

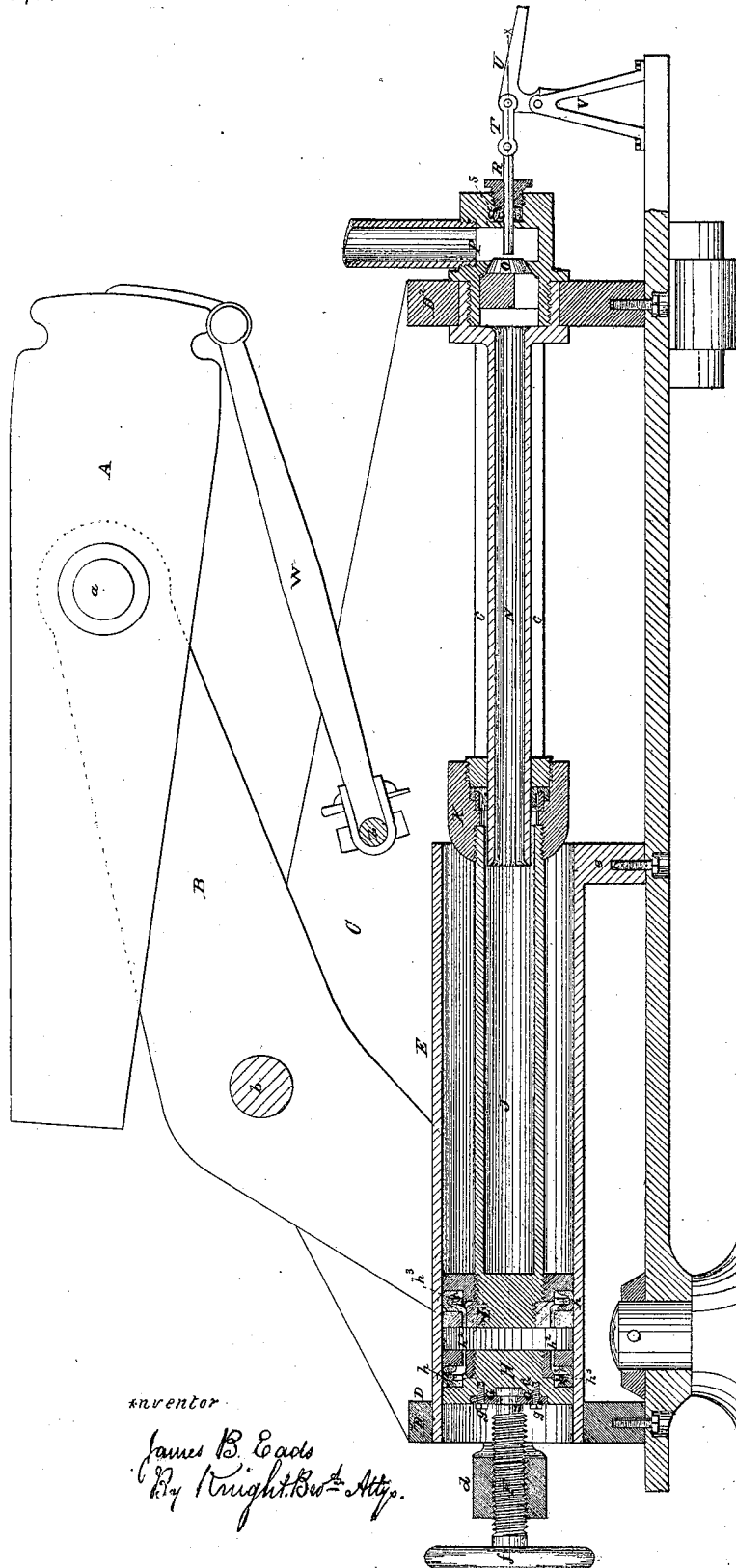
JAMES B. EADS.

Improvement in Gun-Carriages.

No. 115,181.

Patented May 23, 1871.

Fig. 1.



Attest
Tos. L. Quinn
Walter Allen

Inventor
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JAMES B. EADS.

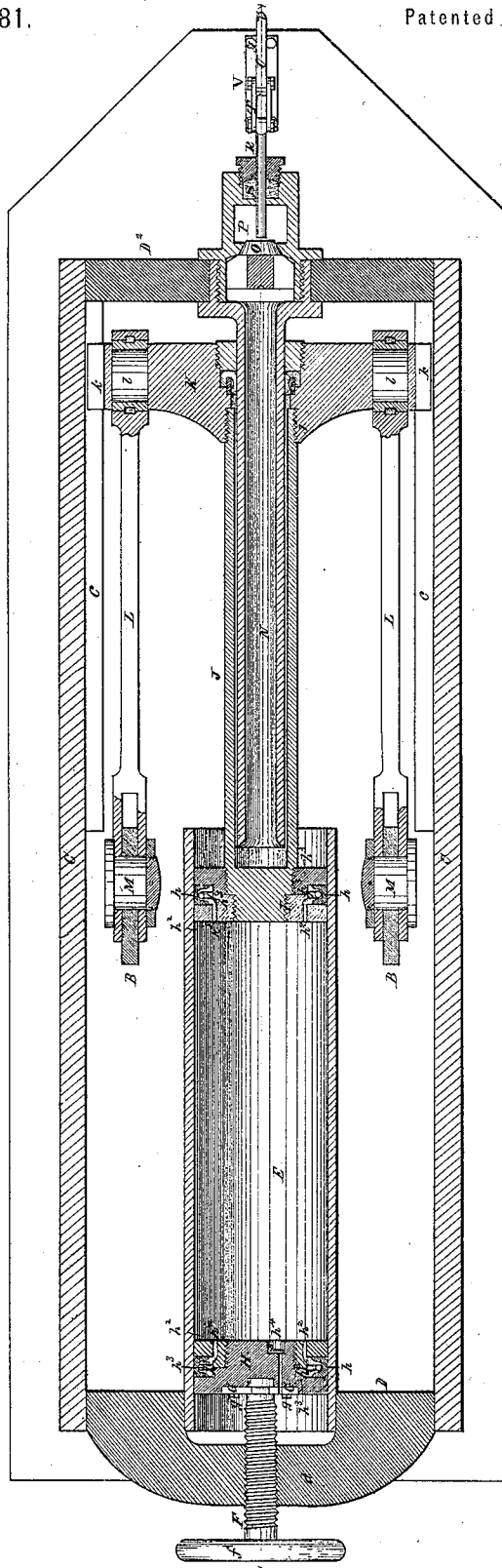
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Fig. 2



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UNITED STATES PATENT OFFICE.

JAMES B. EADS, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN GUN-CARRIAGES.

Specification forming part of Letters Patent No. 115,181, dated May 23, 1871.

I, JAMES B. EADS, of the city and county of St. Louis and State of Missouri, have invented certain new and useful Improvements in Operating Ordnance, of which the following is a specification:

Nature and Object of the Invention.

My present invention relates to improvements upon patent No. 93,691, granted to me August 17, 1869, entitled "improvement in gun-carriages;" and the first part of my present invention consists in the following devices: The lower ends of the levers by which the gun is carried are connected to a cross-head, to which is attached a cylindrical piston-rod whose piston works in a cylinder containing air, and open at the end toward the cross-head, the recoil of the gun compressing the air therein. Within the cross-head is a stuffing-box, through which works an open-ended cylinder, one end of which is received within the cylindrical piston-rod, and the other end is attached to the carriage and communicates with a water-vessel through an inwardly-opening valve that retains the water within the last-mentioned cylinder and cylindrical piston-rod, and prevents the gun from being thrown up until the valve is opened. The second part of my invention relates to the means employed to adjust the air-spring to the amount of ammunition used. This is done by providing an adjustable cylinder-head capable of being moved endwise of the cylinder by a screw or other means.

Description of the Drawing.

Figure 1 is a vertical section of the operating parts at the line Y Y, Fig. 2, showing the gun, &c., in loading position. Fig. 2 is a horizontal section at the line X X, Fig. 1, showing the parts in firing position.

General Description.

A is the gun, and *a* one of the trunnions by which the gun is supported upon two levers, B, one of which is shown in Fig. 1, and the lower ends of both in section in Fig. 2. The levers B are fulcrumed by a cross-bar, *b*, to the sides C of the gun-carriage. The sides C are shown attached to end pieces D D². The end piece D has a circular opening to receive the end of the cylinder E, which is firmly fixed

therein, the other end being supported and held in place by a foot-lug, *e*, firmly bolted to the base. *d* is an arch spanning the forward end of the air-cylinder E, and F is a screw turning in the arch and operated by the hand-wheel *f*. The end of the screw has a circumferential gain that receives the inner edges of the sectional plates G, which are flush-sunk in the cylinder-head H, and held in place by screws *g*. The screw F affords means to adjust the cylinder-head within the cylinder to suit the difference in the recoil force of the gun. The said cylinder-head may be packed in any manner to render its connection with the cylinder air-tight, the packing shown being a leather ring, *h*, behind which the compressed air is admitted through inlets *h*²; the packing being shown held in contact with the cylinder, when not under pressure by the expansion-ring *h*³. The cylinder-head is shown made in two portions screwed together, but the construction may be varied. An inwardly-opening valve may be placed in the cylinder-head or piston, as shown at *h*⁴, Fig. 2, to insure the cylinder being full of air at its normal density when the gun is up in its firing position, if the fit of the cylinder-head or piston be too close to supply any vacuum resulting from leakage in recoil. I is a piston that may be similar to the cylinder-head H, except that it is reversed in position, and, instead of being connected to an adjusting-screw, it is attached to a cylindrical piston-rod, J, screwed at its open end *j* into a cross-head, K, the ends *k* of which work in horizontal slides, the lower portion of which upon each side is shown at *c*, Fig. 2. The cross-head has round portions *l*, connected by side or connecting-rods L and pins M to the lower ends of the levers B. N is an open-ended cylinder or plunger, attached at one end to the end piece D² of the carriage, and extending through a stuffing-box in the cross-head, and into the cylindrical piston-rod J, being telescoped therein. The interior of the cylinder N communicates at its fixed end with the chamber of an inwardly-opening valve, O, the valve being interposed between said chamber and the water-vessel P, the latter being open to the outer air, and made in any form found suitable. In line with the axis of the valve is a rod, R, that passes through a stuffing-box, S, and is connected by shackles T to the lever

U fulcrumed on a standard-frame, V. W is a rod, by which the "elevation" of the gun is adjusted, the rod being pivoted to the breech of the gun and to an adjustable cross-rod, Z. The cylinders, guides, &c., have been described as horizontal, but may be inclined to check the recoil or otherwise.

Operation.

Supposing the gun to be in the loading position shown in Fig. 1, and it is desired to throw it upward into the firing position, the lever U is raised and the valve O opened by the pressure of the rod R. The piston I is thus relieved from the pressure of the water upon its rear side. The pressure of the air between the cylinder-head and piston I then drives the latter from the former, and forces a portion of the water (with which the cylinders J and N are filled) through the valve-port, up through the pipe P, back into the tank, and the parts are made to assume the position shown in Fig. 2. The cross-head K, owing to its connection to the piston I, having been driven toward the carriage end D², and, by means of the connecting-rods L, having drawn backward the lower ends of the levers B, as the lower ends of said levers are drawn backward the upper ends, on which the gun is supported, are thrown upward and forward, carrying the gun also upward and forward into the firing position. When the discharge takes place the recoil of the gun throws it and the upper ends of its supporting levers backward and downward, and restores the parts to the position shown in Fig. 1, in which position the small space between the cylinder-head H and piston I is filled with densely-compressed air, the expansive force of which is again utilized

in throwing up the gun into the firing position. As the gun descends the pressure is removed from the inner side of the valve P and the water flows into the increasing space within the cylinders J and N; and when the recoil power has become exhausted the pressure of the air between the cylinder-head and piston causes the valve to close, and the parts are held in the loading position, owing to the comparative incompressibility of the water. The point to which the gun descends in recoiling, being effected by differences in the weight of the projectile and the amount of powder used, is regulated by the position of the cylinder-head H, the latter being moved outward or inward by means of the screw F. This adjustment is easily made when the gun is in firing position, as there is then little or no abnormal air-pressure upon the cylinder-head or its packing.

Claims.

I claim as my invention—

1. In combination with the gun A and levers B, the connecting-rod L, cross-head K, piston I, cylinder E, cylindrical piston-rod J, cylindrical plunger N, and valve O, or their substantial equivalents, for the purpose described.

2. The combination, with the cylinder E, of the movable head H, arranged and operating substantially as described, to adjust the air-cushion to correspond with the force of recoil.

In testimony of which invention I have hereunto set my hand.

JAS. B. EADS.

Witnesses:

SAM. KNIGHT,
GEO. C. FABIAN.