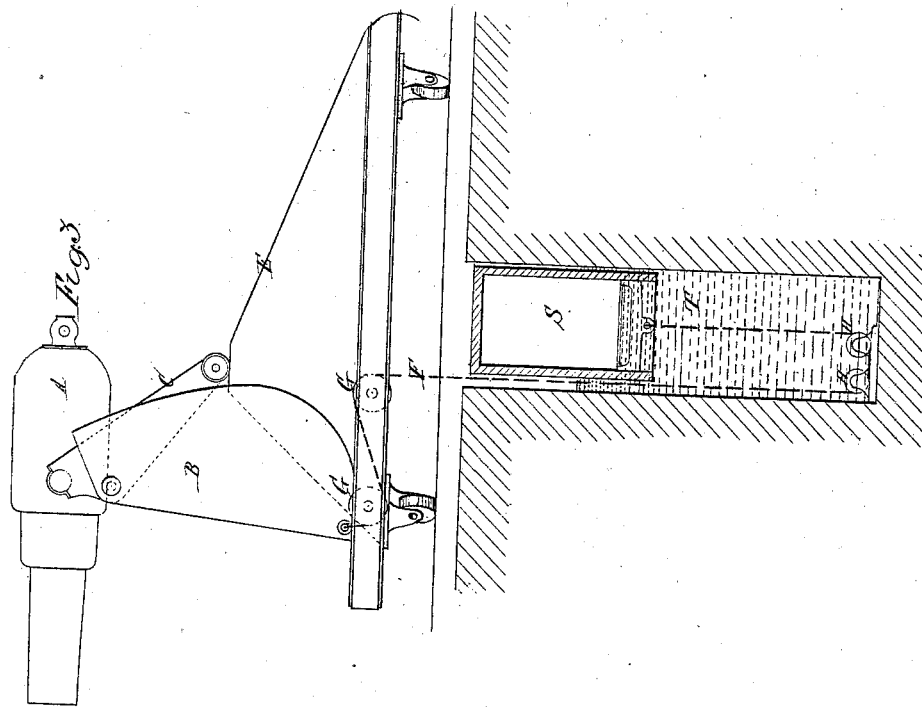
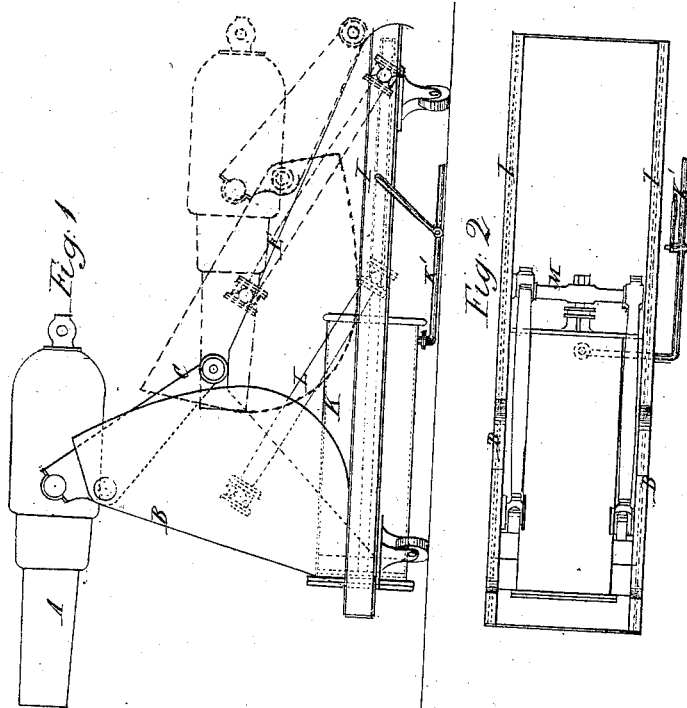


A. MONCRIEFF.
 Improvement in Mounting and Working Ordnance.
 No. 115,502.
 Patented May 30, 1871.

2 Sheets--Sheet 1.



Witnesses
 Chas D. Abel
 Geo M. Millard

A. Moncrieff

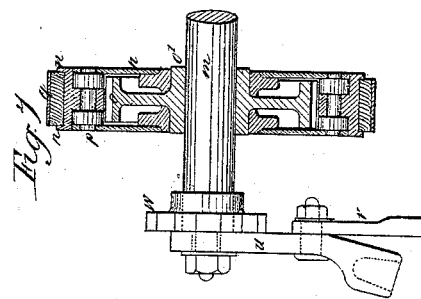
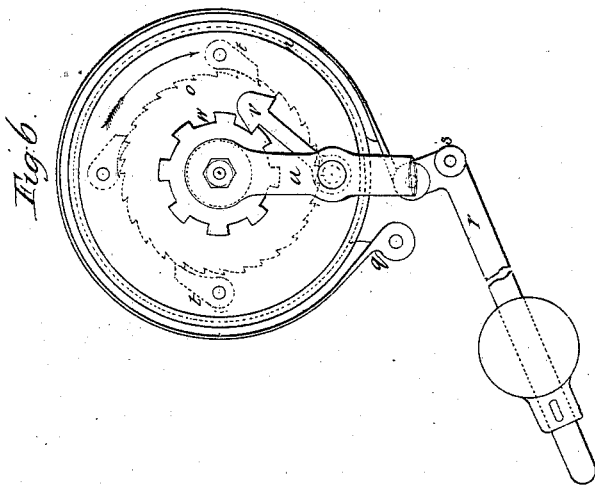
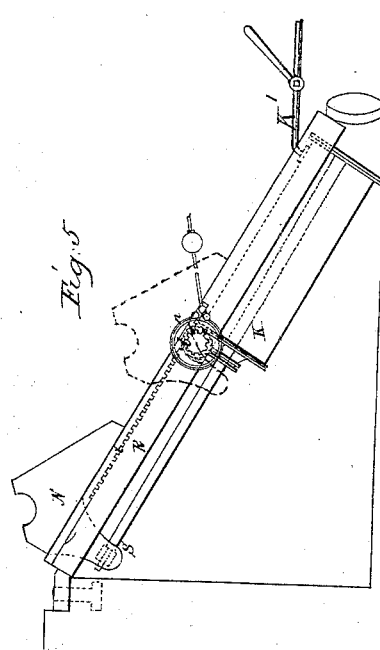
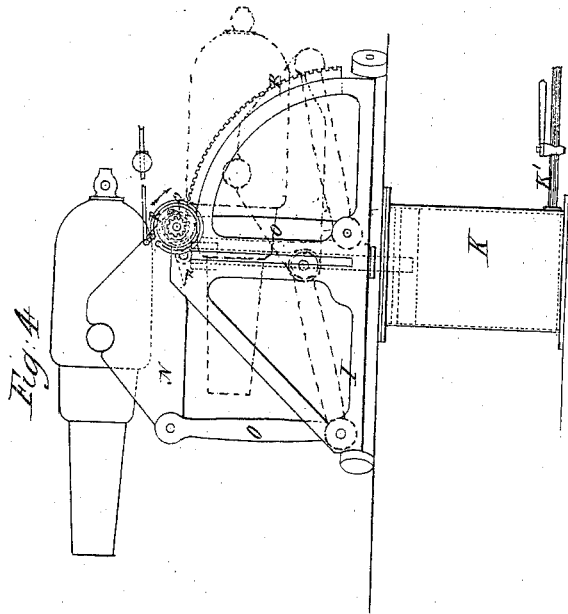
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2 Sheets--Sheet 2.

Improvement in Mounting and Working Ordnance.

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Witnesses
Chas. J. Abel
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A. Moncrieff

UNITED STATES PATENT OFFICE.

ALEXANDER MONCRIEFF, OF CULFARGIE, SCOTLAND.

IMPROVEMENT IN MOUNTING AND WORKING ORDNANCE.

Specification forming part of Letters Patent No. 115,502, dated May 30, 1871.

To all whom it may concern:

Be it known that I, ALEXANDER MONCRIEFF, of Culfargie, in the county of Perth, Scotland, have invented a new or Improved Method of Mounting and Working Ordnance on the "Moncrieff System;" and do hereby declare that the following description, taken in connection with the accompanying sheets of drawing hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvement, by which my invention may be distinguished from others of a similar class, together with such parts as I claim and desire to secure by Letters Patent; that is to say—

My present invention has for its object to dispense, either entirely or partially, with the use of heavy counter-weights or strong springs heretofore employed in the Moncrieff system for receiving and storing up the recoil, as described in the specification to my former patent, dated 10th November, 1868, as hereinafter described.

The accompanying drawing serves to show some of the numerous arrangements of which my present invention is susceptible.

Figures 1 to 3 on Sheet I show the application of my invention to guns carried by rolling elevators, similar in construction to those described in my former patent, but without the counter-weights. Figs. 1 and 2 show, respectively, a side elevation (one of the side frames being removed) and a plan of an arrangement in which a cylinder, K, containing water, oil, or other fluid or gas, is fixed in a horizontal position between the sides of the platform I.

The elevators B, carrying the gun A, are connected by the connecting-rods L to the cross-head M of the piston-rod of the cylinder in such manner that, on the recoil of the gun into the position shown in red lines, the motion of the elevators forces back the piston, and either compresses the elastic fluid or gas contained behind it in the cylinder, or forces the non-elastic fluid through an aperture in the end of the cylinder into a pipe, K', communicating either with a stand-pipe or with an "accumulator" similar to those employed with hydraulic cranes; the pressure of which fluid in the stand-pipe or accumulator reacts upon the piston and forces it forward again when it is desired to raise the gun into firing position.

The controlling of the motion of the gun is effected either, as in my previous patent, by means of a friction-brake and pawling mechanism in gear with toothed racks connected to the elevators, an improved construction of which brake will be presently described, or by contracting or closing the exit-orifices for the fluid by means of a cock or valve on the pipe K', as indicated, so as to check its flow and prevent it from reacting in the cylinder until it is desired to raise the gun into firing position, which is effected by opening the cock or valve. The cross-head M is guided in its motion by sliding between guides on the platform I.

Although I prefer to employ this arrangement without counter-weights, yet it will be evident that, if requisite, a counter-weight constructed as in my previous patent may be employed in addition to the action of the fluid or gases in the cylinder K. The carriage C of the gun rests upon the side frames E of the platform, as in the arrangement described in my previous patent.

In the arrangement shown in sectional side elevation at Fig. 3 the elevators B are connected by a chain, F, passing over the guide-pulleys G G H H to the lower open end of a cylindrical or other shaped vessel, S, partially immersed in the water or other fluid contained in the well T.

On the firing of the gun and consequent descent of the elevators, these, in drawing up the chain F, cause the cylinder S to be immersed to a greater extent in the fluid, thereby both causing it to displace a greater quantity of fluid so as to increase its buoyancy, and at the same time compressing the air inside it, the elastic force of which consequently tends, together with the buoyancy of the cylinder, to draw the elevators and gun back into firing position. These are held in the lower position by means of the friction-brake and pawling arrangement before mentioned. Figs. 4 and 5 on Sheet II show two other modifications of my improved system, in which the rolling elevators of my former system are also dispensed with, as well as the counter-weights.

In the arrangements shown at Fig. 4 the gun A is mounted on a carriage, N, supported by bars or links O, working on fixed fulcrums on the platform I, on which they turn so as to allow of the gun descending into the position

indicated in red lines. The compressing or forcing out of the gas or fluid contained in the cylinder K is effected by causing the end of the piston-rod to bear, by means of anti-friction rollers, against the under surface of the carriage N, which, in descending, consequently forces down the piston in the cylinder. In order to increase such compressing action at the commencement of the downward motion of the gun, an incline, *n*, is formed on the under side of the carriage N to act on the anti-friction rollers. The raising of the gun is effected by the upward pressure of the piston-rod against the under surface of the carriage. In this arrangement the controlling action is obtained either by controlling the flow of gas or fluid from the reservoir or stand-pipe back into the cylinder through the pipe K', provided for this purpose with a cock or valve, as in Fig. 1, or by forming quadrant-racks P on the platform, in gear with which are pinions Q on the carriage, fixed on the same shaft as the friction-brake mechanism R, shown detached to an enlarged scale at Figs. 6 and 7, which mechanism is equally applicable to all other arrangements of gun-carriages working on my system.

Fig. 6 shows a front view, and Fig. 7 shows a cross-section of the same. On the shaft *m*, carrying the pinions Q before mentioned, is fixed a ratchet-wheel, *o*, loose upon the boss *o'* of which are the disks or cheeks *p p*, connected to each other and to the rim *n*, and constituting the brake-drum, round which passes the brake-strap *q*, actuated by the weighted lever *r*, turning on a fulcrum at *s*. The rim *n* of the brake-drum carries pawls *t t*, which take into the teeth of the ratchet-wheel *o*, whereby the shaft *m* and with it the ratchet-wheel *o* are free to revolve in the direction of the arrow on the descent of the gun; but their rotation in the contrary direction may at any time be controlled and stopped by the action of the pawls on the application of the brake-strap. In order to allow of the gun being lowered or raised by manual power when not in action, a lever, *u*, with a socket to receive a bar for purchase, may be connected loosely to the end of the shaft *m*, and having a pawl or catch, *v*, which is made to catch into the

notches in the notched disk *w*, fixed on the shaft.

I do not claim this construction of brake as forming part of my present invention.

In the arrangement shown at Fig. 5 the gun-carriage N is caused, by the recoil, to slide down the inclined guides R, the piston-rod of the cylinder K being connected at S to a guide on the under side of the carriage so as directly to cause the gun-carriage to rise up the slides by the reaction of the compressed fluid or gas in the cylinder. The rising of the gun is controlled, as before, either by the friction-brake contrivance R, constructed as just described, in gear with racks T, fixed to the gun-carriage N and sliding between guides formed on R, or by controlling the entrance of the gas or fluid into the cylinder K by means of the cock or valve on the pipe K'.

In all the before-described arrangements, if steam is used as the elastic fluid, I prefer to provide means for allowing the steam to be passed back from the cylinder K into the boiler, during the first part of the recoil, until the force of the latter is equal to the pressure of the steam, after which I cause the remainder of the steam in the cylinder to escape in order to effect the full depression of the gun.

In the event of the steam pressure being too small, or when a sufficiently large-sized cylinder would be inconvenient, air or other permanent elastic gases may be pumped into the cylinder in place of steam.

I claim—

1. The combination herein described of the cylinder K, bar O, carriage N, and pipe K', with elastic or non-elastic fluids for absorbing and storing up the force of the recoil of guns, and utilizing the same to raise the gun into firing position, as set forth.

2. The arrangement of the cylinders containing fluids or gases, as above described, with gun-carriages supported upon inclined slides, guides, or rails, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses, this 30th day of May, 1870.

Witnesses: A. MONCRIEFF.

JNO. BN. MILLARD,
CHAS. D. ABEL.