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PATENTED MAR. 17, 1903.

O. LAUBER.  
RECOIL BRAKE FOR GUNS.  
APPLICATION FILED JUNE 16, 1902.

NO MODEL.

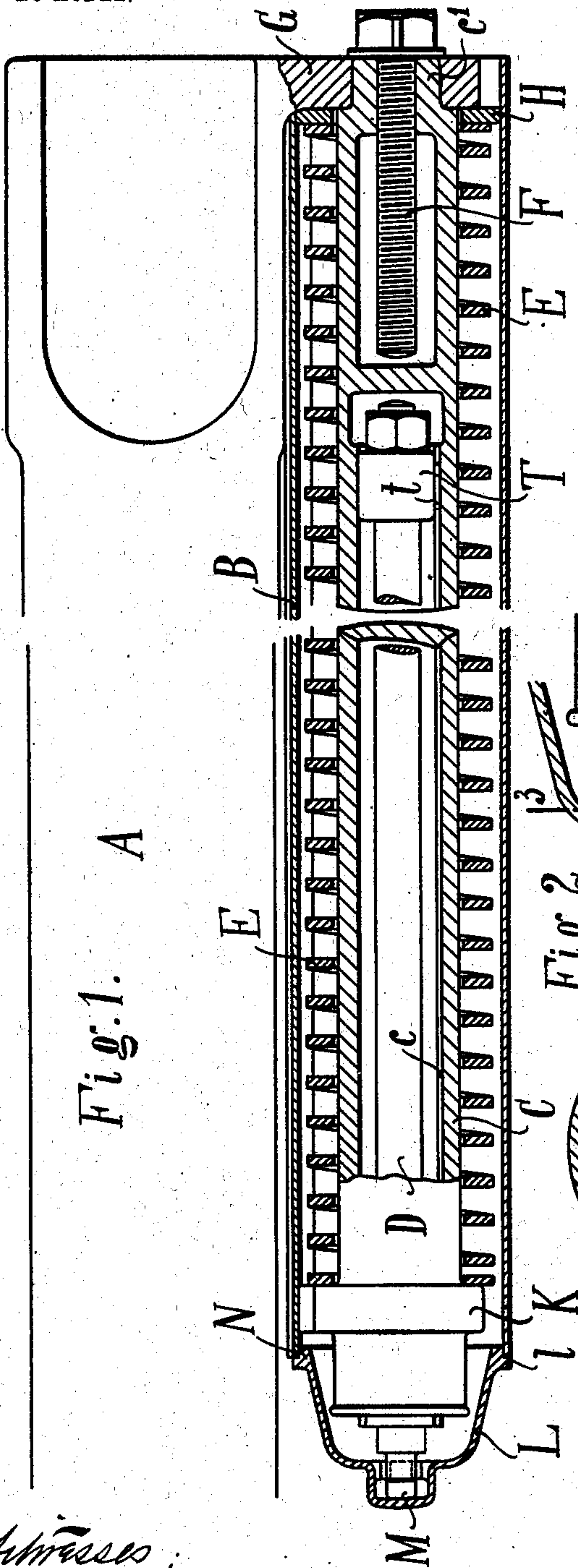


Fig. 1. A

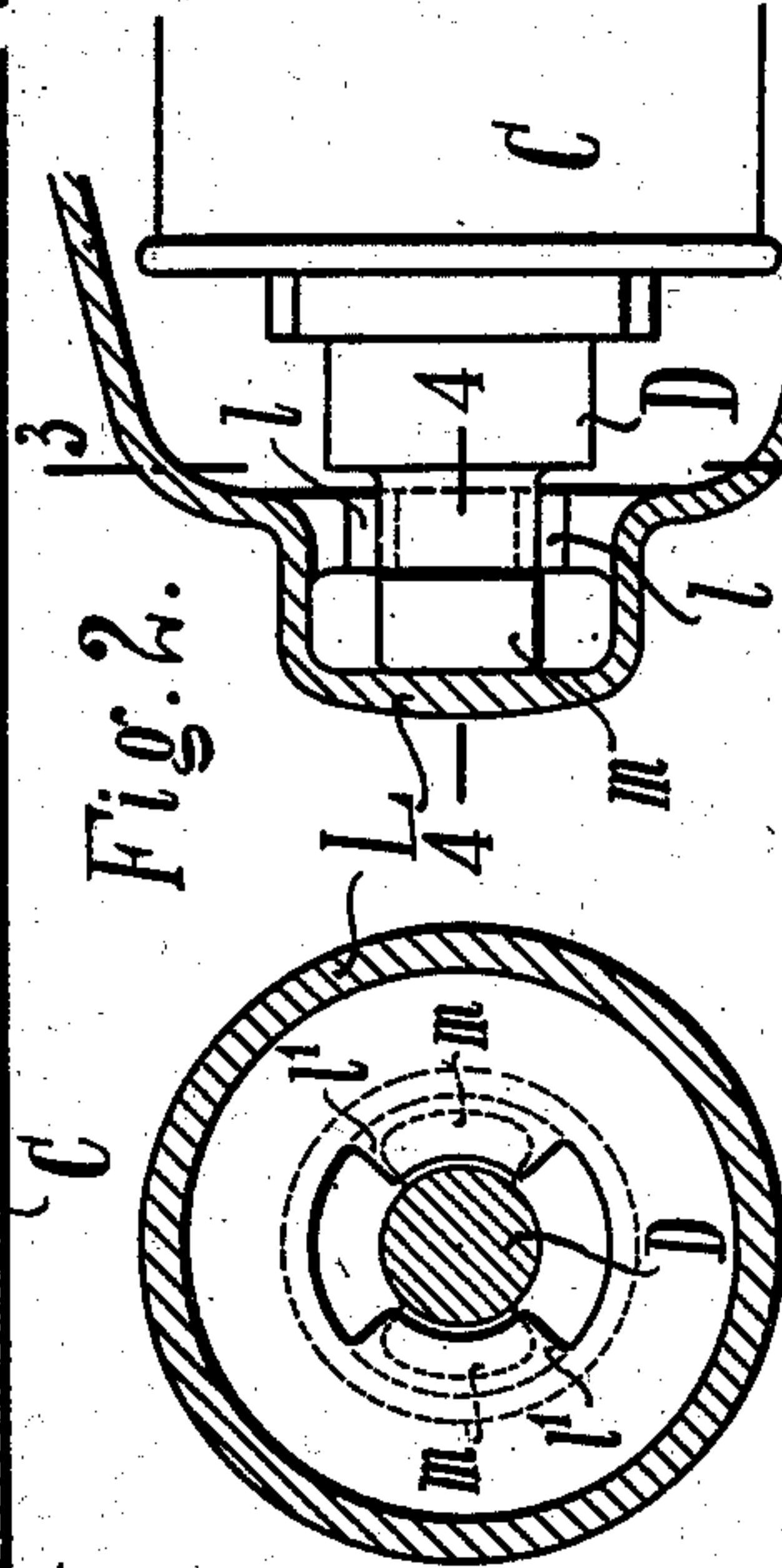


Fig. 2.

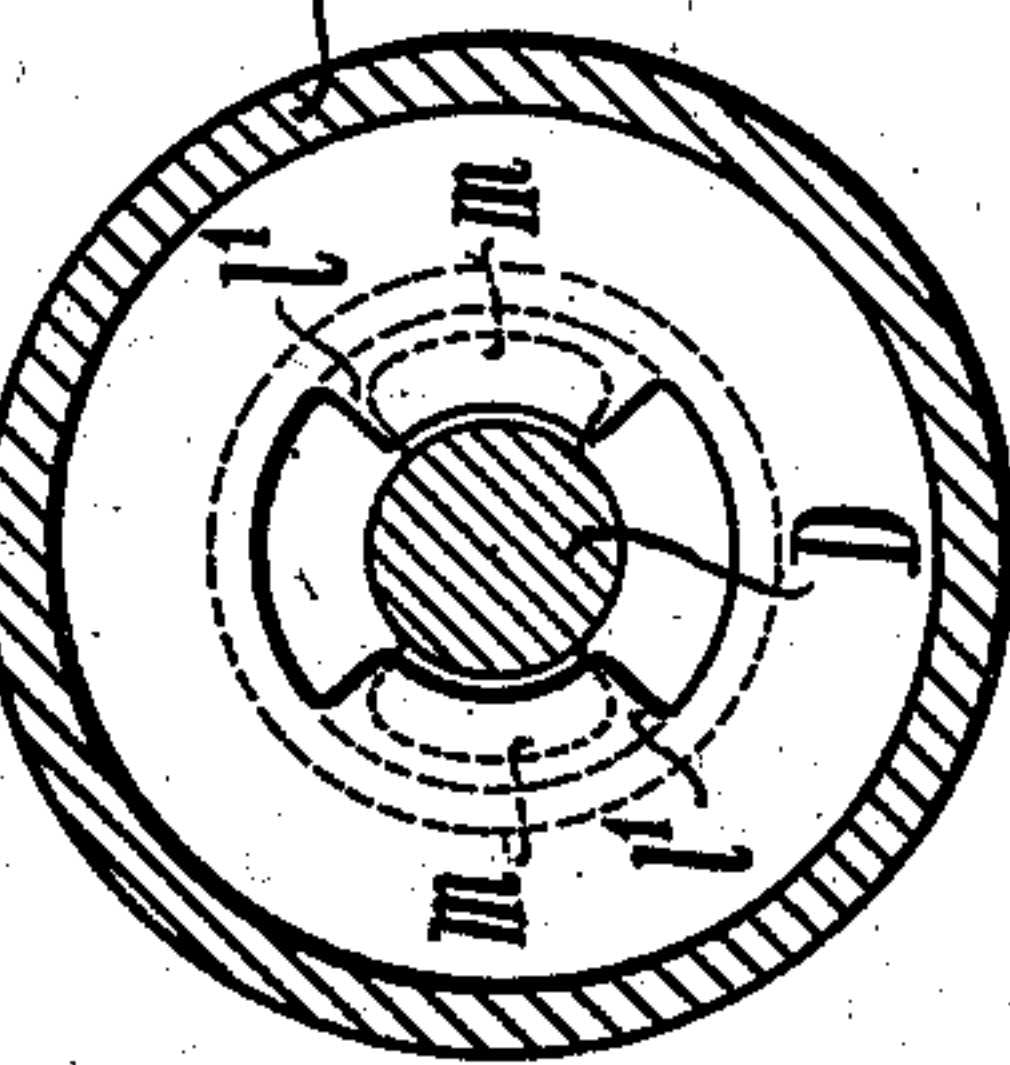


Fig. 3.

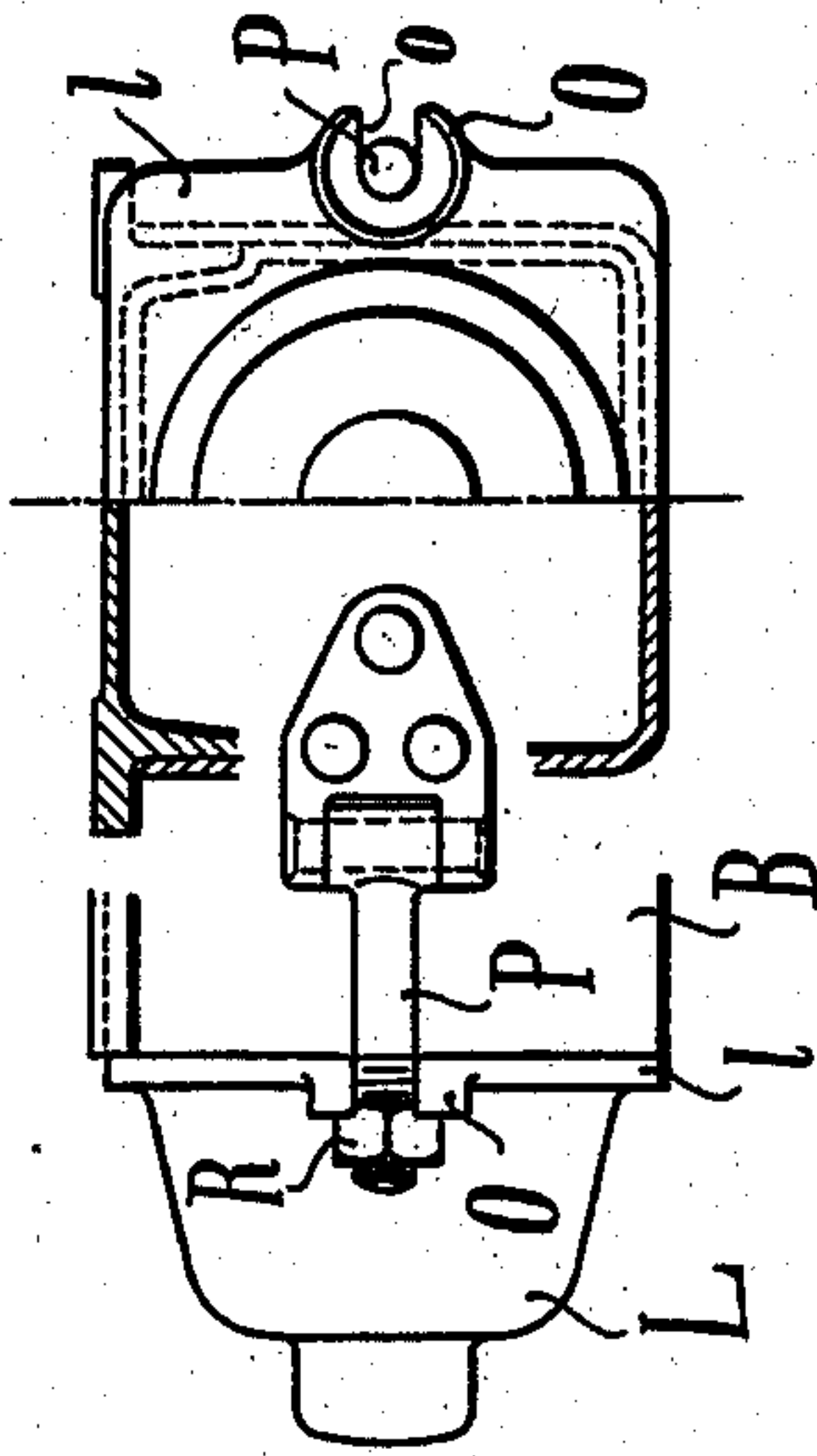


Fig. 5.

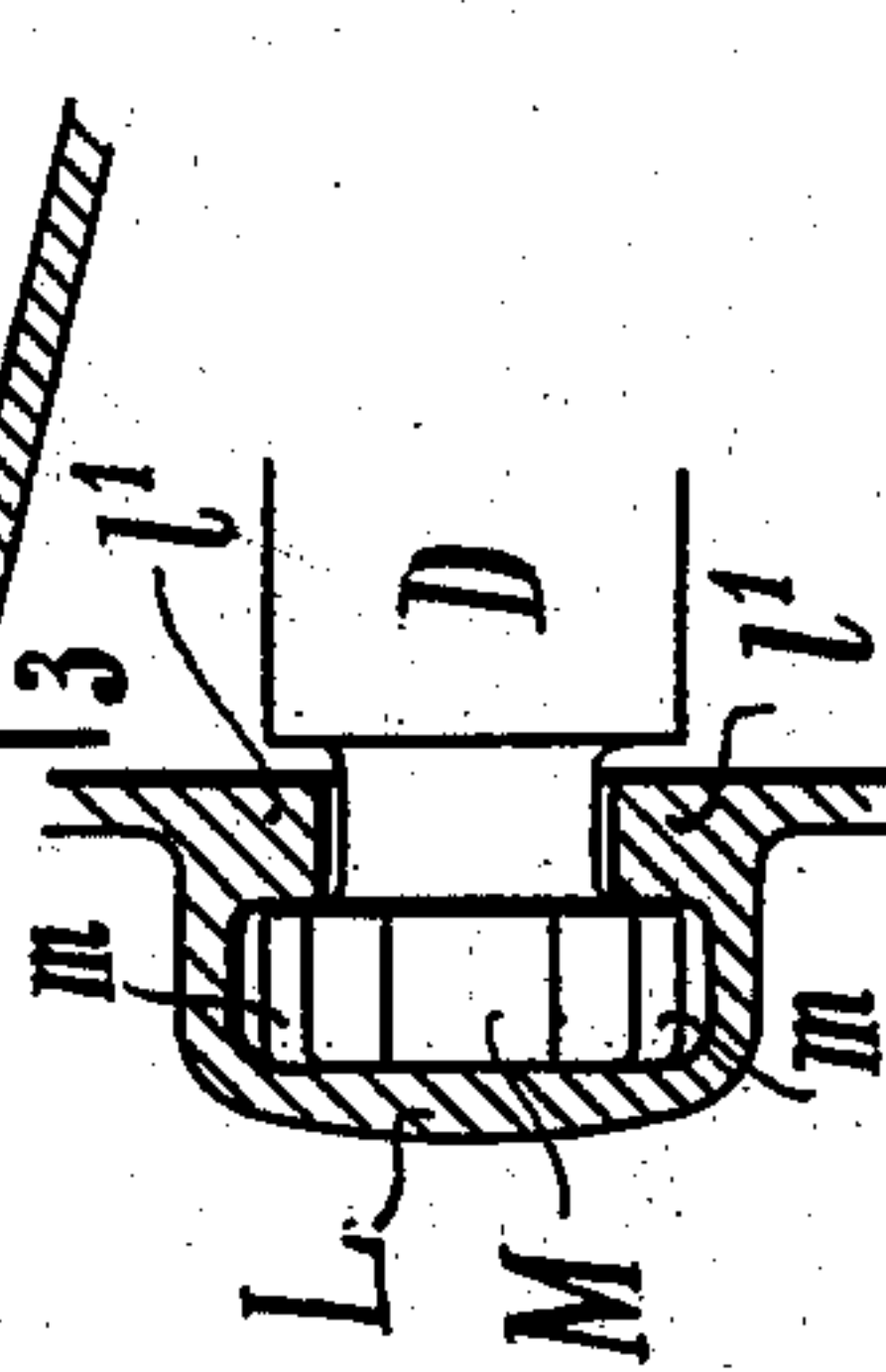


Fig. 4

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# UNITED STATES PATENT OFFICE.

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## RECOIL-BRAKE FOR GUNS.

SPECIFICATION forming part of Letters Patent No. 722,724, dated March 17, 1903.

Application filed June 16, 1902. Serial No. 111,899. (No model.)

*To all whom it may concern:*

Be it known that I, OTTO LAUBER, engineer, a subject of the Emperor of Germany, and a resident of Essen-on-the-Ruhr, Germany, have invented certain new and useful Improvements in Recoil-Brakes for Guns, of which the following is a specification.

This invention relates to recoil-brakes for guns in which the barrel alone recoils, and particularly to a device for connecting the piston-rod of the recoil-brake with the cradle or with the gun-barrel.

The object of the invention is to provide a connection which will permit the quickest possible detachment and connection of the brake and hold the piston-rod free from tendency to bend. This object is accomplished by this invention by having the rod of the brake-piston secured to the cap which closes the end of the cradle or to a horn on the breech of the gun through the medium of a bayonet-joint, the piston-rod, and the cap, respectively, the barrel being held against turning.

One embodiment of this invention is represented by way of illustration in the accompanying drawings, in which the piston-rod is connected with the cradle.

In the drawings, Figure 1 shows the recoil-brake, together with the parts of the gun which come under consideration, partly in side elevation and partly in vertical longitudinal section. Fig. 2 is a detail view, on an enlarged scale, of parts shown in Fig. 1. Fig. 3 is a section on the line 3 3, Fig. 2, viewed from the right. Fig. 4 is a section on the line 4 4, Fig. 2. Fig. 5 is a side elevation of the forward end of the recoil-brake, and Fig. 6 is a front view of the same parts in which the cap is partly cut away.

The gun-barrel A is guided in a well-known manner upon a cradle B, of essentially rectangular section. (See Fig. 6.) The cradle incloses the hydraulic brake C D, the recuperator-spring E, and a tension-screw F, which latter serves at the same time for fixing the brake-cylinder C to a horn G of the gun-breech. The recuperator-spring E is slid upon the brake-cylinder C and abuts, on the one hand, against an abutment H, rigidly connected with the cradle, and, on the other

hand, against a shoulder K on the brake-cylinder. The hydraulic brake may be of any desirable character, so long as it will fulfil the conditions that the brake-piston and with it the piston-rod are guided in the brake-cylinder without rotation. In the present case it is assumed that the piston T, which is rigidly connected to the piston-rod D, is provided with an extension *t*, which engages in a rectilinear groove *c* of the brake-cylinder C. The piston-rod D is provided with a head M, constructed with lateral projections *m*, Figs. 3 and 4, which head is designed to establish connection between the piston-rod and the cradle B through the medium of a cap L, closing the forward end of the cradle in a manner to be hereinafter more fully described. The cap L has the form of a hollow truncated cone, approximately, which is set upon a rectangular plate *l*. The latter is provided with a substantially rectangular ledge N, which fits into the forward end of the cradle and secures the cap L against turning. In the middle of two oppositely-lying side edges of the plate *l* are provided lugs O, formed with slits *o*. On the forward ends of the side walls of the cradle B are two screw-bolts P, mounted to swing in a horizontal plane, which can be laid into the slits *o* and will thus serve, in connection with the nuts R, to set up an easily-releasable connection between the cradle B and the cap L. Within the cap L and lying diametrically opposite each other are two segmental lugs *l'*, offset from the end of the cap L a distance corresponding to the height of the extensions *m* on the head M of the piston-rod. The lugs *l'* are so shaped that they leave a free opening corresponding to the section of the piston-rod head, through which opening the piston-rod head may be easily introduced.

The assembling of the recoil-brake is accomplished as follows: After sliding the recuperator-spring E on the brake-cylinder C the brake-cylinder is forced into the cradle of the gun-barrel, accompanied by a compression of the spring E from the front, until the screw F takes into the threads of the cylinder extension *c'*. The screw F is then turned in until the extension *c'* passes through



the abutment H and seats itself in the opening of the horn G and the brake-cylinder rests upon the horn G. By this means the recuperator-spring will be put under its initial tension. Then the piston-rod D, together with the piston T, is introduced into the brake-cylinder in such a way that the projection *t* of the piston engages in the groove *c* of the brake-cylinder. The projections *m* of the piston-rod head will now be found in a horizontal position. The forward end of the brake-cylinder is now closed, and while the piston-rod has not been forced completely into the brake-cylinder the cap L is so placed upon the piston-rod that the head of the latter enters the opening between the lugs *l'* of the cap L and its face lies against the closed end of the cap. The cap is now rotated relatively to the piston-rod ninety degrees, so that the projections *m* of the piston-rod head M enter behind the lugs *l'* of the cap L and the cap is securely fastened to the piston-rod in an axial direction. The cap L, together with the piston-rod, is now moved until the cap comes against the forward end of the cradle, with the guiding-ledges N engaging in the forward end of the cradle. Finally the screw-bolts are clapped into the slits *o* and a rigid connection between the cap and the cradle is established through the nuts R. The brake-piston is now securely connected with the cradle through the medium of the cap L and remain fixed or at rest in the recoil and running-out movements of the gun-barrel, while the brake-cylinder follows these movements with the gun-barrel. The disassembling of the brake takes place in the reverse order.

The described arrangement insures not only facility for assembling and disassembling the recoil-brake, but the further advantage of permitting the head of the piston-rod to have play in a plane perpendicular to the longitudinal axis of the rod, in consequence of which latter the piston, together with the piston-rod, can yield slightly and follow any deviation of the brake-cylinder from its prescribed path, so that the tendency of the piston-rod to bend and uneven wearing of the stuffing-box will be prevented.

For those cases in which the brake-cylinder is secured to the cradle fixedly and the piston-rod is connected with the horn G on the breech of the gun-barrel, so that the piston-rod and piston partake of the movement of the gun-barrel, it is obvious that the openings and lugs shown in the drawings as being provided in the cap L for the head M of the piston-rod would be provided in the horn G instead. The connection of the piston-rod with the gun-barrel would then follow in the same manner as has been described above with reference to the connection of the piston-rod with the cap or through the cap with the cradle.

Having thus described the invention, the following is what is claimed as new therein:

1. In a recoil-brake for guns, a device for securing the piston-rod of the recoil-brake to the part with which it is to be connected, consisting of a bayonet-joint connection between said piston-rod and the part with which it is to be connected, means for securing said piston-rod against turning, and means also for securing said part against turning.

2. In a recoil-brake for guns, a device for securing the piston-rod of the recoil-brake to the part with which it is to be connected, consisting of a cap having a bayonet-joint connection with said piston-rod, and means for detachably securing the cap to the part of the gun to which the rod is to be secured.

3. In combination with a gun and its mount, constructed to move, the one relatively to the other, in the recoil and running-out movements of the gun, a recoil-brake comprising a cylinder, a piston held against turning in the cylinder, and a cap having bayonet-joint connection with the rod of the piston, and means for detachably securing the cap to one of the parts of the gun between which relative movement takes place.

4. In a recoil-brake for guns, the combination of a cylinder, a piston working in the cylinder, but prevented from turning therein, a piston-rod, a cap having bayonet-joint connection with said piston-rod, and fitted to the part of the gun to which the piston-rod is to be secured, and bolts securing said cap in place.

5. In a recoil-brake for guns, the combination of a cylinder, a piston working in the cylinder, means holding the piston against turning in the cylinder, a piston-rod, a cap secured to said piston-rod with a turning movement, and means for locking said cap against turning on the gun.

6. In a recoil-brake for guns, the combination of a brake-cylinder, a piston working in said cylinder, but prevented from turning therein, a piston-rod formed with projections, a cap having an opening receiving said projections, and lugs behind which said projections engage when the cap is rotated relatively to said piston-rod, and means detachably securing the cap to the portion of the gun with which the piston-rod is to be connected.

7. In a recoil-brake for guns, the combination with a cylinder, a piston working in said cylinder and having a piston-rod, a cap detachably secured to said piston-rod, and means for securing said cap to the part of the gun to which the piston-rod is to be connected, consisting of the screw-bolts connected to said part, swinging laterally thereon, and carrying nuts, and lugs formed on said cap slitted to receive the screw-bolts, substantially as set forth.

8. In a recoil-brake, the combination with the cradle, a barrel sliding thereon, a brake-cylinder mounted within the cradle and secured to the gun, a piston working in the cylinder, provided with a piston-rod, and means holding the piston and rod against turning,



of a removable cap closing the end of the cradle and securing the piston-rod to the said cradle.

9. In a recoil-brake, the combination with  
5 the cradle, a barrel sliding thereon, a brake-cylinder mounted within the cradle and secured to the gun, a piston working in the cylinder, provided with a piston-rod, and means holding the piston and rod against turning,  
10 of a cap secured to the piston-rod by a turning movement, and means securing the cap to the cradle to prevent its turning.

10. In a recoil-brake for guns, the combination with a barrel, a cylinder, a piston working in the cylinder, and provided with a piston-rod, of means movably securing the piston-rod to the gun. 15

The foregoing specification signed at Dusseldorf this 30th day of May, 1902.

OTTO LAUBER.

In presence of—  
WILLIAM ESSENWEIN,  
PETER LIEBER.