

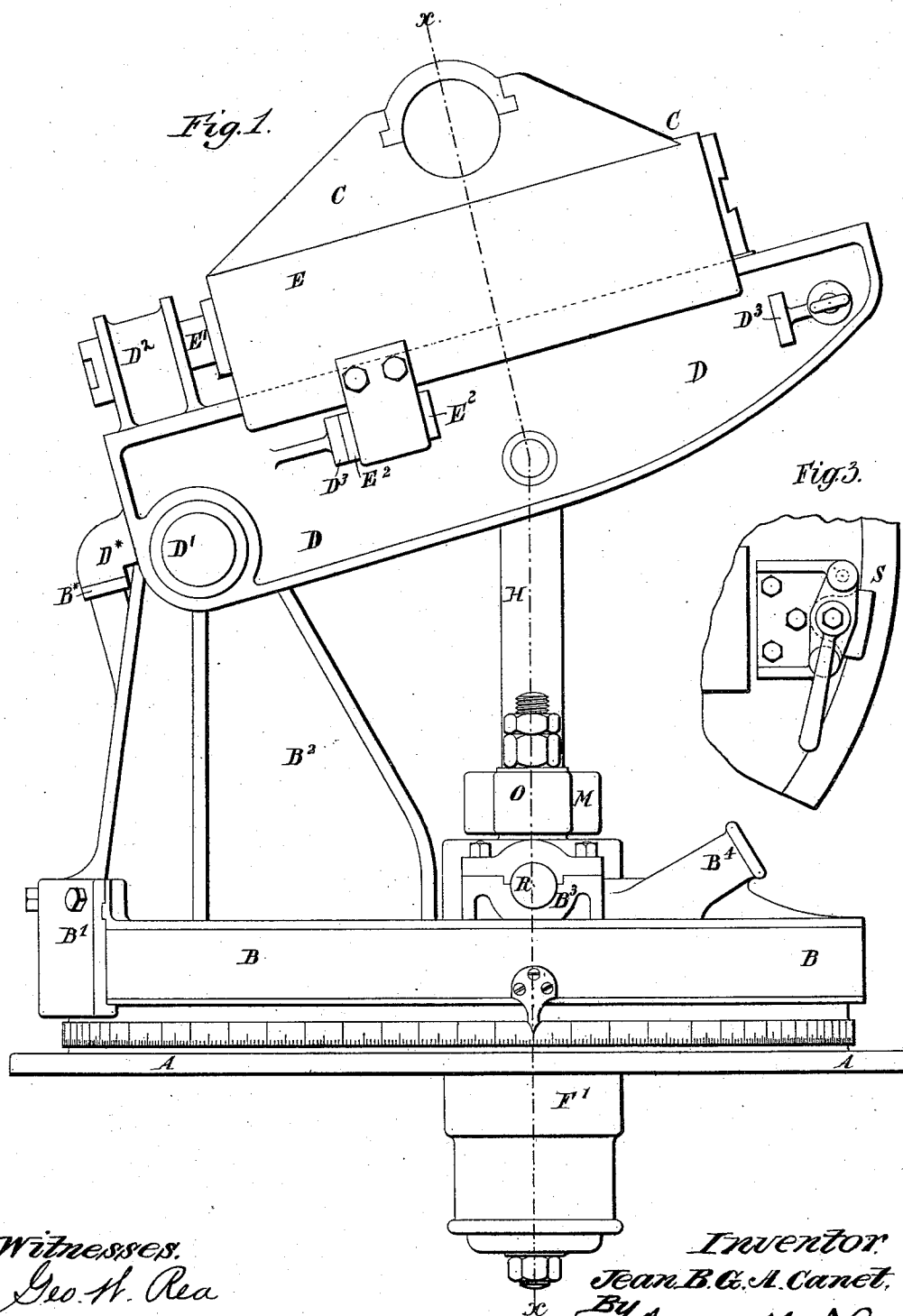
(No Model.)

4 Sheets—Sheet 1.

J. B. G. A. CANET.
GUN CARRIAGE OR MOUNTING.

No. 470,036.

Patented Mar. 1, 1892.



Witnesses.

Geo. H. Rea

Robert G. Smith,

Inventor.

Jean B. G. A. Canet,

By James L. Norris
Atty.

(No Model.)

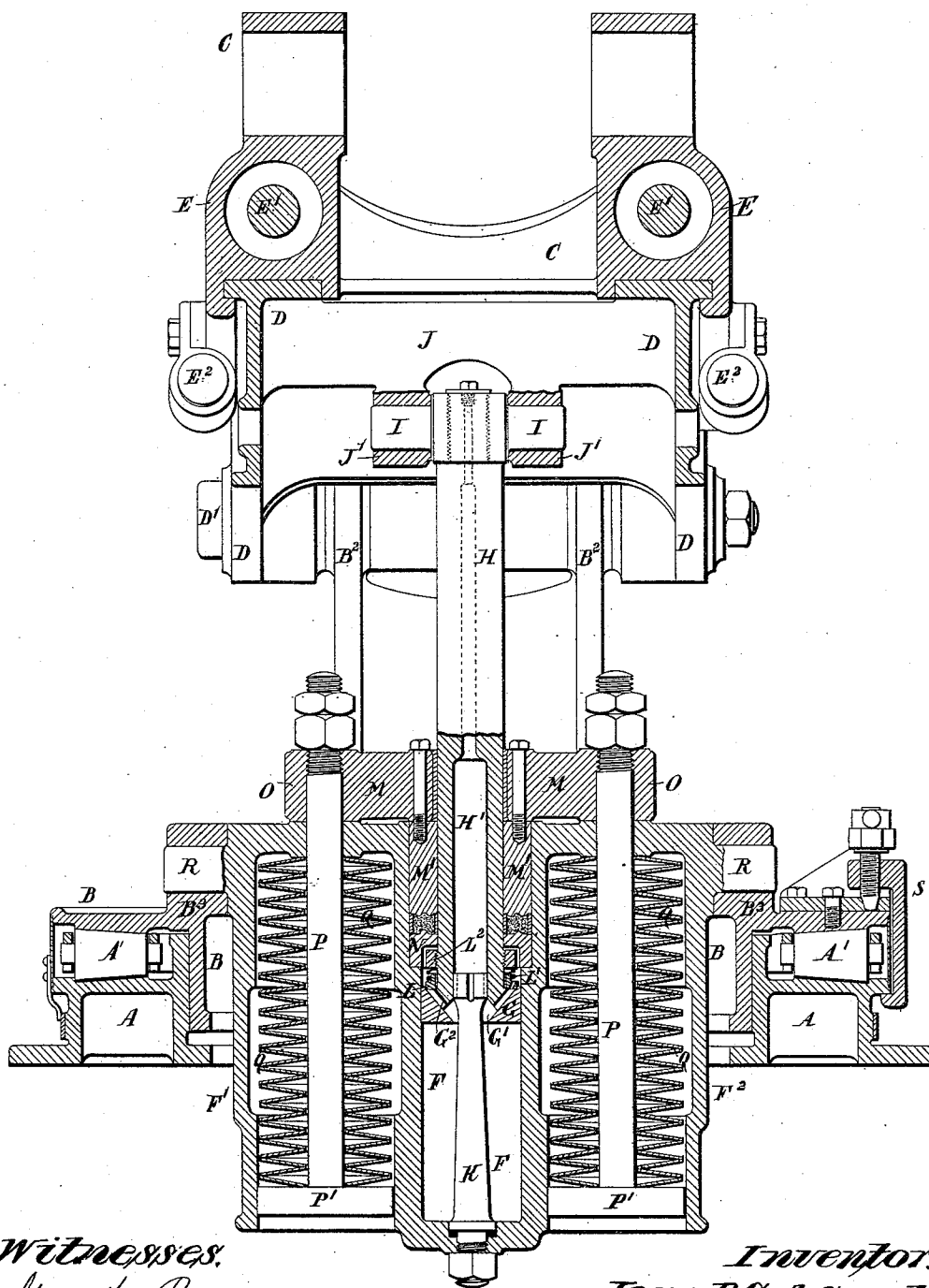
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Fig. 2.



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Att'y.

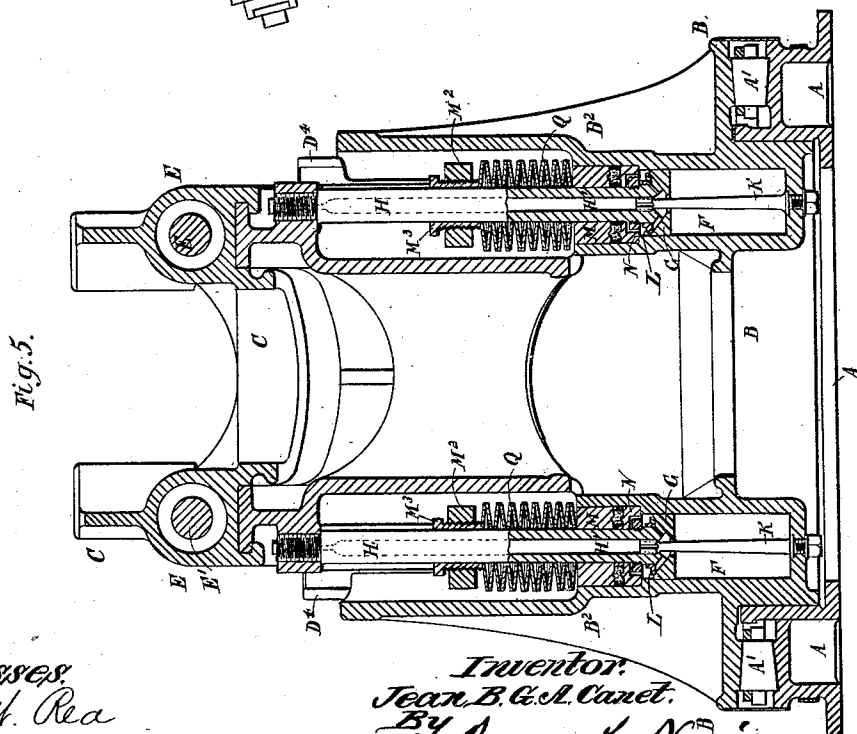
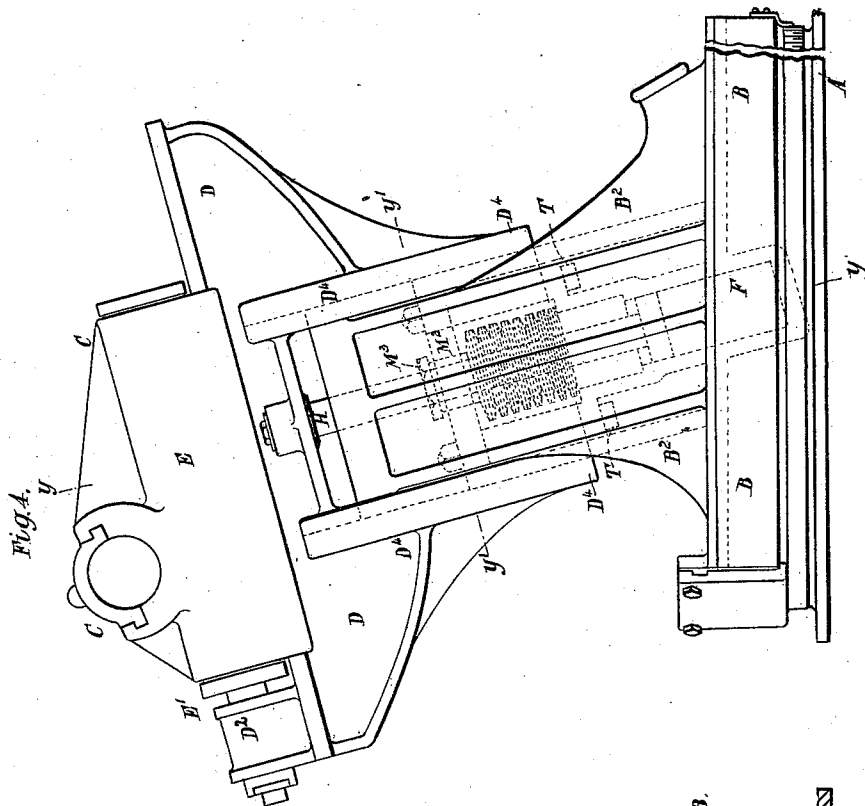
(No Model.)

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J. B. G. A. CANET.
GUN CARRIAGE OR MOUNTING.

No. 470,036.

Patented Mar. 1, 1892.



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(No Model.)

4 Sheets—Sheet 4.

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Fig. 7.

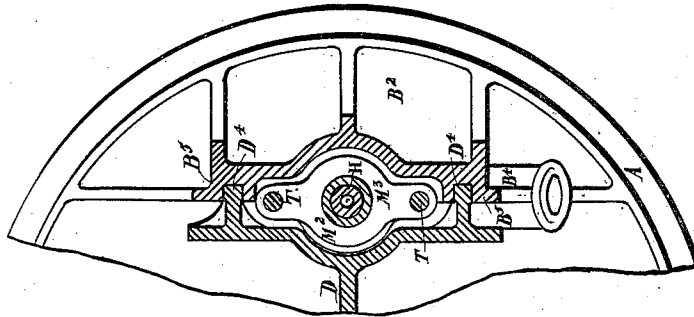
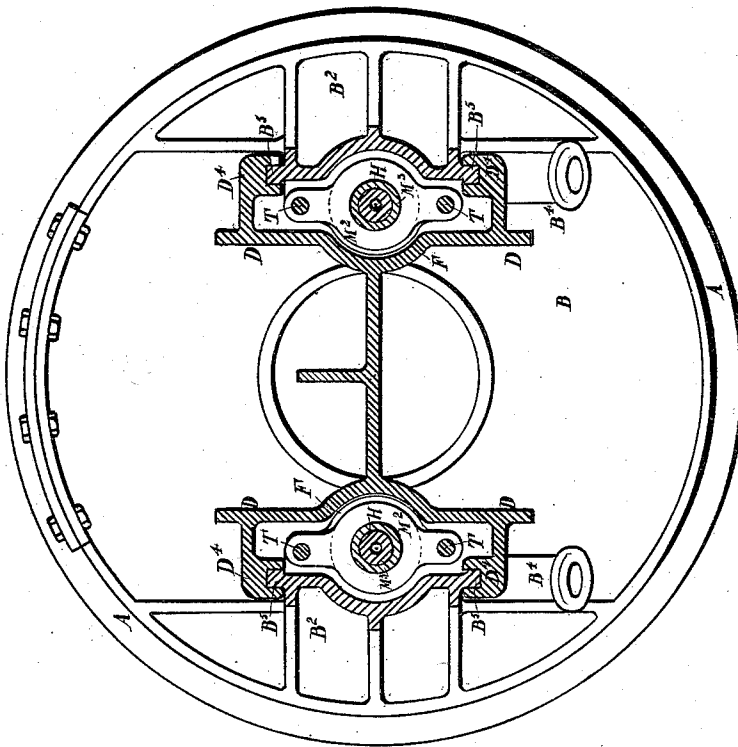


Fig. 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

JEAN BAPTISTE GUSTAVE ADOLPHE CANET, OF PARIS, FRANCE, ASSIGNOR
OF ONE-HALF TO THE SIR JOSEPH WHITWORTH & COMPANY, LIMITED,
OF MANCHESTER, ENGLAND.

GUN CARRIAGE OR MOUNTING.

SPECIFICATION forming part of Letters Patent No. 470,036, dated March 1, 1892.

Application filed June 29, 1888. Serial No. 278,594. (No model.) Patented in France December 18, 1886, No. 180,349, and in England June 29, 1887, No. 9,217.

To all whom it may concern:

Be it known that I, JEAN BAPTISTE GUSTAVE ADOLPHE CANET, engineer, a citizen of the Republic of France, and a resident of Paris, France, have invented new and useful Improvements in and Relating to Gun Carriages or Mountings, (for which I have obtained patents in Great Britain, No. 9,217, dated June 29, 1887, and in France, No. 180,349, dated December 18, 1886,) of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to gun carriages or mountings, and has for its object to diminish the concussion or shock to which the apparatus is subjected in the recoil of the gun. For this purpose I make use of two sets of brake apparatus, so arranged that the one will resist the horizontal or nearly horizontal force or stress exerted in the recoil. I have hereinafter distinguished these sets of apparatus as "horizontal" and "vertical" brakes.

My improvements are applicable to guns mounted on platforms for use on board ship or on land and also to siege and other gun carriages supported on wheels.

In the accompanying drawings, Figure 1 is a side elevation of one form of my improved gun carriage or mounting with a rotating platform or turn-table. Fig. 2 is a transverse section on the line $x x$, Fig. 1. Fig. 3 is a plan showing a clip, hereinafter referred to. Fig. 4 is a side elevation showing another form or modification of my improved gun carriage or mounting with a rotating platform or turn-table. Fig. 5 is a transverse section on the line $y y$, Fig. 4. Fig. 6 is a section on the line $y' y'$, Fig. 4. Fig. 7 is a similar section showing another modification of my invention, hereinafter described.

Like letters indicate corresponding parts throughout the drawings.

A is the base-plate or racer-path, forming also a pivot.

B is the turn-table or rotating platform carrying the frame and supported on the said base-plate or racer-path by rollers or balls A'.

C is the cradle, in which the gun is supported by trunnions.

In the gun-mounting shown in Figs. 1 and 2 the turn-table or platform B is prevented from tilting by one or more clips B'. The cradle C is arranged to slide upon a frame D, which is movable in a vertical plane about a fulcrum-pin or pivot-pin D', carried by a frame or standards B², formed with or firmly attached to the turn-table or platform B. The movable frame or slide D is provided at its forward end with projections or brackets D², in which are secured the piston-rods E' of the horizontal brakes E. The frame or slide D is under normal conditions inclined, as shown in Fig. 1, to permit the return of the gun to the firing position by the action of gravity.

The platform or turn-table B carries the vertical brake apparatus designed to diminish the concussion or shock due to the downward blow or thrust of the recoil. This brake apparatus comprises a cylinder F, provided with a piston G, the rod H of which is made with a central cavity H', and is coupled to the frame D by means of a trunnion-block I, fitted in bearings J' on one of the transoms J of the said frame or slide D. The piston G has at its center a hole or aperture G', through which a rod K of unequal or varying diameter extends into the cavity H' of the hollow piston-rod H for the purpose of varying the flow of fluid through the piston in the downward movement thereof. The piston G is provided with an annular valve L, which is held down by a spring L', adjustable by means of a screw-nut L² on the rod H. This valve L is so arranged that when by the effect of the recoil, the piston begins to descend the liquid beneath the said piston passing through the apertures or passages G' G² will exert pressure on and lift the said valve as far as allowed by the spring L' and nut L², and thus pass to the other side of the piston. The cylinder F is closed at its upper end by a cover M, which serves as a cross-head and which is arranged somewhat like the gland of a stuffing-box—that is to say, it is provided with a projecting piece or plug M', which ex-

tends into an enlargement of the bore of the cylinder F. Suitable packing is placed between the said projecting piece or plug and a disk or ring N. To the two arms or extensions O of the cover or cross-head M are secured two rods P, provided with disks or pistons P', arranged in combination with springs Q (preferably so-called "Belleville" springs) in cylinders or boxes F' F², or the said rods may be provided with or connected with pistons or plungers working in air-chambers. The cylinders or boxes F' F² are formed in one piece with the cylinder F or are otherwise securely connected therewith.

The vertical brake apparatus works upon trunnions R, supported in bearings B³ on the turn-table B, so that while resisting the downward movement of the frame or slide D the brake can freely adapt itself to the angular changes in the position of the said frame.

By providing a suitable connection of the piston-rod to the frame or slide D I can avoid the necessity of mounting the brake-cylinder on trunnions.

When the piston G is moved downward by the recoil, the liquid below the said piston in the cylinder F is, as above stated, forced through the holes G' G² and lifts the valve L, thus passing to the space above the said piston. The immersion of the rod H in the cylinder F causes the displacement of some of the liquid and the consequent raising of the disk or ring N, cover or cross-head M, and pistons P'. The springs Q will by the rising of the cover M and pistons P' be compressed during the downward movement of the piston G and will react at the termination of the recoil. The valve L will then drop upon its seat, so that the liquid must return through orifices provided in the valve L or in the piston G to the space below the said piston. The piston then slowly rises under the pressure of the liquid, due to the action of the recuperating-springs Q, and thus by raising the frame D allows the return of the gun to the firing position by gravity.

Any suitable device for effecting the elevation of the gun about its trunnions can be applied in combination with the above-described apparatus. Moreover, any suitable means may be provided for training the gun. For small guns I sometimes use for this purpose one or more hand-levers or handspikes, which are inserted in sockets B⁴, formed on the platform or turn-table B. I provide a suitable clamp S on the side of the turn-table B or other suitable means for securing the said turn-table in any position to which it may be adjusted.

The frame D is provided with projections or lugs D³, arranged to act in combination with buffers or cushions E², for the purpose of arresting the movement of the gun at either extremity of its travel on the frame D. The said frame is also provided with projections or arms D*, which at the termination of the upward or return movement of the said frame

abut or impinge against stops B*, formed on or firmly attached to the standards B².

In the modification of my said invention (illustrated in Figs. 4, 5, and 6) the frame D, which carries the horizontal brake, instead of turning upon a fulcrum or pivot, as above described, is provided with extensions D⁴, fitted to slide upon guides B⁵ on the standards B², so that its successive positions are parallel to each other throughout its descent. Instead of a single cylinder F, as in the gun-carriage shown in Figs. 1 and 2, the vertical brake apparatus in this modification comprises two cylinders F, each provided with a piston G and a rod K of unequal or varying diameter, as above described, and with a disk or ring N and a movable cover M, between which and a cross-head M² is placed a Bellevillespring Q or other suitable spring. Each of the said cross-heads M² is firmly secured by bolts T or otherwise to the corresponding standard B² and is provided with a screw-threaded sleeve M³, which may be adjusted to regulate the compression of the spring Q. The springs Q perform the functions of a recuperator—that is to say, in the recoil the springs Q are compressed and after the recoil the said springs react to raise the frame D. The rod K and also the piston G and parts connected therewith are arranged to operate so that the flow of liquid through the piston will be regulated or controlled—that is to say, in the downward movement of the piston the valve L opens and the fluid flows through the piston, its velocity being controlled by the taper rod K. At the same time the springs Q are compressed. The said springs then react and slowly raise the gun, the said valve L being closed by its spring L', and the fluid having to be forced through a hole or groove in the said valve or in its seat or in the piston, which hole is shown in the valve, Figs. 2 and 5, is simply such as will permit a slow flow of the fluid from the space above to that below the said piston. The extensions D⁴ of the frame D are sometimes fitted to slide within the guides B⁵, as shown in Fig. 7.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I wish it understood that I am aware that in the specification of British Letters Patents dated December 24, A. D. 1878, No. 5,264, a gun-mounting is described wherein the gun recoils upon a slide pivoted at its forward end and arranged in combination with hydraulic apparatus for turning the said slide about its fulcrum or pivot to effect the vertical pointing or elevation of the gun, and I therefore make no claim to the use of a pivoted slide on which the gun recoils, except as one of the elements of my improved gun-mounting; nor do I claim, generally or irrespectively of my present improvements, the use of parallel-motion apparatus for elevating the gun, as I will describe and claim this in another application for Letters Patent of the United States; but

I claim—

1. In a gun-mounting, the combination, with a turn-table or under carriage and a slide upon which the gun moves to and fro in its recoil and running out, of a vertical brake connecting the said slide with the turn-table or under carriage and partially supporting the said slide with the gun thereon, and a recuperator whereby energy is stored up during the downward movement of the gun and its slide due to the recoil and is utilized for raising the same, substantially as and for the purpose set forth.

2. In a gun-mounting, the combination, with a turn-table or under carriage, of a slide upon which the gun moves to and fro in its recoil and running out and which is capable of up-and-down movement relatively to the said turn-table or under carriage, a brake arranged between the said turn-table or under carriage and the slide, and a recuperator whereby energy is stored up during the downward movement of the gun and its slide due to the recoil and is utilized for raising the same, substantially as and for the purposes set forth.

3. In a gun-mounting, the combination, with the under carriage, of a slide upon which the gun moves to and fro in its recoil and running out and which is capable of up-and-down movement relatively to the said under carriage, a cradle or top carriage carrying the gun and arranged to move to and fro there-with upon the said slide, brakes for controlling the recoil movement of the said cradle or top carriage, a brake which is secured to the under carriage and the piston-rod or plunger of which is secured to the said slide, and a recuperator whereby energy is stored up during the downward movement of the gun and its slide due to the recoil and is utilized for raising the same, substantially as and for the purposes set forth.

4. In a gun-mounting, the combination, with the under carriage, of a frame or slide which is capable of up-and-down movement and upon which the gun is arranged to recoil, a brake which is secured to the said under carriage and the piston-rod of which is connected with the said frame or slide, and a recuperator comprising a movable cover for the brake-cylinder and a spring acting upon the said cover, substantially as and for the purposes set forth.

5. In a gun-mounting, the combination, with the under carriage, of an inclined slide which is secured thereto in such a manner that it is capable of up-and-down movement thereon and upon which the gun is arranged to move to and fro in its recoil and running out, a brake which is secured to the said under carriage and the piston-rod or plunger of which is secured to the said slide, and a recuperator connected with the said brake for returning the gun-slide to the firing position, substantially as and for the purposes set forth.

6. In a gun-mounting, the combination,

with the under carriage, of an inclined slide which is pivoted to the said under carriage and upon which the gun is arranged to move to and fro in its recoil and running out, a brake which is secured to the said under carriage and the piston-rod or plunger of which is coupled to the said pivoted slide, and a recuperator connected with the said brake for returning the gun-slide to the firing position, substantially as and for the purposes set forth.

7. In a gun-mounting, the combination, with the under carriage, of a slide which is pivoted to the said under carriage and upon which the gun moves to and fro in its recoil and running out, a brake which is secured to the said under carriage and whose piston-rod is coupled to the said slide, and a recuperator comprising a cross-head serving as the cover of the brake-cylinder, and springs connected with the said cross-head, the said brake and recuperator being supported in bearings in the under carriage by means of trunnions, substantially as and for the purposes set forth.

8. In a gun-mounting, the combination, with the under carriage, of a slide which is capable of up-and-down movement and upon which the gun moves to and fro in its recoil and running out, guides for directing the movement of the said frame or slide so that its successive positions are parallel to each other, a brake arranged between the under carriage and the said slide, and a recuperator connected with the said brake for returning the gun-slide to the firing position, substantially as and for the purposes set forth.

9. In a gun-mounting, the combination, with the under carriage B, of the frame or slide D, the cradle or top carriage C, the brakes E, the vertical brake comprising the cylinder F and the piston G, having its rod H secured to the said frame or slide, the cover or cross-head M, the disk or ring N, and means, substantially such as above described, for storing up energy when the said cover is raised by the action of the said vertical brake and for utilizing such energy to effect the return movement of the said cover and the consequent raising of the gun, substantially as and for the purposes set forth.

10. In a gun-mounting, the combination, with the under carriage B, of the frame or slide D, the cradle or top carriage C, the brakes E, the brake-cylinder F, the piston G, having its rod H coupled to the said frame or slide, the cover or cross-head M, the disk or ring N, the rods P, connected with said cross-head and provided with the disks or pistons P', and the springs Q, all substantially as and for the purposes set forth.

11. In a gun-mounting, the combination, with the under carriage B, of the frame or slide D, capable of up-and-down movement, the cradle or top carriage C, the brakes E for controlling the recoil of the gun, a brake for diminishing the shock or concussion due to the downward thrust of the recoil and com-

prising a cylinder F and a piston G, the rod of which is secured to said frame or slide, guides D⁴ B⁵ for directing the movement of the said frame or slide, and means substantially such as above described for storing up energy during the downward movement of the gun and its frame or slide and utilizing such energy for raising the same, substantially as and for the purposes set forth.

12. In a gun-mounting, the combination, with the under carriage B, of the frame or slide D, capable of up-and-down movement, the cradle or top carriage C, arranged to slide thereon, the brakes E for controlling the recoil of the gun, guides D⁴ B⁵ for directing the movement of the said frame or slide, brakes for diminishing the shock or concussion due to the downward thrust of the recoil and each comprising a cylinder F, a movable cover M therefor, and a piston G, the rod of which is secured to the said frame or slide, fixed cross-heads or abutments M², and springs Q, arranged between the same and the said movable covers, substantially as and for the purposes set forth.

13. In a gun-mounting wherein a brake is arranged, in combination with the under carriage and with a part of the mounting which is capable of up-and-down movement with the gun, substantially as described, a piston for the said brake, provided with apertures or passages for the flow of liquid through the said piston and with a valve for closing the said apertures or passages, in combination

with a movable cover for the brake-cylinder, and means, substantially such as above described, for storing up energy when the said cover is moved upward by the action of the brake and for utilizing such energy to effect the return movement of the said cover and the consequent raising of the gun, substantially as and for the purpose set forth.

14. In a gun-mounting wherein a brake is arranged, in combination with the under carriage and with a part of the mounting which is capable of up-and-down movement with the gun, substantially as described, a piston for the said brake, provided with apertures or passages for the flow of liquid through the same and with a valve for closing the said passages, in combination with a hollow piston-rod, a taper rod or rod of varying diameter secured in the brake-cylinder and extending into the said piston-rod, a movable cover for the brake-cylinder, and means substantially such as above described for storing up energy when the said cover is moved upward by the action of the brake and for utilizing such energy to effect the return movement of the said cover and the consequent raising of the gun, substantially as and for the purposes set forth.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JEAN BAPTISTE GUSTAVE ADOLPHE CANET.

Witnesses:

ROBT. M. HOOPER,
R. J. PRESTON.