(No Model.)

J. A. POWLETT.

PNEUMATIC CARRIAGE FOR ORDNANCE.

No. 339,466. Patented Apr. 6, 1886.

Fig. 1.

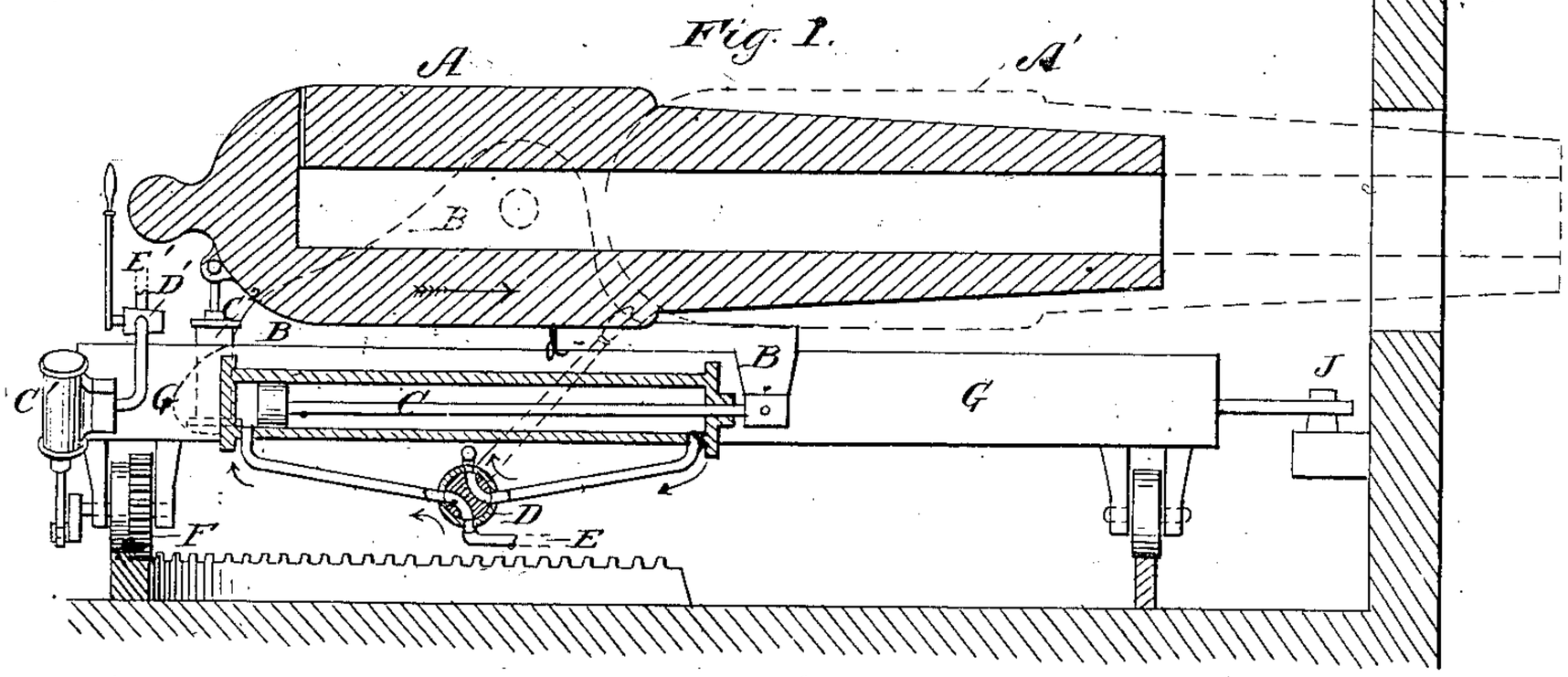


Fig. 2.

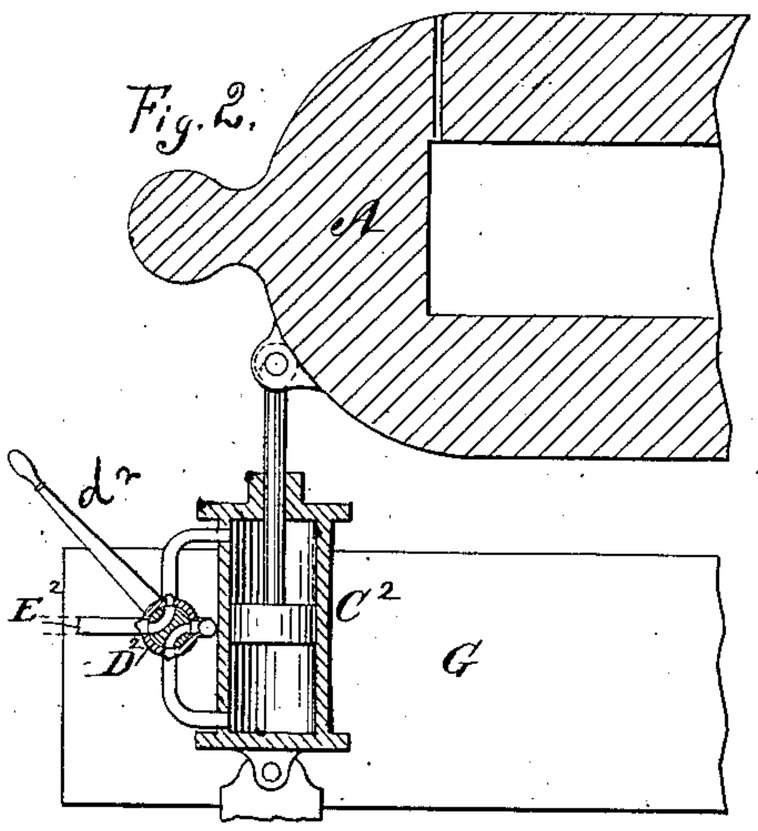


Fig. 3.

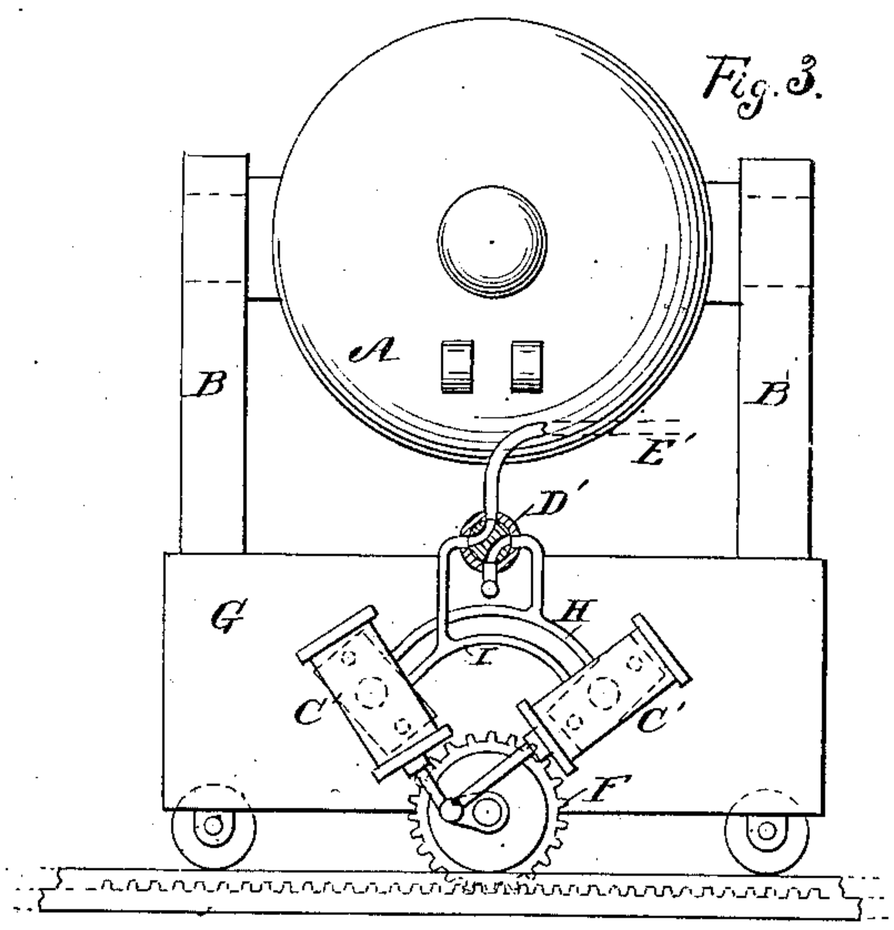
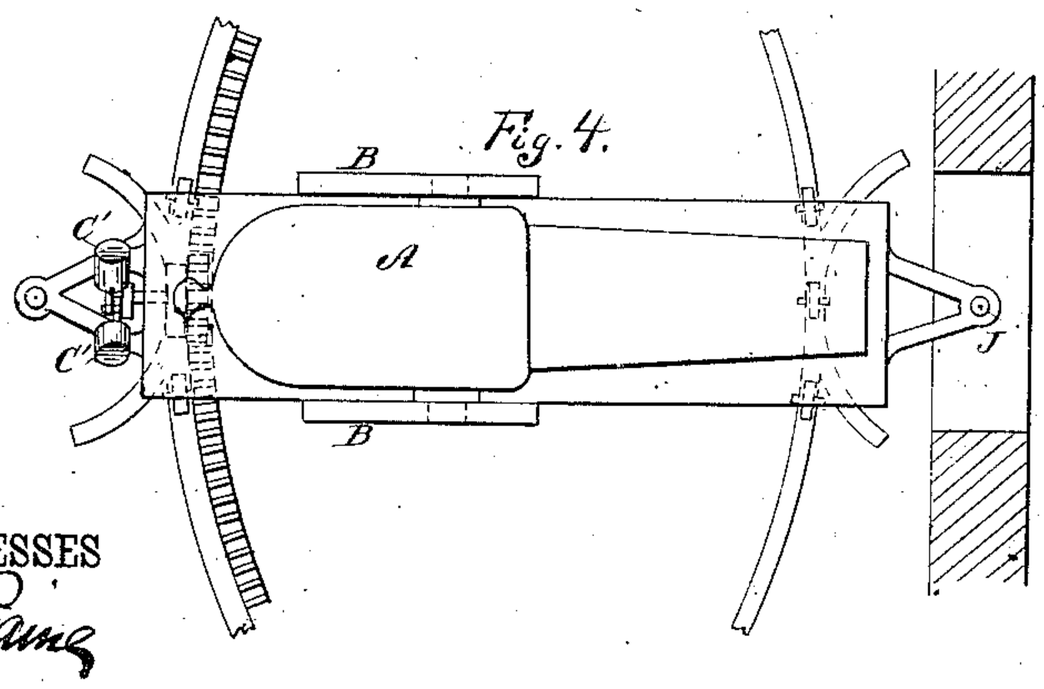


Fig. 4.



WITNESSES

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JAMES A. POWLETT, OF NEW YORK, N. Y., ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE PNEUMATIC GUN CARRIAGE COMPANY, OF BALTIMORE, MARYLAND.

PNEUMATIC CARRIAGE FOR ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 339,466, dated April 6, 1886.

Application filed July 31, 1884. Renewed February 7, 1885. Again renewed September 21, 1885. Serial No. 177,776. (No model.)

To all whom it may concern:

Be it known that I, JAMES ALBERT POWLETT, of the city, county, and State of New York, have invented a new and useful Improvement in Pneumatic Machine-Gun Carriages, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

This invention relates to means for operating guns and gun-carriages.

Heretofore guns and gun-carriages have been operated by hydraulic power and also by steam-power, and in the employment of these the gun has been moved out or to battery and moved in, has been elevated and depressed and traversed, and it has also been attempted to take up the recoil of the gun in hydraulic mechanism by the intervention of water, and, in connection therewith, of an air-cushion; but in no case, so far as known, has compressed air alone been employed as the sole motive and checking power in operating ordnance, thus to constitute in the true sense a purely pneumatic device.

The object of this invention, then, is to utilize compressed air, or any suitable gas or elastic fluid, designated hereinafter as an "aeriform fluid" as distinguished from steam, and by the employment of this to provide simple and less complicated means than heretofore employed for operating heavy guns and gun-carriages, which means shall be immediate, direct, reliable, and certain in operation, and enable the position of a gun to be changed in the shortest possible time. The object is, further, to provide mechanism which shall be so protected as to be safe from injury in an engagement, and whereby heavy guns may be manipulated by a much smaller number of men than has heretofore been requisite; and, finally, the object is to produce novel means whereby a cushion is provided by which the force exerted by the recoil of the gun is taken up.

To these ends the invention consists in the combination, with a gun-carriage, of a cylinder or cylinders provided with pistons, and supplied with a suitable fluid under pressure to operate them, and, through their rods, to run the gun out or in; furthermore, in the combination, with a gun-carriage, of a cylinder or cylinders similarly provided and supplied to traverse the gun; furthermore, in the combination, with a gun-carriage, of a cylinder or cylinders similarly provided and supplied to elevate and depress the gun; and, finally, in the combination, with a gun-carriage and gun, of a body of confined compressible fluid, which takes the force of the recoil of the gun, acting as a buffer.

In the accompanying drawings, in which like letters of reference indicate corresponding parts, Figure 1 is a longitudinal section of a gun-carriage and gun thereon, showing in section and in detail an embodiment of that part of the invention by which the gun is run in or out; also, showing means for elevating and depressing and for traversing. Fig. 2 is a longitudinal sectional view of the rear end of the gun, showing in detail an embodiment of that part of the invention by which the gun is elevated and depressed. Fig. 3 is a rear elevation of the carriage and gun, showing in section and in detail an embodiment of that part of the invention by which the gun is traversed or moved from side to side; and Fig. 4 is a plan view of the carriage and gun, showing the invention, particularly the traverse portion adapted to a vessel.

In the drawings, A represents a gun provided with the usual trunnions, which rest in suitable bearings in the cheeks of the carriage. The carriage is provided with the usual slide, so that the gun may be run out or to battery or be run in, and is also provided with the usual supporting-wheels, upon which the carriage traverses.

C represents a cylinder, of proper dimensions, which is attached to the carriage, preferably beneath the gun, in such position as to be protected from becoming damaged or disabled in action. This cylinder is provided near each end with ports, where any suitable compressed fluid is admitted or allowed to escape, according to the direction in which it is desired to move the piston of the cylinder.

Air is furnished to the cylinder through a supply-pipe, E, and branch pipes *e*, at the point of juncture of which is placed a four-

way cock, so arranged as to admit the fluid upon one side of the cylinder and to form an escape-passage upon the other side thereof, for the escape of the air confined between the piston and the end of the cylinder, so that the piston may be moved in either direction to accomplish the desired movement of the gun.

It will be apparent that a cushion of compressed elastic fluid may be formed for taking up the recoil of the gun by cutting off the escape through the rear part of the cylinder C just before the gun is fired. This will cause the air or other elastic fluid which is confined between the end of the cylinder and the piston to become compressed as the gun moves back in recoiling, and its elasticity will tend to reduce the shock of the recoil.

On land the apparatus for supplying the compressed elastic fluid is placed in a protected position, while on shipboard it is preferably placed below decks, in order to be free from danger in an engagement and offer no obstruction to the manipulation of the gun.

The raising and lowering of the breech of the gun is accomplished by means of the cylinder C^2, placed upon a suitable part of the gun-carriage, and having the projecting end of the piston-rod connected to the breech of the gun. This cylinder is provided with ports, above and below the piston, through which air is admitted or allowed to escape, according as it is desired to raise the breech and depress the gun or lower the breech and elevate the gun. The fluid under pressure is supplied to this cylinder through the pipe E^2, and by suitable branch pipes at the point of juncture, between which is placed the four-way cock D^2, having the operating-lever d^2, by means of which the port through which the fluid is admitted and that through which it is allowed to escape is controlled and the amount of fluid admitted regulated.

The traversing of the gun is accomplished by means of the two cylinders C′ C′, which are mounted upon the rear portion of the carriage, and have their piston-rods connected to a pin mounted eccentrically of one of the supporting-wheels. The cylinders are supplied with compressed fluid from a pipe, E′, and branch pipes H and I, the latter being connected to the cylinders respectively above and below the pistons. At the point at which the supply-pipe E′ and branch pipes H and I join is placed a four-way cock, D′, so constructed as to be capable of being turned to allow the inlet of the compressed fluid to either of the supply-pipes simultaneously with the outlet of the same from the other.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In mechanism for operating guns, the combination, with the gun-carriage and with a supply or reservoir of compressed aeriform fluid, of a cylinder provided with suitable inlet or exhaust ports, and having its piston connected with the carriage, whereby a gun may be run out or to battery or be run in entirely by pneumatic pressure, as described.

2. In mechanism for operating guns, the combination, with the supporting-frame of the gun-carriage and with a supply or reservoir of compressed aeriform fluid, of a cylinder located beneath the gun, and thus protected and having its piston-rod connected to the sliding portion of the carriage and provided with suitable ports for the admission and discharge of compressed aeriform fluid, of conduits for conducting such compressed fluid to the cylinder and conveying it away therefrom, and of means for controlling the flow of the fluid, whereby the device is operated by compressed aeriform fluid alone, substantially as set forth.

3. As a means of traversing a gun-carriage, two cylinders mounted upon the carriage and having their piston-rods connected to a crank upon one of the supporting-wheels, the said cylinders being provided with inlet and outlet ports and suitable means for regulating the inlet and outlet of compressed fluid by which the pistons are operated.

4. In mechanism for operating guns, the combination, with the gun-carriage and with a supply or reservoir of compressed aeriform fluid, of a cylinder provided on opposite sides of the piston with inlet and exhaust ports, and having its piston connected to the breech of the gun, whereby a gun may be directly elevated or directly depressed entirely by pneumatic pressure, substantially as described.

5. In combination with a gun-carriage or gun, and with a supply or reservoir of compressed aeriform fluid, of a cylinder containing a body of compressible aeriform fluid, and valve mechanism to admit such fluid to either side of the piston to act as a buffer and counter-check, substantially as described.

6. In mechanism for operating guns, the combination, with a gun-carriage and gun and with a supply or reservoir of compressed aeriform fluid, of a cylinder or cylinders provided with suitable inlet or exhaust ports, and having the piston or pistons connected to the part to be operated, of conduits for conducting the compressed aeriform fluid to the cylinder or cylinders, means for controlling the flow of such fluid, and a reversing-cock or cocks, whereby the compressed aeriform fluid may be admitted to either side of a piston and allowed to escape from the other, substantially as described.

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Witnesses:
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