

(No Model.)

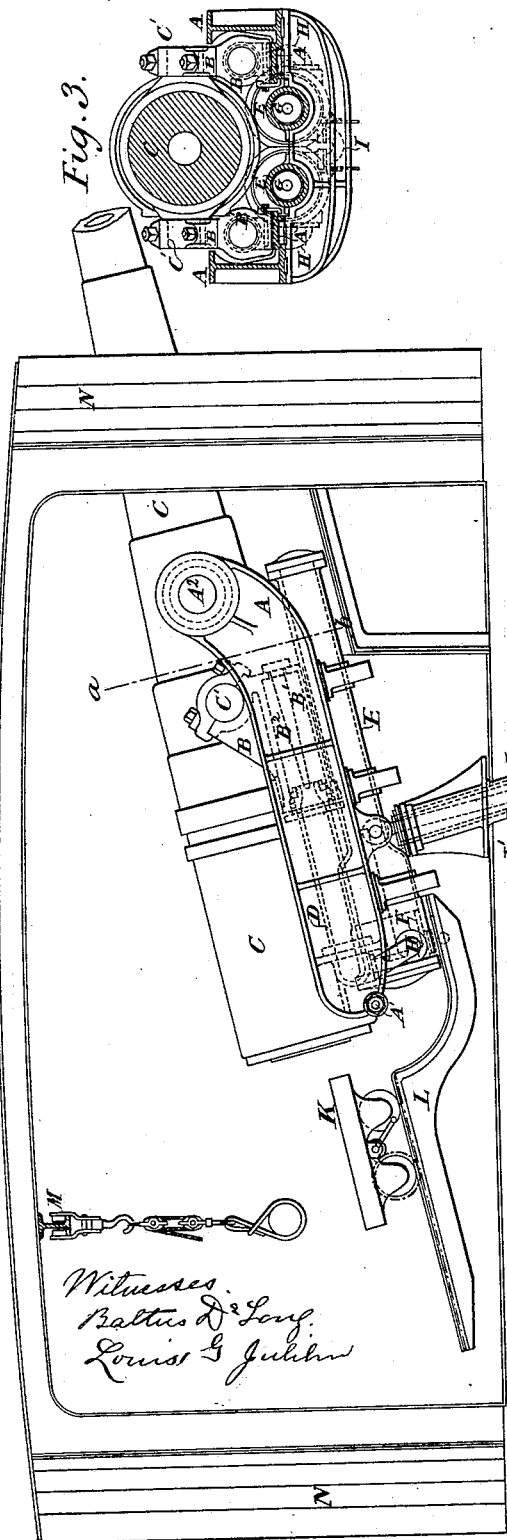
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W. ANDERSON.  
MOUNTING ORDNANCE.

No. 422,002.

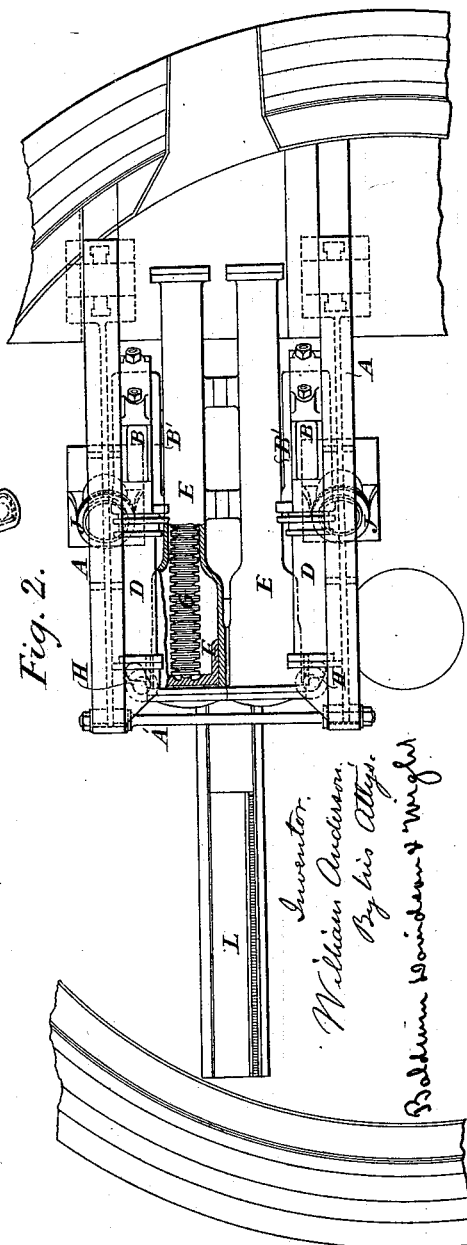
Patented Feb. 25, 1890.

Fig. 1



Witnesses  
Baltus D. Long  
Louis S. Johnson

Fig. 2.



Inventor  
William Anderson  
By his Attys.  
Baldwin, Bondurant & Wright

(No Model.)

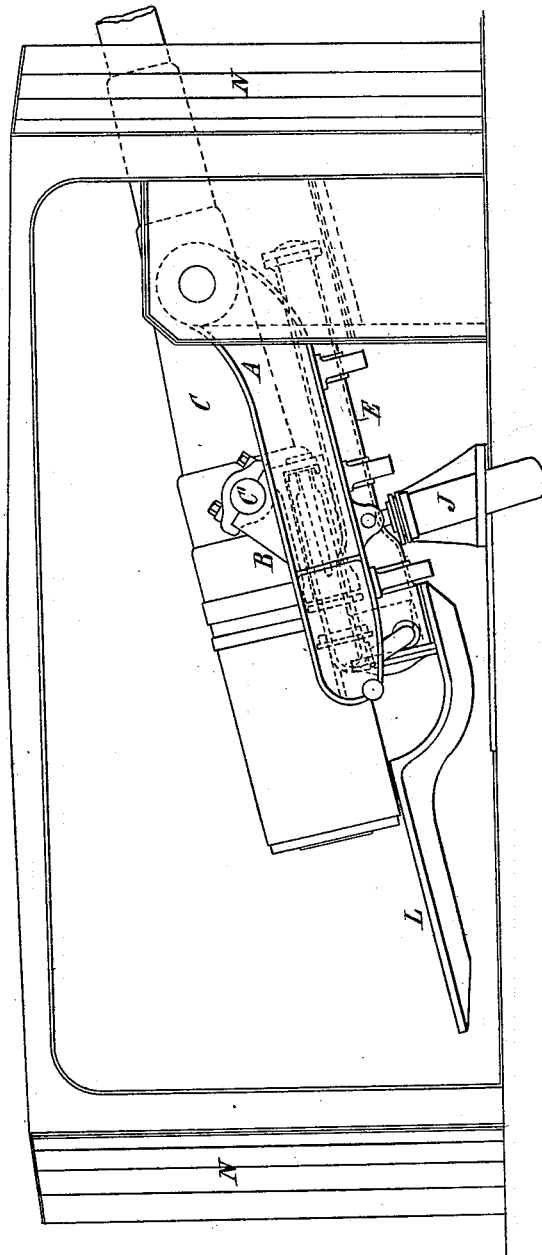
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Fig. 4.



Witnesses

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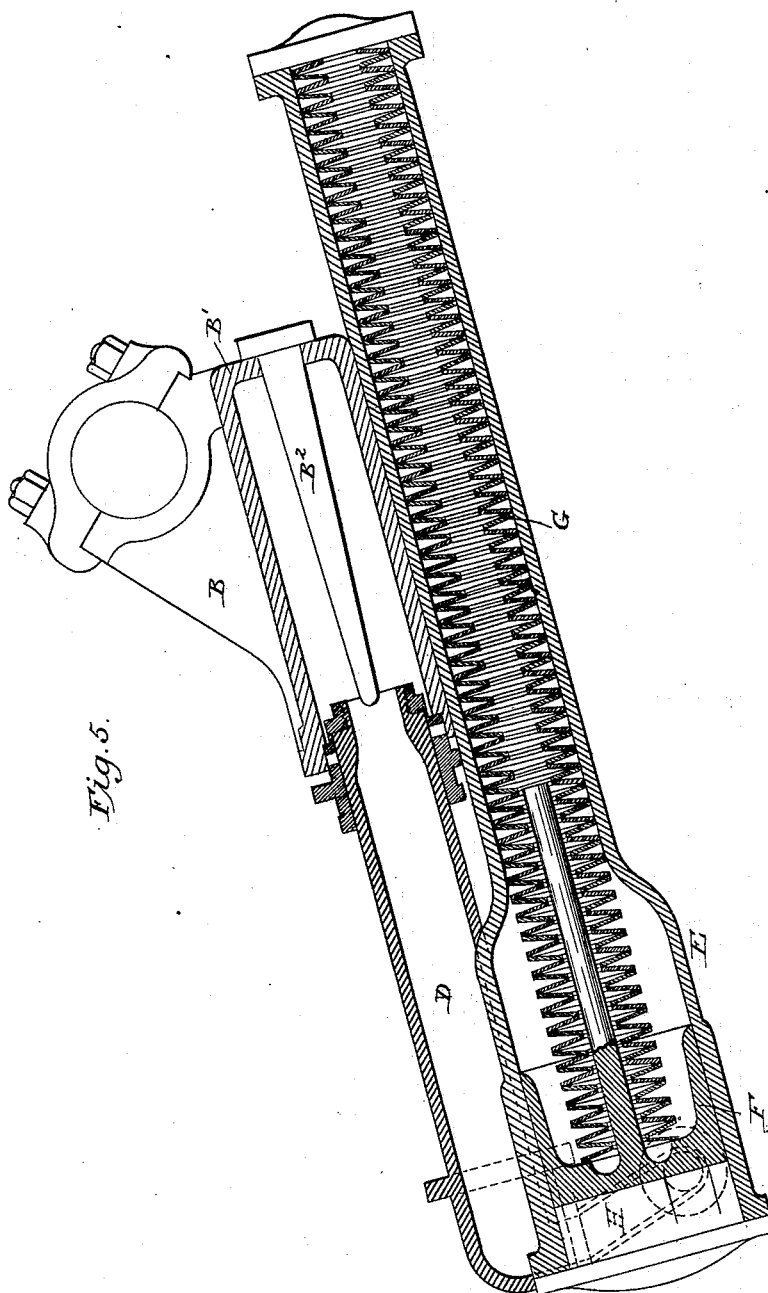
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Patented Feb. 25, 1890.



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(No Model.)

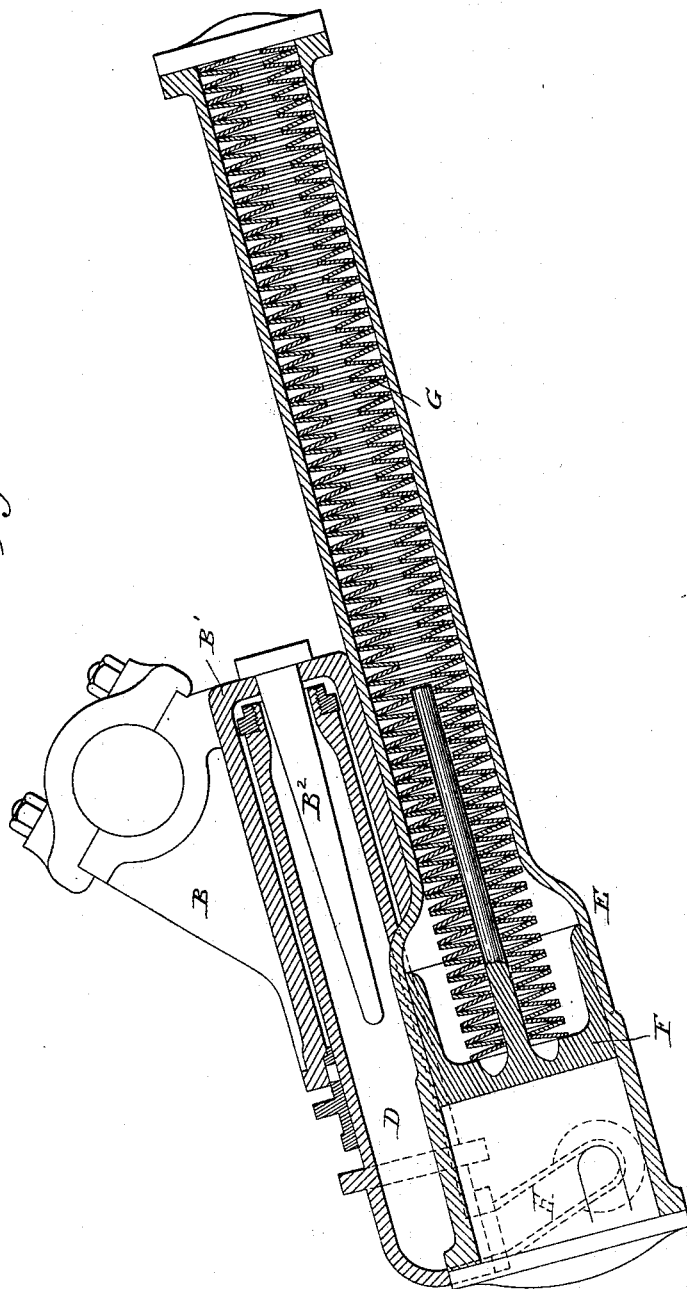
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MOUNTING ORDNANCE.

No. 422,002.

Patented Feb. 25, 1890.

Fig. 6



Witnesses  
Baltus De Long.  
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Inventor  
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Baldwin, Davidson & Mighl.

# UNITED STATES PATENT OFFICE.

WILLIAM ANDERSON, OF WESTMINSTER, ENGLAND.

## MOUNTING ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 422,002, dated February 25, 1890.

Application filed July 10, 1889. Serial No. 316,998. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM ANDERSON, civil engineer, a subject of the Queen of Great Britain, residing at 3 Whitehall Place, in the city of Westminster, England, have invented certain new and useful Improvements in Mounting Ordnance, of which the following is a specification.

This invention relates especially to the mounting of guns in turrets. The turret will usually contain a pair of guns. Each gun is mounted on a carriage capable of recoiling along a pair of slides, the forward ends of which are hinged to the turret. The rear ends of the slides are supported by a pair of hydraulic cylinders fixed to the floor of the turret and fitted with trunks and connecting-rods, the outer ends of which are attached to the rear ends of the slides. The form of the slides is such that the hinges have the center lines of their pins intersecting the center lines of the gun, so that the recoil produces no additional pressure on the elevating-cylinders beyond that momentarily due to the weight of the gun moving to the rear. The carriage is in two independent parts—one under each gun-trunnion—and in each part is a compressor-cylinder bored out to receive a hollow compressor-ram passing through a stuffing-box. The inner end of the ram terminates in a piston-head of somewhat larger diameter, and the cylinder is so formed that for the greater part of the stroke the piston-head will not touch its sides, but within a few inches of the run-out position the cylinder is contracted and the piston becomes an easy fit, so as to imprison an annulus of water, which will only be able to escape through the windage-space between the piston-head and the cylinder, and will thus offer sufficient resistance to check the gun in running out without shock. The trunnion-bearings are formed on the upper and forward ends of the carriage-cylinders. In the recoil the water in the compressor escapes through the hollow rams. The ends of these rams inside the cylinders are bored out to receive taper spindles. The outer end of each spindle is fixed to the cylinder-cover. These spindles are so proportioned that at the commencement of recoil the water-way down the hol-

low ram is quite free; but as the recoil proceeds the spindle gradually narrows the aperture, and at last when within a few inches of the end closes it almost completely, the water being able to make its way through the windage only. The hollow rams are attached to the inner faces of the slides and communicate by means of passages with the rear ends of a pair of storage-cylinders fitted with rams, the rear ends of which carry U-leathers to form a water-tight joint. These cylinders are bolted to the under side of the slides immediately under the gun, and are produced forward to accommodate two sets of disk-springs of sufficient stiffness to give the pressure necessary to run out the gun. The water from the compressors passes through the hollow rams into the storage-cylinders, and in so doing drives out their rams and further compresses the springs, which have an initial tension given to them sufficient to support the gun when run out. The recoil of the gun is therefore taken up partly in compressing the storage-springs, but chiefly in overcoming the resistance of the water squeezing its way between the side of the aperture in the end of the recoil-ram and the taper spindle.

An automatic recoil-valve may be introduced between the compressors and the storage-cylinders; but, preferably, there will be no valves whatever connected with the compressors.

The gun is immovably fixed in its carriage, and it may therefore be trunnionless. The elevation is accomplished by raising the rear ends of the slides by means of the hydraulic cylinder fixed to the floor of the turret.

Figure 1 is a vertical section through the center of a turret containing a pair of guns mounted in the above manner. Fig. 2 is a plan view of one of the gun-mountings and part of the turret. Fig. 3 is a cross-section through the line *a b*, Fig. 1. Fig. 4 is a vertical section through a turret, showing a gun in position, and showing how the slides are pivoted to the turret. Fig. 5 is a detail view showing the position of the recoil mechanism before firing, and Fig. 6 is a similar view showing the position of the recoil mechanism after firing.

A A are slides, hinged at their forward end to the turret and at their rear end secured one to the other by a cross-bar A'.

B B are carriages capable of sliding along the slides A.

C is the gun.

C' are trunnions or projections standing out from its sides and secured to the carriages B. It will be seen that the forward ends of the slides are curved upward, so that the center lines of the pins A<sup>2</sup>, on which the slides turn, pass through the center line of the gun, as above mentioned.

B' B' are compressor-cylinders, one formed with each carriage B.

D D are hollow rams working in the cylinders and fixed at their rear ends to the rear ends of the slides.

B<sup>2</sup> are tapering spindles secured to the front ends of the compressor-cylinders and entering into the open forward ends of the rams.

E are the storage-cylinders. F are pistons fitting therein.

G G are series of dished springs contained in the cylinders E and bearing against the pistons F.

H H are passages from the rear ends of the hollow rams to the rear ends of the storage-cylinders.

I (see Fig. 3) is a passage from the rear end of one storage-cylinder to the other.

J J are hydraulic cylinders fixed to the floor of the turret, and each fitted with a trunk-ram J', from the bottom of which a rod passes to the under side of one or other of the slides A. By these the rear ends of the slides A can be raised or lowered, as required.

K is a truck to be used in loading. It runs on an arm L, which extends from the rear ends of the slides. The truck is for carrying the shot into position to be thrust forward

into the breech end of the gun when the breech has been opened. The shot may be deposited onto the truck by means of elevating-pulleys and an overhead railway M, as shown. By this means the gun may be loaded without having always to be brought back to a fixed position.

N is the revolving turret, within which the mounting is contained.

What I claim is—

1. The combination of the gun, the gun-carriages, the slides upon which the carriages slide, their pivots at their forward ends having their central line in a plane passing through the center of the gun, the hydraulic cylinders supporting the rear ends of the slides, the compressor-cylinder on each carriage, the hollow ram working therein and fixed at its rear end to the slide, the tapering spindle carried by the front end of the compressor-cylinder and entering the front end of the hollow ram, the storage-cylinder, also carried by the slide at one side of the compressor-cylinder, the piston of the storage-cylinder pressed against by a series of dished springs, and the passage connecting the rear end of the storage-cylinder with the rear end of the compressor-cylinder.

2. The combination of the revolving turret, the gun, the gun-carriages, the slides upon which they slide, mechanism for checking the recoil of the carriages upon the slides, the arms projecting backward from the slides, the truck capable of being moved along the arms to convey projectiles to the breech end of the gun, and the overhead railway for placing projectiles onto the truck.

WILLIAM ANDERSON.

Witnesses:

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J. M. HAMILTON.