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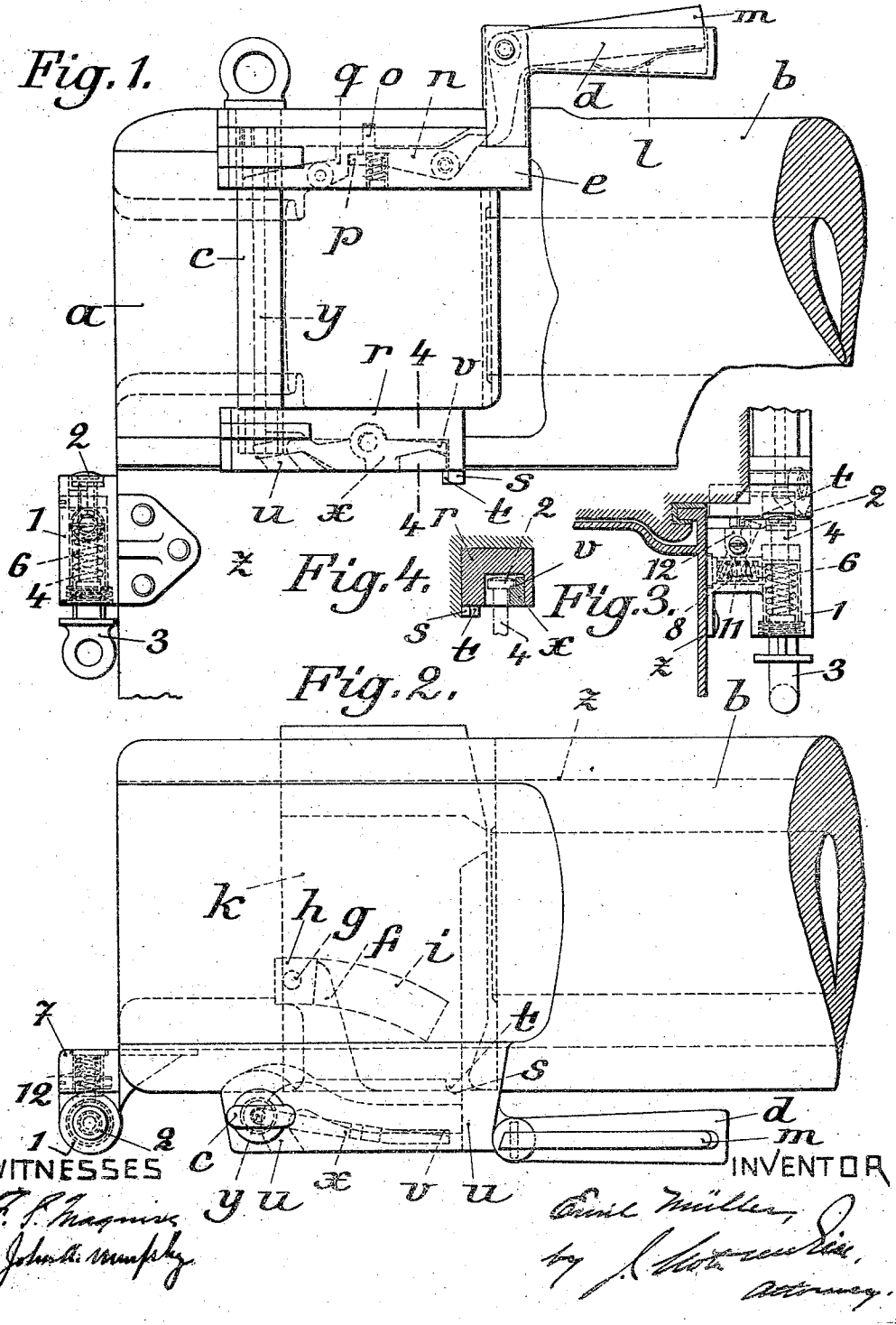
BREECH BLOCK MECHANISM OF GUNS.

APPLICATION FILED JAN. 4, 1911.

**1,003,288.** Patented Sept. 12, 1911.

2 SHEETS—SHEET 1.



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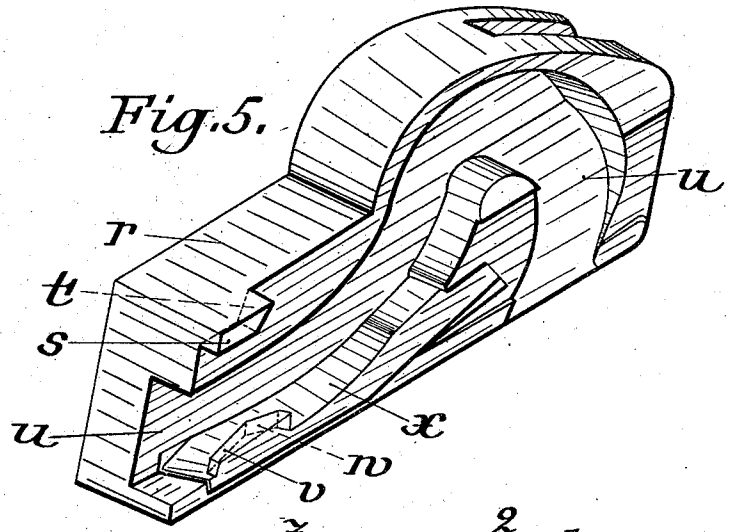
2 SHEETS—SHEET 2.

Fig. 5.



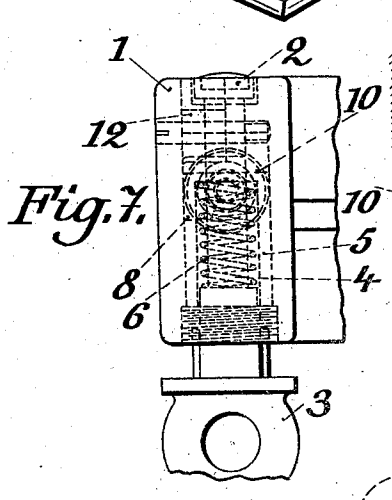




Fig. 7.

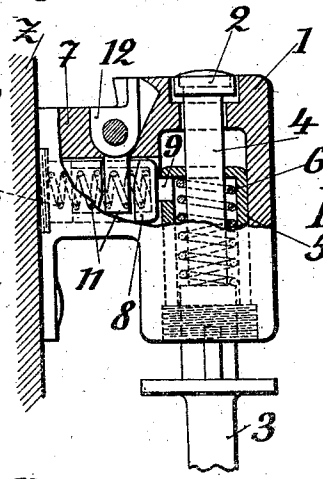



Fig. 8.

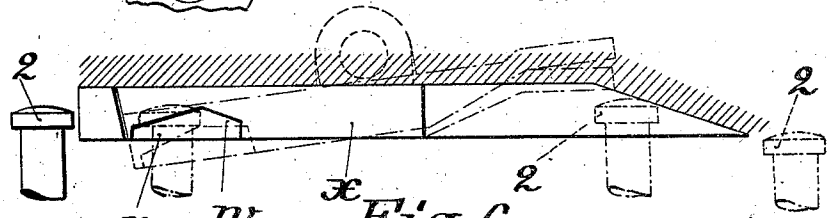



Fig. 6.

WITNESSES

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# UNITED STATES PATENT OFFICE.

EMIL MÜLLER, OF DUSSELDORF, GERMANY, ASSIGNOR TO RHEINISCHE METALLWAAREN- UND MASCHINENFABRIK, OF DUSSELDORF-DERENDORF, GERMANY, A CORPORATION OF GERMANY.

## BREECH-BLOCK MECHANISM OF GUNS.

1,003,288. Specification of Letters Patent. Patented Sept. 12, 1911.

Application filed January 4, 1911. Serial No. 600,756.

*To all whom it may concern:*

Be it known that I, EMIL MÜLLER, engineer, a subject of the German Emperor, residing at 83 Collenbachstrasse, Dusseldorf, Germany, have invented certain new and useful Improvements in Breech-Block Mechanism of Guns; 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.

This invention relates to a breech block mechanism for guns having a recoiling barrel, of the kind in which the breech is automatically opened by the rotation of a cranked lever through a second cranked lever, the first lever being adapted to move the breech block.

According to the invention the cradle carries a pin which, during the sliding movement of the barrel, is liberated by a tappet on the underside of the second cranked lever and when so liberated enters into a curved groove in this second cranked lever and unlocks the first cranked lever through a separate lever, after which it turns both the cranked levers to move the breech block and then is returned to its original position at the end of the groove.

The accompanying drawings illustrate the invention.

Figure 1 is a side elevation of the breech end of the barrel and a part of the cradle. Fig. 2 is a plan; Fig. 3 is an elevation of the casing mounted on the cradle and of the second cranked lever. Fig. 4 is a section on line 4—4 of Fig. 1 through the second cranked lever and the lever journaled therein. Fig. 5 is a perspective view drawn to an enlarged scale of the last named two parts. Fig. 6 is a section through the curved groove of the second cranked lever on the middle line *u—u* which is drawn as a straight line. Figs. 7 and 8 are detail views drawn to an enlarged scale of the casing mounted on the carriage with spring pins.

At the upper part of the breech end *a* of the barrel *b* is pivoted by a bolt *c* a cranked lever *e* provided with a handle *d*. The arm *f* of this cranked lever carries a pin *g* on which is mounted the sliding block *h* which engages in the groove *i* of the breech block *k*. In the handle *d* there is pivoted a bent lever *m* subject to the action of a spring *l*. The lower arm of this lever abuts against one end of a lever *n*, this contact being maintained by a spring. The other end of lever *n* carries a tooth *o* which when the breech is closed engages in a notch in the breech end. On the same end of the lever *n* is a projection *p* engaging beneath one end of another lever *q*, the other end of which extends into a cavity in the bolt *c*. The bolt *c* is connected at its lower end with a second cranked lever *r* so that when the upper cranked lever is turned this lower cranked lever also turns. On the under surface of the cranked lever *r* is a tappet *s* having an inclined surface *t* and a curved groove *u*. Into this groove there projects laterally a lug *w* having an inclined surface *v* and carried by a lever *x*, one end of which extends into a cavity in the bolt *c*. The two levers *q* and *x* are connected by a pin *y* guided in a bore in the bolt *c*.

On the cradle *z* is fixed a casing 1 in which is guided a pin 4 carrying at its upper end a roller 2 and at its lower end an eye 3. This pin carries a casing 5 which is urged upward by a spring 6. In a projecting piece 7 of the casing 1 there is lodged a casing 8 carrying a pin 9 which under the action of a spring 10 projects into a cavity in the casing 5. Between two projections 11 on the casing 8 there engages the lower arm of a lever 12, the upper arm of which projects from the casing 1 and lies in the path of the tappet *s* on the lever *r*.

This construction operates as follows:— When the recoiling barrel brings the surface *t* of the tappet *s* against that arm of the lever 12 which projects from the casing 1 and thus moves the casing 8, the pin 9 is withdrawn from the cavity of the casing 5 and the pin 4 under the action of its spring 6 is pushed upward. When the barrel returns the roller 2 of the pin 4 enters the curved groove *u*. While it is traveling on the surface *v* of the projection *w* of the lever *x* (Fig. 6) the latter is depressed. This movement of the lever *x* is communicated through pin *y* to the lever *q* in such a manner as to depress that end of lever *n* which carries the tooth *o* and thus to unlock the upper cranked lever *e*. As soon as the curved part of the groove *u* acts on the roller 2, the second cranked lever *r* is turned and with it, through the bolt *c*, the upper

cranked lever *e*. The arm *f* of the latter moves the block *h* in the curved groove *i* and thus shifts the breech block *k* outward opening the breech. The groove *u* in the second cranked lever *r* slopes toward the rear end in the downward direction, that is to say it terminates on the under surface of the cranked lever. The pin 4 is therefore pressed downward against the pressure of its spring until the pin 9 again engages in the cavity of the casing 5 and locks the pin. To close the breech the two cranked levers are returned to their original position. By engaging the handle *d*, the tooth *o* is pressed downward by the bent lever *m* and when the handle is released the tooth again engages in the notch in the breech end. It is obvious that by gripping the handle *d*, the breech can be opened independently of the automatic device just described.

I claim as my invention:

1. The combination with a gun having a recoiling barrel, a cradle therefor, and a breech block, of a lever for opening and closing the breech block, means for locking such lever when the breech block is in its closed position and while recoiling, a second lever connected to the first mentioned lever, a spring pressed pin mounted on the cradle and normally retained in an inactive position, means for liberating such pin during the recoil whereby it assumes its active position, means actuated by said pin during the return movement of the barrel for automatically releasing said locking means of the first mentioned lever, and means coöperating with said pin for actuating both levers during the return movement of the barrel for opening the breech block.

2. The combination with a gun having a recoiling barrel, a cradle therefor, and a breech block, of a lever for opening and closing the breech block, means for locking such lever when the breech block is in its closed position and while recoiling, a second lever connected to the first mentioned lever, a spring pressed pin mounted on the cradle and normally retained in an inactive position, means for liberating such pin during the recoil whereby it assumes its active position, means actuated by said pin during the return movement of the barrel for automatically releasing said locking means of the first mentioned lever, means coöperating with said pin for actuating both levers during the return movement of the barrel for opening the breech block, and means carried by said second lever for automatically returning said pin to its inactive position after the breech has been opened.

3. The combination with a gun having a recoiling barrel, a cradle therefor, and a breech block, of a lever for opening and closing the breech block, means for locking such lever when the breech block is in its closed position and while recoiling, a second lever connected to the first mentioned lever, a spring pressed pin mounted on the cradle and normally retained in an inactive position, means carried by said second lever for liberating such pin during the recoil whereby it assumes its active position, means actuated by said pin during the return movement of the barrel for automatically releasing said locking means of the first mentioned lever, and means coöperating with said pin for actuating both levers during the return movement of the barrel for opening the breech block.

4. The combination with a gun having a recoiling barrel, a cradle therefor, and a breech block, of a lever for opening and closing the breech block, means for locking such lever when the breech block is in its closed position and while recoiling, a second lever connected to the first mentioned lever, a spring pressed pin mounted on the cradle and normally retained in an inactive position, means for liberating such pin during the recoil whereby it assumes its active position, means actuated by said pin during the return movement of the barrel for automatically releasing said locking means of the first mentioned lever, and means carried by said second lever coöperating with said pin for actuating both levers during the return movement of the barrel for opening the breech block.

5. The combination with a gun having a recoiling barrel, a cradle therefor, and a breech block, of a lever for opening and closing the breech block, means for locking such lever when the breech block is in its closed position and while recoiling, a second lever connected to the first mentioned lever, a spring pressed pin mounted on the cradle and normally retained in an inactive position, means carried by said second lever for liberating such pin during the recoil whereby it assumes its active position, means actuated by said pin during the return movement of the barrel for automatically releasing said locking means of the first mentioned lever, and means carried by said second lever coöperating with said pin for actuating both levers during the return movement of the barrel for opening the breech block.

6. The combination with a gun having a recoiling barrel, a cradle therefor, and a breech block, of a lever for opening and closing the breech block, means for locking such lever when the breech block is in its closed position and while recoiling, a second lever connected to the first mentioned lever, a spring pressed pin mounted on the cradle and normally retained in an inactive position, means for liberating such pin during the recoil whereby it assumes its active position, and means actuated by said pin during

the return movement of the barrel to release the locking means of the first mentioned lever, said second lever having a cam groove into which said pin projects during the return of the barrel, said groove being formed to effect, with the coöperation of said pin, the actuation of both levers to open the breech.

7. The combination with a gun having a recoiling barrel, a cradle therefor, and a breech block, of a lever for opening and closing the breech block, means for locking such lever when the breech block is in its closed position and while recoiling, a second lever connected to the first mentioned lever, a spring pressed pin mounted on the cradle and normally retained in an inactive position, means for liberating such pin during the recoil whereby it assumes its active position, and means actuated by said pin during the return movement of the barrel to release the locking means of the first mentioned lever, said second lever having a cam groove into which said pin projects during the return of the barrel, said groove being formed to effect, with the coöperation of said pin, the actuation of both levers to open the breech and to return the pin to its normal inactive position.

8. The combination with a recoiling barrel having a breech block, and a cradle for the barrel, of a lever for actuating the breech block, a pivot bolt for said lever, a second lever mounted on said pivot bolt and having a cam groove in its under face, a tappet carried by said second lever, a spring pressed pin, a casing therefor mounted on the cradle, means for normally holding said pin inactive, means actuated by said tappet for liberating said pin during the recoil of the barrel to permit said pin to enter said cam groove on the return of the barrel, the engagement of said pin with said cam groove actuating both levers to open the breech.

9. The combination with a recoiling barrel having a breech block, and a cradle for the barrel, of a lever for actuating the breech block, a pivot bolt for said lever, locking means carried by said lever, a second lever mounted on said pivot bolt and having a tappet and a cam groove in its underside, a spring pressed pin, a casing therefor mounted on said cradle, means for normally holding said pin inactive, means actuated by said tappet for liberating said pin during the recoil of the barrel, a third lever mounted in said second lever and designed to be engaged and actuated by said pin during the return of the barrel, and means actuated by said third lever for automatically releasing the locking means of the first mentioned lever, said cam groove in the second mentioned lever being formed to coöperate with the pin to actuate the first and second levers to automatically open the breech and return the pin into inactive position.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

EMIL MÜLLER. [L. S.]

Witnesses:
CHAS. J. WRIGHT,
WALTER VONNEGUT.