

(No Model.)

F. MOHR.  
BRAKE FOR GUN CARRIAGES.

No. 500,927.

Patented July 4, 1893.

FIG. I.

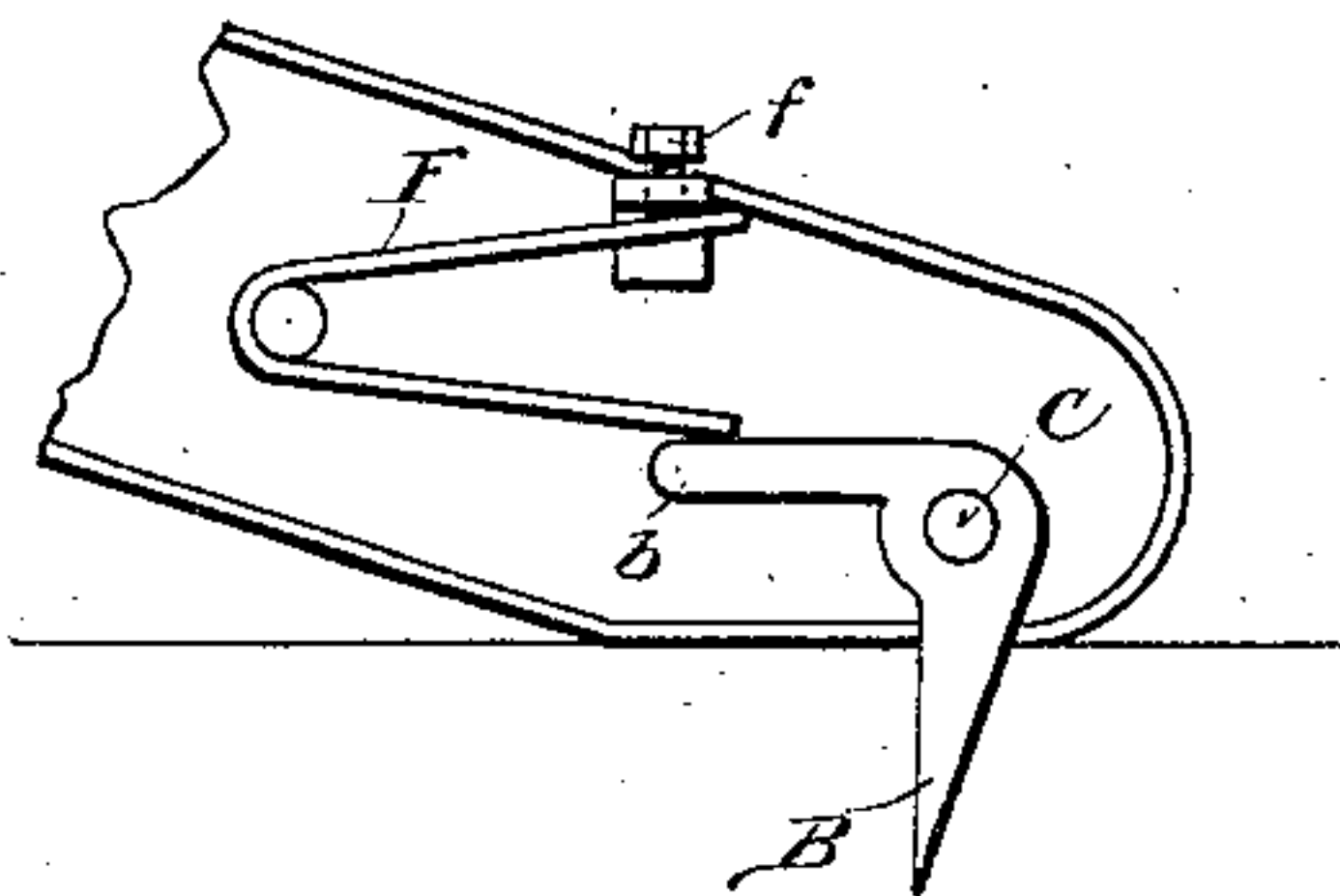


FIG. II.

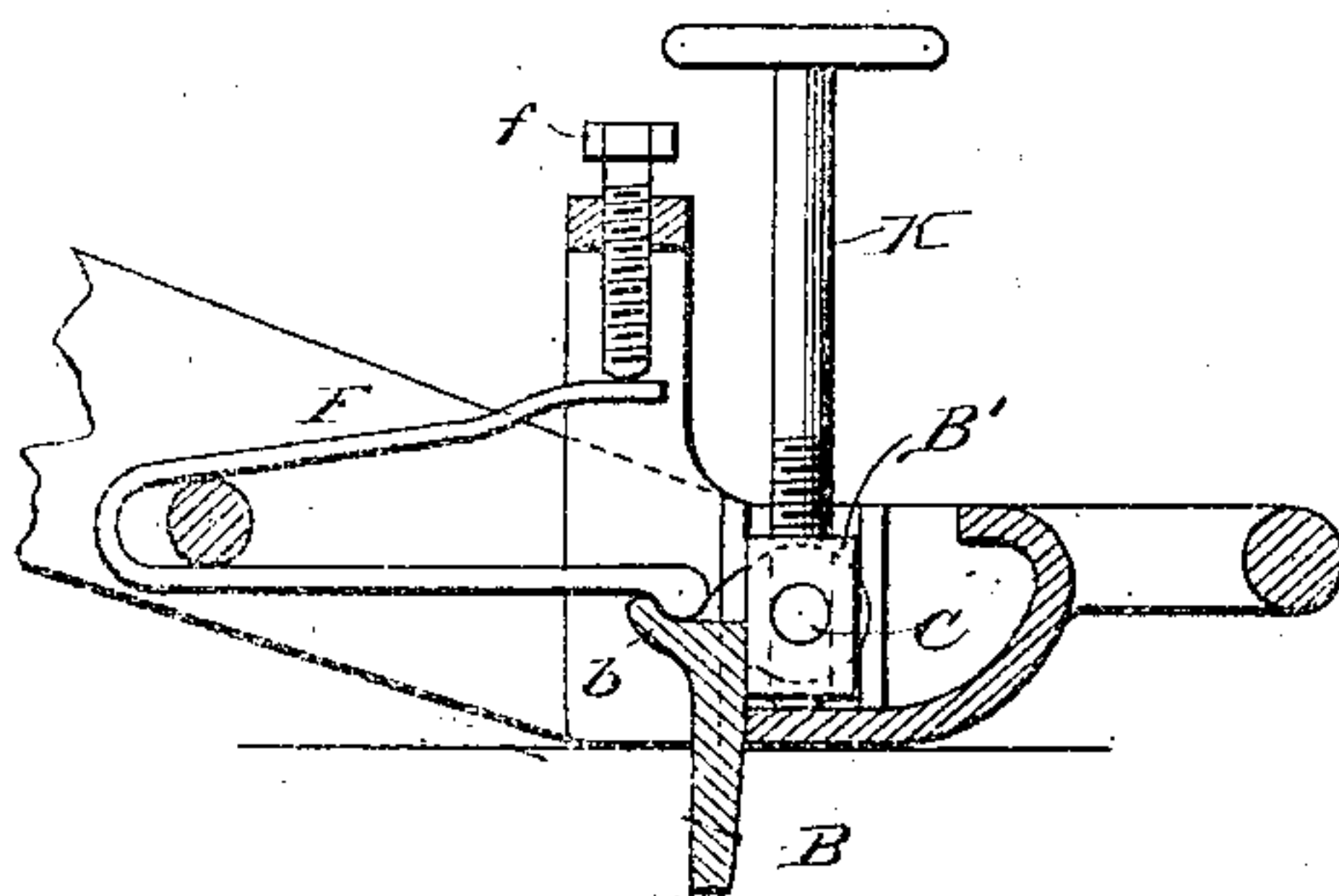
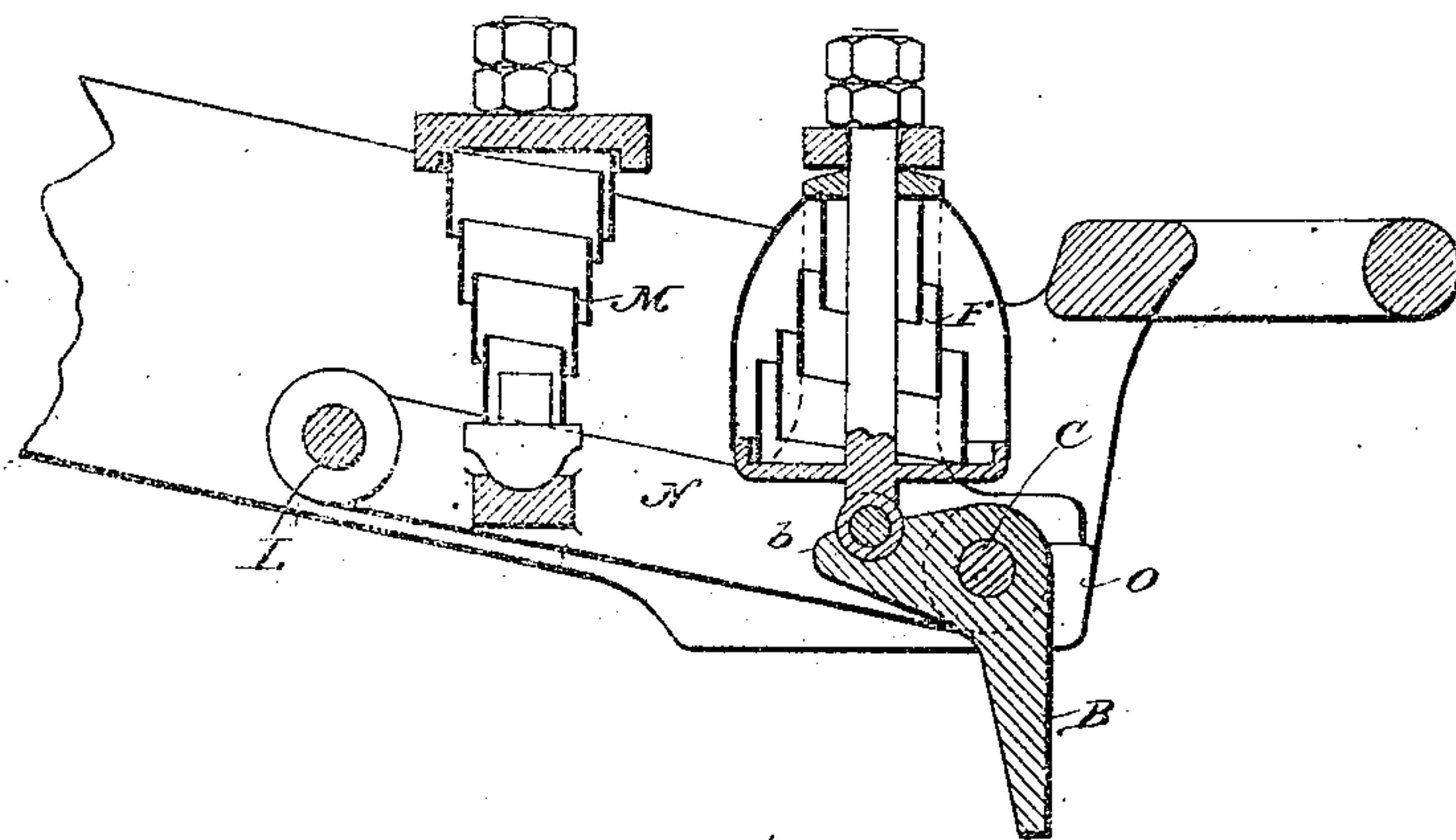


FIG. III.



Witnesses:  
Henry S. Rohrer.  
George E. Crum.

Inventor:  
Frederick Mohr.  
By Smith Bros.  
Attorneys

# UNITED STATES PATENT OFFICE.

FREDERIK MOHR, OF MAGDEBURG-BUCKAU, GERMANY, ASSIGNOR TO THE GRUSONWERK, OF SAME PLACE.

## BRAKE FOR GUN-CARRIAGES.

SPECIFICATION forming part of Letters Patent No. 500,927, dated July 4, 1893.

Application filed October 5, 1892. Serial No. 447,894. (No model.) Patented in Belgium May 13, 1892, No. 99,673.

*To all whom it may concern:*

Be it known that I, FREDERIK MOHR, a subject of the King of Denmark, and a resident of Magdeburg-Buckau, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Brakes for Gun-Carriages, (for which I have obtained Letters Patent in Belgium, No. 99,673, dated May 13, 1892,) of which the following is a specification.

My invention relates to a brake for gun-carriages which is particularly adapted for use upon wheeled gun-carriages.

The object of my said invention is to provide upon the gun carriage a simple and efficient brake which engages with the ground, and offers to the recoil a resistance which is automatically proportioned so that it may never cause the gun to jump.

According to the said invention the improved brake has a spur, arranged preferably on the trail of the gun-carriage so as to be forced into the ground and increase the frictional resistance to the recoil. The resistance is kept constant for any particular state of the ground by means of a special device hereinafter fully explained.

In order that my invention may be clearly understood I will now proceed to describe the same with reference to the accompanying drawings in which—

Figure I is a side elevation of the end of the trail of a gun to which an improved brake according to my said invention is applied, and Figs. II and III are longitudinal central sections through the ends of other trails, to which alternative forms of the said improved brake are applied.

Like letters indicate corresponding parts throughout the drawings.

With reference first to Fig. I, B is a spur adapted to turn upon a bolt C fixed in the trail of the gun-carriage, and provided with an arm *b*. F is a spring secured to the trail with one of its ends arranged to bear upon the arm *b*. *f* is an adjusting-screw bearing upon the other end of the spring, and capable of being adjusted in a suitable bearing in the trail to vary the compression of the spring and the pressure on *b*. When the gun is unlimbered, the spur B is forced into the ground

by that part of the weight of gun and carriage, which rests upon the trail of the gun-carriage. The said spur enters more or less deeply into the ground according to the nature and condition of the same and is driven in still farther during the firing. During the recoil the spur B cuts a furrow in the ground, the length of which represents the minimum recoil reached under the conditions chosen. When succeeding rounds are fired this furrow is lengthened, as the shortness of the same renders it superfluous to run the gun up to the original position for firing. The device so far as it has been described would control the recoil upon ground of a certain kind, if a fixed spur of suitable proportions were chosen. But if a gun-carriage provided with such a fixed spur were brought upon firmer ground, for example, jumping of the gun would soon occur, in the firing, as the resistance of the spur to the recoil would exceed the admissible limit. It is to permit of the regulation of the resistance offered by the spur, that, as hereinbefore described it is pivoted upon the axis C, and the power of the spring F is such that in the recoil there will be a turning movement of the spur B upon the axis C at the moment when the pressure of the wheels upon the ground becomes approximately nothing. When the spur B turns, its depth of penetration decreases, and thus, also, the resistance which it offers to the recoil. Accordingly the said brake apparatus adjusts itself, in each case automatically, as the brake spur turns exactly as far as the resistance of the ground demands. The wheel brakes of the gun-carriage therefore become superfluous for preventing recoil although they may of course be retained for other purposes. The power of the spring F which is required for the purpose can be readily calculated without difficulty and can moreover be regulated by the adjusting screw, while the most favorable dimensions of the spur B can best be determined by experiment. In lieu of the spring F weights could be arranged to bear upon the spur B, but it is undesirable to increase the weight of the gun-carriage, by employing weights in this manner. As another alternative other pressure may be employed to bear upon the spur by any suitable means. If it be desired to still farther de-



crease the recoil at the expense of a slight jumping of the gun-carriage, it is only necessary to increase the compression of the spring sufficiently.

5 In the arrangement shown in Figs. II and III the spur, for reasons hereinafter set forth, need not be made of a length and width to render it suitable for use in the softest ground. With reference now to Fig. II, K is a screw 10 which bears upon a portion of the trail and passes through a block B' to which the spur is rotatably secured. By employing the said screw to move the block, the spur can be adjusted so that it protrudes more or less from 15 the trail of the gun carriage. It is thus adjusted when in use, thereby enabling the resistance of the ground to act upon a greater or smaller surface of the spur and its mean effective leverage to be varied.

20 In Fig. III is shown an arrangement in which the spur is also automatically adjusted vertically according to the nature or condition of the ground. In this modification the pin C on which the spur turns is carried by an arm 25 or frame N arranged to turn about the second bolt L which is fixed in the trail of the gun-carriage. A spring M presses upon a part of the trail and upon the said arm or frame. According to the resistance of the ground and 30 of the spring M the spur is forced more or less deeply into the same. O is a stop by which the downward movement of the arm or frame N is limited.

To determine the dimensions of the spur 35 let the assumption be made that it is entirely sunk in loose ground in a vertical position and that the gun is fired in the lowest position of depression. The resistance offered by the spur to the recoil of the gun must then 40 be such that jumping of the gun round the trail of the gun-carriage is just prevented or is confined to definite admissible limit. In general only the first case will have to be taken into consideration, that is to say the recoil 45 will be limited only to such an extent that jumping of the gun is just avoided. If this condition is fulfilled the pressure of the wheels upon the ground will be approximately nil at the moment of the firing, and the pressure of the trail of the gun-carriage upon the 50 ground and therefore also the frictional resistance will reach their admissible maximum.

As hereinbefore stated the object in the 55 construction of such improved brakes is to bring the resistance offered by the spur to the turning movement into proper relation with the momentum of the force counteract-

ing the bouncing of the gun. The designer will have to decide first how nearly it is desirable to approach the attainable minimum 60 of the recoil.

Having now particularly described my invention, what I claim is—

1. The combination with the trail of a gun, 65 of a spur hinged thereon and projecting downward for insertion into the ground, and a spring having one end fixed and the other end adjusted to oppose the turning of said spur on its hinge substantially for the purpose explained. 70

2. In a brake for a gun carriage the combination with the trail, of a hinged spur projecting downward therefrom and suitable means for adjusting the position of the hinge 75 on the trail, substantially as and for the purposes specified.

3. In a brake for a gun-carriage the combination with the trail, of an arm or frame pivoted to the trail, and having a spur projecting 80 therefrom and a spring on the trail adjusted to resist the swinging movement of said arm or frame on its hinge, substantially as and for the purposes specified.

4. In a brake for a gun-carriage the combination of the trail, a pivoted spur projecting 85 from the end of the trail and having an extension, and a spring between said extension and a fixed portion of the trail, as and for the purpose specified. 90

5. In a brake for a gun-carriage, the combination of the trail, a pivoted spur, a spring bearing at one end upon the spur and resisting its swinging movement, and a screw 95 threaded in a fixed part and engaging the other end of said spring, all substantially as and for the purposes set forth.

6. In a brake for gun-carriages the combination of the trail, the pivoted spur, means for adjustably securing the pivot of the spur 100 on the trail, and the spring mounted on the trail and bearing against the spur, substantially as and for the purposes set forth.

7. In a gun-carriage the combination of the trail a frame pivoted on the trail, a spur pivoted in said frame, a spring also carried by 105 the frame and bearing against the spur for keeping it in vertical position, and a spring carried by the trail and bearing on the pivoted frame for holding it down with a yielding pressure, all substantially as and for the 110 purpose set forth.

Witnesses:

FREDERIK MOHR.

HERMANN LUBOWSKI,  
EMIL KALLNECKER.