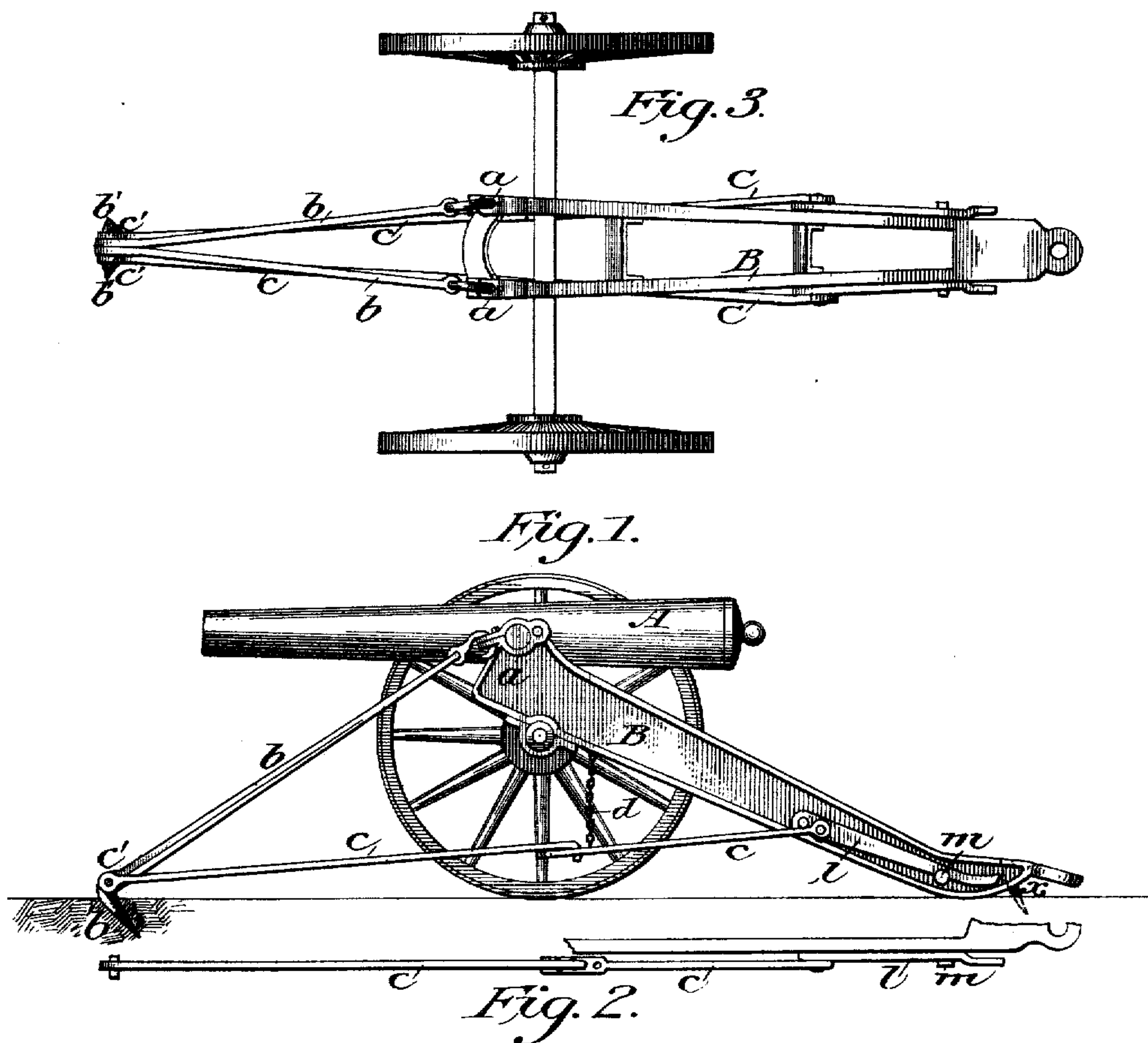


(No Model.)

G. G. GREENOUGH.
RECOIL CHECK FOR GUN CARRIAGES.

No. 462,484.

Patented Nov. 3, 1891.



Witnesses.
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UNITED STATES PATENT OFFICE.

GEORGE G. GREENOUGH, OF THE UNITED STATES ARMY.

RECOIL-CHECK FOR GUN-CARRIAGES.

SPECIFICATION forming part of Letters Patent No. 462,484, dated November 3, 1891.

Application filed December 13, 1889. Serial No. 333,826. (No model.)

To all whom it may concern:

Be it known that I, GEORGE GORDON GREENOUGH, of the United States Army, now stationed at Fort McPherson, Fulton county, in the State of Georgia, have invented a new and useful device for checking the recoil of field-pieces or siege and other guns and for relieving the strain upon their gun-carriages thereby occasioned, of which the following is a description.

The well-known recoil of field-pieces, with its attendant evils, has long since attracted the attention of artillerists, and numerous devices have been suggested to take up the recoil or counteract in part its effects; but I am not aware that the defect has been materially amended or the carriage relieved from the severe strain of the recoil in firing.

My device is intended to remedy these defects and hold the piece in position without the complex apparatus of recoil-cushions, springs, or other devices so liable to get out of order that have heretofore been attempted, by a simple and cheap construction, easily worked, and not liable to derangement, that is easily repaired, and that relieves the carriage from the shock of the discharge without rigidity in holding. I attain these purposes by the devices illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of the carriage and gun with the left-hand wheel removed. Fig. 2 shows a coupling to hold and regulate the length of the chord or tension-rod *c*. Fig. 3 is a plan of the gun-carriage and anchor.

The reference-letters are used in all the figures to designate like parts.

A indicates the gun; B, the gun-carriage. These should be made in the most approved form; but my device can be applied to any carriage to which it is suited. That is no part of my invention. The trunnion plate or seat and cap-square surrounding the trunnion should be strong, and in front formed into a ring or other device to receive a hook or other convenient fastening on the upper end of a bar *b*, by which the parts are readily united. The bar *b* extends forward from that point to the ground, as clearly seen in Fig. 1, and terminates in a spade or other suitably-formed anchor *b'*, that stands nearly at right angles

to the shank of bar *b*, and is so shaped as to readily enter the ground. It should have a flat or concave face to hold by. The bar *b*, 55 extending up to the carriage on one side, has a duplicate or counter bar *b* connecting with the opposite trunnion. These bars and anchor can be made in one piece, or the anchor divided and coupled at their junction, 60 or otherwise. Near the spade *b'* a tension-rod *c* is coupled with each bar *b* at *c'* and extends back to the trail of the carriage. These rods *c* are so formed that they can be made longer or shorter in any convenient way, so 65 as to be drawn taut, when the anchor is in the ground, to hold it.

To effect the tightening I employ a lever *l* or an equivalent device. This lever *l* may be pivoted to the trail of the carriage, the tension-rod being attached to the lever at a proper 70 distance from the fulcrum, so that when the lever is drawn back the chord or tension-rod *c* is tightened. The lever may be held by bringing the connecting-point of the tension-rod 75 with the lever *l* below the line of the pivot or fulcrum, as seen in the drawings, where the lever rests on stop *m*. By raising the lever the tension-rod is freed, and the anchor can then be readily raised from the ground. 80 The rod *c*, if made in two parts, can be contracted or lengthened according to the inclination of the ground by a series of holes, as seen in Fig. 2, or by any other well-known or convenient way. The rod *c* and the bar *b*, or 85 either, may have a yielding coupling, if desired, to relieve the sudden percussive strain if the ground-anchor is not found to be entirely sufficient to take up the shock of the recoil. The tension-rod may be suspended by a chain 90 or link *d* to the trail of the carriage. Chains may be substituted in part for the rods or bars when applicable without changing the character of the invention.

The anchor and its several attachments 95 should be so formed as to be readily thrown back upon the trail or uncoupled and packed upon the carriage and as readily coupled for action. The spade can be easily raised from the ground by freeing the tension-rods, and 100 by tightening them the spades are held down. The spades, when made separately, can be united by a bolt or clamp at *c'*, where the tension-rods are connected with the bars *b*,

or be used separately, one from each trunnion, if found more advantageous in aiming, holding, or working the gun, or the bar *b* can be attached to the center under the gun when a
5 single bar is used.

Having thus set forth my invention, I claim—

1. The combination of a spade or spades anchored in front of the axle, as described,
10 with the rear end of the trail of a gun-carriage by means of a rod extending from the anchor to the trail, substantially as and for the purposes specified.

2. The anchors placed in front of the axle,

as described, combined with the trunnions of a gun by a direct connection extending from one to the other, as specified, by which the carriage, axle, and wheels are relieved from the principal strain and concussion in firing.

3. The combination of an anchor-bar, gun-carriage trail, and connecting-chord forming a truss to resist the action of the recoil upon the carriage, as specified.

G. G. GREENOUGH.

Witnesses:

J. J. GREENOUGH,

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