

(No Model.)

5 Sheets—Sheet 1.

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

No. 497,704.

Patented May 16, 1893.

Fig. 1.

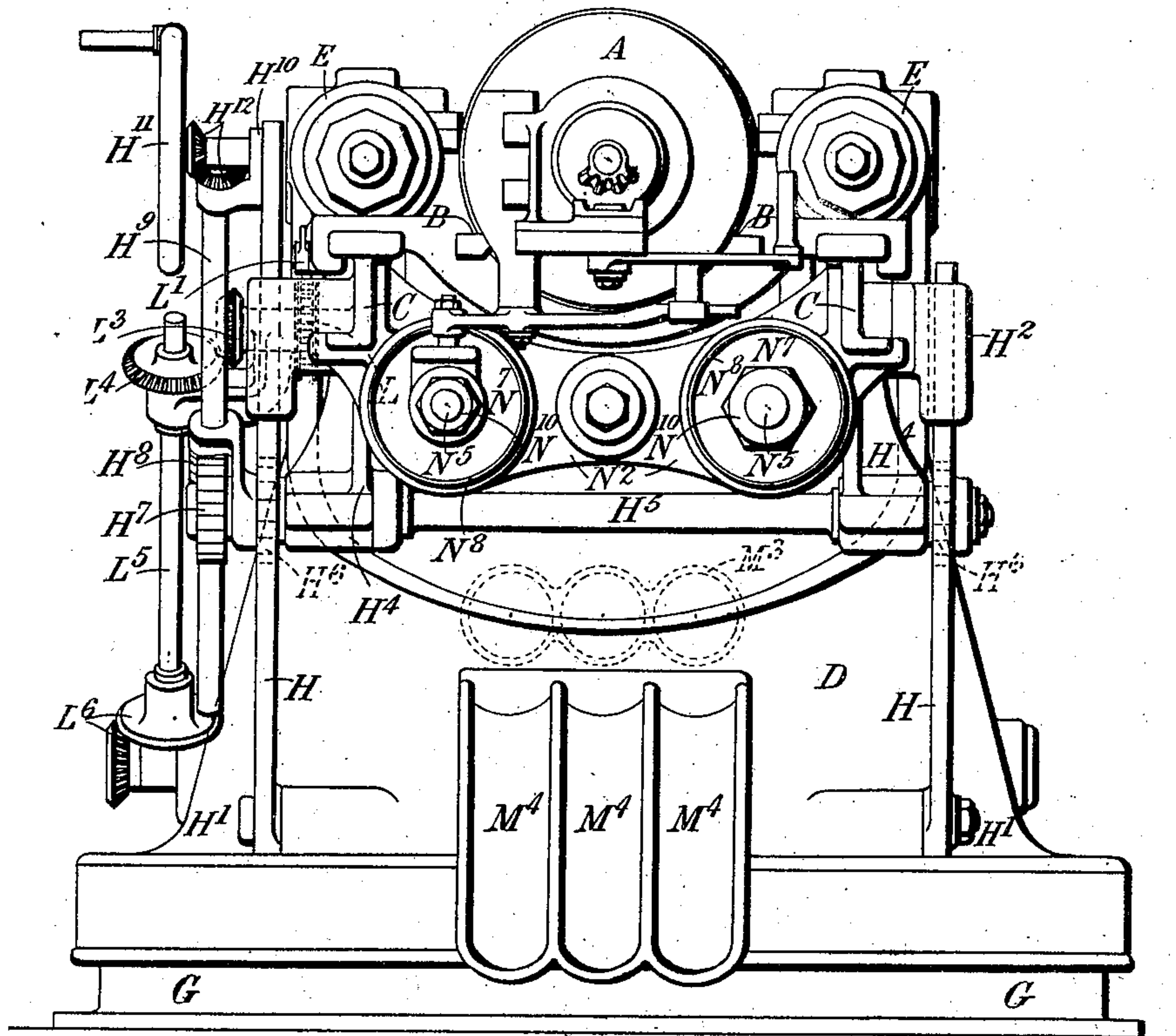
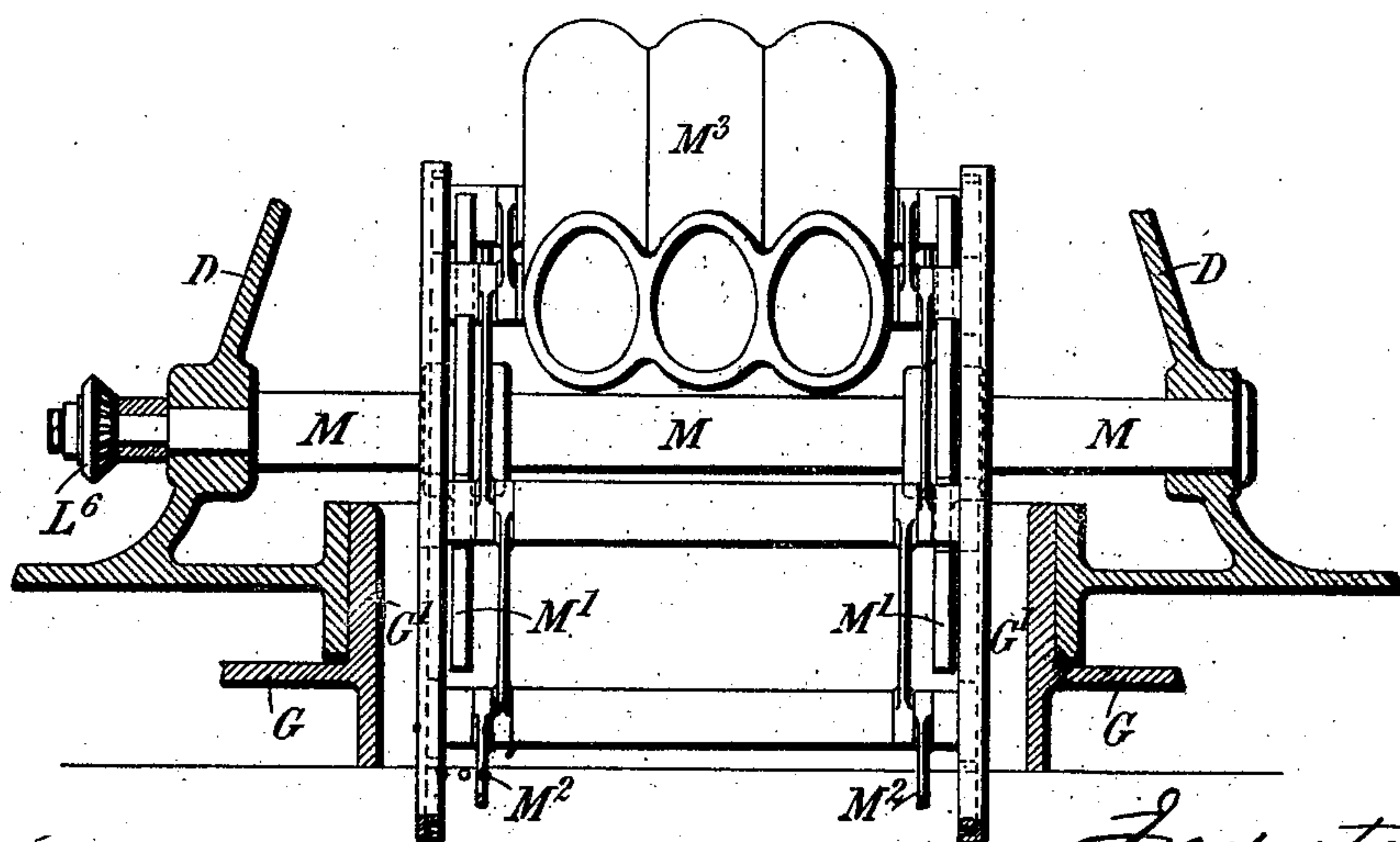


Fig. 5.



Witnesses:
J. A. Rutherford.
Robert Crockett.

Inventor:
Jean B. G. A. Canet.
By James H. Norris.
Attorney.

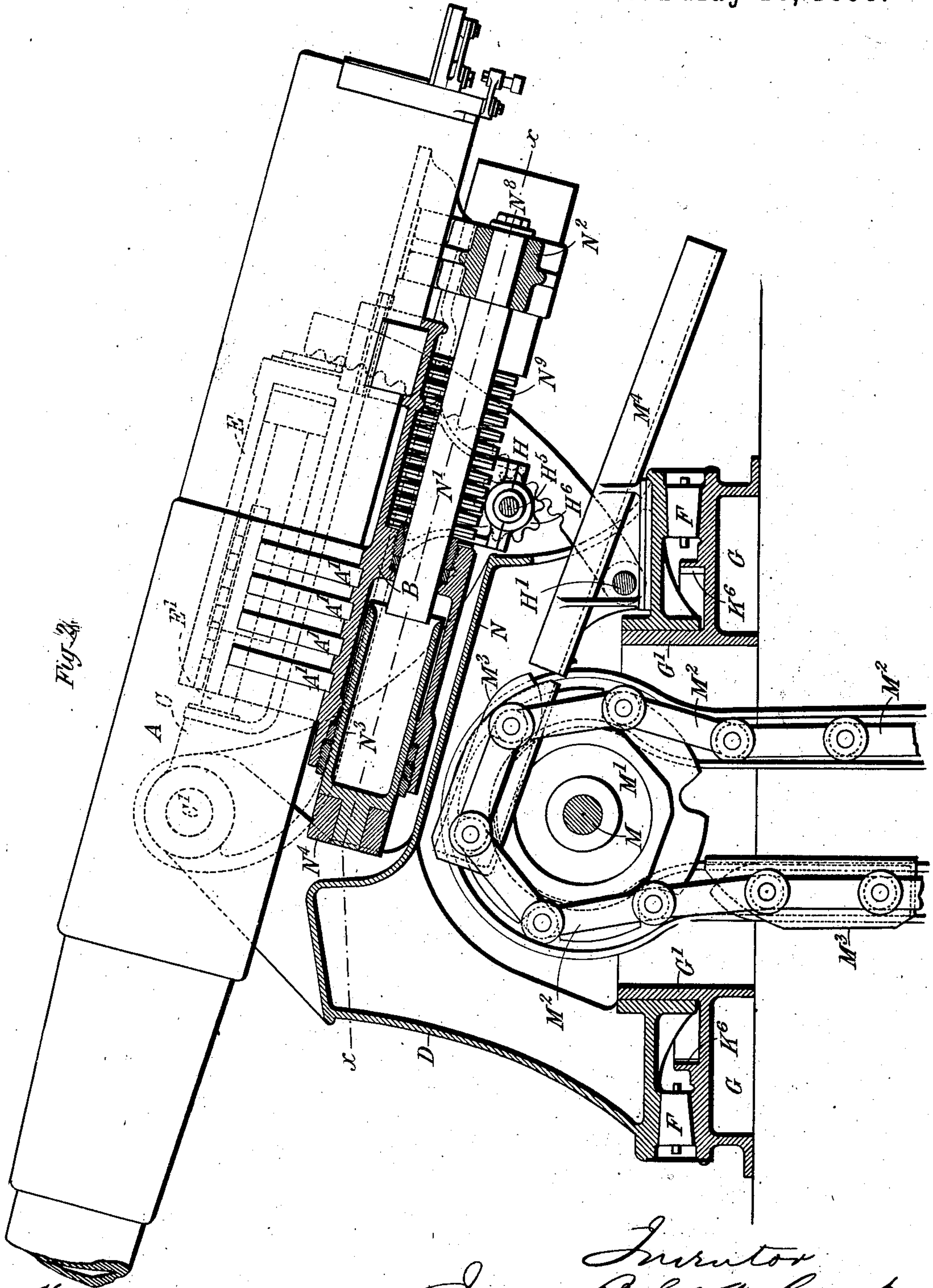
(No Model.).

5 Sheets—Sheet 2.

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

No. 497,704.

Patented May 16, 1893.



Witnesses:
J. A. Rutherford.
Robert Burnett.

Inventor
Jean B. G. A. Janet.
By James L. Norris.
Attorney.

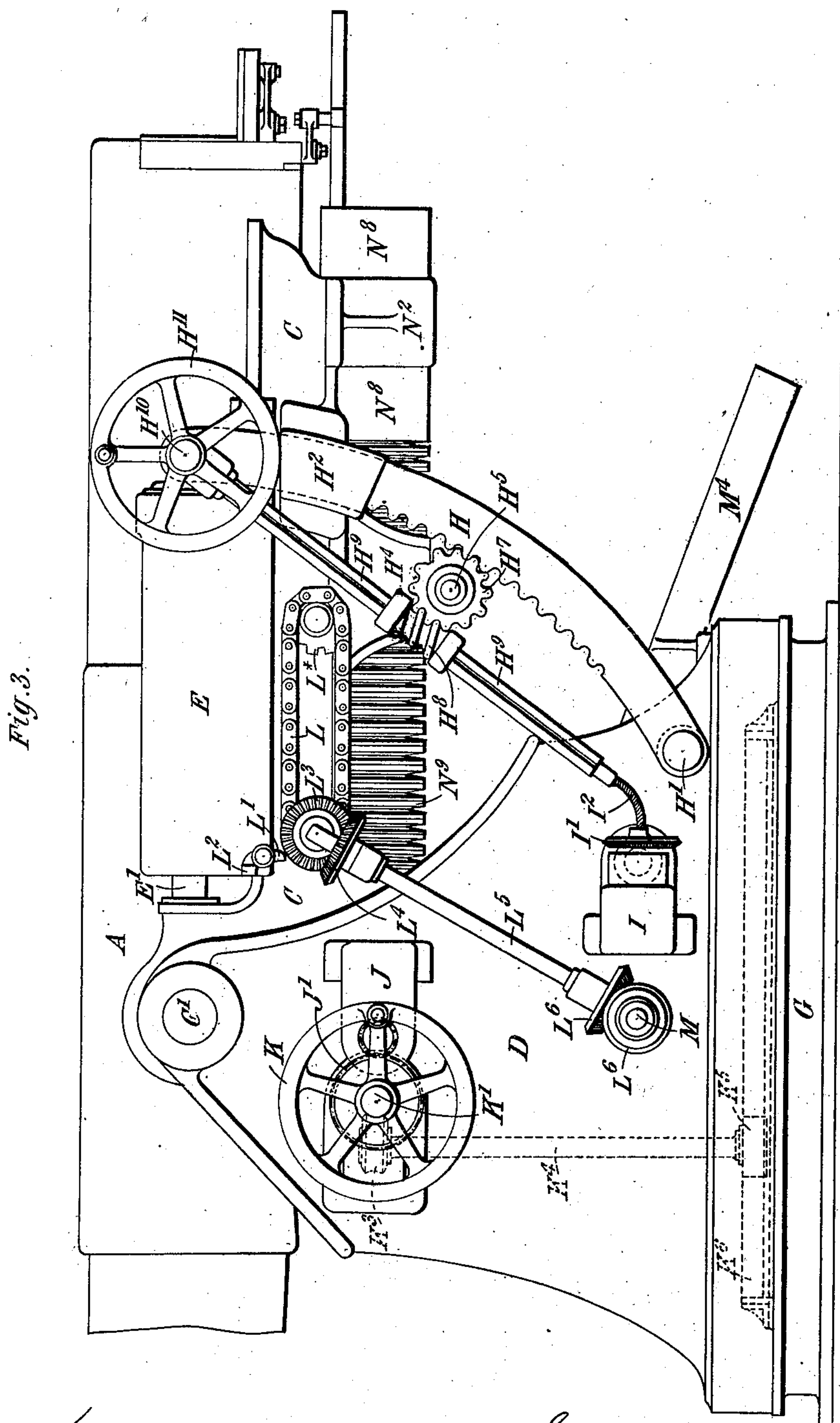
(No Model.)

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

5 Sheets—Sheet 3.

No. 497,704.

Patented May 16, 1893.



Witnesses:
J. A. Rutherford
Robert Garrett.

Inventor.
 John B. G. Canby.
 By Frederick Torrie
 Attorney.

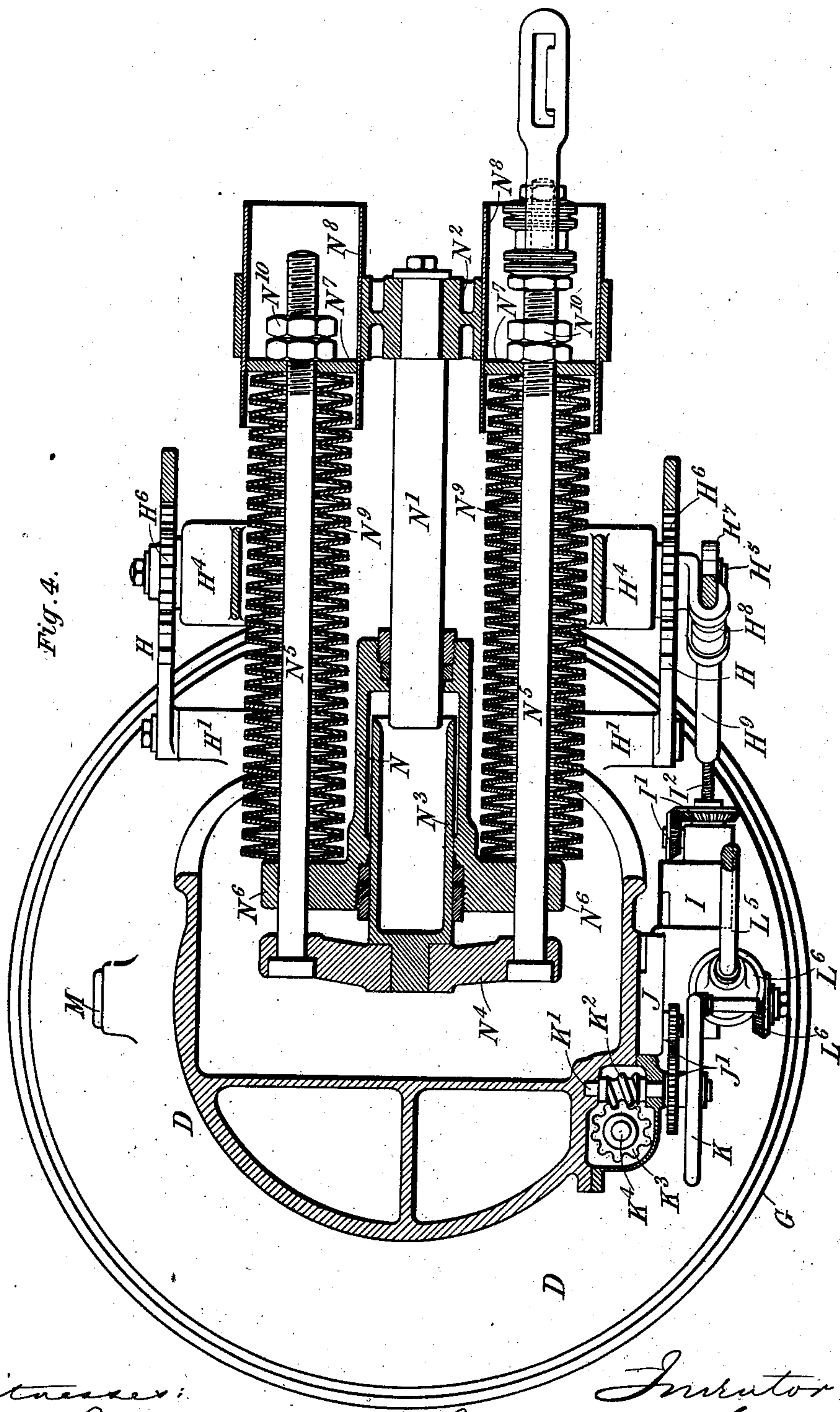
(No Model.)

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

5 Sheets—Sheet 4.

No. 497,704.

Patented May 16, 1893.



Witnesses:
J. A. Rutherford
Robert Emmett

Inventor:
Jean B. G. A. Canet
By James L. Norris
Attorney

(No Model.)

5 Sheets—Sheet 5.

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

No. 497,704.

Patented May 16, 1893.

Fig. 6.

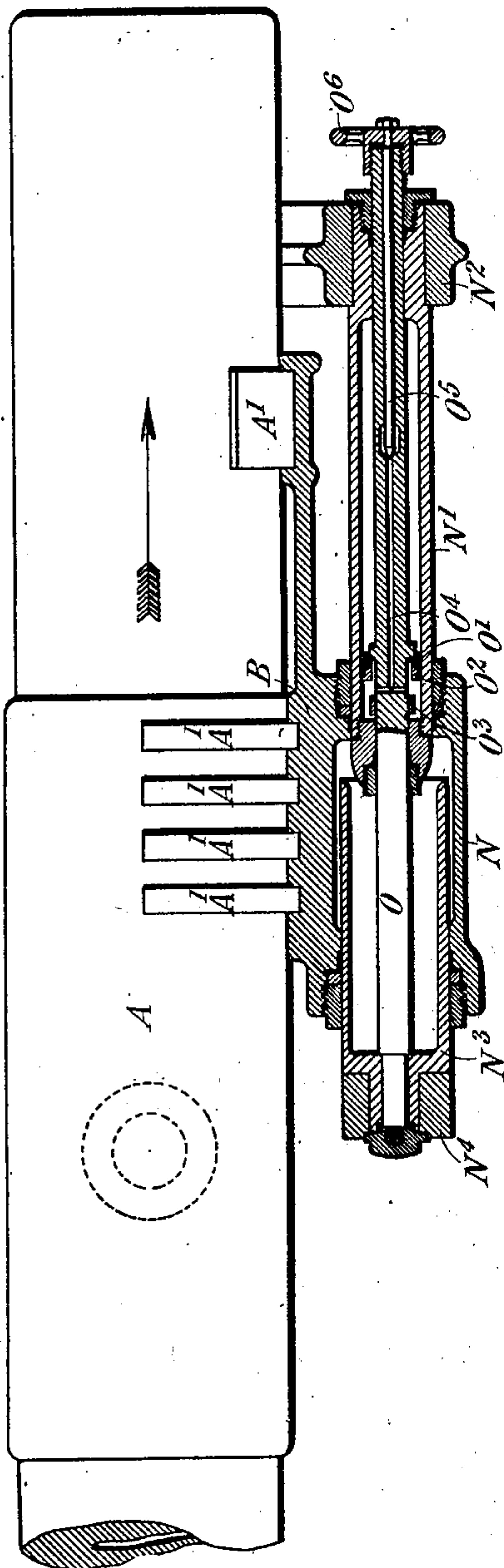
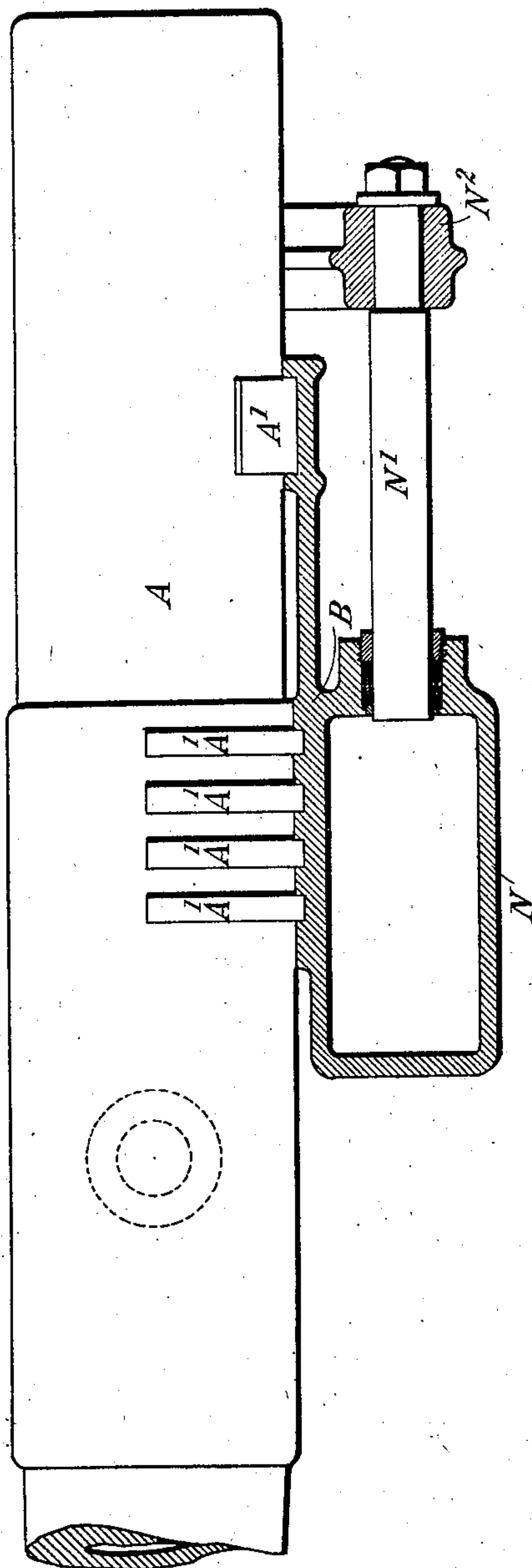


Fig. 7.



Witnesses:-
J. A. Rutherford.
Robert Everett.

Inwitness:
Jean B. G. A. Canet.
By James L. Norris.
Attorney.

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-MOUNTING.

SPECIFICATION forming part of Letters Patent No. 497,704, dated May 16, 1893.

Application filed July 21, 1892. Serial No. 440,756. (No model.) Patented in England June 8, 1889, No. 285, and in France June 8, 1889, No. 198,814.

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 certain new and useful Improvements in Gun-Mountings, (for which I have obtained patents in the following countries, viz: Great Britain, No. 285 of 1890, but dated under the international convention as of June 8, 1889, and France, No. 198,814, dated June 8, 1889,) of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to gun mountings and comprises improved mechanism for working and loading the gun, the chief object of the invention being to increase the facility for working the gun so as to render this operation easy and rapid.

In the accompanying drawings I have shown my invention applied to a quick-firing gun although it is obvious that it may be applied to guns of other types.

Figure 1 is a rear end elevation of the gun and mounting. Fig. 2 is a longitudinal central section through the mounting, the gun being shown in side elevation. Fig. 3 is a side elevation of the gun and mounting. Fig. 4 is a sectional plan taken on the line $x x$ Fig. 2. Fig. 5 is a rear elevation of the upper portion of the charge elevator. Fig. 6 is a longitudinal section of a run out check hereinafter described, and Fig. 7 is a longitudinal section of a compressed air apparatus for running out the gun.

Like letters indicate corresponding parts throughout the drawings.

The gun A is mounted in a cradle B to which it is secured by keys, and is prevented from sliding therein by collars A' Fig. 2 formed on the gun and corresponding grooves in the cradle in which the said collars rest.

The cradle B Fig. 1 carries the brake and the parts for running the gun out. It is mounted to slide on a frame C which is supported at its forward end by trunnions C' Fig. 3 which rest in bearings formed in a pillar D.

E E are the brake cylinders which are car-

ried by the cradle B. The brake piston rods E' are attached at their forward ends to the frame C.

Any suitable system of hydraulic brake may be employed in combination with my improved recuperator apparatus hereinafter described. The trunnions are situated in a plane passing through the axis of the gun and the axes of the brake cylinders, thereby avoiding all chance of tilting of the frame C when the gun is fired. The pillar D is supported by conical or spherical rollers or balls F Fig. 2 which roll upon a bed plate G. The bed plate G is provided with an annular part G' Fig. 2 that forms a pivot on which the pillar D can turn. The said pillar D is of cylindro-conical form closed at the front and sides for the purpose of protecting the working parts of the mounting.

For supporting the rear end of the frame C and for effecting the vertical pointing of the gun I provide as follows: H, H Fig. 3 are curved toothed racks or sectors arranged on each side of the mounting and pivoted at their lower ends to the pillar D at H' H'. The upper ends of the said racks or sectors slide through guides H², H² fixed to the frame C. The racks are so placed that they have the same center of curvature as the trunnions C'. Consequently the frame C when raised and lowered does not affect the inclination of the toothed sectors. H⁴, H⁴ are brackets fixed to the frame C and forming bearings for a shaft H⁵ on which is keyed a pair of spur wheels H⁶ Figs. 2 and 4 that gears with the toothed sectors H. H⁷ is a worm wheel also keyed on the shaft H⁵ and gearing with a worm or endless screw H⁸ which is mounted on an inclined shaft H⁹ and connected therewith by a feather key in such a manner as to be compelled to rotate with the shaft while being capable of sliding thereon. The said shaft H⁹ is hinged at H¹⁰ to the upper end of the adjoining sector H so as to be capable of swinging about its pivot as the frame C moves up and down. H¹¹ is a hand wheel carried by the sector H and geared to the shaft H⁹ by a pair of wheels H¹² Fig. 1 through which the said shaft may be rotated to vary the elevation of the gun.

When the gun is run out the mounting is nearly balanced on its trunnions. Consequently the power required to elevate the gun is reduced to a minimum.

- 5 In place of the hand arrangement just described or in addition thereto I may employ a suitable motor I for elevating the gun, the said motor operating through gearing I' to drive a flexible shaft I² which is connected
10 with the lower end of the inclined shaft II⁹.

The mechanism for training the gun laterally comprises a hand wheel K Fig. 4 mounted on a shaft K' which is geared through a worm K², worm wheel K³, vertical shaft K⁴
15 and pinion K⁵ Fig. 3 with a toothed ring K⁶ fixed on the base plate or bed G. The lateral training may also be effected by a motor J which is geared to the shaft K' by gear wheels J'.

- 20 My loading mechanism which enables the charges to be raised from the magazine and conveyed behind the breech in whatever position the gun may be trained is constructed as follows: On studs fixed in the side of the
25 frame C I mount a pair of chain wheels L* Fig. 3 which are connected by a chain L. To the side of the cradle B I pivot a tappet or catch L' which is free to turn in one direction but is prevented by a stop L² from turning in the other direction. The said catch
30 engages with the chain L when the gun is running out and drags the chain round, but in the recoil the catch turns on its pivot and slides over the chain without moving it. On
35 the shaft of the forward chain wheel is keyed a miter wheel L³ which gears with another miter wheel L⁴ keyed on a shaft L⁵. L⁶, L⁶ are other miter wheels connecting the shaft L⁵ with a horizontal shaft M that passes
40 through the pillar D. Upon the said shaft M are keyed two large chain wheels M' M' which drive endless chains M² M² Fig. 2 that descend into the central charging well. An ordinary swivel tension wheel is provided at the lower
45 end of the chains M² which while maintaining the chains in tension permits them to follow the rotation of the mounting. M³, M³ are buckets carried by the chains M². As the said buckets pass through the magazine they
50 are loaded with the charges, which charges are then elevated, as the gun runs out, by the tappet L' and chain L above described. As each bucket arrives at the top and passes over the chain wheels M' the contents thereof are
55 tipped out down a chute M⁴ which is carried by the mounting and is arranged to deliver the charges upon the floor near the breech end of the gun. When it is desired not to work the charge elevator by the gun, all that
60 is necessary to do is to raise the tappet L' out of gear with the chain L. If desired the charge elevator may be operated by hand or it may be driven by a motor.

- I provide my improved gun mounting with
65 a recuperator constructed as follows: N Fig. 4 is a cylinder formed in the cradle B. N' is a piston rod which projects through a packed

gland in the rear end of the said cylinder N and is attached at its rear extremity to a transom N² fixed to the frame C. Projecting through a packed gland in the forward end of the cylinder N is a movable hollow plunger N³ which is secured to a cross beam N⁴. N⁵, N⁵ are the tension rods of the recuperator. The said rods are attached at their forward ends to the beam N⁴, and passing through holes N⁶, N⁶ in the cylinder head are supported at their rear ends by disks N⁷, N⁷ which are capable of sliding in tubular supports N⁸, N⁸ fixed to the transom N². The recuperator springs N⁹, N⁹ are compressed between the cylinder head and the disks N⁷, N⁷. N¹⁰, N¹⁰ are nuts for adjusting the initial compression of the recuperator springs. The cylinder N is filled with liquid. When the gun recoils the said
8 cylinder N slides on the stationary plunger N' and the liquid displaced by the plunger N' operates to force outward the hollow plunger N³ thus compressing the recuperator springs and storing up energy therein which is utilized for subsequently running out the gun.

In Fig. 7 I have shown a simpler form of recuperator which consists of a chamber N containing compressed air, and a plunger N' which enters the said chamber as in the arrangement just described. When the gun recoils the air in the chamber N is still further compressed by the plunger N' and energy is thus stored for running the gun out.

In some cases I provide the mounting with a run out check to prevent the gun running out until required. This device is shown in Fig. 6. The plunger N' in this case is made hollow.

O is a rod fixed to the forward end of the plunger N³ and which extends through the hollow plunger N'. The said plunger is filled with liquid and is closed at both ends by packed glands through which the rod O can slide.

O' is a collar on the rod O forming a seat for an annular valve O² which fits the interior of the rod N' and can slide to and fro between the valve seat and a stop O³.

O⁴ is a small thoroughfare formed in the rod O and constituting a communication between the two ends of the chamber of the hollow plunger N' on opposite sides of the valve O².

O⁵ is a valve spindle for closing the thoroughfare O⁴ when desired. The said spindle is secured to a hand wheel O⁶ which is screwed on the rear end of the rod O so that by turning the said wheel the valve can be opened and closed. When the gun recoils the rod O is carried back by the plunger N³ and the pressure of the liquid in rear of the valve O² opens the said valve so that the liquid has a free passage through the valve opening, and offers no resistance to the recoil. Immediately however the gun begins to run out, the valve O² is pressed to its seat and imprisons the liquid in the front end of the chamber in the plunger N'. Consequently the run out

movement is checked. When it is desired the gun shall run out, the wheel O^6 is turned so as to open the valve O^5 which puts both ends of the plunger chamber in free communication and allows the liquid to return through the small thoroughfare O^4 , whereupon the recuperator springs are free to run out the gun.

The above description assumes that the valve O^5 is shut when the gun is fired. If however the valve is open the gun will immediately commence to run out, and by regulating the amount of opening of the said valve the speed at which the gun shall run out may be adjusted as desired. It is obvious that this automatic check may be applied to the air recuperator as well as to the spring recuperator.

What I claim is—

1. The combination with the gun A, the cradle B for the same, and the frame C upon which the said cradle can slide of the crinoline or cylindro-conical shaped pillar D having trunnion bearings for supporting the frame C, and being closed at the front and sides so as to protect the working parts of the gun-mounting, substantially as described.

2. The combination of the gun A, the cradle B for the same, the frame C upon which the said cradle can slide, and recuperator apparatus comprising a hydraulic cylinder N formed in the cradle, a fixed or non-recoiling plunger N' projecting into the said cylinder, and a movable plunger N^3 also projecting into the cylinder and connected with the recuperator springs, substantially as described.

3. The combination of the gun A, the cradle B for the same, the frame C upon which the said cradle can slide, recuperator apparatus comprising a hydraulic cylinder N formed in the cradle, a fixed or non-recoiling hollow plunger N' filled with liquid and projecting into the said cylinder, a movable plunger N^3 also projecting into the cylinder N and connected with the recuperator springs, and a

run out check comprising a rod O fixed to the plunger N^3 and passing through the stationary hollow plunger N' , a non-return valve O^2 forming a division in the chamber of the plunger N' , a by-pass O^4 communicating with the two ends of the chamber of the plunger N' on opposite sides of the valve O^2 , and a manually operated valve O^5 for closing or regulating the extent of opening of the said by-pass, substantially as, and for the purpose, specified.

4. The combination of the gun A, the cradle B for the same, the frame C upon which the said cradle can slide, the pillar D in which one end of the frame C is carried by trunnion bearings, and elevating apparatus comprising curved toothed sectors H hinged to the pillar D at their lower ends and passing through slides H^2 fixed to the frame C, pinions H^6 carried by the frame C and gearing with the sectors H, and worm gear H^7 , H^8 for rotating the piston shaft, the worm shaft H^9 on which the worm can slide being hinged to the sector H at its upper end, substantially as described, and for the purpose specified.

5. The combination of the gun A, the cradle B for the same, the frame C upon which the said cradle can slide and which is pivoted on a rotatable pillar D, the chain L carried by the frame C, the tappet L' for working the said chain when the gun is running out, gearing connecting the said chain with chain wheels M' , the bucket chain M^2 passing down to a central charging well, and a chute M^4 carried by the mounting, for receiving the charges delivered by the bucket chain, substantially as described, and for the purpose specified.

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,

J. CHATEL.