

No. 722,725.

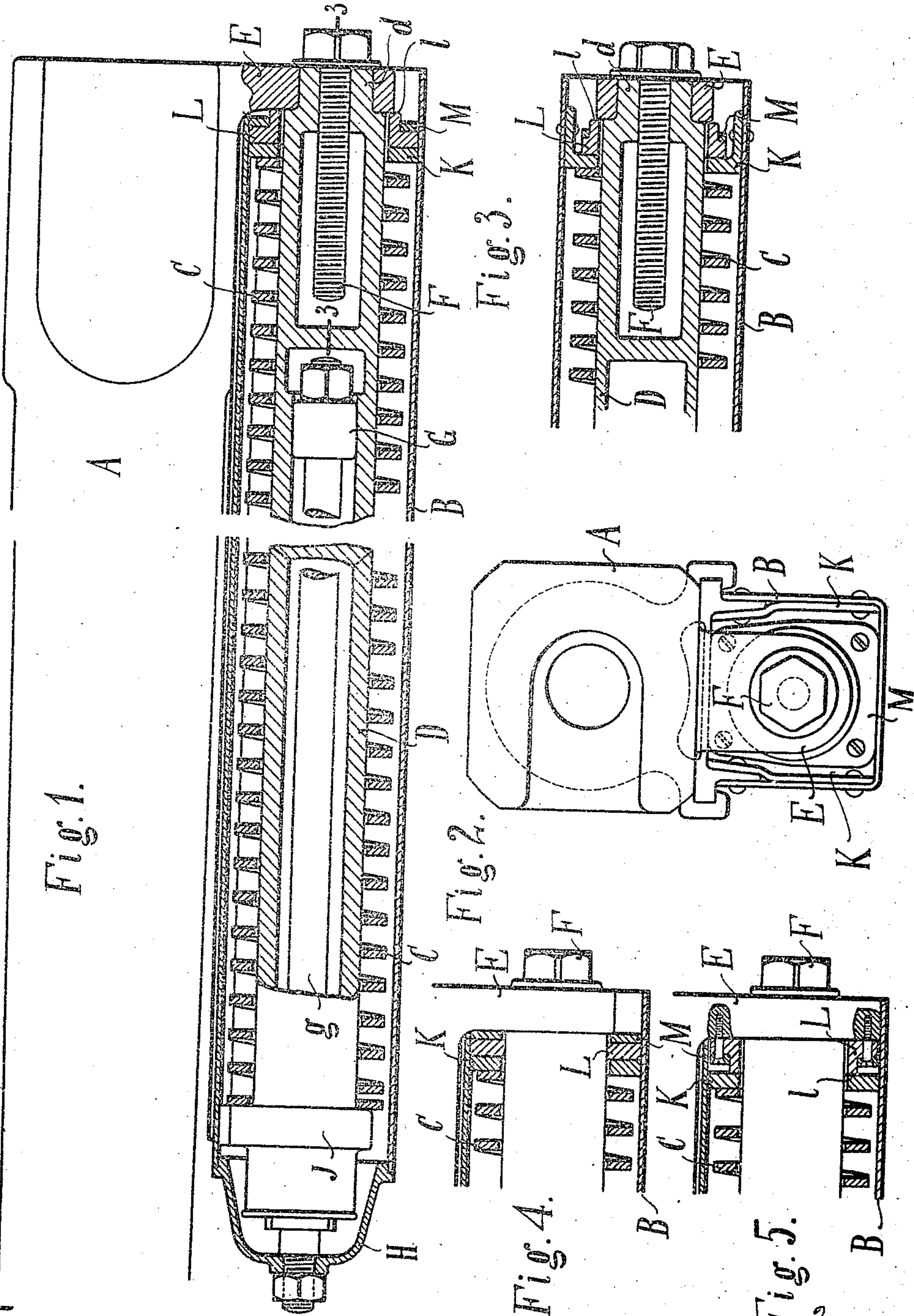
PATENTED MAR. 17, 1903.

O. LAUBER.

GUN WITH BARREL RECOIL HAVING RECUPERATOR SPRING.

APPLICATION FILED JULY 28, 1902.

NO MODEL.



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# UNITED STATES PATENT OFFICE.

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## GUN WITH BARREL-RECOIL HAVING RECUPERATOR-SPRING.

SPECIFICATION forming part of Letters Patent No. 722,725, dated March 17, 1903.

Application filed July 23, 1902. Serial No 117,348. (No model.)

*To all whom it may concern:*

Be it known that I, OTTO LAUBER, a subject of the Emperor of Germany, and a resident of 36/2 Holsterhausen, Essen-on-the-Ruhr, Germany, have invented certain new and useful Improvements in Guns with Barrel-Recoils Having Recuperator-Springs, of which the following is a specification.

This invention relates to guns with barrel-recoil and recuperator-springs for returning the gun-barrel to the firing position, and has for its object to provide means for protecting the interior of the cradle against the entrance of dust and other foreign matter. In guns of this type as heretofore constructed the end of the cradle toward the breech end of the gun (the rear end) is not closed. In consequence of this dust and dirt enter the cradle during travel, lodge between the coils of the recuperator-spring, and seriously hinder the recoil and running-out movements of the gun-barrel in firing. The present invention avoids this difficulty by arranging a packing on the cradle or on the gun-barrel which encircles the part of the recoil-brake which moves with the gun in such a manner that the space between this reciprocating part and the cradle is closed at least in the firing position of the gun-barrel.

Three embodiments of this invention are shown in the accompanying drawings, in which—

Figure 1 is an embodiment of the invention in which the packing is arranged on the cradle, those parts of the gun which come under discussion being shown partly in side elevation and partly in vertical section. Fig. 2 is a rear view of Fig. 1. Fig. 3 is a section on the line 3-3 of Fig. 1 seen from above. Fig. 4 is another embodiment in which the packing is likewise arranged on the cradle, and Fig. 5 is a third embodiment of the invention in which the packing is arranged on the gun-barrel.

The gun-barrel A is mounted upon the cradle B in a well-known manner, which cradle incloses the fluid-pressure brake and the recuperator-spring C. The fluid-brake may be of any suitable known construction. The cylinder D of the brake is connected with a horn E on the breech of the gun-barrel by

means of a screw F, while the piston-rod g of the brake-piston G is securely fastened to the cradle through the medium of a cap H. The brake-cylinder D is surrounded by the recuperator-spring C, which abuts at its forward end against a shoulder J of the brake-cylinder D and at its rear end against a plate K, secured to the cradle. This plate K joins the inner wall of the cradle in a dust-tight connection and encircles the brake-cylinder D so as to allow the latter some play.

According to the embodiment shown in Figs. 1 to 4 a packing L is secured to the plate K, which packing encircles the brake-cylinder in the form of a ring. In Figs. 1 to 3 this packing is shown with an L-shaped section, while in Fig. 4 it is shown with a rectangular section and secured to the plate K through the medium of a covering-plate M, lying parallel to said plate K, and suitable screws passing through the plate M into the plate K.

According to the embodiment shown in Fig. 5 the packing L retains its L-shaped section, but is not attached to a part of the cradle, but to the horn E on the breech of the gun-barrel, being likewise secured in place, however, through the medium of a covering-plate M and suitable screws or the like.

In the embodiment shown in Figs. 1 to 3 and also in that shown in Fig. 5 the packing L is constructed of elastic material and encircles the brake-cylinder with play. When the gun-barrel is in its firing position, the annular face l of the packing lies against the horn E of the gun-breech in the form shown in Figs. 1 to 3; but in the form shown in Fig. 5 it rests against the plate K. In the form shown in Fig. 4 the packing L consists of packing material and the dust-tight connection is made by its impingement against the periphery of the brake-cylinder.

The operation of the several arrangements described is as follows: Since, on the one hand, the cradle B is connected through the medium of the cap H with the rod of the brake-piston G, and, on the other hand, the brake-cylinder is connected to the gun-barrel through the screw F, the brake-piston remains stationary during recoil and running-out movements of the barrel, while the brake-



cylinder follows these movements. In the form shown in Fig. 4 when the gun-barrel runs back after a shot the packing L slides upon the outer surface of the brake-cylinder and protects the interior of the cradle against dust and the like during the movements of the barrel, as well as when the barrel is in its firing position. In the forms shown in Figs. 1 to 3 and in Fig. 5 the interior of the cradle is protected only when the parts are in firing position. In the latter cases the packing L works like a valve. As the packing in the two last-named cases is constructed of elastic material, it serves likewise as a buffer for the gun-barrel in the running-out movement of the latter.

Obviously without departing from the spirit of this invention the brake piston-rod could be connected with the horn on the gun-breech and the brake-cylinder connected to the front end of the cradle. With the parts arranged in this manner the packing L would surround the piston-rod instead of the brake-cylinder.

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

1. In a gun, the combination with the barrel, a hollow cradle open at one end, and a recuperator-spring mounted within the cradle, of means for protecting the interior of the cradle from dust or the like, consisting of a packing introduced into the space between the relatively moving parts at the open end of the cradle.

2. In a gun, the combination with the barrel, the open-ended hollow cradle, and the recoil-brake having a recuperator-spring mounted within the cradle, of a packing closing said open end at least when the barrel is in its firing position, surrounding the part which

reciprocates with the gun-barrel, secured to one of the relatively moving parts, and forming a dust-tight joint by impinging against the other.

3. In a gun, the combination with the barrel, the open-ended hollow cradle, and the recoil-brake having recuperator-springs mounted within the cradle, of a packing secured to the cradle, surrounding the parts that reciprocate with the gun-barrel and sliding thereon during recoil and return movement of the barrel and a plate M through which the packing is secured in place.

4. In a gun, the combination with the barrel, the hollow cradle open at one end, the recoil-brake secured to the gun-barrel and moving through the open end of the cradle, and the horn E projecting from the gun-barrel, of the plate K secured in the open end of the cradle, and the packing L between the horn and plate, making a dust-tight connection therewith, substantially as set forth.

5. In a gun, the combination with the barrel, hollow cradle having an open end, and a recoil-brake having a recuperator-spring mounted within the cradle, of a packing closing the space between said open end and parts which reciprocate therein during the recoil and return movement of the barrel; said packing being formed of elastic material, and affording a buffer for the gun-barrel in its return movement.

The foregoing specification signed at Dusseldorf, Germany, this 9th day of July, 1902.

OTTO LAUBER.

In presence of—

P. LIEBER,

WILLIAM ESSENWEIN.