2 Sheets—Sheet 1.

L. W. BROADWELL.

Breech-loading Ordnance.

No. 2,872.
No. 33,876.

Patented Dec. 10, 1861.

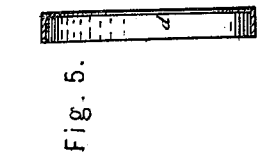

Fig. 5.

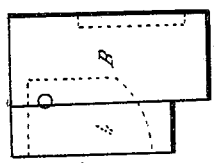

Fig. 4.

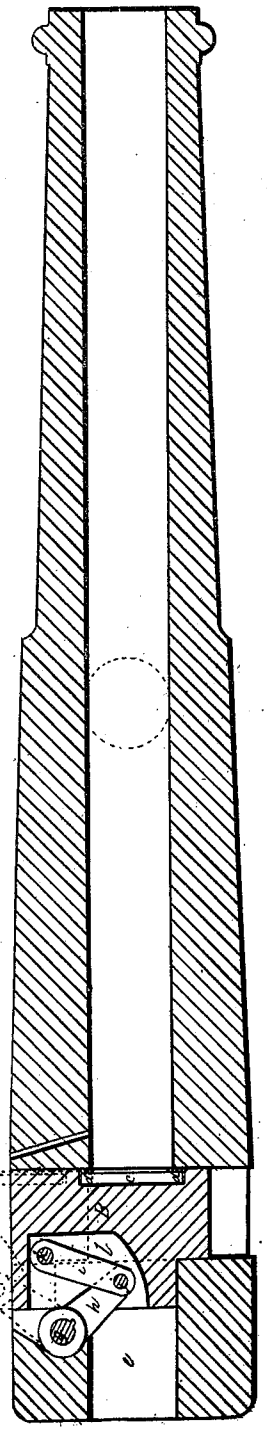

Fig. 1.

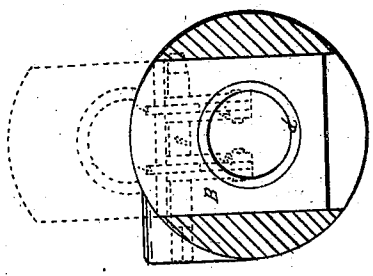

Fig. 3.

Witnesses.
Geo. Coombs
M. M. Livingston

Inventor.
L. W. Broadwell
per Munn & Co
Attorneys

2 Sheets—Sheet 2.

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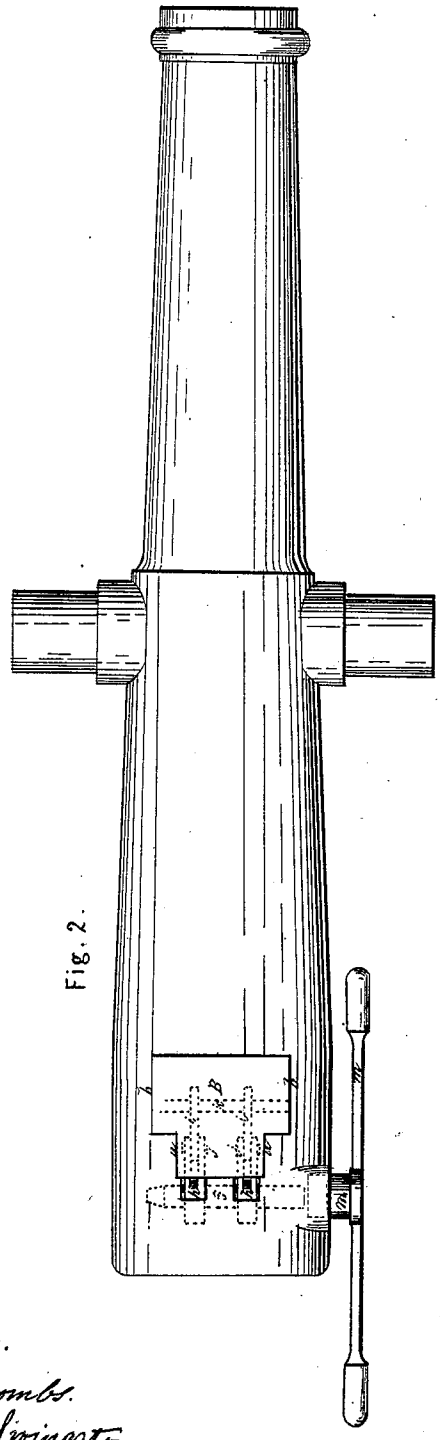

Fig. 2.

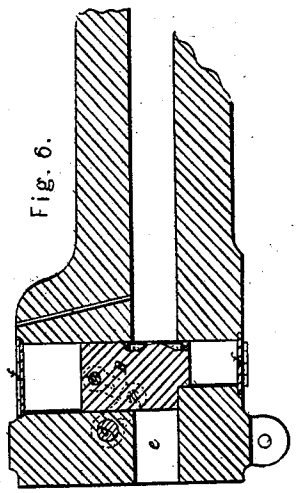

Fig. 6.

Witnesses.

J. W. Coombs.

M. M. Livingston

Inventor.

L. W. Broadwell

per Munn & Co.

Attorneys

UNITED STATES PATENT OFFICE.

LEWIS WELLS BROADWELL, OF ST. PETERSBURG, RUSSIA.

IMPROVEMENT IN BREECH-LOADING ORDNANCE.

Specification forming part of Letters Patent No. **33,876**, dated December 10, 1861.

To all whom it may concern:

Be it known that I, LEWIS WELLS BROADWELL, a citizen of the United States, at present residing in St. Petersburg, in the Empire of Russia, have invented a new and useful Improvement in Breech-Loading Ordnance; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central longitudinal vertical section of a cannon with my improvement. Fig. 2 is a top view of the same. Fig. 3 is a transverse section of the same close in front of the sliding breech-block. Fig. 4 is a side view of the sliding breech-block detached from the gun. Fig. 5 is a central section of the gas-ring. Fig. 6 exhibits a central vertical section of the breech, illustrating a modification of my invention.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to the employment for opening and closing the breech of a piece of ordnance of a sliding breech-block having a movement perpendicular to the bore of the piece; and it consists in an improved mode of producing the movement of the said breech-block.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In applying the invention the bore of the gun is continued right through the breech, and a mortise *a a b b* is cut for the reception of the sliding breech-block B. The mouth of this mortise is on the upper side of the gun. The front portion *b b* is wider than the back portion *a a*, as shown in Fig. 2, and may extend right through the gun; but the narrower back portion *a a* should terminate in the lower side of the bore, that the bottom of that portion may serve as a stop to prevent the breech-block B from being forced too far or too tightly into the mortise. The sides or ends of the mortise which are toward the sides of the gun are parallel; but the front and back are very slightly inclined toward each other toward the bottom.

The breech-block B is made of a form to fit the mortise, and is consequently slightly tapered in a downward direction. In the front face of the said block there is provided a circular cavity *c*, of larger diameter than the bore of the gun, for the reception of a gas-ring *d*, which is intended to fit against that portion of the front of the mortise of the gun immediately surrounding the bore. When the charge of the gun is fired, the gas entering the cavity *c* gets behind the ring *d* and forces it forward against the portion of the front of the mortise surrounding the bore, and so prevents the escape of gas at the breech of the gun.

The portion *e* of the bore of the gun behind the mortise is made slightly larger than the portion in front of it to facilitate the loading of the gun when the breech-block is raised to the proper position.

In constructing new guns for the application of my invention I propose to provide a sufficient thickness of metal at the breech, as shown in Fig. 6, to allow the opening movement of the breech-block to be effected without its projecting above the gun itself, and to close the mortise at the top and bottom by means of either hinged or sliding shutters *f f* for the exclusion of dust.

The means employed to raise and lower the breech-block consist of a transverse shaft *g*, having two arms *h h*, which are connected with the breech-block by means of two links *i i* and pins *j j* and *k*. The shaft *g* is arranged in rear of the mortise which contains the breech-block and just above the portion *e* of the bore, where suitable bearings are provided for it in the solid metal of the gun. The arms *h h* are firmly secured to the shaft, and they, with the links *i i*, work in narrow mortises *l l*, provided for them in the back part of the breech-block. The pin *k*, which attaches the links to the breech-block, passes right through the said block. No part of the shaft *g* projects from the gun; but a square is formed on one end, and the cannon is countersunk around that end for the reception of a lever *m*, which is put on the shaft only when the breech is to be operated.

The operation—*i. e.*, the opening and closing of the breech—is effected by merely turning the shaft to the extent of about a quarter-revolution. In this operation the arms *h h* and links *i i* operate as a toggle. When the

block is raised up entirely above the bore and the breech is open for the reception of the load, the arms and links are in line with each other, as shown in dotted outline in Fig. 1, and when it is closed they assume the position indicated in bold outline in the same figure.

When the gun is constructed as shown in Fig. 6, the breech and all its operating mechanism are kept entirely within the gun, even when the breech is open, and the whole is protected from dust and from the weather.

What I claim as my invention, and desire to secure by Letters Patent, is—

The employment, for elevating and depressing the breech-block B for opening and closing the breech, of a shaft *g*, arms *h h*, and links *i i*, the whole combined, arranged, and operating substantially as herein specified.

LEWIS WELLS BROADWELL.

Witnesses:

A. G. GOODALL,

W. M. WINANS.