4 Sheets—Sheet 1.

J. B. EADS.

Gun-Carriage.

No. 45,704.

Patented Jan. 3, 1865.

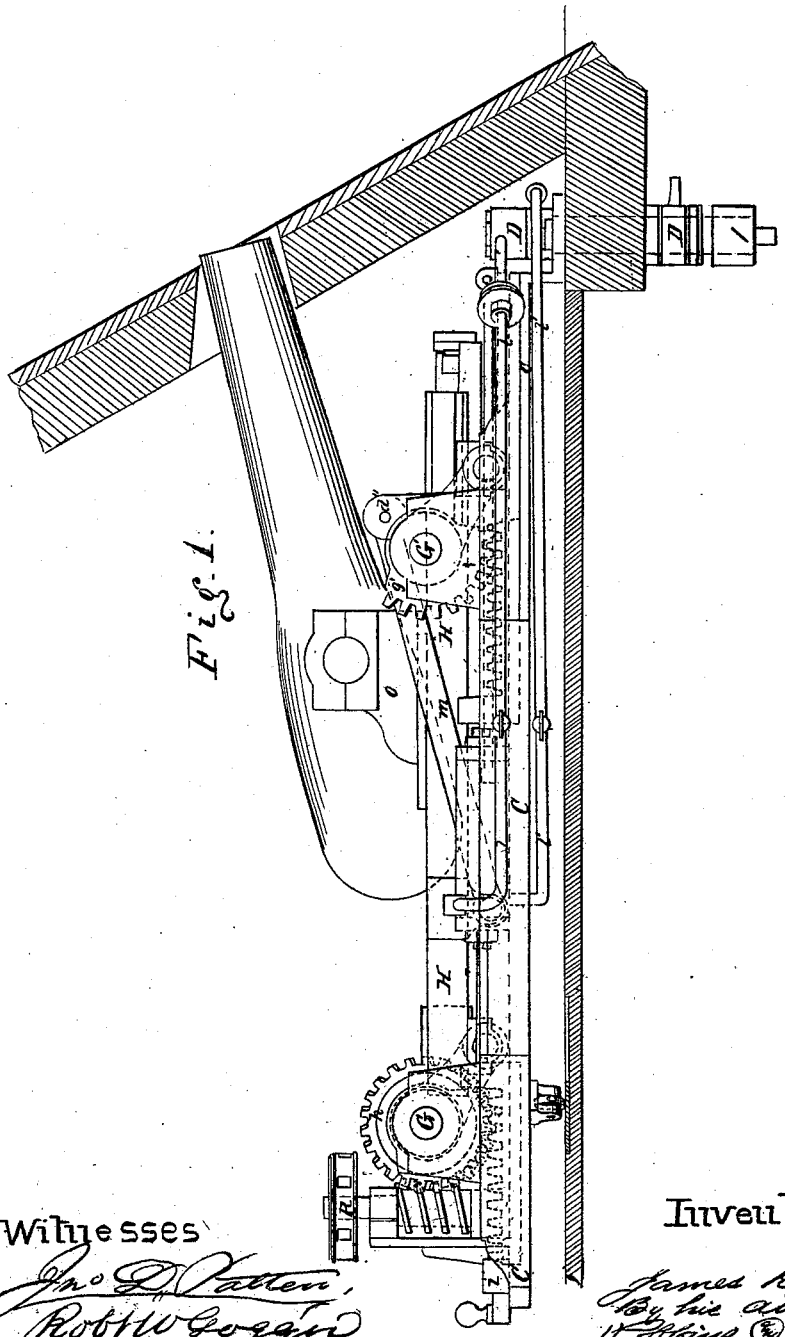

Fig. 1.

Witnesses

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Robt. W. Goggin

Inventor

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By his attorneys

Baldwin & Brown

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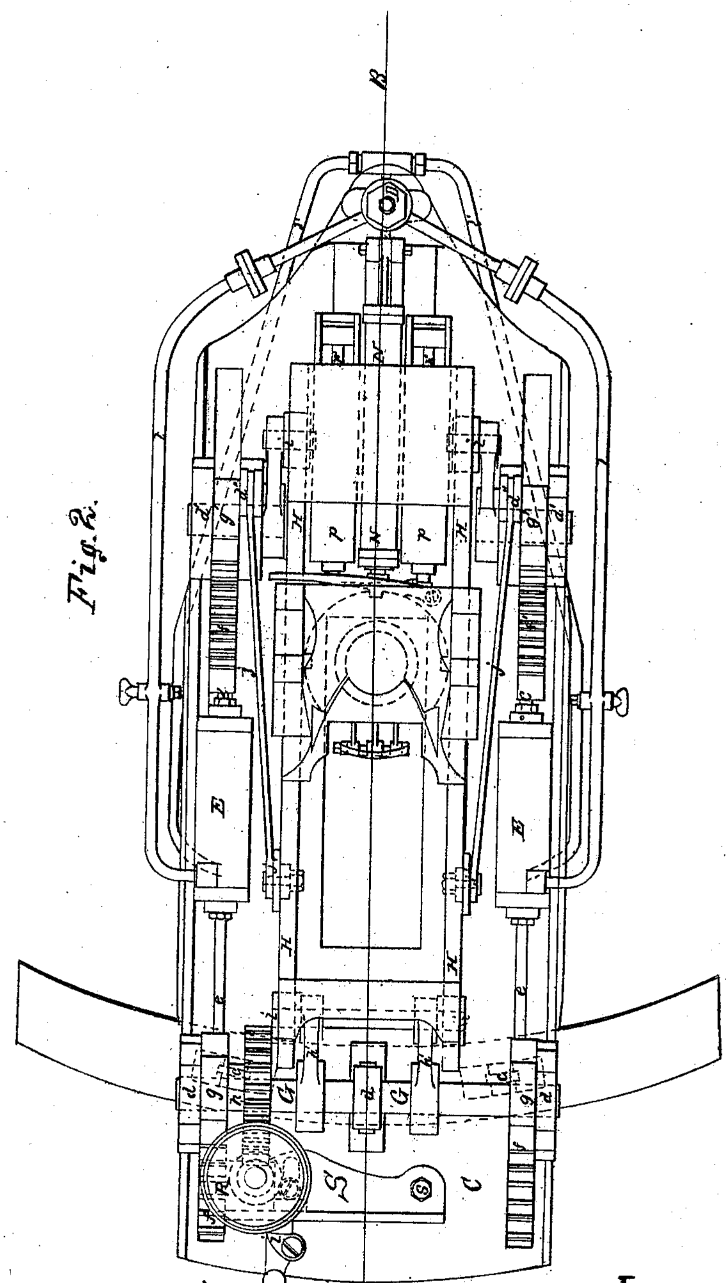

Fig. 2.

Witnesses

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4 Sheets—Sheet 3.

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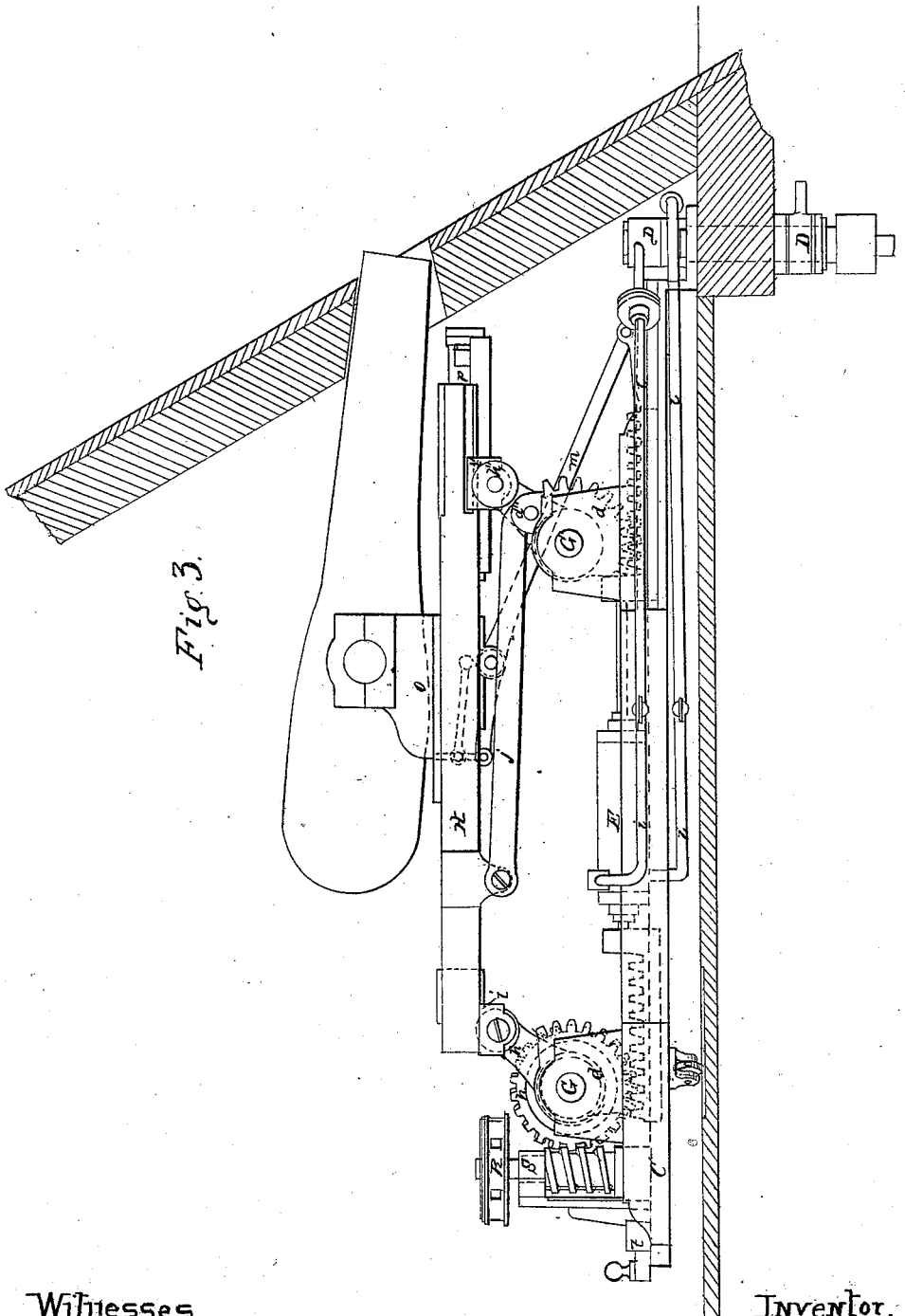

Fig. 3.

Witnesses

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4 Sheets—Sheet 4

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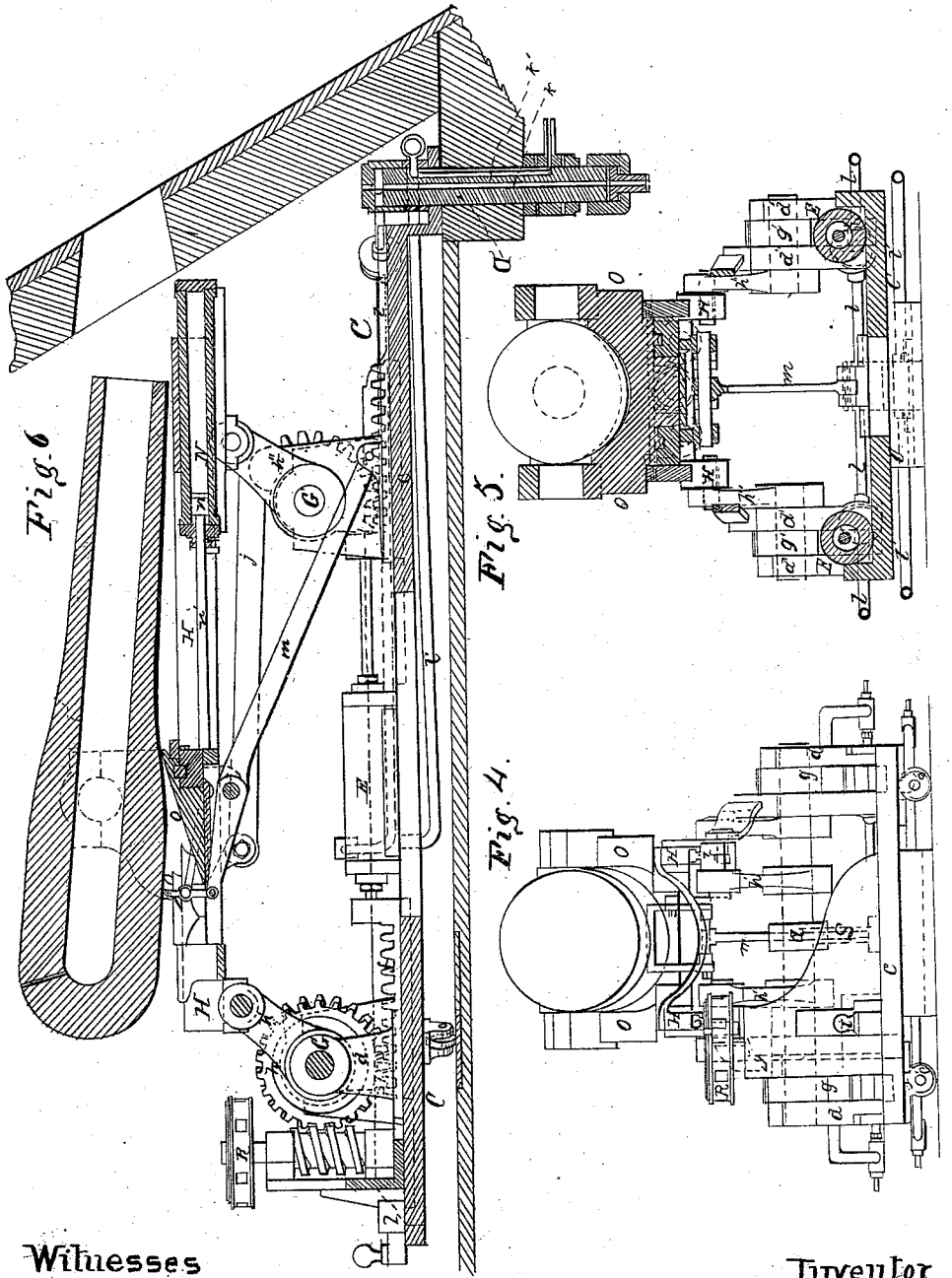

Fig. 6

Fig. 5.

Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN MOUNTING AND OPERATING ORDNANCE.

Specification forming part of Letters Patent No. 45,704, dated January 3, 1865; antedated December 29, 1864.

To all whom it may concern:

Be it known that I, JAMES B. EADS, of the city and county of St. Louis, and State of Missouri, have invented certain new and useful Improvements in Methods of Mounting and Operating Heavy Ordnance; and I do hereby declare that the following is a full and faithful description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, and made to form a part of this specification, in which—

Figure 1 is a side elevation of the improvement. Fig. 2 represents a top view or plan. Fig. 3 is a side elevation. Fig. 4 represents a rear end elevation, and Fig. 5 is a transverse vertical section. Fig. 6 represents a longitudinal vertical section taken through the line A B, Fig. 2.

The nature of this invention relates, first, to the devices by means of which the gun, with its carriage and frame, may be elevated or lowered in order to secure the proper vertical aim or range of the gun; second, to certain devices by means of which the gun-frame may be operated by hand, when necessary.

C represents the base or platform, which sustains the gun, with its carriage, frame, and the devices for operating the same. This platform will be pivoted at its forward end at a point as near as possible to the side of the vessel, casemate, or other protection by means of a pin or pivot, D, and its rear end may be supported by means of friction trucks or rollers *c*.

Properly secured and arranged at the sides of the platform C will be two hydraulic, steam, air, or other cylinders, E E, provided with suitable pistons, having piston-rods *e e′ e′ e′* extending from both ends of the said cylinders, and attached to the cogged racks *f f f′ f′*, the said racks being constructed and adjusted in such manner that they may be made to reciprocate by and in harmony with the action of said piston-rods.

G represents a shaft having suitable bearings in standards *d d d*, provided with segmental gears *g g*, which are adapted to work into the cogged racks *f f*, with a cogged pinion, *h*, and with two arms, *h′ h′*. These arms extend forward from the shaft G, and are pivoted to the slides *i i*, which support the rear end of the gun-frame H. The standards *d′ d″* *d′ d″* are adapted to afford bearings for two short shafts, G′. (Seen in the side elevations, and indicated by dotted lines in the transverse section, Fig. 5.) These short shafts are provided with segmental gears *g′ g′*, which are adapted to work into the cogged racks *f′ f′*, and with arms *h″ h″*, which are pivoted to the slides *i′ i′*, by means of which the front end of the frame H is supported.

j j represent rods pivoted to standards *d″* *d″*, and to the gun-frame H at *j′ j′*, as seen clearly in Figs. 2 and 3, by means of which the frame H, while being elevated or depressed, may be always maintained in its proper longitudinal position, so that the gun will not be moved forward in the direction of or retracted from its port by the operation of the frame.

The pin or pivot D may be made with apertures or passages *k k′* for the purpose, respectively, of supplying and exhausting the element employed to actuate the pistons of cylinders E E, *l l* being the supply-pipes, and *l′ l′* the exhaust-pipes to said cylinders. Should it be found necessary from any cause, the power employed will be applied to the cylinders E E in such manner as to actuate their pistons in either direction at will. It will now be readily seen and understood that by actuating the pistons of the said cylinders E E the frame H, with its gun and gun-carriage, will be elevated or depressed, as the case may be, through the medium of the piston-rods *e e e′ e′*, racks *f f f′ f′*, segmental gears *g g g′ g′*, arms *h′ h′ h″ h″*, and slides *i i i′ i′* in such manner that any required vertical aim or range may be obtained, the angle of the horizontal axis of the gun being always maintained in harmony with the vertical elevation of the frame H by means of the lever *m* and its auxiliary devices, so that while the muzzle of the gun may occupy nearly the same position, its breech may be elevated or depressed, as required, thereby involving the necessity of a port-hole a mere trifle larger than the muzzle of the gun, as has been fully set forth in Letters Patent already granted me for "improvements in operating heavy ordnance."

N (seen clearly in the section, Fig. 6) represents a cylinder that may be constructed for the use of water, air, steam, or other suitable agent, provided with a piston, *n*, and pis-

ton-rod n', which is attached to the gun-carriage O. The said carriage, which immediately supports the gun, is so constructed and arranged as to slide upon the gun-frame H, so that by actuating the piston n the gun may be drawn forward to its port or retracted therefrom, as may be desired, the said piston-rod being arranged to be disengaged from said carriage when the gun is run out, so that said piston may not be affected in case water or other non-elastic element is employed in the said cylinder. The element employed to actuate the said piston n may be received and discharged by means of passages k k' of pin D and other suitable pipes leading therefrom. For convenience in loading the gun, the carriage O may be arranged to turn upon a pivot.

p p represent cylinders attached to the frame H, provided with suitable pistons, and with piston-rods p' p', which will be attached to the carriage O. These cylinders may be made open at their forward ends, so that they may be readily furnished with air or other suitable elastic element, which, occupying the spaces within the cylinders behind the pistons, may serve as cushions upon which the said pistons may act, and thereby take up the recoil of the gun.

R represents a capstan, the lower portion of which is provided with a screw-thread or worm, which is adapted to take into and actuate the pinion h, and thereby, through the medium of shaft G, segmental gears g g', racks f f f' f', and arms h' h' h'' h'', to elevate or depress the frame H, as before described, and this operation, by means of suitable levers, may be accomplished very readily by hand. The said capstan will be carried upon a frame, s, which is pivoted to platform C at s', so that when desired the capstan may be released from pinion h, or may be secured in working position by means of the movable dog t.

This device may be adapted to use at any time, but is especially requisite, in case of any derangement of or accident to the other machinery employed, to operate the frame H.

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

1. The employment of the cylinders E E, in combination with the racks f f f' f', gears g g g' g', and arms h' h' h'' h'', or their substantial equivalents in effect, all being constructed and arranged to operate essentially as and for the purposes herein set forth.

2. In combination with the other operative mechanical devices for operating the frame H, the adjustable capstan R, substantially as and for the purposes set forth.

In testimony of which invention I have hereunto set my hand and seal this 17th day of May, 1864.

JAS. B. EADS. [L. S.]

In presence of—

H. E. CLIFTON,

AMOS HOWE.