

(No Model.)

L. N. TONNS.  
GUN CARRIAGE.

No. 384,942.

Patented June 19, 1888.

Fig. 1

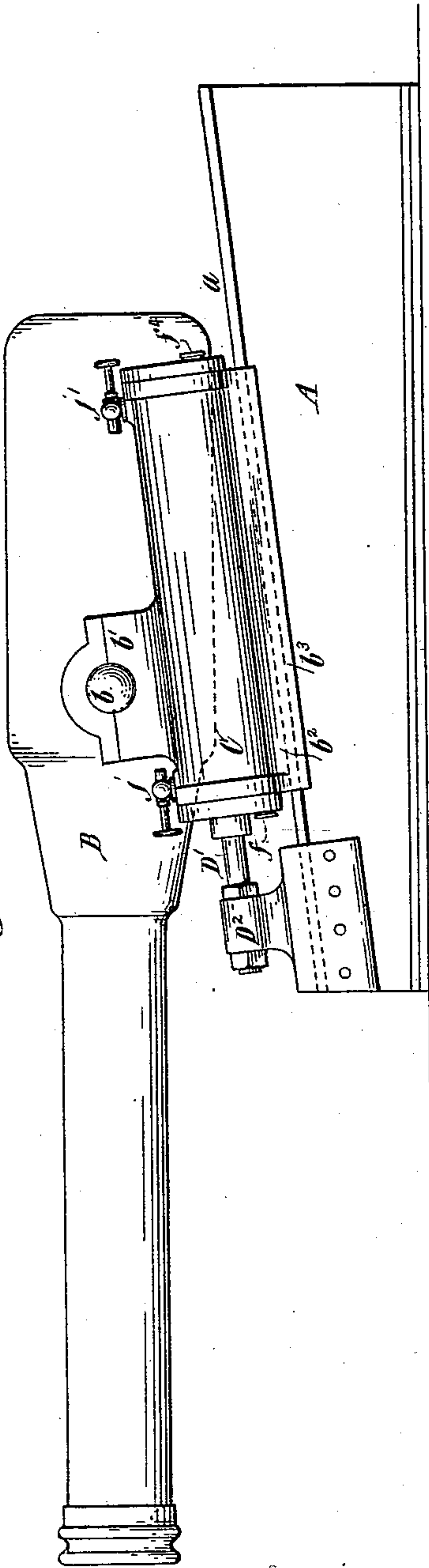


Fig. 3.

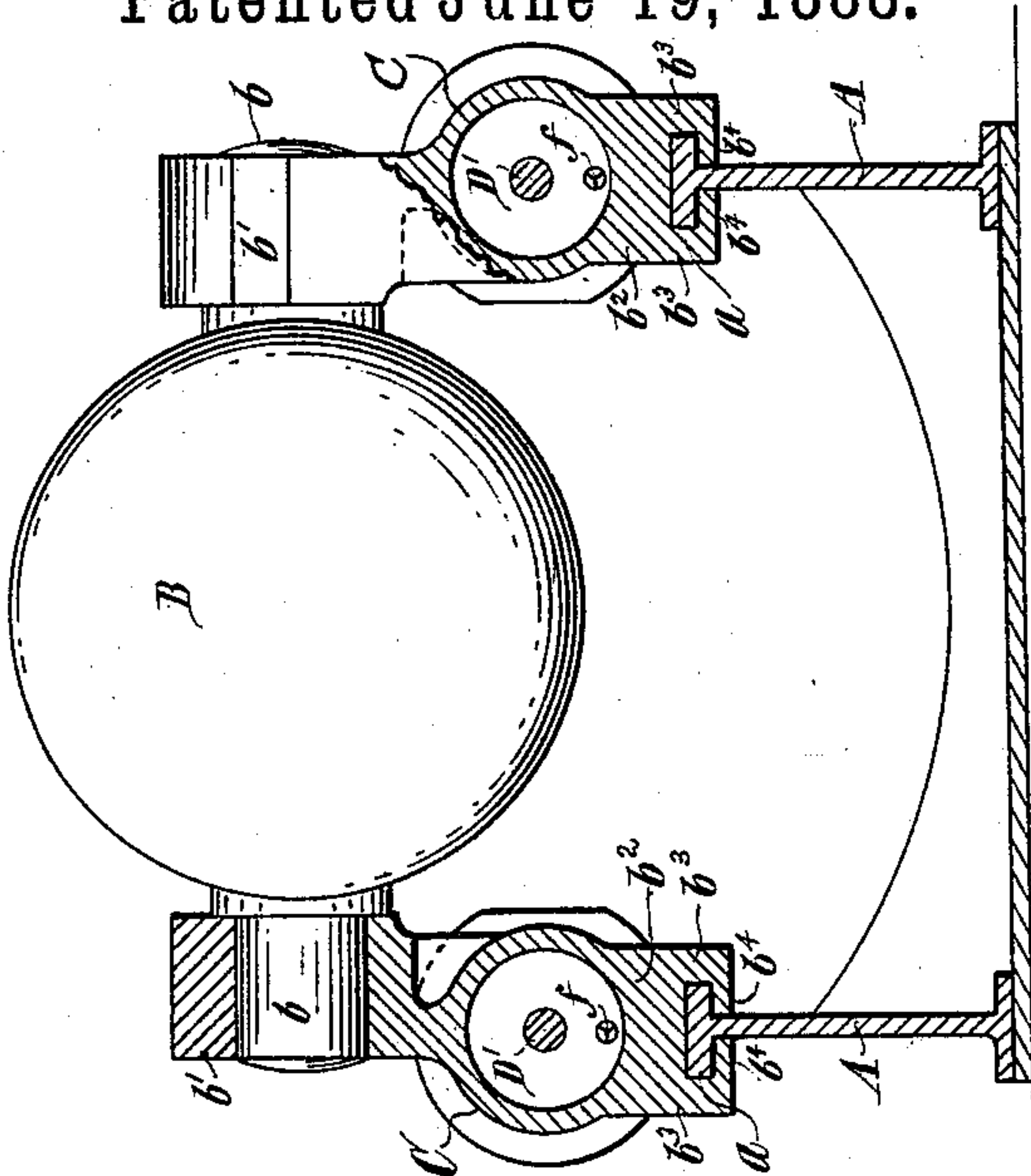
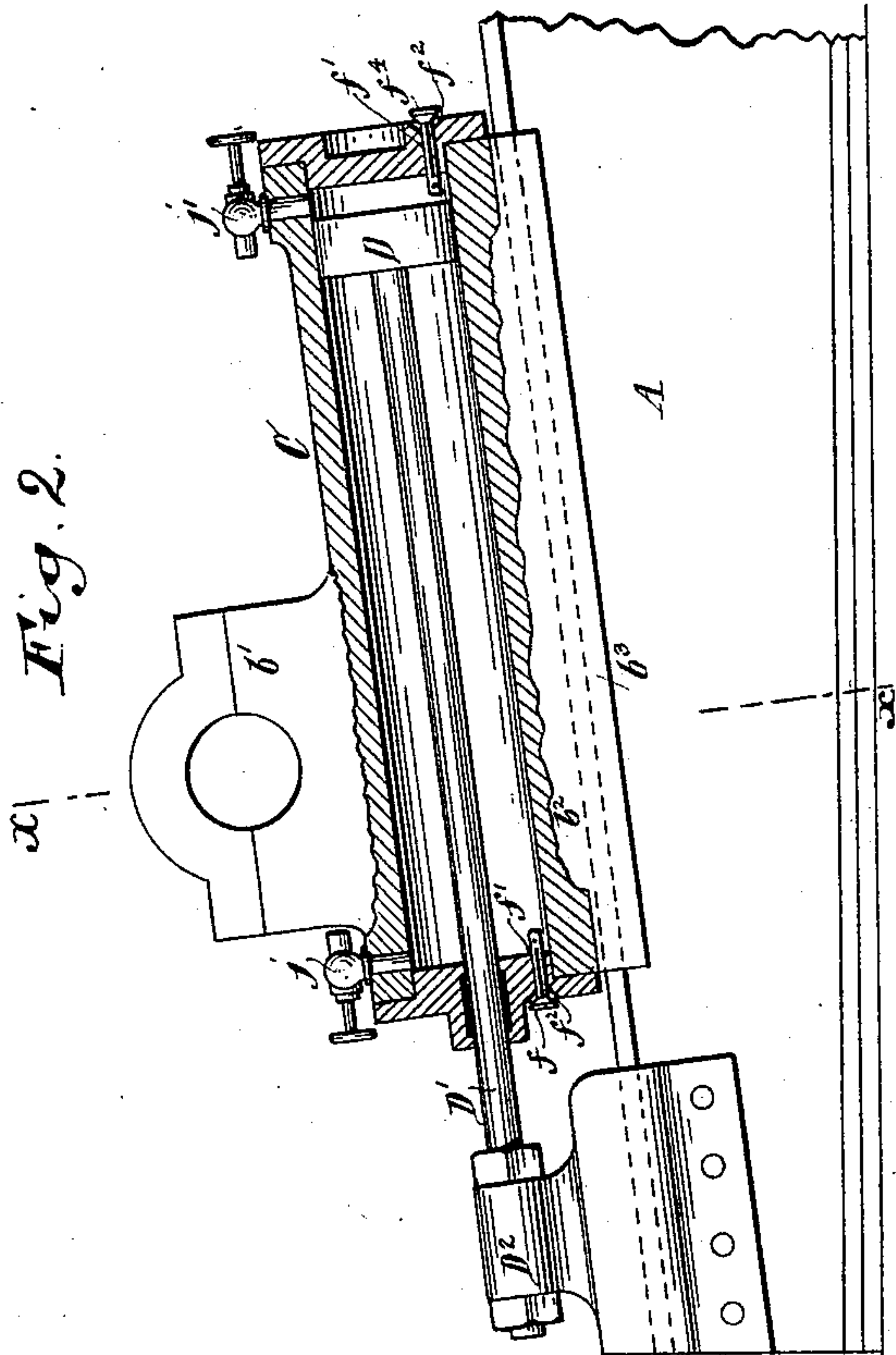


Fig. 2.



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# UNITED STATES PATENT OFFICE.

LOUIS N. TONNS, OF NEW BRIGHTON, ASSIGNOR OF TWO-THIRDS TO GEORGE H. ALLEN, OF NEW YORK, AND EDWARD H. HALL, OF BROOKLYN, NEW YORK.

## GUN-CARRIAGE.

SPECIFICATION forming part of Letters Patent No. 384,942, dated June 19, 1888.

Application filed April 26, 1887. Serial No. 236,232. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS N. TONNS, of New Brighton, in the county of Richmond and State of New York, have invented a certain  
5 new and useful Improvement in Gun-Carriages, of which the following is a specification.

My improvement relates to carriages upon which ordnance is mounted.

I will describe a gun-carriage embodying my  
10 improvement in detail, and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a gun-carriage embodying my improvement with a cannon mounted there-  
15 on. Fig. 2 is a longitudinal view of a cylinder employed in the same, with other parts. Fig. 3 is a rear view, partly in section.

Similar letters of reference designate corresponding parts in all the figures.

20 A designates the frame of the carriage, which may be of metal or other suitable material and mounted on any suitable support. The sides of this carriage have inclined upper edges, the inclines being highest at the rear end of the  
25 carriage. These inclined surfaces may be provided with suitable rails, *a*.

B designates a cannon which may be of any desired construction. This cannon is provided on its sides with trunnions *b*, which are jour-  
30 naled in suitable bearings, *b'*, formed upon or secured to the upper sides of the cylinders C. These cylinders are provided upon their under sides with projecting portions *b''*, which por-  
35 tions are grooved upon their under sides. These grooves receive the rails *a* of the inclined sides of the frame. Flanges *b'''* on the portions *b''* extend downwardly at the sides of the rails *a*, and, as shown, said flanges are pro-  
40 vided with inwardly-turned portions *b''''*, which extend beneath the overhanging edges of the rails *a*. By this means the cannon and the cylinders are firmly maintained on the rails and prevented from both lateral and vertical movement. It is of course to be understood  
45 that the cannon is supported upon the cylinders C.

D designates pistons within the cylinders B. These pistons fit snugly within the cylinders and may be provided with any suitable pack-  
50 ing. I have shown piston-rods D' secured to

said pistons and extending through suitable stuffing-boxes in the cylinders toward the forward end of the gun-carriage. Outside the cylinders these piston-rods are connected to rigid abutments D<sup>2</sup>, formed with or secured to  
55 the gun-carriage upon the sides thereof.

In the cylinders I arrange valves at their front ends and upon the outside thereof, and at the rear ends thereof I arrange similar valves. These valves operate as reflow check-  
60 valves and may be of any desired construction. I have shown wing-valves *f f'* contained in valve-chests *f'* and adapted to fit upon valve-seats *f''*. These valves being arranged upon opposite ends of the cylinders, it is apparent  
65 that when the cylinders are moved along the pistons will operate through atmospheric pressure to close the valves upon one of the ends of the cylinders and open those upon the other ends.  
70

When the cannon is discharged and the recoil takes place, the cannon, together with the cylinders, is moved backwardly and up the inclined sides of the carriage. This movement causes the pistons to apparently travel  
75 toward the front ends of the cylinders. The instant the backward movement of the cylinders starts the valves *f'* at the rear of the cylinders are closed, and the result is that the apparent forward movement of the pistons causes  
80 a partial vacuum to be formed in the rearward portion of the cylinders, which operates to check the recoil of the gun. In this operation it is to be understood that the forward valves  
85 *f* are open and air from within the cylinders at the forward ends thereof is being forced out. When the gun starts to return down the inclined planes, the valves *f* are at once closed and a partial vacuum is formed in the forward  
90 portions of the cylinders. The gun will then, owing to its weight, move downwardly quite rapidly until the vacuums in the rearward portions of the cylinders are destroyed and the valves *f'* open, when it will descend slowly  
95 against the increasing vacuums in the forward ends of the cylinders to its normal or lowermost position. It is desirable to destroy the vacuums in the forward ends of the cylinders before the gun is again discharged, and for  
100 this purpose I have shown stop-cocks *j*, which



may be operated to admit air for this purpose. I have also shown other stop-cocks,  $j'$ , at the rear ends of the cylinders.

I term the apparatus which I have described for checking the recoil of the gun a "pneumatic recoil-check."

Of course, instead of using two pneumatic recoil-checks I may use but one, or I may use more than one; and it is quite apparent that the check or checks may be arranged otherwise than as shown—as, for instance, the cannon might be mounted directly upon the sides of the frame and cylinders be rigidly secured to the rear or front of the carriage, while the piston-rod would be pivotally connected to the cannon. I may also compress the air in the cylinders instead of creating vacuums therein, and this might be accomplished by merely arranging the valves  $f f'$  to operate in the reverse manner to that shown and described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a cannon, of a carriage therefor having inclined sides upon which said cannon is supported, a cylinder, a

piston within said cylinder, and a valve near each end of said cylinder, said piston and cylinder being one connected with the cannon and the other with a rigid support, and the said valves being alternately opened and closed according as the cannon is moved in one direction or the other by atmospheric pressure, substantially as specified.

2. The combination, with a cannon, of a carriage therefor having inclined sides upon which said cannon is supported, a cylinder, a piston within said cylinder, a valve near each end of said cylinder, said piston and cylinder being one connected with the cannon and the other with a rigid support, and a stop-cock near each end of said cylinder, the said valves being alternately opened and closed according as the cannon is moved in one direction or the other by atmospheric pressure, substantially as specified.

LOUIS N. TONNS.

Witnesses:

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