

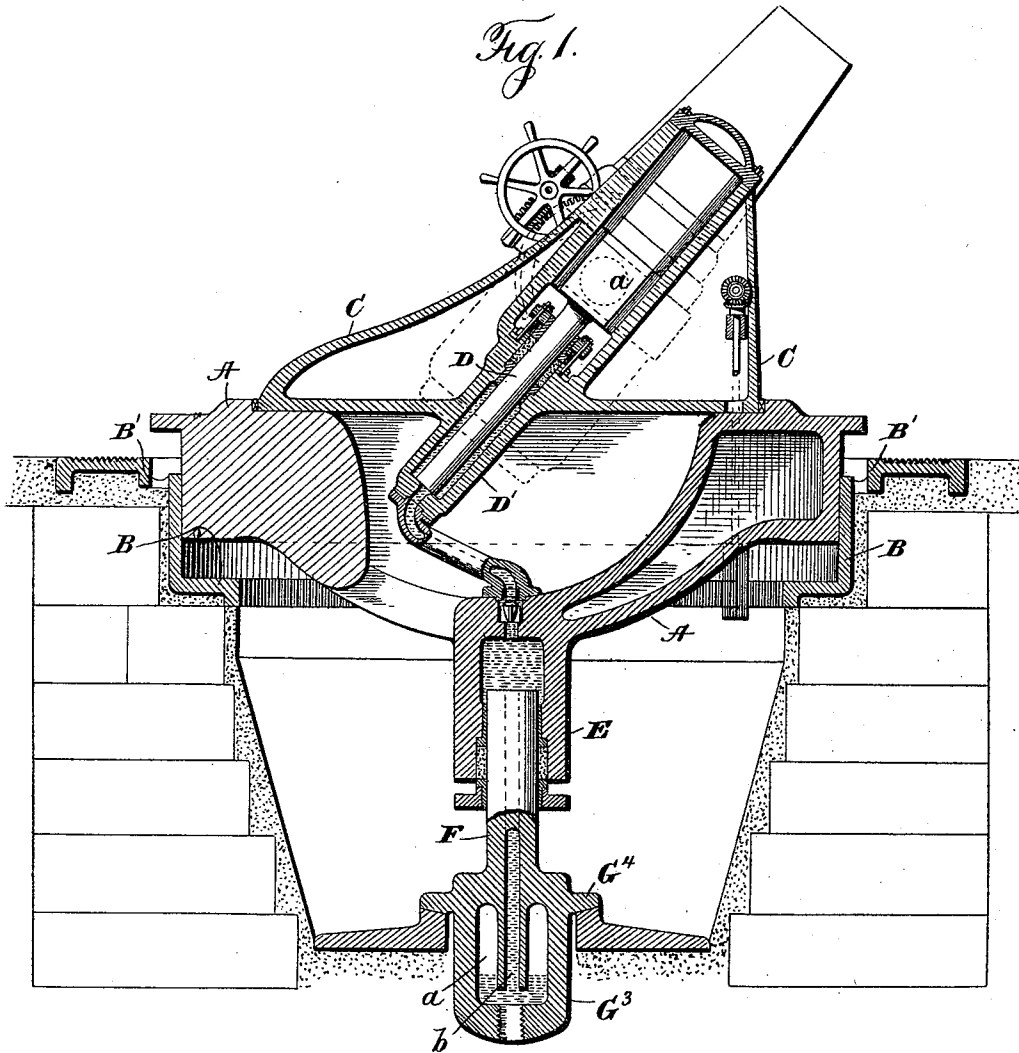
(No Model.)

4 Sheets—Sheet 1.

W. H. MORGAN.
MORTAR MOUNTING.

No. 479,446.

Patented July 26, 1892.



Witnesses

Jas. E. Hutchinson.
G. F. Downing.

Inventor

William H. Morgan
By H. A. Seymour
Attorney

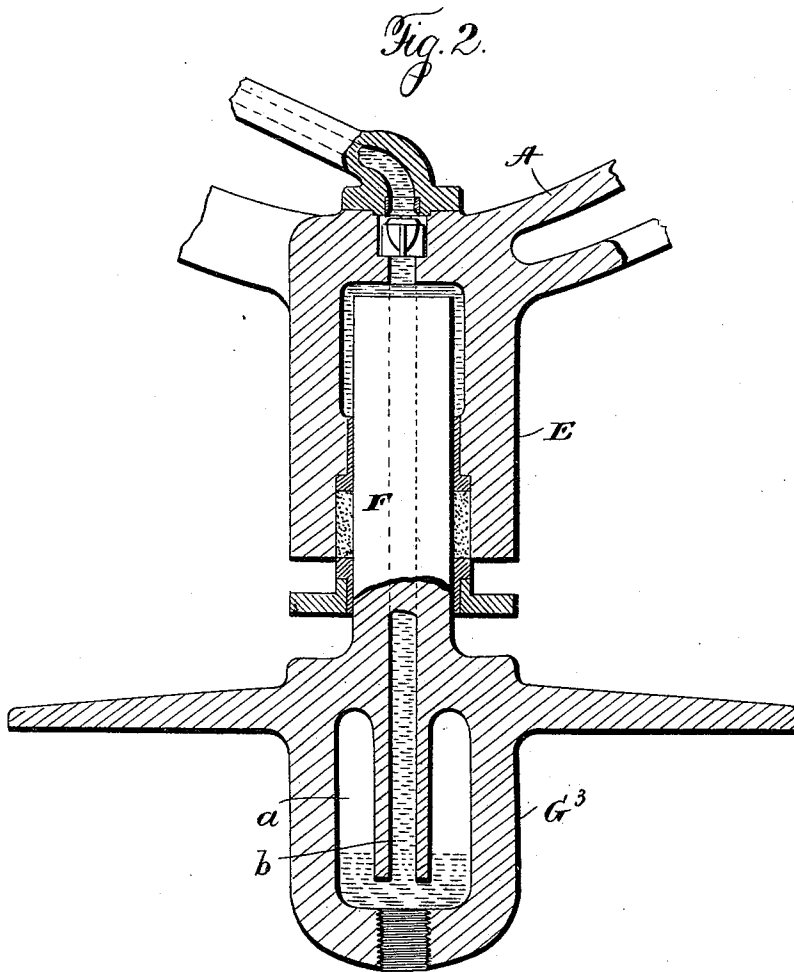
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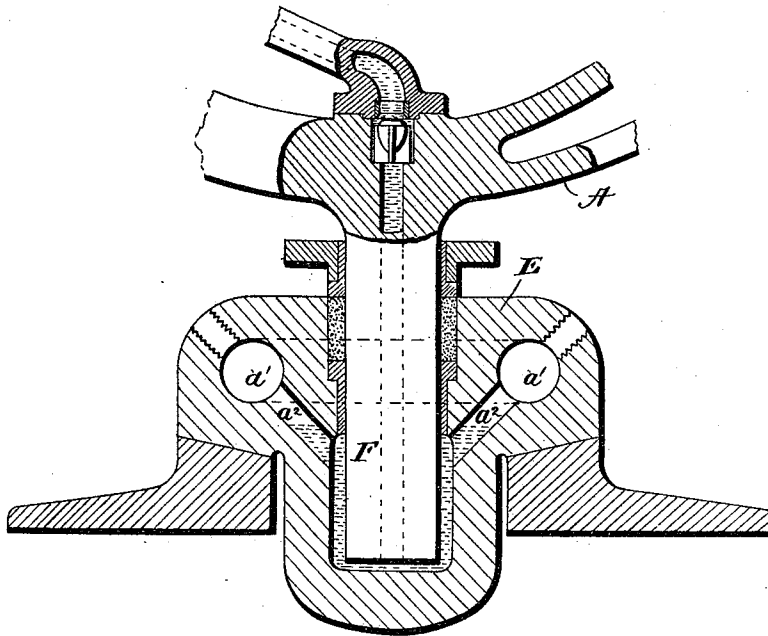
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Fig 3.



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Jas C Hutchinson.
G. F. Downing.

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By H. A. Seymour
Attorney

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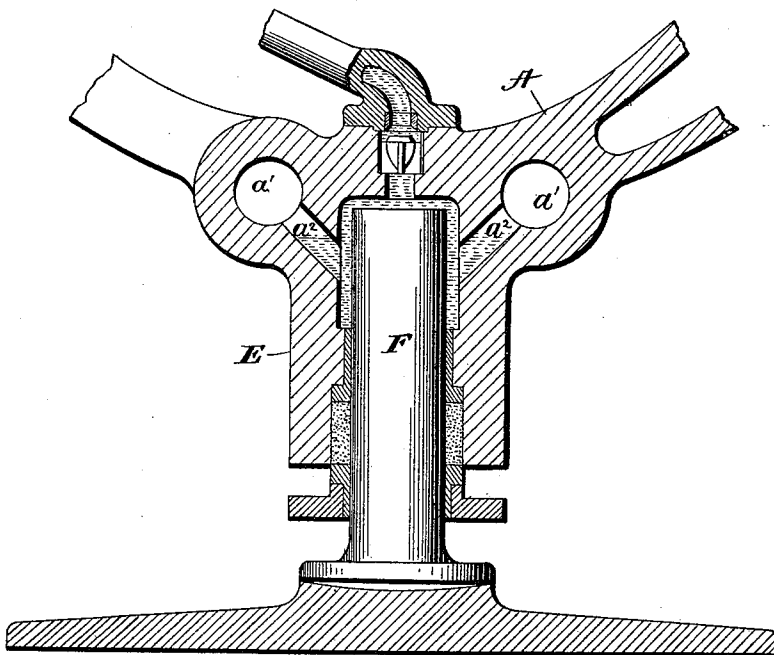
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Fig. 4.



Witnesses
James Hutchinson
G. F. Downing

Inventor
William H. Morgan
By *H. A. Seymour*
Attorney

UNITED STATES PATENT OFFICE.

WILLIAM H. MORGAN, OF ALLIANCE, OHIO, ASSIGNOR OF THREE-FOURTHS
TO THOMAS R. MORGAN, SR., THOMAS R. MORGAN, JR., AND JOHN R.
MORGAN, OF SAME PLACE.

MORTAR-MOUNTING.

SPECIFICATION forming part of Letters Patent No. 479,446, dated July 26, 1892.

Application filed June 24, 1891. Serial No. 397,352. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. MORGAN, of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful
5 Improvements in Mortar-Mountings; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

10 This invention relates to an improvement in mortar-mountings, and is designed more particularly as an improvement on the devices wherein the recoil of the gun forces fluid contained in hydraulic cylinders carried by the
15 carriage down into a cylinder below the carriage, whereby the carriage is elevated and the force of energy of the recoil stored for elevating the gun. Water being practically incompressible, it will not when properly housed
20 yield to pressure, and hence may prove too rigid and unyielding under the first shock of the recoil and before it begins to escape from the cylinders carried by the carriage, and to obviate this objection I provide air-chambers
25 in communication with one of the cylinders into which the fluid can escape from said cylinder under the first shock of the recoil.

My invention consists in the parts and combinations of parts, as will be more fully described, and pointed out in the claims.

30 In the accompanying drawings, Figure 1 is a view in section of a gun-carriage and gun, showing my improvements in section; and Figs. 2, 3, and 4 are views of modified forms.

35 A represents a carriage normally resting on the flange B' of the ring B and provided with upwardly-projecting castings or sections C, having machined slideways in which boxes a, carrying the trunnions of the gun, move. The
40 boxes a are connected to the upper ends of the plungers D, which latter move in cylinders carried by the carriage. These cylinders D' are connected by pipes with a cylinder E, located below the carriage, and the water or
45 other fluid as it is acted upon by the movement of the plungers, caused by the recoil of the gun, is forced from the cylinders on the carriage into the cylinder under the carriage and there, acting on the plunger F, operates to
50 elevate the carriage. Now by opening com-

munication between the lower cylinder and the upper cylinders the weight of the carriage, which is greater than that of the gun, will expel the liquid from the lower cylinder and force it into the upper cylinders, thereby permitting
55 the carriage to descend to its normal position, and elevate the gun to its position for firing.

The improvements claimed in this specification relate solely to the construction of the lower cylinder and its plunger. In Fig. 1 the
60 plunger F is shown mounted on a base-plate G³, which latter is provided with an opening for the plunger and with an upwardly-projecting bearing or seat concaved on its upper
65 face for the reception of the outwardly-projecting flange G⁴ of plunger F. The lower face of this flange is convex or curved so as to have a loose fit on the seat of the base-plate, and thereby accommodate itself to
70 shocks and jars to which the carriage is subjected. The plunger F is provided with an enlarged lower end, within which is found an air-chamber a, into which the fluid passage-way b in plunger F terminates. This fluid
75 passage-way extends through the plunger, and is in open communication with cylinder G, carried by the carriage, and hence it follows that the fluid, as it enters cylinder G and before it begins to elevate said cylinder and
80 carriage, passes down said fluid passage-way b and into the air-chamber. The fluid passage-way or bore b terminates near the lower end of the air-chamber. Consequently under
85 ordinary conditions the portion of air-chamber b above the lower end of bore b is an air-space, while the lower end or floor of the chamber up to a line with or slightly above the bore b is constantly filled with the fluid. Thus it will be seen that the instant fluid is
90 forced from the upper cylinders or the cylinders on the carriage into the lower cylinder by the recoil of the gun the fluid first forced into the lower cylinder operates to compress the air in the air-chamber, and thus give time for the carriage to recover from the shock.
95 After the air has been compressed to its limit the fluid then entering naturally elevates the carriage; but the movement is gradual in comparison to what it would be were no provision made for increasing the space to receive
100

the fluid first forced into the lower cylinder. After the carriage has been elevated its excess of weight over and above the gun is utilized in forcing the water in the lower cylinder back into the upper cylinders, thus permitting the carriage to descend and at the same time elevating the gun.

The construction disclosed in Fig. 2 differs from Fig. 1 only in making the plunger and base-plate integral, instead of loosely, as in Fig. 1.

In Fig. 3 I have shown the parts of figure reversed, the plunger in this instance being attached to the carriage and the cylinder seated on the base-plate, so as to accommodate itself to jars or shocks of the carriage. In this construction the cylinder is provided with a preferably circular chamber or cavity a' , which is in direct communication with the cylinder by a series of passage-ways a^2 . Thus it will be seen that as the fluid enters the cylinder it rises in the passage-ways a^2 and compresses the air in chamber a' . Instead of making the base and cylinder of two parts, they can be made integral.

In Fig. 4 I have shown the cylinder attached to the carriage and an air-chamber in the cylinder, or rather in the carriage, with passage-ways leading thereto, as in Fig. 3.

I do not claim, broadly, in this specification devices so arranged that the recoil of the gun forces fluid contained in hydraulic cylinders carried by the carriage down into a cylinder below the carriage, whereby the carriage is elevated and the force of energy of the recoil stored for elevating the gun, but claim the above devices when combined with an air-chamber.

It is evident that numerous changes in this construction and relative arrangement of the several parts might be resorted to without departing from the spirit and scope of my in-

vention. Hence I would have it understood that I do not confine myself to the exact construction shown and described, but consider myself at liberty to make such changes as fairly fall within the spirit and scope of my invention.

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

1. The combination, with a gun-carriage and hydraulic devices thereon adapted to yield under the recoil, of a cylinder and plunger for elevating the carriage, pipes leading from the hydraulic devices on the carriage to the cylinder below the carriage, and an air-chamber in open communication with said cylinder, substantially as set forth.

2. The combination, with a gun-carriage and hydraulic devices thereon, adapted to yield under the recoil, of a cylinder and plunger below the cylinder, pipes leading from the hydraulic devices on the carriage to the cylinder below the carriage, an air-chamber and fluid passage-ways leading from the cylinder below the carriage to the air-chamber, substantially as set forth.

3. The combination, with a gun-carriage and hydraulic devices thereon, adapted to yield under the recoil, of a cylinder below the carriage and connected thereto and a stationary plunger fitting said cylinder and provided with an air-chamber and with a bore or passage-way leading from its inner end to said chamber, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM H. MORGAN.

Witnesses:

T. R. MORGAN, Jr.,
FRANK E. DUSSEL.