

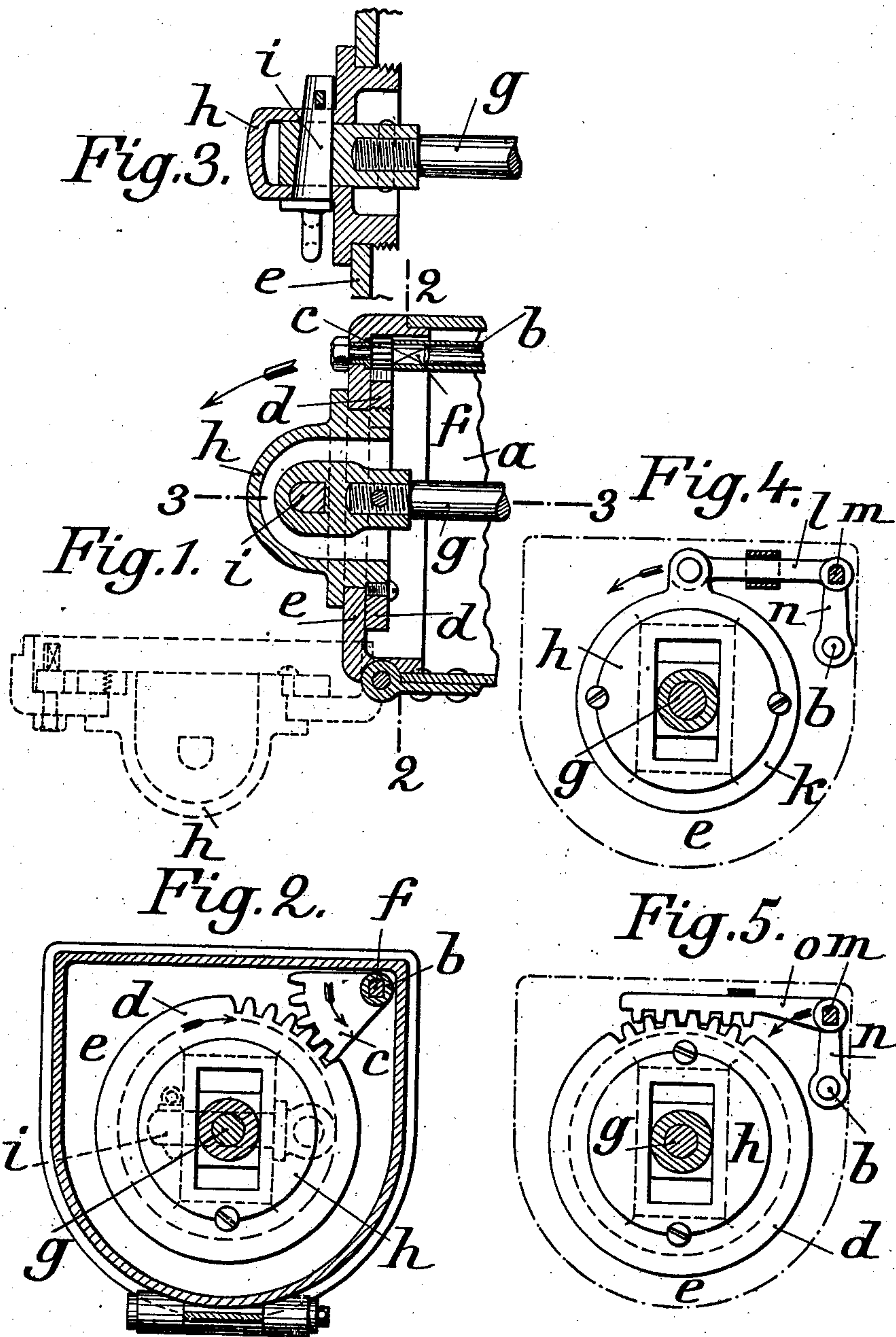
No. 827,678.

PATENTED JULY 31, 1906.

K. VÖLLER.

GUN HAVING A RECOIL BARREL AND AN ADJUSTABLE BRAKE.

APPLICATION FILED JAN. 26, 1906.



WITNESSES

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KARL VÖLLER, OF DUSSELDORF, GERMANY.

GUN HAVING A RECOIL-BARREL AND AN ADJUSTABLE BRAKE.

No. 827,678.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed January 26, 1906. Serial No. 298,057.

To all whom it may concern:

Be it known that I, KARL VÖLLER, engineer, a subject of the German Emperor, residing at 47 Zülicherstrasse, Dusseldorf, Germany, have invented certain new and useful Improvements Relating to Guns Having a Recoiling Barrel and an Adjustable Brake; 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.

In guns having a recoiling barrel of which the recoil is automatically effected by the movement for elevating the barrel in a certain sense, such as by being diminished as the elevation is increased, it is sometimes essential to remove or swing open the front plate of the cradle in which is arranged in part the mechanism for transmitting the movement for elevating to the device for regulating the braking action in order that the mechanism in the cradle may be inspected, oiled, or repaired. It can easily happen that when the front plate is replaced the transmission-gear is brought into incorrect relationship. For instance, should a toothed wheel carried by the front plate be accidentally rotated while the plate is removed it would engage falsely with the remaining gear within the cradle when the plate was replaced. In such a case the braking action would not properly correspond with the elevation.

According to the present invention part of the transmitting mechanism for the aforesaid purpose is so mounted on the front plate of the cradle that it can only engage with the part of the mechanism within the cradle when in proper relation thereto.

The accompanying drawings illustrate the invention in several modifications.

Figures 1 to 3 show an arrangement wherein the movement for elevating is transformed by toothed gear into a rotary movement of the piston-rod through which the braking action is regulated. Fig. 1 is a vertical section through the front end of the cradle. Fig. 2 is a transverse section on line 2 2 of Fig. 1, and Fig. 3 is a part horizontal section on line 3 3 of Fig. 1. Figs. 4 and 5 show two modifications.

Referring to Figs. 1 to 3, the elevating movement, produced in any known manner, is transferred to the tubular shaft *b*, contained in the cradle *a*. At the front end of

this shaft is a toothed sector *c*, which transmits the rotary movement of the shaft to the toothed disk or wheel *d*. According to the present invention the axle of the toothed sector *c* is journaled in the front plate *e* of the cradle, which plate can swing open on a hinge or be completely removed. The engagement between the said axle and the tubular shaft is by means of the partly-squared end *f* of the former, which end fits easily the correspondingly-shaped end of the tube *b*, so that the sector and tube, by reason of the unsymmetrical coupling, can only be engaged with each other in one position. The toothed wheel *d* is fixed on a hood *h*, acting as a nave to the wheel and rotating in the front plate *e* as a bearing. The head of the piston-rod *g* enters the hood when the front plate is in place and is engaged with it by an unsymmetrical key *i*, which can be inserted only when the head of the piston-rod and the toothed wheel *d* are in correct relative position. When the key *i* has been withdrawn, the front plate *e* can be swung open on a hinge, whereupon the end *f* of the axle of the sector on account of the considerable radius between itself and the hinge can easily withdraw itself from the tube *b*. All the parts and the interior of the cradle are then accessible. When the end plate *e* is swung to again, the end *f* can only engage in the shaft *b* when the two are in the same relative position that they were in before. Thus even should the toothed wheel *d* be turned while the end plate is open no accident can occur, because the plate cannot be closed again until the error has been rectified. So, also, the piston-rod *g* cannot be engaged with the toothed wheel if this has been turned even through one hundred and eighty degrees, owing to the shape of the key *i*.

In the modification shown in Fig. 4 the movement of the shaft *b* is transmitted to the hood *h* through a ring *k*, fixed to the hood and having a lug to which is pivoted one end of a rod *l*, carried in guides by the front plate. The other end of this rod has an unsymmetrical pin *m* extending at right angles to it, which pin enters a similarly-shaped hole in the arm *n*, mounted on the shaft *b*.

In Fig. 5 the toothed wheel *d* of Fig. 1 is retained, and for the rod *l* of Fig. 4 is substituted the rack *o*. Otherwise the construction is similar to that shown in Fig. 4.

Having now particularly described and as-

certained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination, with a recoil-brake, and a control device regulated by the elevation of the gun, of an unsymmetrical coupling inserted between the control device and brake.

2. The combination, with a recoil-brake, and a control device regulated by the elevation of the gun, of removable mechanism for transmitting the movement of the control device to the brake, and an unsymmetrical coupling inserted in the transmitting mechanism.

3. The combination with a recoil-brake, and a control device regulated by the elevation of the gun, of mechanism carried by the removable plate of the cradle for transmitting the movement of the control device to the brake, and an unsymmetrical coupling between the transmitting mechanism and the other parts.

4. The combination, with a recoil-brake, and a control device regulated by the elevation of the gun, of mechanism carried by the removable plate of the cradle for transmitting the movement of the control device to the brake, and an unsymmetrical coupling interposed between the transmitting mechanism and the control device on the one hand and between said mechanism and the brake on the other.

5. The combination, with a recoil-brake, and a control device regulated by the elevation of the gun, of mechanism carried by the removable plate of the cradle for transmitting the movement of the control device to the brake, an angular coupling interposed between the transmitting mechanism and the control device, and an unsymmetrical key connecting the said mechanism and the brake.

6. The combination, with a recoil-brake, and a control device regulated by the elevation of the gun, of a disk rotatably mounted on the removable plate of the cradle, and an unsymmetrical coupling interposed between the disk and control device on the one hand and between the disk and brake on the other.

7. The combination, with a recoil-brake, and a control device regulated by the elevation of the gun, of a disk rotatably mounted

on the removable plate of the cradle, an angular coupling interposed between the disk and control device, and an unsymmetrical coupling between the axis of the disk and the brake.

8. The combination, with a recoil-brake, and a control device regulated by the elevation of the gun, of a toothed disk rotatably mounted on the removable plate of the cradle, a toothed member in engagement with the toothed disk, an unsymmetrical coupling between the toothed member and the control device, and an unsymmetrical coupling between the disk and the brake.

9. The combination, with a recoil-brake, and a control device regulated by the elevation of the gun, of a toothed disk rotatably mounted on the removable plate of the cradle, a toothed segment in engagement with the disk, an unsymmetrical coupling between the toothed member and the control device, and an unsymmetrical coupling between the disk and the brake.

10. The combination, with a recoil piston-brake, and a control device comprising a shaft rotated by the elevation of the gun, of a toothed disk having its nave journaled in the removable end plate of the cradle, a toothed segment in engagement with the toothed disk and provided with an unsymmetrical opening to receive the corresponding unsymmetrical end of the shaft, and an unsymmetrical coupling between the nave of the disk and the piston-rod of the brake.

11. The combination, with a recoil piston-brake and a control device comprising a shaft rotated by the elevation of the gun, of a toothed disk having its nave journaled in the removable end plate of the cradle, a toothed segment in engagement with the toothed disk and provided with a squared opening to receive the squared end of the shaft, and an unsymmetrical key coupling the piston-rod of the brake with the nave of the disk.

In testimony whereof I have affixed my signature to this specification in the presence of two witnesses.

KARL VÖLLER.

Witnesses:

PETER LIEBER,
WILLIAM ESSENWEIN