

J. Ericsson. Sheet 1. 3 Sheets.

Gun Carriage.

N^o 43298.

Patented Jun. 28. 1864.

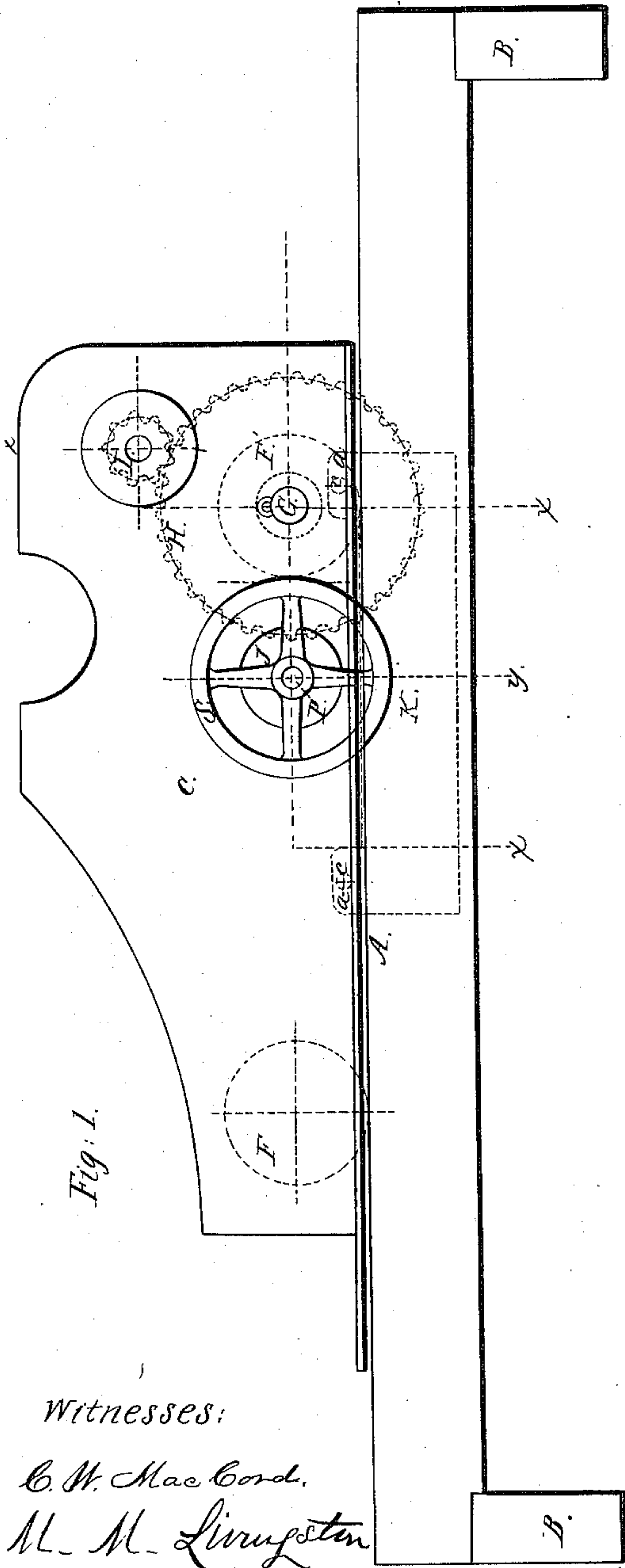


Fig: 1.

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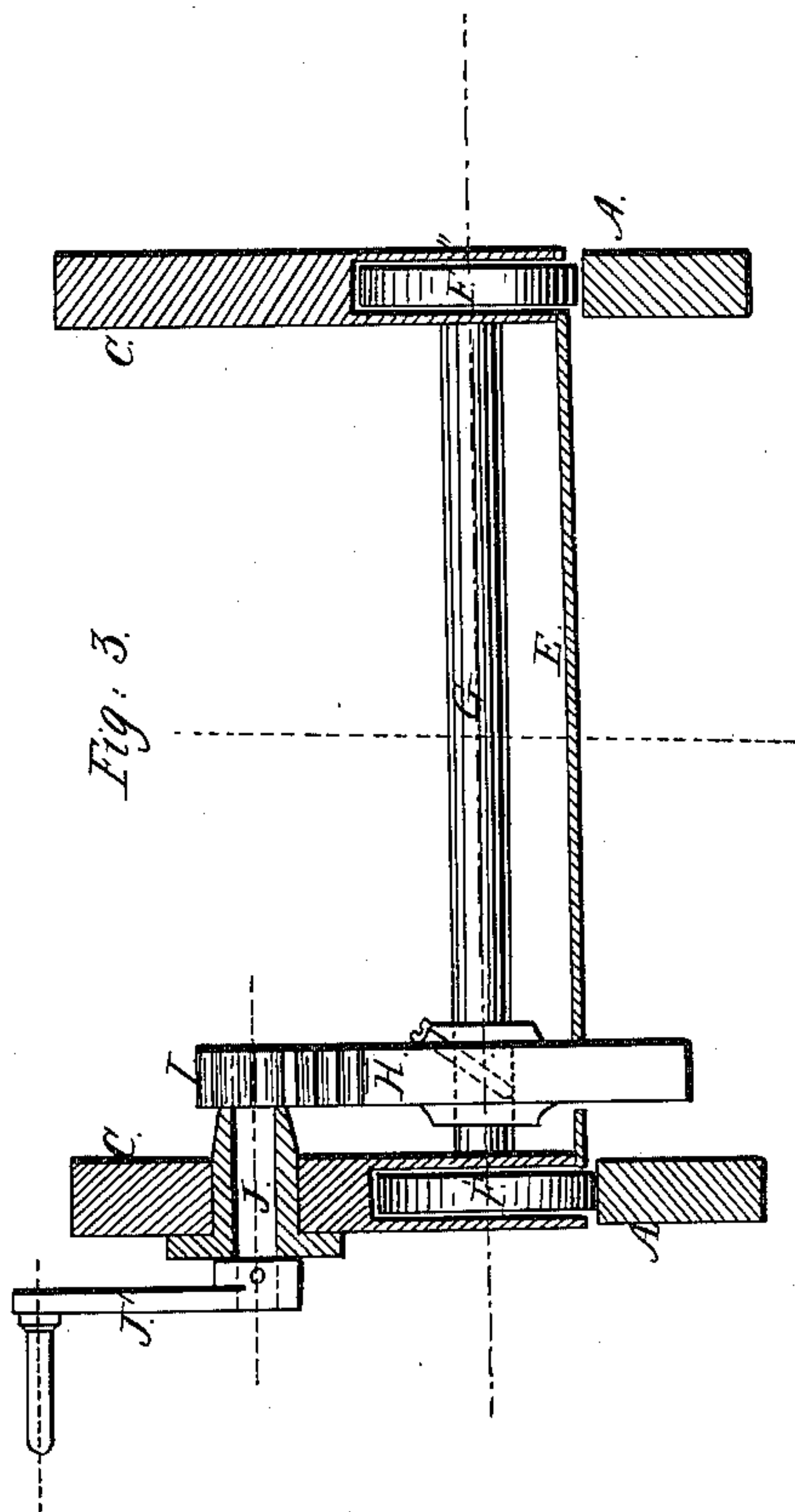


Fig. 3.

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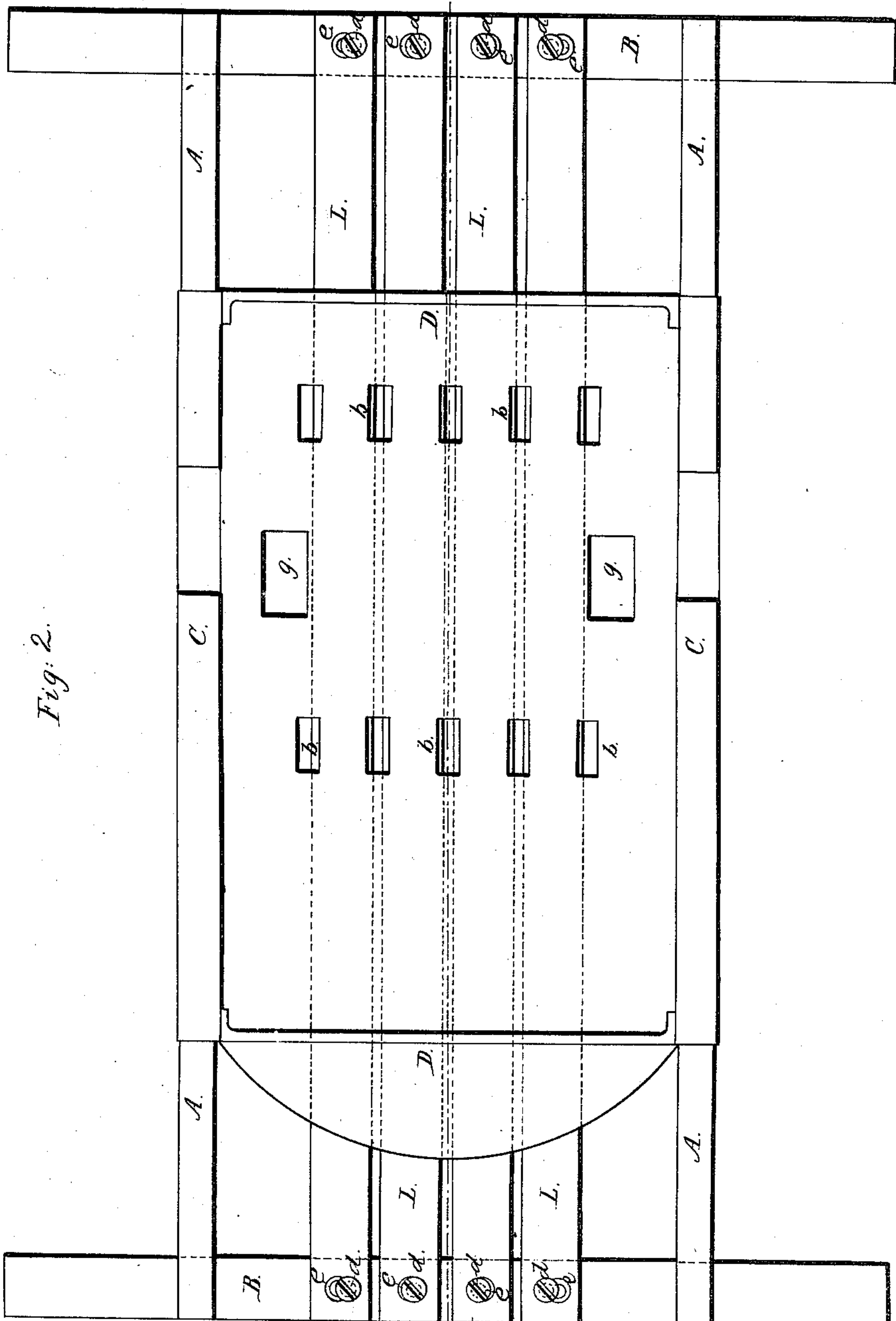
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Fig. 2.



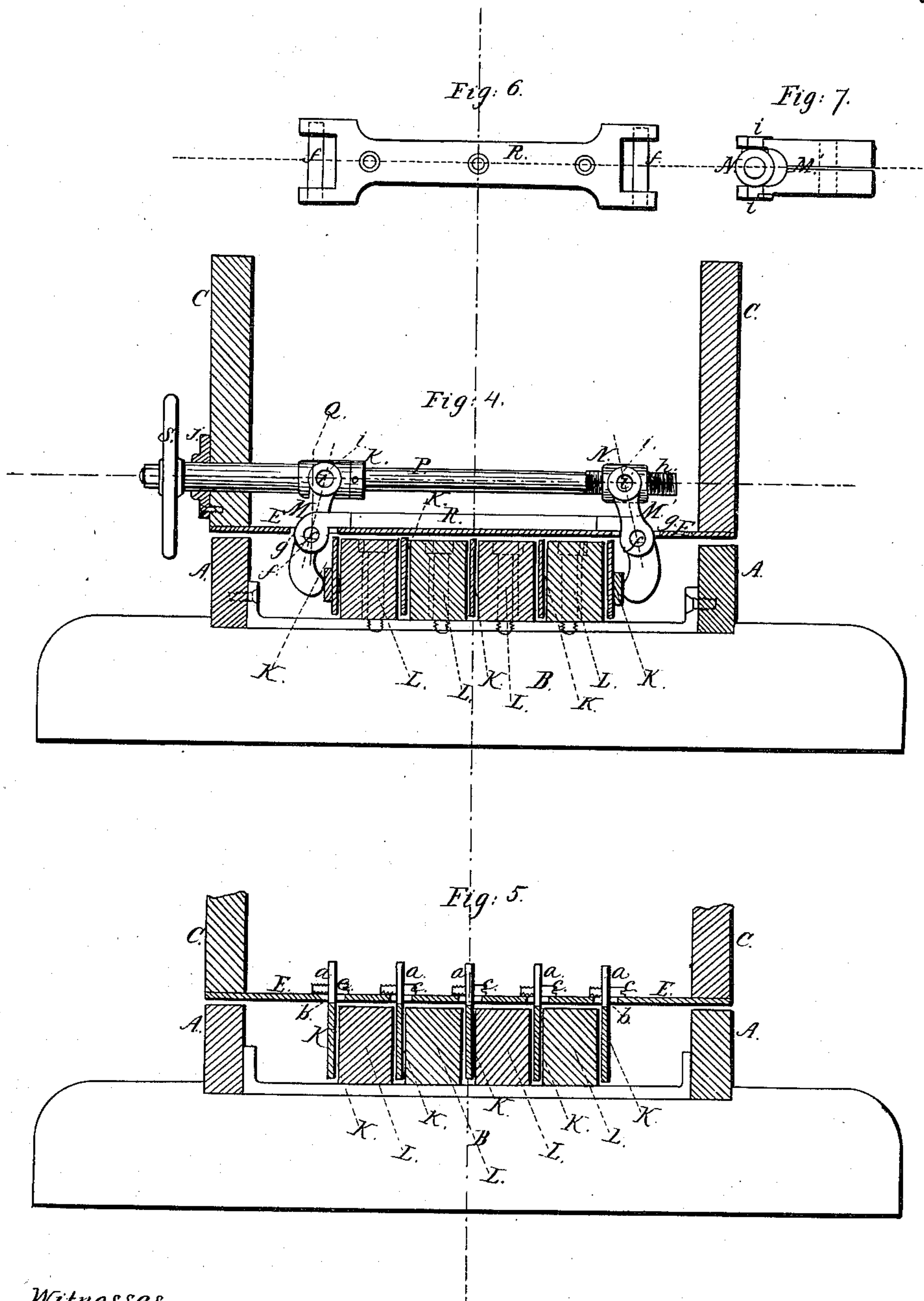
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UNITED STATES PATENT OFFICE.

JOHN ERICSSON, OF NEW YORK, N. Y.

IMPROVEMENT IN GUN-CARRIAGES.

Specification forming part of Letters Patent No. 43,298, dated June 28, 1864.

To all whom it may concern:

Be it known that I, JOHN ERICSSON, of the city, county, and State of New York, have invented certain new and useful Improvements in Gun-Carriages; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of a naval gun-carriage with my improvements. Fig. 2 is a plan of the same. Fig. 3 is a transverse vertical section of the same in the plane indicated by the line *x x* in Fig. 1. Fig. 4 is a transverse vertical section of the same in the plane indicated by the line *y y* in Fig. 1. Fig. 5 is a transverse vertical section of the lower part of the same in the plane indicated by the line *z* in Fig. 1. Figs. 6 and 7 are detail views, which will be hereinafter explained.

Similar letters of reference indicate like parts.

The object of this invention is to enable a heavy gun to be worked by few hands, and to reduce the recoil in such a degree as to permit the gun to be worked in a turret or within a limited space.

It consists, first, in providing for the running of a gun-carriage out for firing, or running it in or out for any other purpose, by securing one pair of its trucks firmly upon an axle, which is free to turn in suitable boxes or bearings in the sides or brackets of the carriage, and combining the said shaft with a system of toothed gear-wheels attached to the carriage for the purpose of applying power to it for turning the trucks, and thereby moving the carriage.

It consists, second, in producing the friction necessary to check the recoil of a gun-carriage, or holding it firmly in place in a seaway, or under other circumstances, by means of a system of parallel plates arranged lengthwise of and attached to the carriage, and a system of interposed parallel timbers attached to the bed or platform upon which the carriage works, whereby I am enabled to produce an almost unlimited amount of friction with a small application of force.

It consists, third, in a novel device, which I term a "compressor," for compressing the said

plates and timbers together for the purpose of producing the requisite degree of friction between them.

It consists, fourth, in the construction of a gun-carriage in the form of a box—that is to say, with a bottom whereby the sides or brackets are braced together along the whole or greater portion of their length, and convenience is afforded for attaching the parallel plates hereinbefore mentioned to the carriage.

A A are the rails, on which the carriage runs; and B B the transoms; on which the said rails rest.

C C are the sides or brackets of the gun-carriage; D D, the transoms, and E the bottom.

F F' are the trucks. The rear trucks, F, may be applied in the usual manner, but the front ones, F', are both secured firmly upon an axle, G, which works in bearings in the brackets of the carriage, as shown in Fig. 3. On this axle there is also secured a cog-wheel, H, which gears with a pinion, I, on a short shaft, J, which works in a bearing in one of the brackets C. This shaft is furnished outside of the bracket with a hand-crank, J', a wheel, or other means of applying power to turn the said shaft by hand, and by turning the said shaft the pinion is caused to turn the cog-wheel, and the axle G and trucks F', turning with the latter, cause the carriage to run upon the rails A A either forward or backward, according to the direction in which the shaft is turned. By using a hand crank or wheel of long radius, a small pinion, and a large cog-wheel, the carriage may be moved very easily.

K K are the parallel plates, which I call "check-plates," attached to the carriage, and L L the interposed timbers, which I call "friction-timbers," attached to the transoms B B. These plates and timbers constitute the friction apparatus by which the recoil of the carriage in firing is checked, and the carriage is held stationary at other times.

In applying the friction apparatus to a gun-carriage it will always be better to make the carriage, like a box, or with a bottom, E, of plate-iron extending the whole or greater part of its length.

The check-plates K K consist of straight flat pieces of plate-iron of a suitable length and width, having similar lugs, *a a*, at both ends, as shown in dotted outline in Fig. 1, to enter slots *b b*, provided for their reception in the bot-

tom E of the carriage, that the said plates may be suspended under the carriage by means of pins *c c* inserted horizontally through holes in the portions of the said lugs which project above the upper surface of the bottom E, as shown in Fig. 5. The slots *b b* are of a length only sufficient for the free passage of the lugs *a a*, and therefore no longitudinal movement of the check-plates is permitted; but the said slots are of a width much greater than the thickness of the lugs and plates, to permit a lateral movement of the plates. The friction-timbers *L L*, which are interposed between these check-plates, are arranged parallel with the rails *A A*, and secured at their ends, in such a manner as to be prevented from moving longitudinally, by means of screw-bolts *d d*, which screw into the transoms *B B*. The said timbers should also be fitted to the transoms *B B* with a jog to relieve the bolts *d d* of unnecessary strain. The holes *e e*, provided in the said timbers for the bolts *d d*, are elongated laterally, as shown in Fig. 2, to permit a lateral movement of the said timbers.

I will now describe the compressor by which the check-plates and friction-timbers are compressed together to produce the necessary friction on the said plates to check the recoil of the carriage.

M M' are two levers, placed one on each side of the series of check-plates and friction-bars, and working at right angles to the length of the carriage on fulcrum-pins *f f*, which attach them to a strong supporting-plate, *R*, bolted to the carriage-bottom E, in which there are provided openings *g g* for the said levers to work through.

Fig. 6 is a top view of the plate *R*. The said levers are so formed and arranged that their lower ends will bear against the two outer check-plates of the series. Their upper ends are forked, that of *M'* for the reception of a nut, *N*, which fits to a screw-thread, *h*, on a horizontal shaft, *P*, which is arranged transversely to the gun-carriage, and that of *M* for the reception of a collar, *Q*, which is fitted loosely to the said shaft. The said nut and collar are pivoted to the forks of the levers by pivots *i i*, to permit the movements of the levers while the said nut and collar are in line with the shaft, and to afford facility for the introduction of the pivots into their bearings in the forks of the levers the levers are each made in two pieces, as shown in Fig. 7, which is a back view of the lever *M'*. The shaft *P* has also a fast collar, *k*, close to the loose collar *Q*. The said shaft passes through one of the brackets *C* of the carriage, and is furnished outside of the carriage with a hand-wheel, *S*, by which to turn it. A guide, *j*, is provided in the carriage for the said shaft, but the collar *Q* and nut *N* are the actual bearings of the shaft, which is free to move lengthwise as well as rise and fall slightly, as required by the movement of the levers.

To compress the several check-plates and

friction-bars together, the shaft *P* is turned by the wheel *S* in a direction to cause the movement of the nut *N* toward the end of the screw *h*, and increase the distance between the said nut and the collars *k*. *Q*, on the shaft *k*, and the said nut and collars are thereby caused to force outward the upper ends of the levers *M M'*, and so make the lower ends of the said levers press against the two outer check-plates. This pressure may be increased to produce any desirable amount of friction between the several check-plates and interposed friction-timbers by continuing to turn the hand-wheel *S*.

When it is desired to liberate the carriage in working the gun, the wheel *S* is turned in the reverse direction, and the upper ends of the levers *M M'* thereby drawn toward or allowed to approach each other till the pressure of their lower ends is entirely removed from the check-plates, and the said plates and friction-timbers are all left loose. By substituting for the hand-wheel *S* a cog-wheel operated by a small pinion, such pinion to be worked by a hand-wheel similar to *S*, or by a crank-handle, any required amount of power may be given to the shaft *P*.

One advantage of the friction apparatus hereinabove described is that by using a sufficient number of check-plates and friction-bars a comparatively unlimited amount of friction can be obtained on the carriage with a small application of power to the shaft *P*, for it will be understood that by increasing the number of such plates and bars the friction is increased without requiring a corresponding increase of the pressure by which the friction is produced.

I do not confine myself to the use of the precise construction and arrangement of parts herein specified; but

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

1. Providing for the working of a gun-carriage by securing two of its trucks firmly to a revolving axle, and combining the said axle with a system of toothed gearing attached to the carriage, substantially as herein specified.

2. The employment, for producing the friction necessary to check the recoil of a gun-carriage or hold it securely in any position, of a system of metal plates and a system of interposed timbers, the one attached to the carriage and the other to the bed or platform upon which it works, substantially as herein described.

3. The compressor composed of two levers, *M M'*, and a screw-shaft, *P*, with collars *Q k*, and a nut, *N*, applied and operating in combination with the check-plates *K K* and friction-timbers *L L*, substantially as herein specified.

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Witnesses:

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