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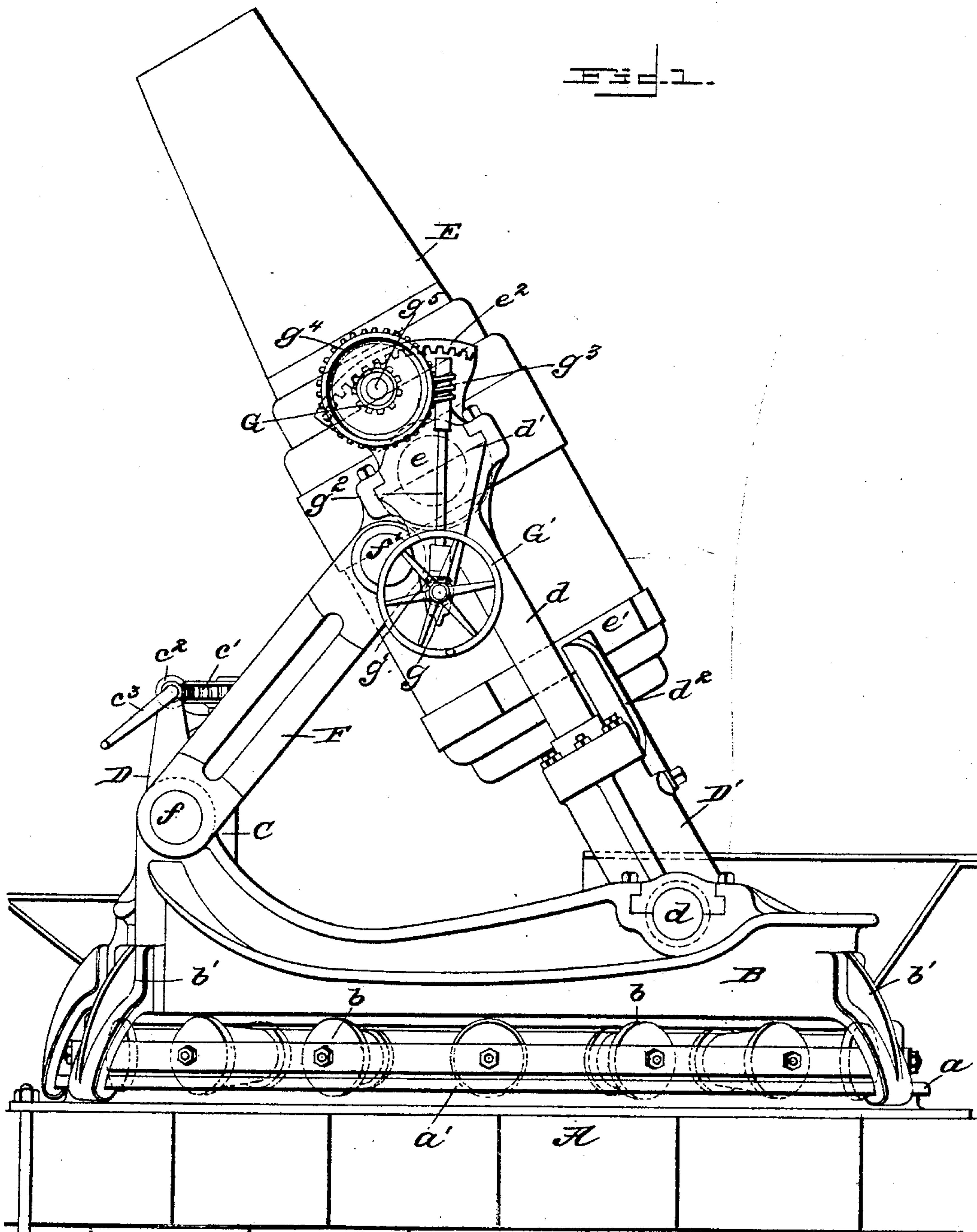
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3 Sheets—Sheet 1.

F. B. TAYLOR.  
MORTAR CARRIAGE.

No. 458,554.

Patented Aug. 25, 1891.



Witnesses

*W. H. Humphrey*  
*David St. Mend.*

Inventor

*Frederic B. Taylor,*  
*by A. E. Dyrenforth,*  
*his Attorney.*

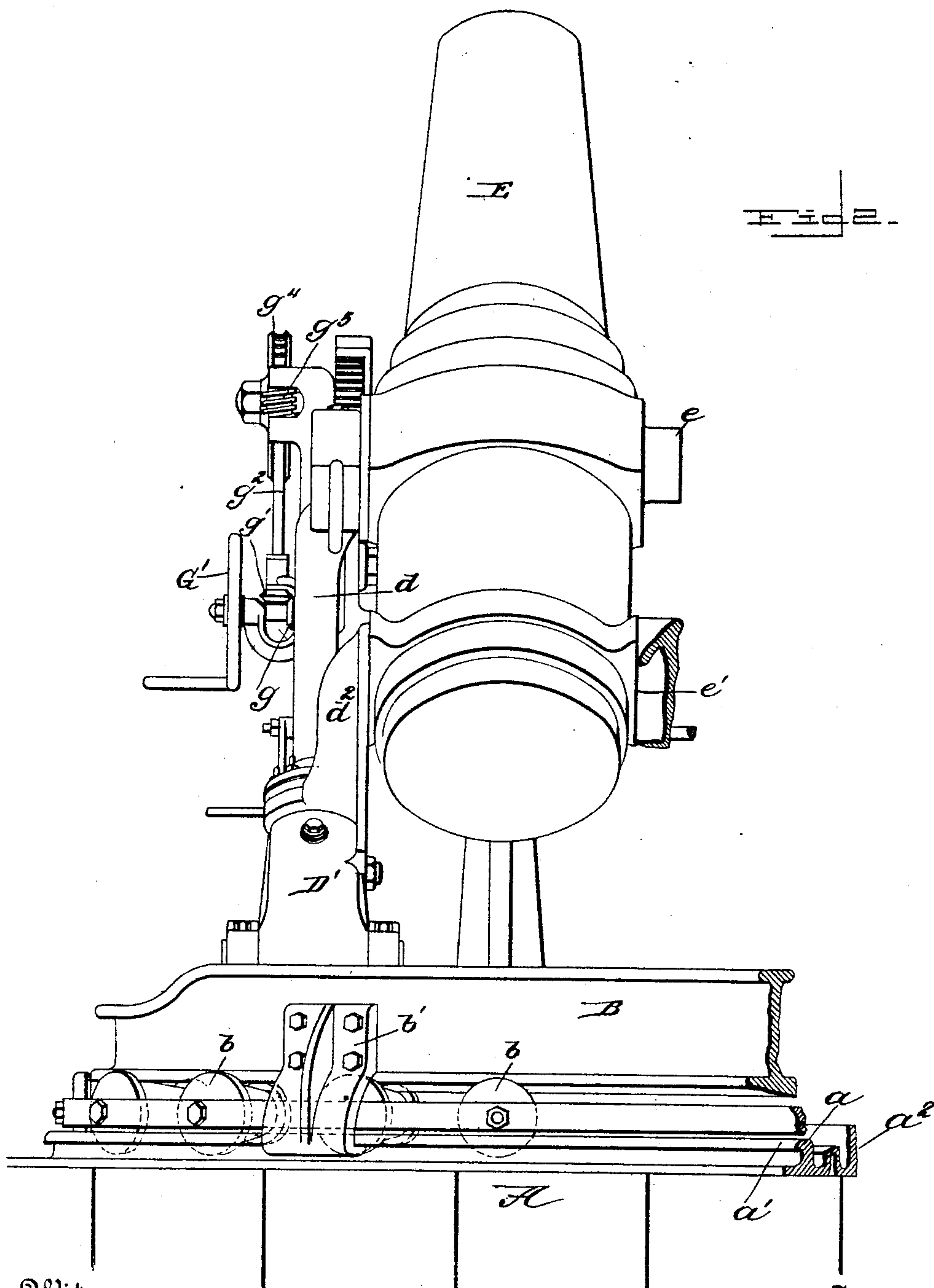
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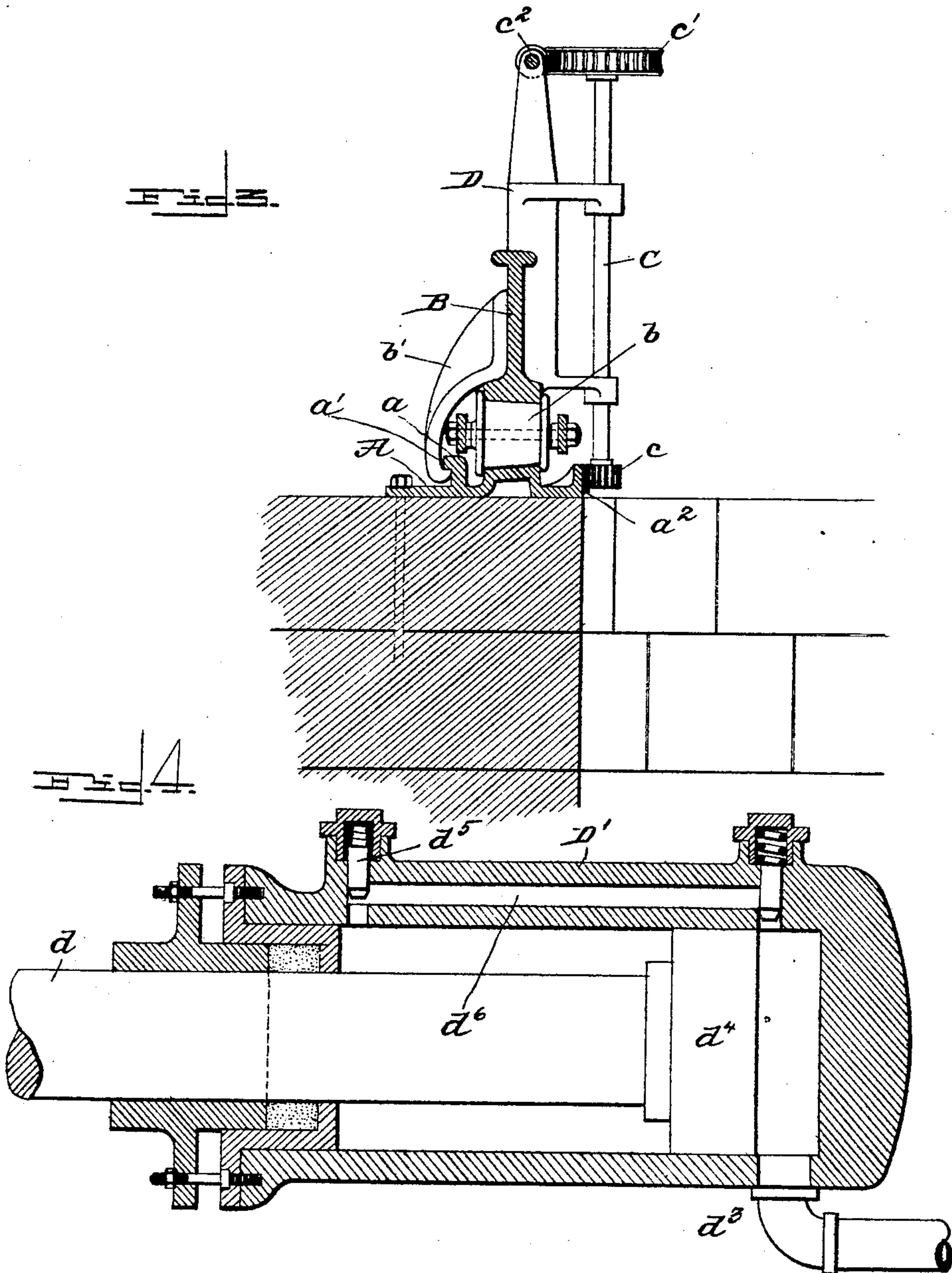
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Witnesses  
N. H. Humphrey.  
David St. Michael.

Inventor  
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his Attorney



# UNITED STATES PATENT OFFICE.

FENNER B. TAYLOR, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR  
TO THE PNEUMATIC GUN CARRIAGE AND POWER COMPANY, OF SAME  
PLACE.

## MORTAR-CARRIAGE.

SPECIFICATION forming part of Letters Patent No. 458,554, dated August 25, 1891.

Application filed June 2, 1891. Serial No. 394,876. (No model.)

*To all whom it may concern:*

Be it known that I, FENNER B. TAYLOR, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Mortar-Carriages; 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 mortar-carriages.

The object of the invention is to produce a mortar-carriage of simple and inexpensive construction, whereby the mortar may be elevated or depressed or trained with great rapidity and ease.

The object of the invention is, furthermore, to produce a mortar-carriage of such construction that the recoil of the mortar shall be taken up and the mortar automatically returned to firing position after each firing in a safe and reliable manner.

With these objects in view the invention consists, essentially, in a mortar-carriage comprising two cylinders having their piston-rods formed with bearings to receive the trunnions of a mortar, the cylinders being mounted in a suitable frame, and links pivoted in the frame and pivotally connected with the bearings for the trunnions, whereby a support for the mortar is provided.

The invention consists, furthermore, in a mortar-carriage comprising two cylinders having their piston-rods provided with bearings for the trunnions of the mortar, the cylinders being mounted in a suitable frame in such manner as to allow them to vibrate, and links pivotally connected with the frame and connected with the bearings for the trunnions of the mortar.

The invention consists, furthermore, in combination, with a mortar provided with the usual trunnions and with a toothed segment, of a mortar-carriage comprising two cylinders having their piston-rods provided with bearings for the trunnions of the mortar, a link pivotally connected with the base of the mor-

tar-carriage and with the bearings for the trunnions, a hand-wheel, a pinion mounted on the piston-rod and meshing with the segment on the mortar, and a connection between the hand-wheel and the pinion, whereby the mortar may be elevated or depressed independently of the piston-rods.

The invention consists, furthermore, in a mortar-carriage comprising a stationary base or foundation provided with a circular track, and a movable frame provided with wheels moving on such track, and provided also with hook-shaped projections the lower ends of which inclose a circular rim on the base or foundation, whereby the raising of the movable part independent of the stationary part is prevented.

The invention consists, furthermore, in a mortar-carriage comprising a stationary base or foundation having a circular track and a movable part provided with supporting-wheels, hook-shaped projections on the movable part engaging an overhanging rim on the stationary part, the stationary portion being provided with an internally-toothed ring, and a pinion mounted on the movable part and engaging said toothed ring, and means for imparting rotary motion to the pinion.

The invention consists, furthermore, in various novel details of construction, whereby the objects of the invention are attained.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a mortar constructed in accordance with my invention, the mortar being shown in firing position. Fig. 2 is a rear elevation of my improved carriage, the cylinder and supporting-links on one side being shown as removed and the base of the carriage being shown as partly in section. Fig. 3 is a sectional view showing the means for attaching the carriage to its supporting-rail. Fig. 4 is a detail view showing the form of cylinder employed.

In the drawings, A represents a stationary bed-plate, which is provided with an outer ring  $\alpha$ , having an overhanging portion  $\alpha'$ , and



provided also with an internally-toothed surface  $a^2$ . This bed-plate is designed to be secured permanently to a solid foundation.

B represents a movable portion of the mortar-carriage, which is provided with suitable wheels  $b$ , preferably conical in form, to facilitate proper rotary movement. The portion B of the carriage is provided with a series of depending hooks or claws  $b'$ , the lower ends whereof engage the overhanging portion  $a'$  of the stationary portion of the frame, thereby preventing raising of the portion B from the stationary bed-plate.

Mounted on a suitable portion D of the frame is a shaft C, the lower end of which is provided with a pinion  $c$ , engaging the circular tooth-plate  $a^2$  of the bed-plate of the carriage. On the upper end of the shaft C is a gear-wheel  $c'$ , with which meshes a worm  $c^2$ , to which motion is imparted through a crank  $c^3$ , mounted adjacent to the gear-wheel. Thus it will be seen that by giving motion to the worm  $c^2$  by the handle  $c^3$  the movable part of the carriage through the pinion  $c$  and the toothed bar  $a^2$  will be given a rotary motion in either direction according to the way in which the handle  $c^3$  is turned.

D' represents the cylinders designed to contain compressed air and provided with trunnions  $d$ , mounted in suitable bearings in the portion B of the frame of the carriage. It is designed that one of these cylinders be placed on each side of the mortar, and the piston-rods  $d$ , which extend one each side of the mortar E, are provided with bearings  $d'$ , receiving the trunnions  $e$  of the mortar. In order to aid in forming a support for the mortar links F are provided, one on each side of the mortar, and are pivoted at points  $f$  to the portion B of the frame at their lower ends, and at their upper ends are pivoted to the depending portion of the piston-rods at a point  $f'$ . The lower rings of the mortar are provided with plane surfaces  $e'$ , and against these surfaces bear the guide-plates  $d^2$ , which are attached to the cylinders D'.

One side of the mortar E is provided with a toothed segment  $e^2$ , and upon a suitable portion of the piston-rod  $d$  is placed a pinion G, meshing with the toothed segment  $e^2$ , whereby by rotating the segment, the mortar may be elevated or depressed at will. One means for imparting motion to this segment is illustrated in the accompanying drawings. In this form a hand-wheel G' is mounted upon a projection from the piston-rod  $d$ , and on the shaft of this hand-wheel is a beveled gear-wheel  $g$ , meshing with a corresponding beveled gear-wheel  $g'$  on the shaft  $g^2$ . The outer end of this shaft  $g^2$  is provided with a worm  $g^3$ , meshing with the gear-wheel  $g^4$ , on the shaft  $g^5$  of which is mounted the pinion G. The hand-wheel G' is mounted in a position to be readily grasped by hand, and it will be seen that by rotating the hand-wheel the mortar may be

elevated or depressed at will. Each of the cylinders is provided with an air-inlet  $d^3$ , through which compressed air is introduced into the lower end of the cylinders for the purpose of elevating the gun to a firing position, the piston-head  $d^4$  at this position being adjacent to the upper head of the cylinder. Each cylinder is also provided with safety-valves  $d^5$ , regulating the opening between the interior of the cylinder and the passage  $d^6$ , which communicates with each end of the cylinder, the purposes of the valves being to allow escape of the compressed air from below the piston-head to a space above it in case the air below the piston-head is compressed too great a degree to allow proper recoil of the mortar.

The operation of the carriage is as follows: When the mortar is fired, the same will recoil, forcing the piston-head  $d^4$  downward into the cylinders D, resulting in compressing the air contained in the cylinders, which is already at sufficient pressure to maintain the weight of the mortar and appurtenances. As soon as the force of the recoil is exhausted the compressed air in the cylinder, which is under great pressure, will force the piston-heads upward, and consequently return the mortar to a normal or firing position.

While I have herein described the use of compressed air in operating the gun-carriage, I do not wish to be understood as claiming it, as the use of compressed air in connection with gun-carriages is broadly covered by Letters Patent No. 339,466, dated April 6, 1886, issued to the Pneumatic Gun Carriage Company.

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

1. A mortar-carriage comprising two cylinders having their piston-rods formed with bearings to receive the trunnions of a mortar, the cylinders being mounted in a suitable frame, and links pivoted in the frame and pivotally connected with the bearings for the trunnions, substantially as described.

2. A mortar-carriage comprising two cylinders having their piston-rods provided with bearings for the trunnions of the mortar, the cylinders being mounted in a suitable frame in such manner as to allow them to vibrate, and links pivotally connected with the bearings for the trunnions of a mortar and pivoted in the frame of the carriage, substantially as described.

3. The combination, with a mortar provided with the usual trunnions and with a toothed segment, of a gun-carriage comprising two cylinders having their piston-rods provided with bearings for the trunnions of the mortar, a link pivotally connected with the base of the mortar-carriage and with the bearings of the trunnions, a hand-wheel, a pinion mounted on the piston-rods and mesh-



ing with the segment on the mortar, and a connection between the hand-wheel and the pinion, substantially as described.

4. A mortar-carriage comprising two cylinders having their piston-rods formed with bearings to receive the trunnions of a mortar, links pivoted in the frame of the carriage and pivotally connected with the bear-

ings, and compressed-air inlets to the cylinders, substantially as described. 10

In testimony whereof I affix my signature in presence of two witnesses.

FENNER B. TAYLOR.

Witnesses:

WM. P. HUNT, Jr.,

EDWD. HAMILTON.