

No. 701,801.

Patented June 3, 1902.

K. DEINLEIN.

RECOIL APPARATUS FOR ORDNANCE.

(Application filed Dec. 28, 1901.)

(No Model.)

Fig. 1.

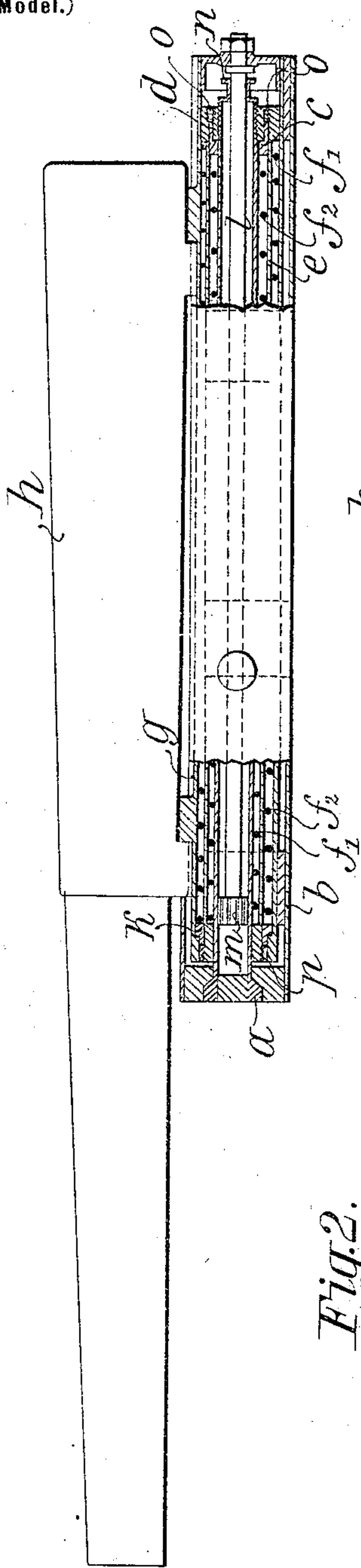


Fig. 2.

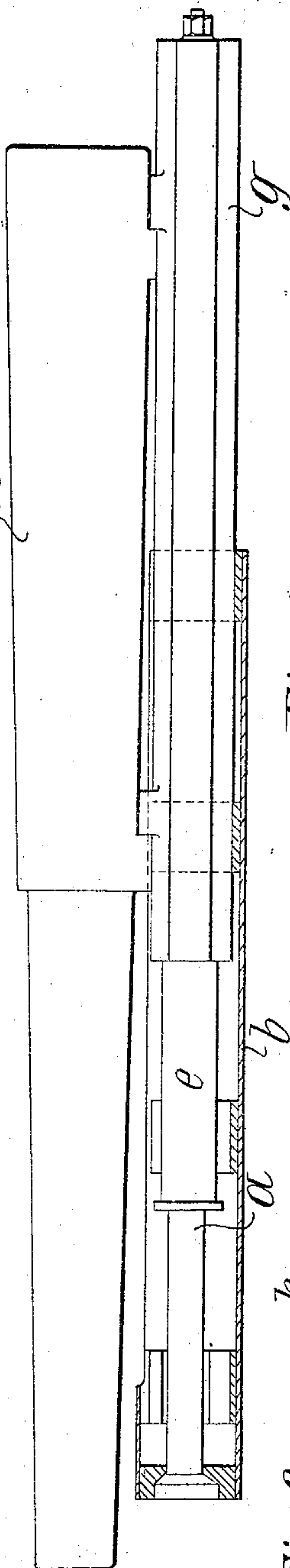


Fig. 3.

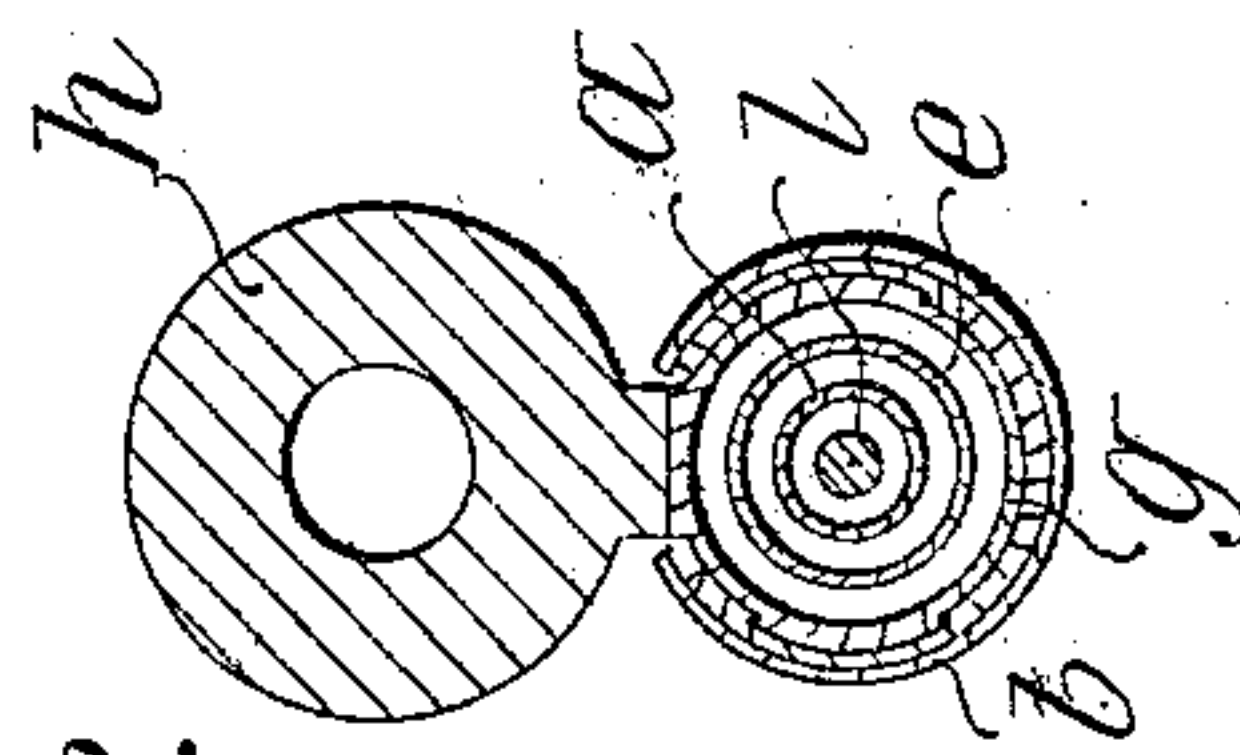
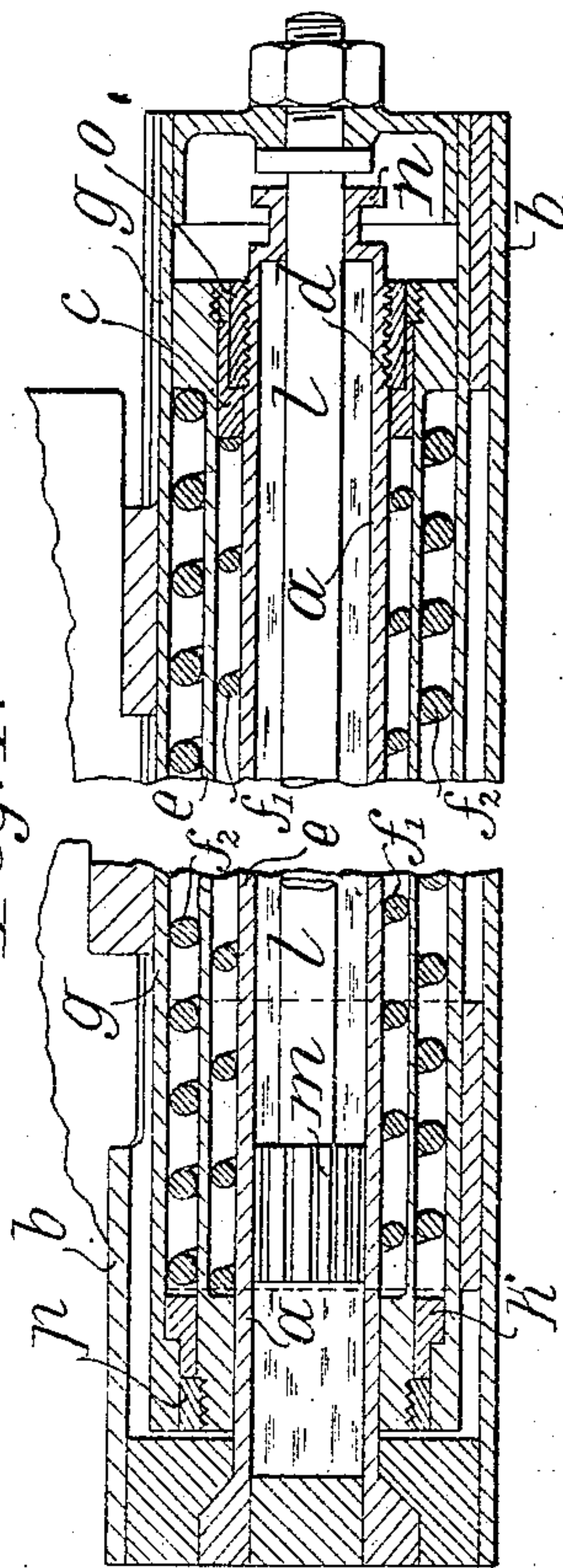


Fig. 4.



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UNITED STATES PATENT OFFICE.

KARL DEINLEIN, OF PILSEN, AUSTRIA-HUNGARY, ASSIGNOR TO SKODA-WERKE ACTIENGESELLSCHAFT IN PILSEN, OF PILSEN, AUSTRIA-HUNGARY, A FIRM.

RECOIL APPARATUS FOR ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 701,801, dated June 3, 1902.

Application filed December 26, 1901. Serial No. 87,260. (No model.)

To all whom it may concern:

Be it known that I, KARL DEINLEIN, a subject of the Emperor of Austria-Hungary, residing at Pilsen, in the Province of Bohemia, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Recoil Apparatus for Ordnance; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to improved means, in combination with a recoil-brake for ordnance provided with recoil-carriages, for returning a gun to its firing position, and comprises apparatus, hereinafter referred to as "compound return apparatus," adapted to be inserted as a single article into the top carriage of the gun or to be removed therefrom when it may be desired to change it. This compound return apparatus comprises substantially two or more coiled springs arranged between telescopic tubes, the outermost tube being adapted to slide in the top carriage and being connected to the piston-rod of the brake, while the innermost tube is adapted to slide on the brake-cylinder. The ends of the telescopic tubes are closed by stationary and movable annular parts, as presently described, that serve as abutments for the ends of the springs. The individual tubes are prevented from sliding away from one another or from the brake-cylinder under the pressure of the springs inserted between them by means of rings screwed either to the fixed annular parts or to the brake-cylinder.

Return apparatus according to this invention may thus form one compound article and can be inserted in the top carriage with the springs extended and be secured in position by means of the screwed ring that connects it to the brake-cylinder, and, if desired, the return apparatus can be changed as one compound article after removing the screwed ring. During the backward movement of the gun the coiled spring having the largest diameter is compressed by means of the outermost tube

simultaneously with the movement of the brake-piston until the compression of the said spring overcomes the resistance of the spring next in order, and this second spring is in turn compressed by the telescopic tube that surrounds it, which is moved forward by the outermost spring, and so on, the power required for returning the gun to the firing position being thus stored up in the springs.

One example of compound return apparatus according to this invention and having two springs is illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of the gun and a part longitudinal section through the top carriage, the brake-cylinder and the springs being in the positions they respectively occupy before firing. Fig. 2 shows a side elevation of the gun and the compound return apparatus located in the top carriage shown in longitudinal section, all the parts being in the positions they respectively occupy after the gun has moved back. Fig. 3 is a cross-section of Fig. 1; and Fig. 4, a section, drawn to a larger scale, showing the forward and rear ends, respectively, of the compound return apparatus.

a is the brake-cylinder, which is attached to the top carriage b at its forward end and in which there is arranged to slide a piston m , provided, as well understood, with holes or passages for the purpose of allowing flow of the retarding liquid and whose rod l passes outwardly through a stuffing-box n of the brake-cylinder. The brake-cylinder is surrounded by one, f' , of the two component springs f' and f'' of the compound return apparatus. This spring bears against the annular part c , surrounding the brake-cylinder, and the said annular part abuts against the ring d , screwed to the brake-cylinder. The spring f' is held in its extended position by means of the shoulder formed on the forward end of the inner tube e , that surrounds the spring. The tube e is also provided at its rear end with a shoulder, against which the spring f'' , that surrounds the tube e , bears. This second spring is surrounded by the outer tube g , connected to the gun h , and bears, as does also a shoulder formed on the forward end of the tube g ,

against an annular part k , adapted to slide on the tube e and to keep the extended spring f^2 in position.

At the rear end of the tube g there is fixed a cover, to which the rod l of the brake-piston is secured.

In order, on the one hand, to prevent the annular parts c and k from being forced outward under the pressure of the extended springs f' and f^2 when the compound return apparatus is not secured to the brake-cylinder, and, on the other hand, to maintain the springs in an extended condition, there are screwed behind the annular parts c and k into the corresponding ends of the tube e rings o and p , so as to enable a compound return apparatus to be withdrawn from or placed in the top carriage as one article. For this purpose it is only necessary in the one case to unscrew the ring d from the brake-cylinder or in the alternative case to screw on the ring after a fresh apparatus has been placed thereon.

During the recoil of the gun h the tube g and also the brake-piston m move in the top carriage b correspondingly therewith. The spring f^2 is compressed by the annular part k , which is guided on and moves on the tube e . When its compression is greater than the resistance of the spring f' , the spring f^2 causes the tube e to slide, so that it is moved, together with the screwed rings o and p , in relation to the brake-cylinder a , and the annular portion c , held by means of the screwed ring d , and so compresses the spring f' . The power required for returning the gun to the firing position is therefore stored up by means of this telescopic movement of the tubes g and e and the compression of the springs thereby produced.

I claim—

1. In an apparatus for returning a gun to its firing position, the combination with a top carriage provided with a slot in the top thereof, of a brake-cylinder mounted within and connected to one end of said carriage, a piston arranged in the cylinder, an inner tube surrounding the brake-cylinder, a spring interposed between said inner tube and said brake-cylinder and adapted to be compressed by said inner tube, an outer tube inclosing said inner tube, a spring interposed between the said inner and outer tubes and adapted to be compressed by said outer tube, connections between the outer tube and the gun, and connections between the outer tube and the piston, the compressing of the spring

upon the inner tube being in advance of the compressing of the spring upon the cylinder during the action of firing.

2. In an apparatus for returning a gun to its normal position, the combination with a top carriage provided with a longitudinal slot, of a brake-cylinder arranged within said carriage and connected to one end thereof, an inner tube inclosing said cylinder, a spring interposed between said inner tube and said cylinder and abutting a shoulder on the latter and adapted to be compressed by said inner tube, an outer tube inclosing said inner tube, a spring interposed between said inner and said outer tube and abutting against a shoulder on the inner tube and adapted to be compressed by the outer tube, and connections between said outer tube and the gun.

3. In an apparatus for returning a gun to its firing position, the combination with the top carriage provided with a longitudinally-extending slot in the top thereof, of a brake-cylinder mounted within and connected to one end of said carriage, a piston arranged in the cylinder, an inner tube surrounding the brake-cylinder and having at its forward end an internal shoulder and at its rear end an external shoulder, an annulus interposed between the rear end of the tube and said cylinder, a ring d secured to the cylinder and arranged between the same and said annulus, a ring o secured to said tube and interposed between the same and said ring d , a spring surrounding said cylinder and abutting against the internal shoulder of the inner tube and said annulus, an outer tube inclosing said inner tube and provided with an internal shoulder at its forward end, an annulus interposed between said outer and inner tube and abutting against the internal shoulder of the outer tube, a ring p secured to the inner tube and arranged between the same and said outer tube, a spring mounted upon said inner tube and abutting against said annulus and external shoulder of the inner tube, connections between said outer tube and the gun, and connections between said outer tube and the piston.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

KARL DEINLEIN.

Witnesses:

JOSEF RÜBURCH,
ALVESTO S. HOGUE.