

No. 633,366.

Patented Sept. 19, 1899.

A. RESOW & O. BEHNKE.

FIRING BRAKE FOR GUNS.

(Application filed July 18, 1899.)

(No Model.)

Fig. 2.

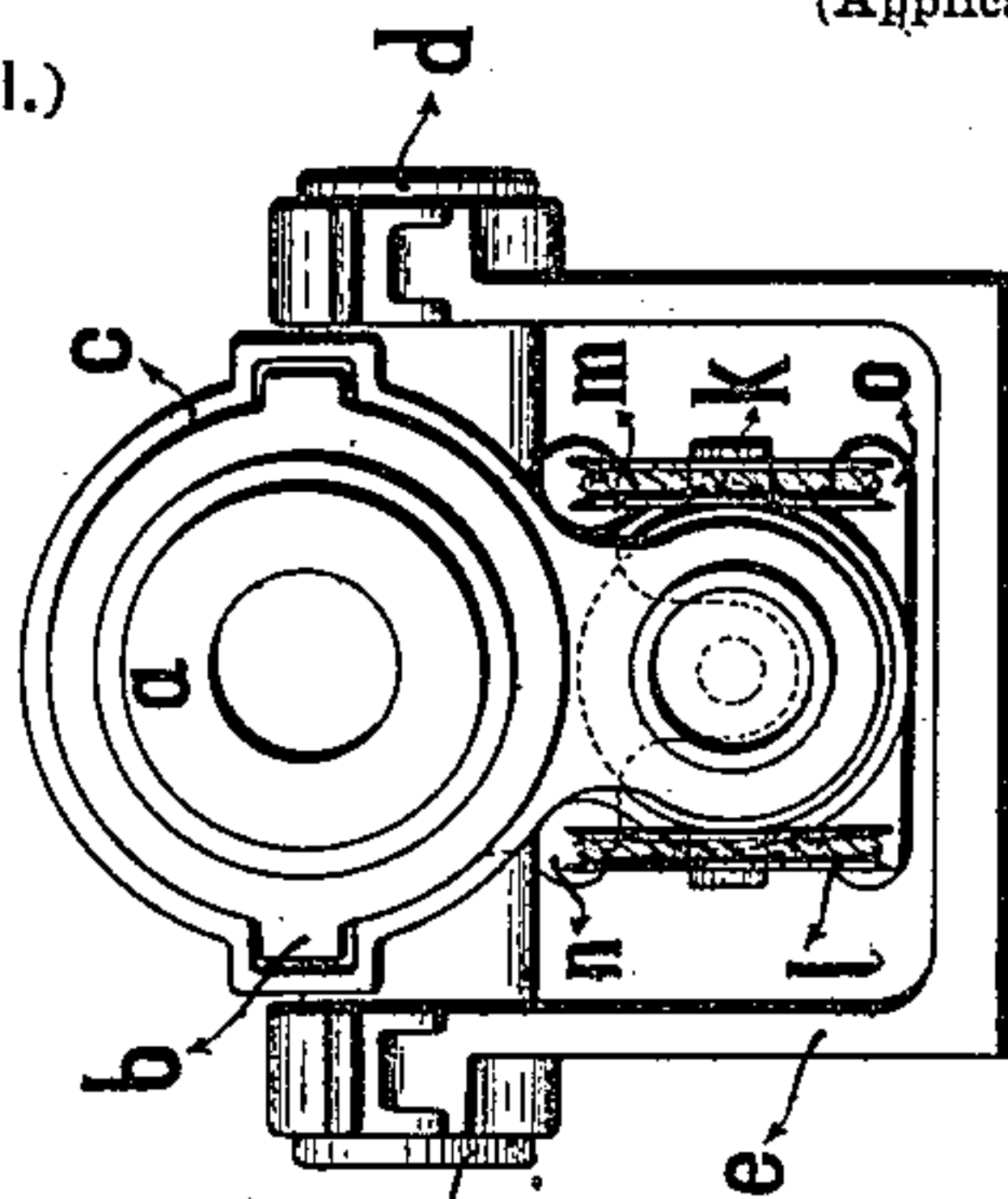


Fig. 4.

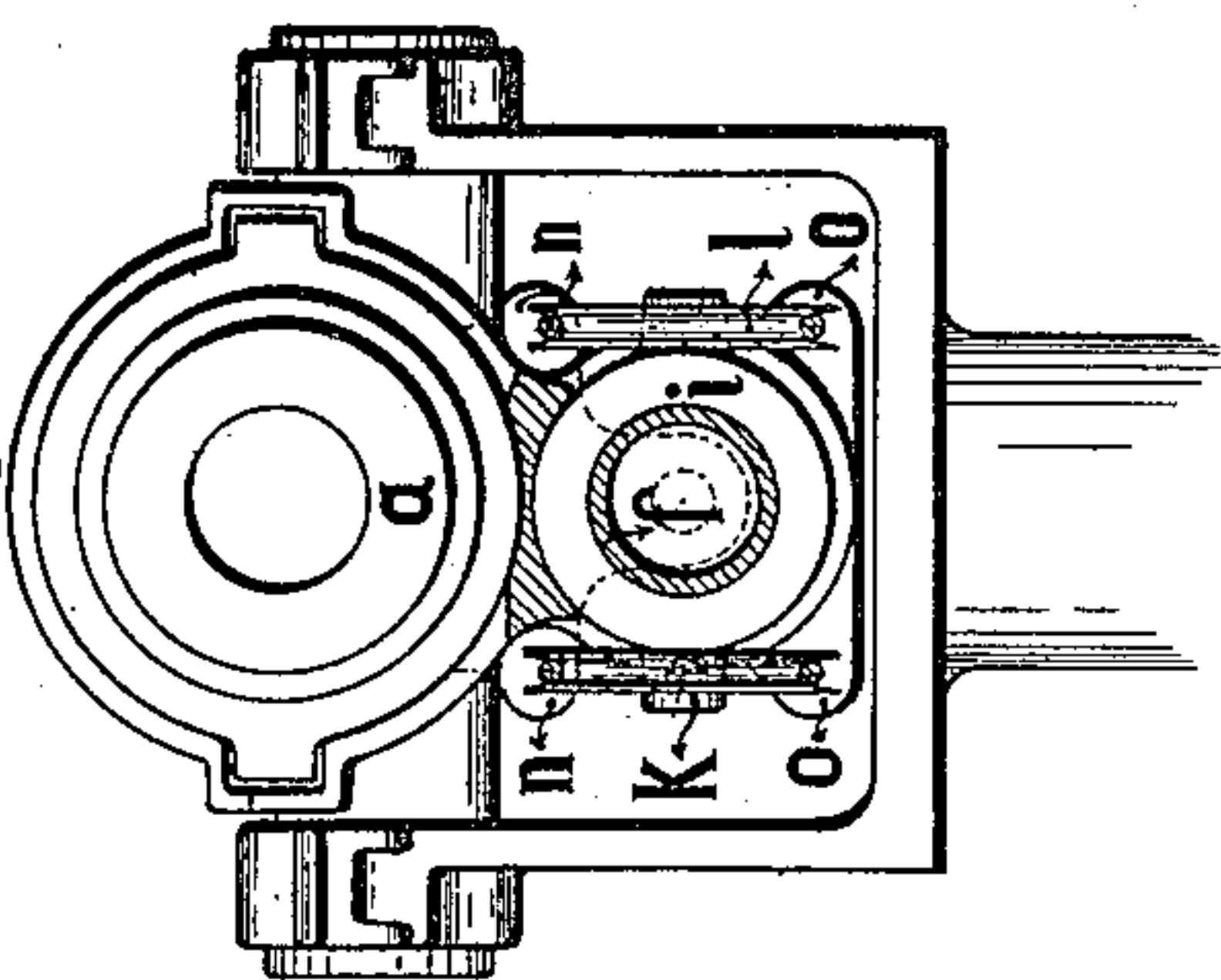


Fig. 1.

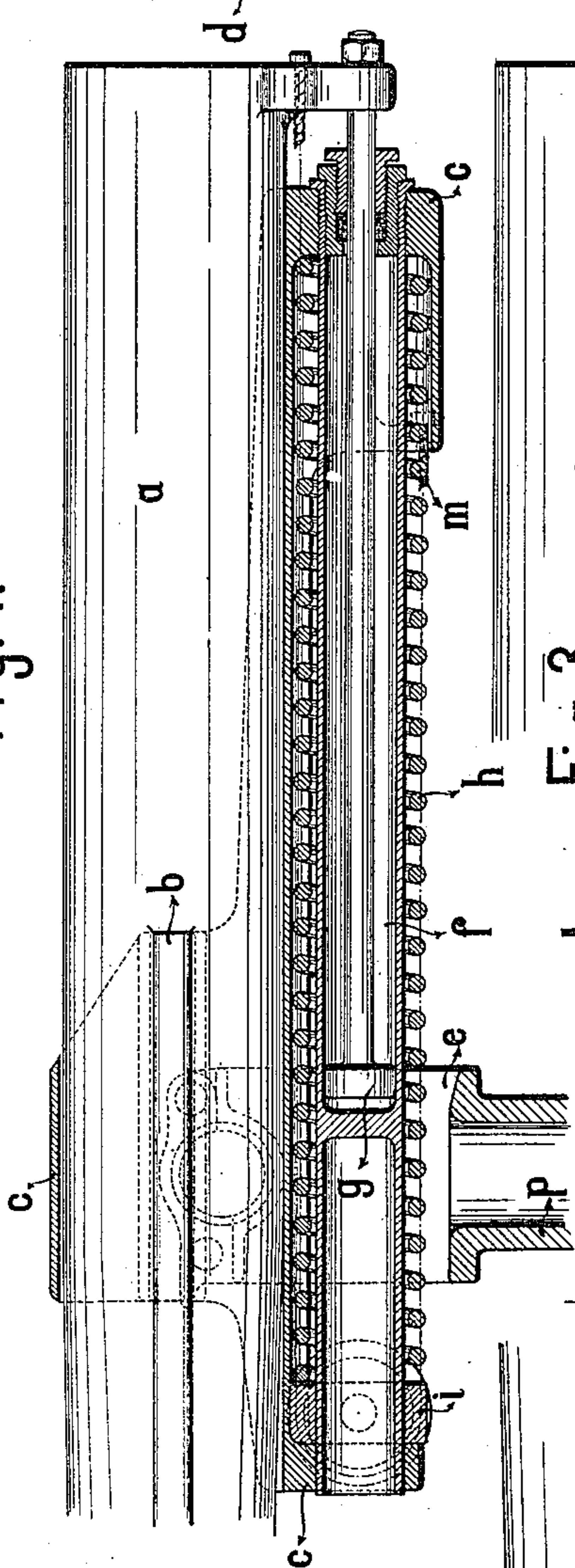


Fig. 3.

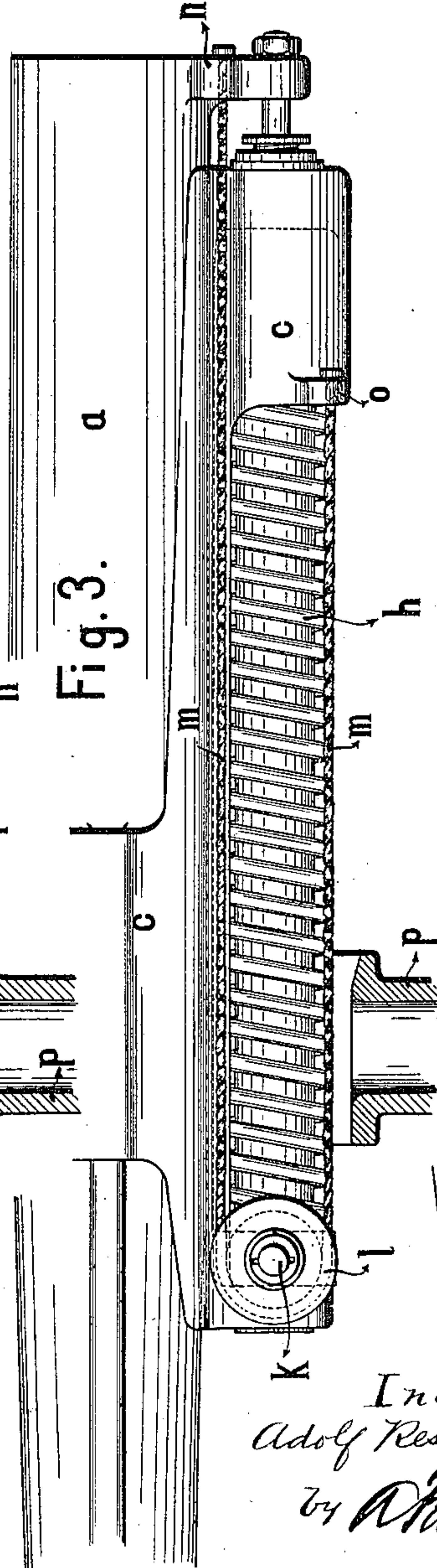
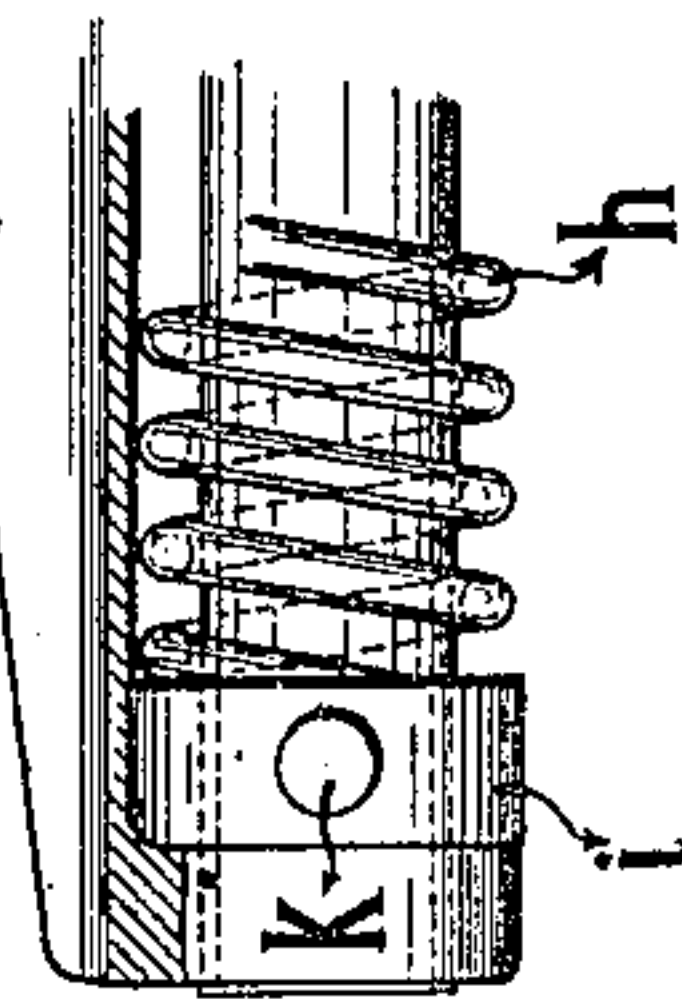


Fig. 5.



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UNITED STATES PATENT OFFICE.

ADOLF RESOW AND OTTO BEHNKE, OF ESSEN, GERMANY, ASSIGNORS TO
FRIED. KRUPP, OF SAME PLACE.

FIRING-BRAKE FOR GUNS.

SPECIFICATION forming part of Letters Patent No. 633,366, dated September 19, 1899.

Application filed July 18, 1899. Serial No. 724,239. (No model.)

To all whom it may concern:

Be it known that we, ADOLF RESOW, engineer, and OTTO BEHNKE, residing at Essen-on-the-Ruhr, Germany, have invented certain new and useful Improvements in Firing-Brakes for Guns, of which the following is a specification.

This invention refers to improvements in that class of firing-brakes for guns which is provided with a spring that is compressed during the recoil of the gun and after completion of the recoil returns the gun to its firing position. In the brakes of this character heretofore known the motion of the parts of the gun participating in the recoil is generally transmitted directly to the spring. This is the case in particular with guns in which the barrel recoils on the carriage. If, then, the length of recoil is very great, very long springs must be used, owing to the limited measure of compressibility of the spring, and said springs are not only difficult to place, but also considerably increase the weight of the gun, owing to the necessary guide-rods. The present invention is intended to avoid these difficulties, the length of compression of the spring being reduced by transmitting the motion of the part of the gun participating in the recoil to the recoil-spring through a rope-and-pulley connection, through which the gun is then returned to the firing position.

The annexed drawings illustrate the application of the invention to a gun with barrel-recoil.

In the drawings, Figure 1 is a longitudinal section of the upper part of the carriage with the gun-barrel in elevation. Fig. 2 is a corresponding front view. Fig. 3 is a side view of Fig. 1. Fig. 4 is a front view with the cradle partly cut away. Fig. 5 is a sectional view of part of Fig. 3.

Similar letters of reference designate corresponding parts throughout the several views of the drawings.

The gun-barrel is guided in the usual manner by its strips *b* sliding in corresponding ways of the cradle *c*, which is pivoted to the

fork *e* by its trunnions *d*. By a vertical pin *p* the fork *e* is pivoted to the lower part of the carriage in a usual manner. A brake-cylinder *f* is secured within the cradle.

g is a piston placed within the brake-cylinder, having its piston-rod rigidly connected to the gun-barrel. The brake-cylinder and its tubular prolongation are surrounded by a spring *h*, one side of which abuts against a fixed part of the cradle *c*, while the other end bears against an annular pulley-carrier *i*, which slides on the brake-cylinder.

k k are trunnions on the carrier *i*, on each of which is loosely mounted a grooved pulley *l*. Two ropes, chains, or the like *m* are connected each at one end to the lug *n* of the gun-barrel, pass over the pulleys *l*, and are connected at their other ends each to one of the eyes *o* of the cradle.

The operation of the apparatus is as follows: During the recoil motion the gun-barrel carries along the piston the ropes *m* and through the latter the pulleys *l*, whereby the spring is compressed. During this recoil action the distance through which the pulley-carrier *i* moves is but one-half of the travel of the gun-barrel, as in the use of a simple block and fall. For this reason the compression of the spring is but one-half of what it would be in the case of direct transmission from the barrel to the spring, so that by using a spring of the proper strength its length may be reduced to one-half without reducing the stored recoil energy. By the subsequent expansion of the spring the gun-barrel is returned to the firing position.

Without changing the nature of the invention a single pulley might be used instead of two, or a block-and-fall arrangement with additional pulleys may be used in a well-known manner, reducing the motion of the spring to one-fourth, one-sixth, &c. It is also immaterial, as far as the action of the apparatus is concerned, whether the spring is arranged on the cradle or on another part of the gun—for instance, within the carriage-body. The invention is also applicable when the gun-barrel does not slide within the car-

riage and the whole carriage compresses a spring while running back against a spur driven into the ground.

What is claimed as new is—

- 5 In a firing-brake for guns, a movable pulley-carrier, a spring abutting against a fixed part of the carriage and the movable pulley-carrier, and a flexible connection attached at one end to a part participating in the recoil
10 and at the other end to a fixed part, and passing over the pulley or pulleys on the carrier so as to form means for reducing the motion

of the spring, said spring returning the gun into the firing position, substantially as and for the purpose specified.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

ADOLF RESOW.
OTTO BEHNKE.

Witnesses:

WM. ESSENWEIN.
GEO. P. PETTIT.