

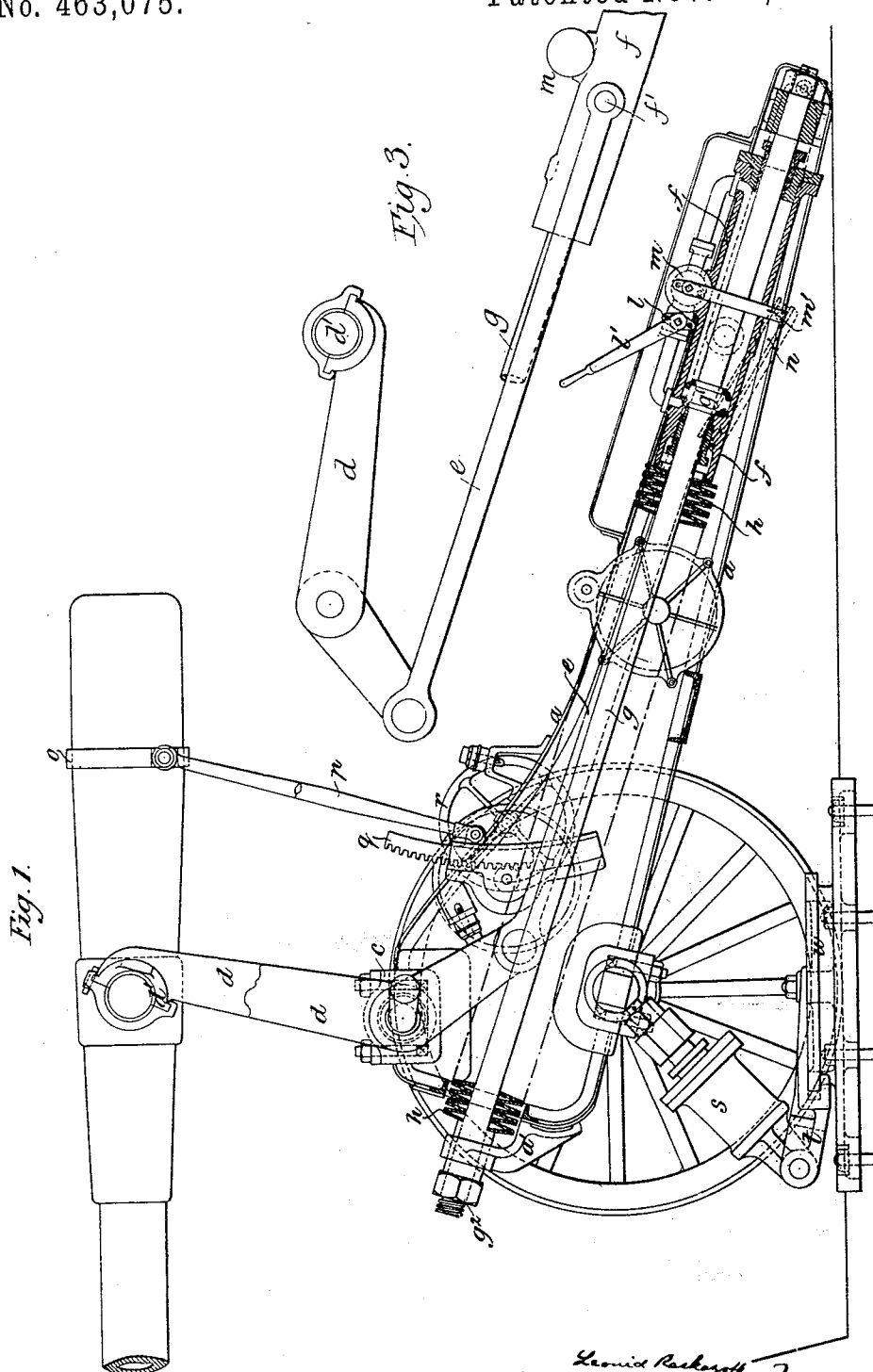
(No Model.)

2 Sheets—Sheet 1.

L. RASKAZOFF & J. E. COMPTON-BRACEBRIDGE.  
GUN MOUNTING.

No. 463,075.

Patented Nov. 10, 1891.



Witnesses,  
W. H. Washington, Miller,  
Baltus & Long.

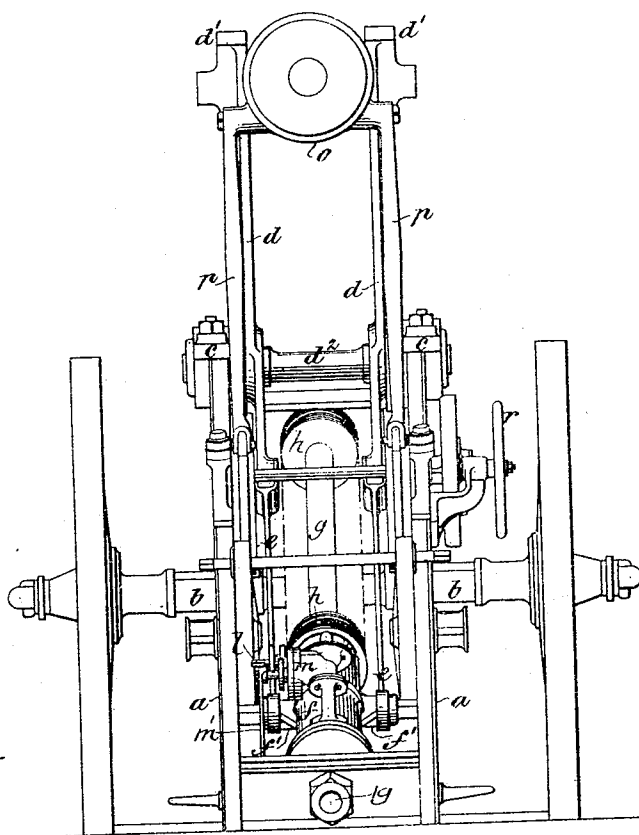
Leonid Raskazoff  
John Edward Compton-Bracebridge } Inventors.  
By their attys.  
Baldwin, Davidson & Night.

2 Sheets—Sheet 2.

## GUN MOUNTING.

Patented Nov. 10, 1891.

*Fig. 2.*



Balthus D<sup>r</sup> Long.

Baldern Davidson & Wright.

# UNITED STATES PATENT OFFICE.

LEONID RASKAZOFF, OF ST. PETERSBURG, RUSSIA, AND JOHN E. COMPTON-  
BRACEBRIDGE, OF LONDON, ENGLAND.

## GUN-MOUNTING.

SPECIFICATION forming part of Letters Patent No. 463,075, dated November 10, 1891.

Application filed June 19, 1891. Serial No. 396,416. (No model.)

*To all whom it may concern:*

Be it known that we, LEONID RASKAZOFF, lieutenant-colonel in the Imperial Russian Marine Artillery, a subject of the Emperor of Russia, residing at St. Petersburg, Russia, (9 Moika,) and JOHN EDWARD COMPTON-BRACEBRIDGE, engineer, a subject of the Queen of Great Britain, residing at 3 Whitehall Place, in Westminster, London, England, have invented certain new and useful Improvements in Gun-Mountings in which Springs are Employed for Working Ordnance, of which the following is a specification.

This invention has for its object improvements in gun-mountings, in which springs are employed for working ordnance.

The improvement has especial reference to the siege or other spring disappearing gun-carriage described in the British Patent No. 1,121, granted to one of us in the year 1885, and it has for its object a new arrangement of the controlling apparatus for automatically retaining in compressed state the springs of the spring accumulator or buffer after discharge of the gun to store up the recoil force.

This new improvement is a hydraulic contrivance introduced instead of the friction-nipping arrangement described in the above-mentioned patent and for the same purpose. This hydraulic contrivance consists of a hydraulic cylinder, through the axis of which is passed the stem of the spring-accumulator, on which the springs are threaded. The springs of the accumulator are in front of the cylinder and are arranged to push or press against the forward end of this cylinder, so that when the springs are compressed or expanded this cylinder will slide up and down along the stem. This sliding cylinder has a couple of horizontal trunnions, one on each of its sides, on which the eyes of connecting-bars are placed to form a connection between the spring-accumulator and rocking levers or elevators supporting the gun. Both ends of this sliding hydraulic cylinder are furnished with water-tight covers and stuffing-boxes where the stem of the accumulator

is passed through them. The length of the cylinder is such as to correspond to the maximum of stroke of the springs of the accumulator. On the part of the stem which is confined inside this cylinder a disk or piston is fixed to the stem. This piston is immovable on the stem and is situated not far from upper cover of the cylinder when the springs of accumulator are not compressed; but when the springs are compressed and the cylinder is forced to slide up along the stem the piston inside of the cylinder approaches the bottom cover. The piston may have holes through its body furnished with valves, which may open and let the liquid pass through only in one direction and only when the springs of accumulator are being compressed, or preferably a pipe connects the two ends of the cylinder through a throttle-valve and a valve which closes to prevent return.

The action of this hydraulic controlling apparatus is as follows: When the gun is fired, its recoil motion by means of rocking levers and connecting-bars will cause the movable hydraulic cylinder to slide along the stem and to compress the springs of the accumulator, which are confined between this sliding cylinder and a nut on the other end of the stem. By this sliding motion of the cylinder the liquid contained in it will be forced to pass through the valve from one end of the cylinder into the other; but in consequence of the valves it cannot return, and thus the springs of the accumulator are kept in a compressed state and the force of recoil is stored. When it is desirable to realize the force of recoil thus stored up in the accumulator for lifting the gun a small valve is opened, by which the liquid is then allowed to pass from one part of the cylinder into the other, and thus the springs of the accumulator are again allowed to move the cylinder along the stem and expand and therefore to do the work of raising the gun by the force of recoil stored in them from a previous discharge. The throttle-valve is controlled by a cam-guide during the recoil. The above-described arrangement of spring-

accumulator may be adapted to howitzer-mountings on rearwardly-inclined slides or in similar cases.

In order that our said invention may be fully understood and readily carried into effect, we will proceed to describe the drawings hereunto annexed.

Figure 1 is a sectional elevation of the gun-mounting. Fig. 2 is a rear elevation. Fig. 3 is a detail view showing the connection between the gun and the recoil-cylinder, the parts being shown in the recoiled position.

The siege-mounting as we prefer to arrange it, and as is here shown, consists of a trail constructed of two plate and angle brackets *a a*, united by a front transom, a center transom underneath, and a rear transom at the trail-eye. The brackets are held to the axle-tree *b* by joggles and plates bolted on. Steel castings *c*, fitted with cap-squares, are riveted to the brackets, in which the pivots of the elevators *d d* rest. The elevators are of bell-crank form and are fitted with trunnion-holes and cap-squares *d'* at their upper ends and are united by a shaft *d''*, which rests in the trunnion-holes in the middle, and at their lower ends are connected by two tension-rods *e e* to projections *f' f'* on the cylinder *f*. The rod or stem *g* of the spring-accumulator is fixed to the rear transom, and upon it is formed a piston *g'*, fitted with double-U leathers sliding water-tight in the cylinder. The other end of the stem *g* is carried by a bracket *a'*, bolted to the front transom, and is fitted with screw and nut *g''* for putting the initial compression on the springs. The disk-springs *h h* are threaded on the stem and bear at their forward end against the nut and at their rear end against projections on the front end of the cylinder *f*. In the drawings I have shown the springs at the front and rear ends only of the stem *g*. They are omitted for the greater part of the length of the stem, in order to show more clearly the elevating mechanism. The cylinder is fitted with stuffing-boxes at either end, through which the stem passes, and with two projections, to which the connecting-rods *e e* are attached, which slide in guides bolted to the inner side of the brackets. The pipe connecting the two ends of the cylinder together has in connection with it a recoil-valve *l* and an automatically-closed throttle-valve *m*. As shown in the drawings, a screw and handle *l'* is provided for lifting the recoil-valve from its seat to admit of the return of the liquid. The automatic throttle-valve *m* is turned by a crank *m'* on its spindle, catching against a groove in a cam-plate *n*, attached to the brackets of the carriage. Thus, when the gun recoils, the automatic valve is gradually closed, and the pressure in the cylinder is kept uniform

throughout its stroke. The elevating-gear consists of an elevating-band *o*, surrounding the gun, furnished with two trunnions, to which are attached two elevating-rods *p p*. The lower ends of the elevating-rods are attached to two studs upon two curved racks *q q*, sliding in guides attached to the brackets of the carriage and actuated through friction and spur gearing by means of a hand-wheel attached to one of the brackets. Suitable stops for checking the gun going up and coming down are provided. The handle of the "running-up" valve *l* as the gun goes up is automatically shut by catching against a projection attached to the brackets of the carriage.

The gun is anchored in the following manner: To the axle-tree is attached a forked rod terminating in a piston fitting loosely in a cylinder *s*, which is attached to an arm *t*, working round a circular plate *u*, bolted to the platform. A spring is inserted in the cylinder *s* to draw the piston down after recoil. By this means the "jump" of the mounting is gradually taken up and the carriage gently returned to its firing position.

What we claim is—

1. In a gun-mounting, the combination consisting of the trail or supporting-frame, the stem passing along the trail from end to end and having a piston upon it, levers or elevators jointed to the trail and supporting the gun, a cylinder surrounding the stem and containing the piston within it, springs around the stem outside the cylinder, compressed between an abutment at the fore end of the trail and the fore end of the cylinder, connecting-rods coupling the elevators with the cylinder, so that when the gun recoils the cylinder is drawn forward and the springs are compressed, a passage by which during recoil liquid can pass from one end of the cylinder to the other, valves which offer a suitable resistance to the passage of the liquid and prevent its return, and mechanism by which a way is opened for the return of the liquid when the gun is required to rise to the firing position.

2. In a gun-mounting, the combination consisting of the supporting-frame, the stem passing along the frame and having a piston upon it, a cylinder surrounding the stem and containing the piston within it, springs around the stem outside the cylinder, compressed between the cylinder and an abutment on the frame, a connection between the cylinder and the gun, such that the cylinder moves, compressing the springs when the gun recoils, a passage by which during recoil liquid can pass from one end of the cylinder to the other, valves which offer a suitable resistance to the passage of the liquid and prevent its return,

and mechanism by which a way is opened for the return of the liquid when the gun is required to rise to the firing position.

3. In a gun-mounting, the recoil apparatus, substantially as described, consisting of the stem with piston thereon, the cylinder containing the piston, the springs on the stem outside the cylinder and between the cylinder end and the abutment, the passage between the ends of the cylinder, the valves regulating the flow of liquid in the passage and preventing return, and mechanism by which a way is opened for the return of the

liquid to allow the gun to come to the firing position.

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