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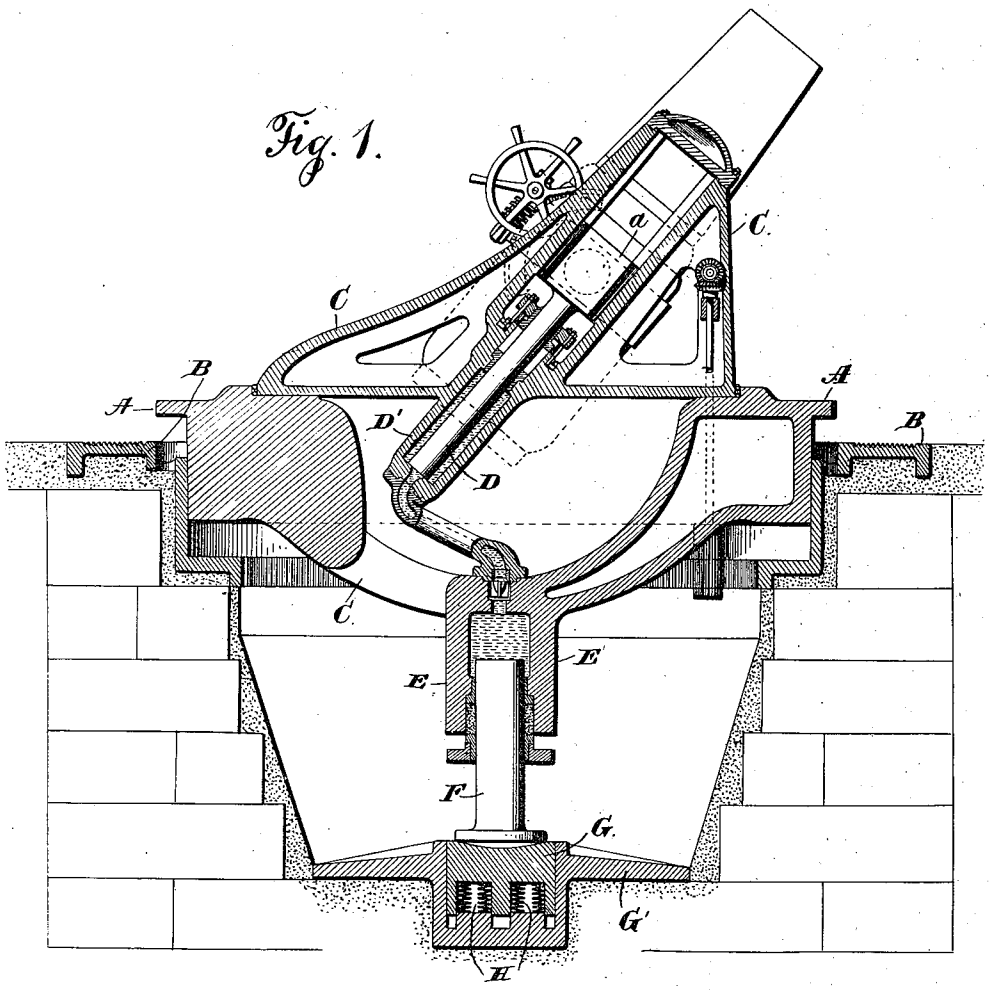
W. H. MORGAN.

MORTAR MOUNTING.

No. 479,445. Patented July 26, 1892.

Fig. 1.



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

Inventor
Wm. H. Morgan,
By H. A. Seymour
Attorney

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W. H. MORGAN.

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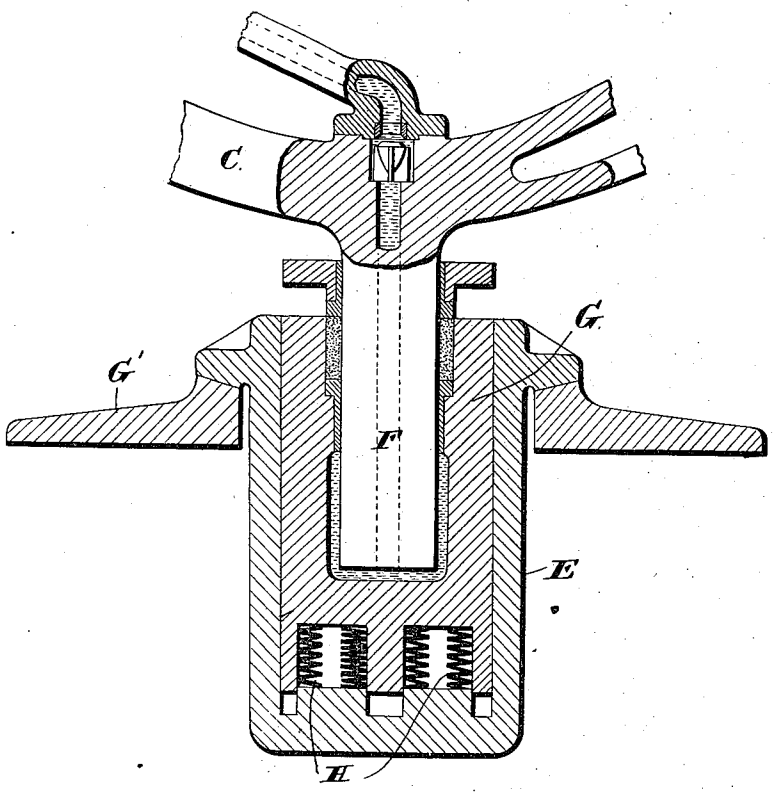
Fig. 2.



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

Inventor
Wm. H. Morgan.
By Hasyngton
Attorney

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W. H. MORGAN.

MORTAR MOUNTING.

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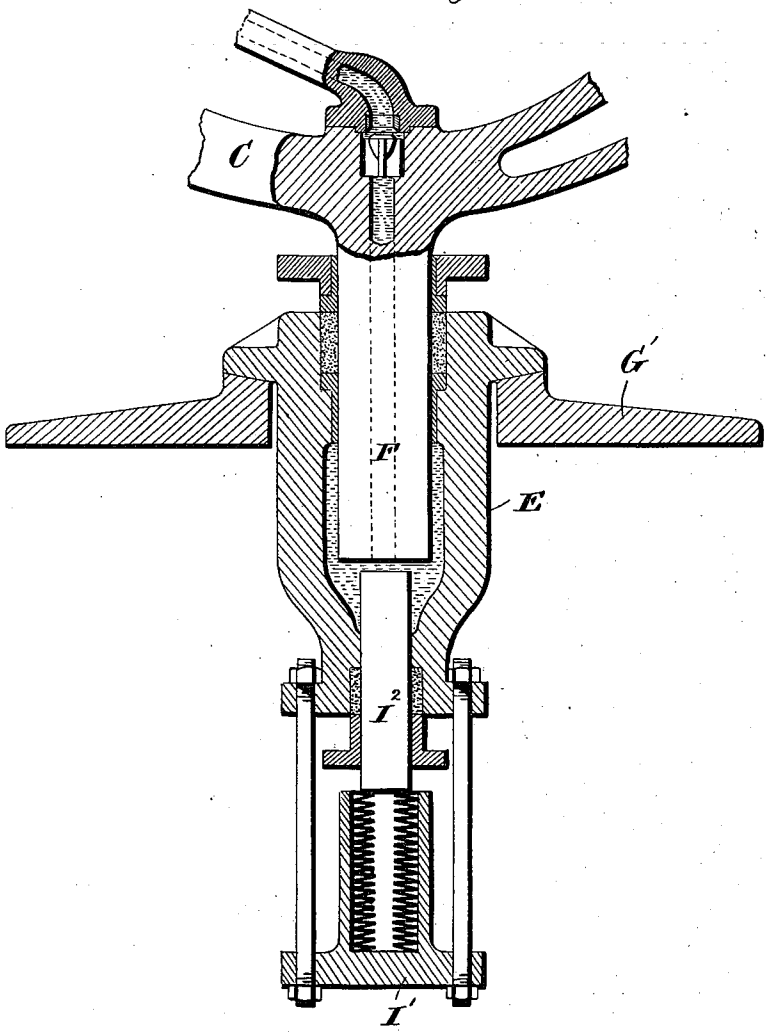
Fig. 3.



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

Inventor
Wm. H. Morgan.
By A. Sugmore
Attorney

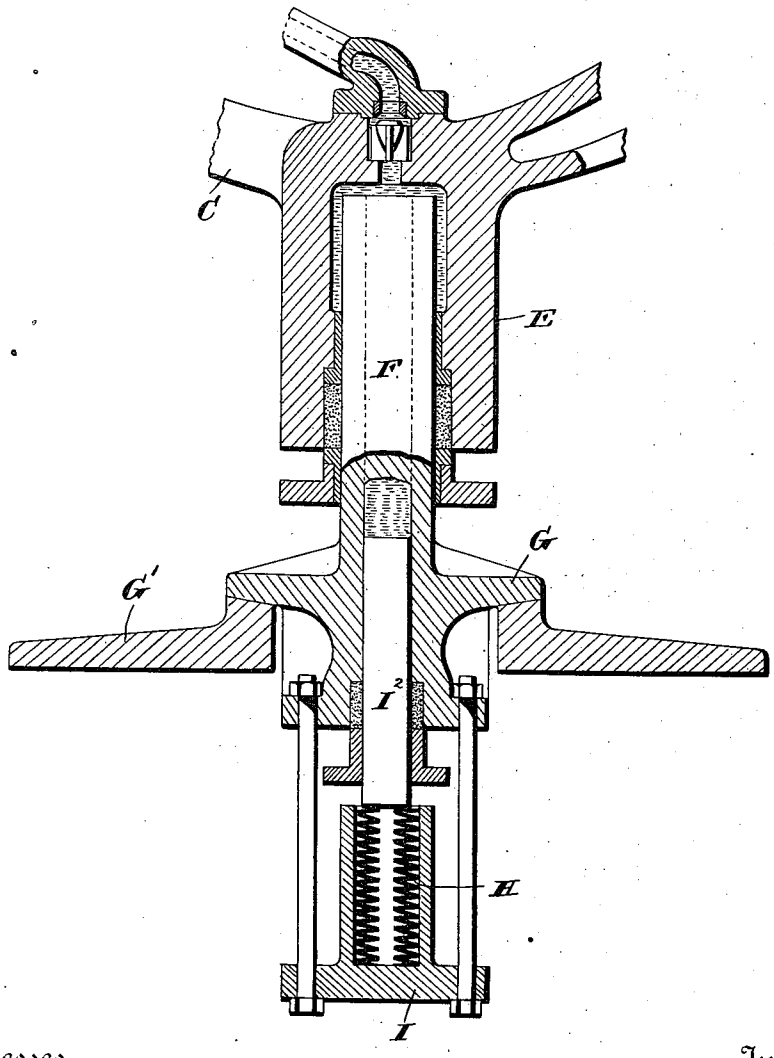
(No Model.) 4 Sheets—Sheet 4.

W. H. MORGAN.

MORTAR MOUNTING.

No. 479,445. Patented July 26, 1892.

Fig. 4.



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

Inventor
Wm. 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. 479,445, dated July 26, 1892.

Application filed June 23, 1891. Serial No. 397,229. (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 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.

This invention relates to an improvement in mortar-mountings, and is designed more particularly as an improvement on a mounting having hydraulic cylinders 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. Water being practically incompressible, it will not when properly housed yield to pressure, and hence may prove too rigid and unyielding under the first shock of the recoil.

The object of the present invention is to provide yielding means adapted to yield under the first shock of the recoil and before the weights begin to move; and it consists in the parts and combinations of parts, as will be more fully described, and pointed out in the claims.

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

A represents a carriage normally resting on the flange B′ of the ring B, and provided with castings C, having inclined slideways in which the boxes *a*, carrying the trunnions of the gun, move. The boxes *a* are connected to the upper ends of plungers D, which latter move in hydraulic cylinders D′, carried by the carriage. These cylinders D′ are connected by pipes with a cylinder E, located below the carriage, and the water or 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 a plunger F operates to elevate the carriage. Now by opening communication between the lower cylinder and the upper cylinders the weight of the carriage will expel the liquid from the lower cylinder and force it into the upper cylinders, thereby permitting the carriage to descend to its normal position and elevating the gun to its position for firing.

In Fig. 1 the plunger F is shown mounted on a block G, seated in the base-plate G′ and supported on a series of springs H. The upper end of the plunger F rests in the cylinder E, and hence it follows that the fluid as it first enters the cylinder E will act on the springs and compress them, thus allowing time for the weight (carriage and gun) to begin to move. The plunger is in effect a spring-plunger, one end being yieldingly supported and the other end adapted to receive the impact of the fluid forced into the lower cylinder from the upper cylinder. This fluid is under powerful pressure and as soon as upper plungers carrying the gun begin to move under the recoil the water in the upper cylinders and in the pipes between the upper and lower cylinders is put in motion, and as the fluid in the lower cylinder is under the same pressure as the fluid in the upper cylinders it follows that the instant fluid is displaced in the upper cylinders an increased space in the lower cylinder must be provided for such displaced fluid. By means of springs yieldingly supporting the plunger the latter is permitted to descend and thus provide space for fluid forced into the cylinder. This takes the shock off the carriage, and the latter is thus given time to recover and begin to ascend gradually in comparison to what its movements would be were the plunger rigid.

In Fig. 2 I have shown the plunger attached to the carriage and the cylinper supported on springs. In both instances, however, the part (plunger or cylinder) which is supported on the springs is mounted loosely, so as to permit said part to have slight lateral swinging movement, whereby it can move to accommodate itself to movements or jars to which the parts supporting the same are subjected.

In Fig. 3 I have shown the plunger attached to the carriage and moving within the

cylinder mounted on the base-plate, and in addition thereto have provided a supplemental plunger I, passing through the bottom of cylinder and resting on springs carried by the yoke I'.

In Fig. 4 I have shown the parts reversed—that is to say, have shown the cylinder depending from the carriage and the plunger mounted on the base-plate. In this instance the plunger is hollow to receive the supplemental plunger I^2, which, like the supplemental plunger shown in Fig. 3, is supported on spring sustained by yoke I.

I do not claim, broadly, in this specification a vertically-movable gun-carriage, a cylinder and plunger for elevating said carriage, and means actuated by the recoil of the gun for forcing the liquid into said cylinder, as the same forms the subject-matter of an application filed by Thos. R. Morgan, Sr., Thos. R. Morgan, Jr., John R. Morgan, and myself June 23, 1891, Serial No. 397,212.

It is evident that numerous slight changes in the construction and arrangement of the several parts of the device might be made without departing from the spirit of the invention. 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 and alterations 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 vertically-movable gun-carriage, of a cylinder and plunger for elevating said carriage, means actuated by the recoil of the gun for forcing a liquid into said cylinder, and means adapted to yield to accommodate fluid forced into the cylinder before the carriage begins to move upwardly, substantially as set forth.

2. The combination, with a vertically-movable gun-carriage and hydraulic devices supporting the gun and adapted to yield under the recoil thereof, of a cylinder and plunger for elevating said carriage, a port or pipe leading from the hydraulic devices on the carriage to the hydraulic cylinder under the carriage whereby the liquid forced from the upper hydraulic device operates to elevate the carriage, and means connected with the lower cylinder and adapted to yield to make space for the fluid forced into the lower cylinder before the carriage begins to move upwardly, substantially as set forth.

3. The combination, with a vertically-movable 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 springs supporting one of said parts, substantially as set forth.

4. The combination, with a vertically-movable gun-carriage and hydraulic devices thereon adapted to yield under the recoil, of a cylinder attached to the carriage for elevating same and a spring-supported plunger fitting in said cylinder, substantially as set forth.

5. The combination, with a vertically-movable gun-carriage and hydraulic devices thereon adapted to yield under the recoil, of a cylinder attached to the carriage, a plunger fitting in said cylinder, and a yielding block supporting said plunger, the said cylinder and plunger adapted to elevate the carriage, 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.