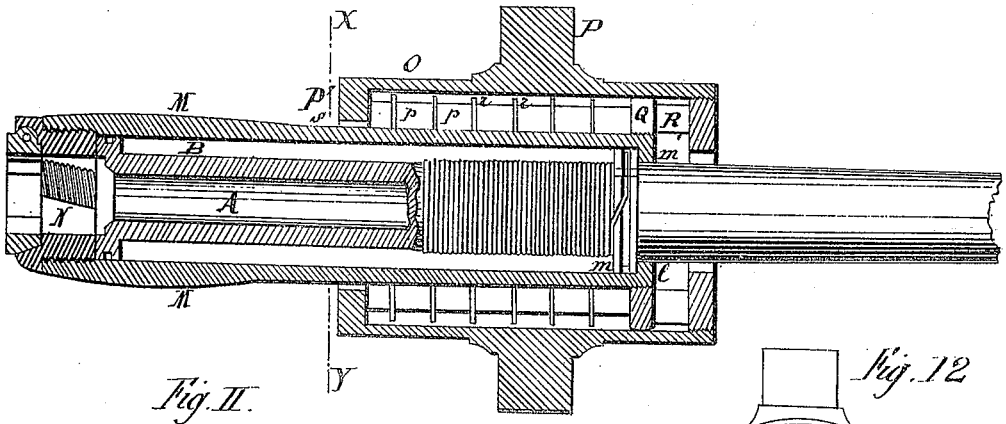


Fig. II.

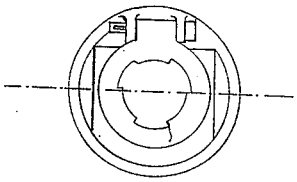


Fig. 12

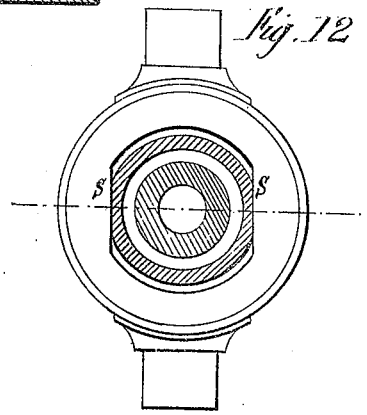


Fig. 10.

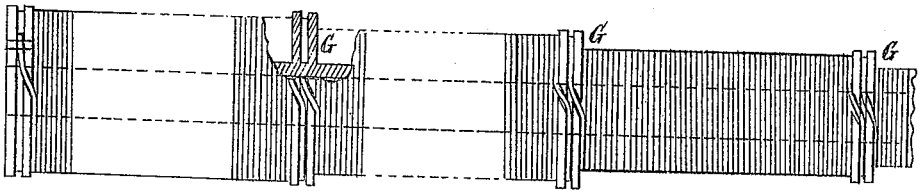
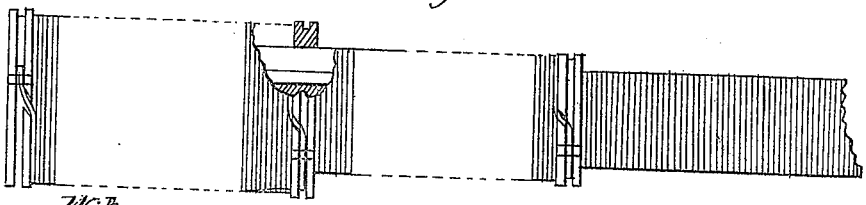


Fig. 11.



Witnesses.

Inventor:
E. Schultz

2 Sheets--Sheet 2.

E. SCHULTZ.

Breech-Loading Ordnance.

No. 168,346. Patented Oct. 5, 1875.

Fig. 3.

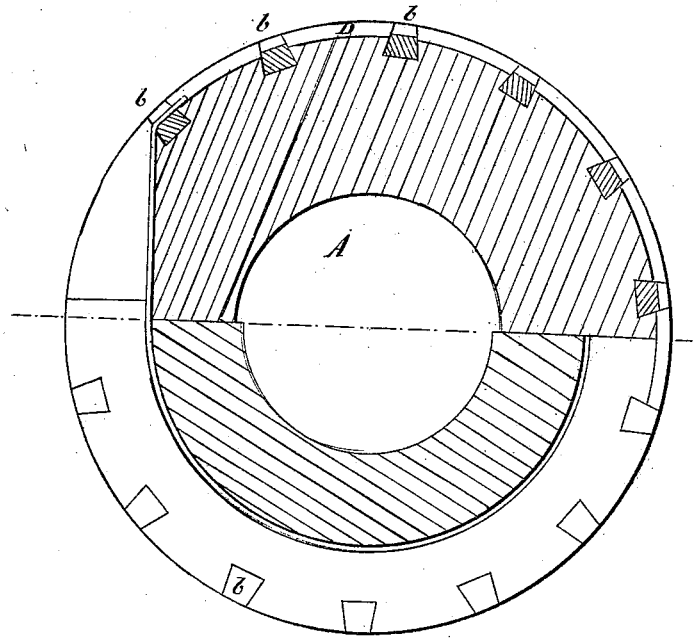


Fig. 4.

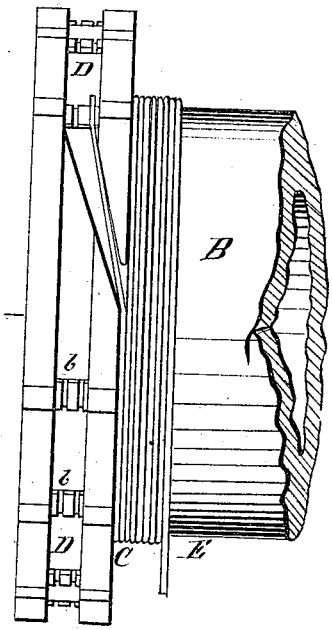


Fig. 5.

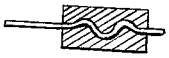


Fig. 6

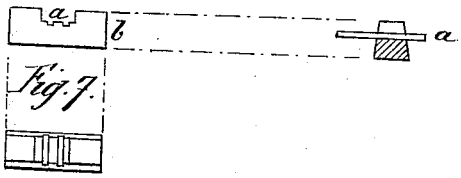


Fig. 7.

Fig. 8.

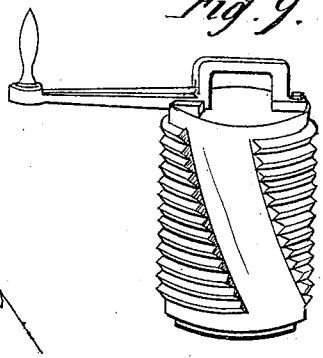


Fig. 9.

Witnesses.

Inventor.
E. Schultz

UNITED STATES PATENT OFFICE.

EMILE SCHULTZ, OF PARIS, FRANCE.

IMPROVEMENT IN BREECH-LOADING ORDNANCE.

Specification forming part of Letters Patent No. 168,346, dated October 5, 1875; application filed July 31, 1874.

To all whom it may concern:

Be it known that I, EMILE SCHULTZ, of Paris, in the Department of the Seine and Republic of France, captain of artillery, have invented Improvements in Ordnance, of which the following is a specification:

The first part of my invention relates to that class of cannon in which the tube or barrel is enveloped in a coil of wire under constant tension; and it consists in a method of fastening the end of the wire, while under tension, by driving it into a slot smaller than the diameter of the said wire. The second part of my invention relates to a method of fixing a piece of ordnance upon its carriage, by the combination of a trunnion case or cylinder with bearing-ring formed on the cannon, and elastic bodies, whereby the shock of the piece against its carriage will be transformed into a continuous pressure; also to a method of lodging the cannon in the rear end of the trunnion case or cylinder so that it may pivot round the axes of the bearing-ring, to permit the lateral pointing of the cannon without displacing the trail.

On the accompanying sheet of drawing, Figure 1 is a longitudinal section of a piece embodying my invention; Fig. 1*, a lateral section of same by X Y; Fig. 2, end view of the breech; Fig. 3, lateral section of a piece following the lines A B C D E of Fig. 4. Figs. 4, 5, 6, 7 and 8 illustrate the fastening of the wires on the piece. Fig. 9 shows breech-screw with threads cut following helicoidal lines. Figs. 10 and 11 are longitudinal sections of two pieces with variable strength or resistance from the breech to the mouth.

A indicates the central tube of the cannon, around which the wire coils at B; C, faces which limit the space reserved for the wires; D, channel in which meet the ends of all the rows of wires; H, ring carrying wire-fastenings; M, casing or jacket enveloping the tube, and carrying the breech and the fastenings for securing the piece upon its carriage; N, screw fixing jacket at the back; O, cylinder with trunnion P; P′, rear end of cylinder; Q, ring or cannon bearing against india-rubber washer R; S S, flattened parts of cannon; *a*, a slit of rectangular section, in tempered steel piece *b*; *l*, projection on jacket abutting against *m*; *p p*, springs or washers of india-rubber; *r r*, sheet-iron washers.

Method of Fastening the Wires.—The method of fastening must meet several requirements: it should be sufficiently simple to occupy but little space; it must be absolutely secure; finally, the fastening must take place while the wire is supporting the coiling-weight, and without any variation of its tension. A means of attaining this object consists in squeezing several wires between two pieces with corrugated surfaces, intended to produce gentle curves in the wires. The squeezing of these pieces is obtained by screws or by wedges; but the means to which I give preference, and which I claim as of my invention, consists in inserting the wire into a slit, *a*, of rectangular section, made in a piece of tempered steel, *b*. The width of this slit is slightly less than the diameter of the wire. The result is that the wire, being sunk into this slot, is cut against the sharp edges of the steel, two small segments are removed, and the wire forms a real riveting, *a*, Fig. 8. The pieces of steel forming fastenings are set transversely to a channel, D, where meet the ends of the wires of all the rows. The wire which it is desired to fix comes onto the edges of the slit while still remaining under the tension of the weight which it supports, a blow from a hammer is sufficient to drive it into the slit, and the fastening is thus completed without any variation of the tension.

Mode of Fixing the Piece upon its Carriage.—The preservation of the carriages is very difficult in the case of light pieces firing with heavy charges; and to obviate this defect it has been proposed to interpose steel springs between the piece and the carriage. To attain the same end, I use the following method of mounting the piece: For this purpose a cylinder, O, Figs. 1 and 1*, having trunnions P, is set in the ordinary manner on a carriage. The piece may slide freely in this cylinder, like a piston. In the space left between the cylinder and the piece are placed springs or washers, of india-rubber, *p p*, analogous to those used for the buffers of railway-wagons, and separated by sheet-iron washers *r r*, intended to isolate and center them. These washers bear against the rear end P′ of the cylinder.

The cannon has a projecting ring, Q, which bears against the india-rubber washers or the steel springs, and compresses them under the effect of the recoil. An india-rubber washer, R, is interposed between the ring and the front end of the cylinder, to deaden the return-shock of the piece when it is brought back to its primitive position by the distension of the compressed washers.

The object of this arrangement is not to lessen the recoil, but to deaden the shock of the piece against its carriage, by transforming it into a continuous pressure.

This arrangement presents another advantage, namely, that of permitting the jointing to be completed without displacing the trail. For this purpose it is only necessary to leave a slight play at *s* for the lodgment of the piece in the rear end of the cylinder, so that it may be moved laterally to a slight extent by pivoting round the axis of the bearing-ring Q against the washers.

The opening left for the passage of the piece into the bottom of the cylinder is made following a straight line horizontally. The piece carrying flattened parts S S rests upon the lower horizontal surface of the opening, and the play only exists laterally. Fig. 1* shows this arrangement.

Two screws or an eccentric permit moving the piece in this opening, and giving it a certain inclination on the axis of the cylinder.

I claim as my invention—

1. The combination, in a piece of ordnance, substantially as described, of the channel D, and piece *b*, with notch *a*, to receive the end of the wire.

2. The combination, in a piece of ordnance, substantially as described, of the cylinder O, ring Q, and elastic bodies *p p* and R.

EMILE SCHULTZ.

Witnesses:

JOHN JAMES REYNOLDS,

WILLIAM HERBERT MAXWELL.