

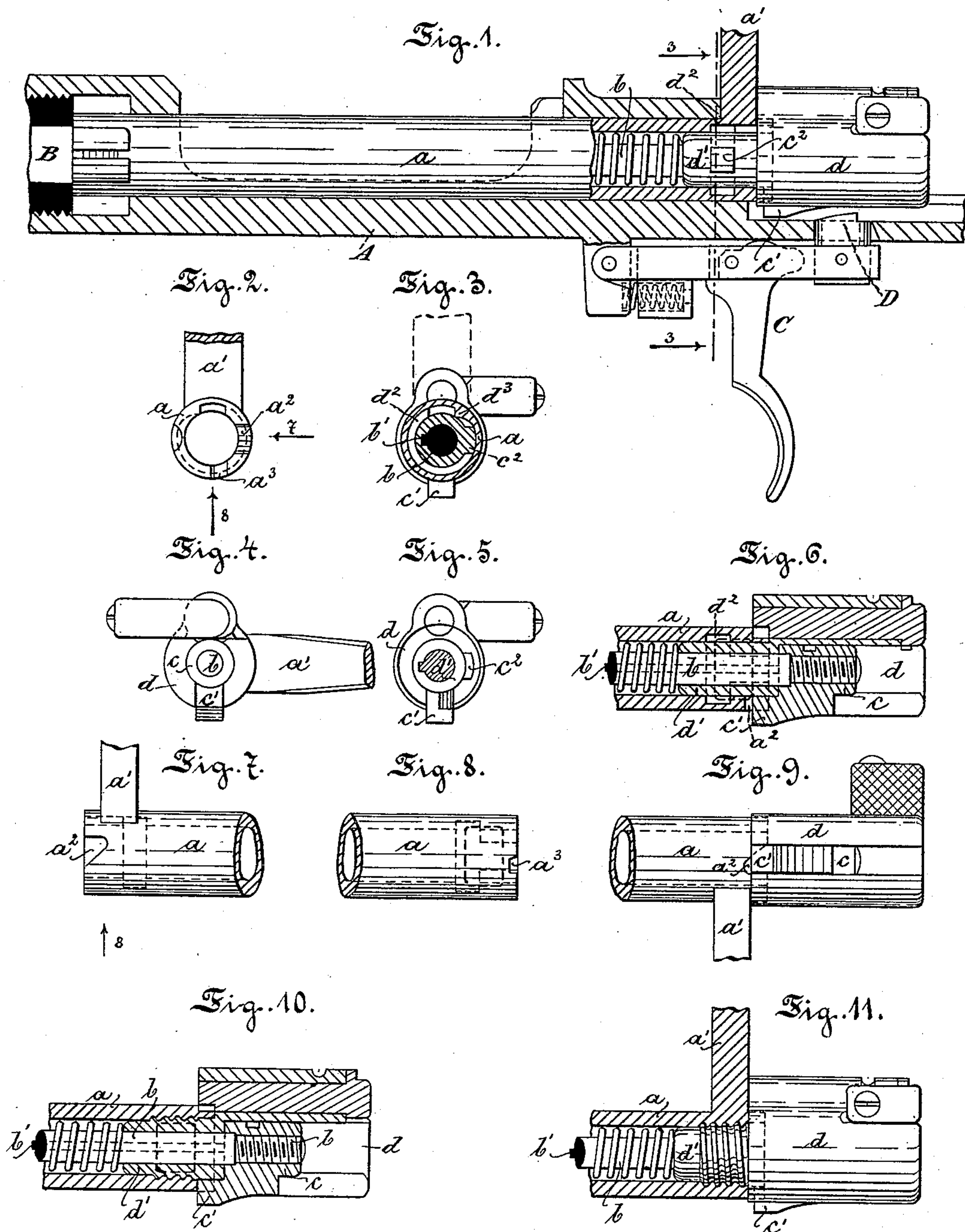
(Model.)

P. MAUSER.

SMALL LOCK FOR BOLTS OF BREECH LOADING GUNS.

No. 440,955.

Patented Nov. 18, 1890.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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SMALL LOCK FOR BOLTS OF BREECH-LOADING GUNS.

SPECIFICATION forming part of Letters Patent No. 440,955, dated November 18, 1890.

Application filed November 7, 1889. Serial No. 329,478. (Model.)

To all whom it may concern:

Be it known that I, PAUL MAUSER, a subject of the King of Würtemberg, German Empire, and a resident of Oberndorf-on-the-Neckar, in the Kingdom of Würtemberg, Germany, have invented certain new and useful Improvements in Small Locks for Breech-Loading Bolt-Guns, of which the following is a specification.

This invention relates to breech-loading fire-arms of the class known as "bolt-guns," and has for its object to improve the lock mechanism of this class of fire-arms.

While my invention is applicable generally to breech-loading fire-arms having a cylindrical bolt, or so-called "bolt-guns," it is especially adapted to bolt-guns constructed according to what is known as the "Mauser system," and it is applicable to either what are called "single-loaders" or "repeaters."

Heretofore the lock mechanism of the Mauser system of bolt-guns consisted of two main parts—namely, the bolt and the firing-pin, with the small lock fixed to it by the pin-nut. The small lock and firing-pin were rigidly connected together, and the former consequently took part in all the movements of the firing-pin, which was disadvantageous.

My present invention aims to overcome the disadvantages due to this construction, and to this end in carrying out my invention I couple the small lock to the bolt, and so connect the small lock and the firing-pin that the latter is capable of longitudinal movement independently of the former, and is connected thereto only by its pin-nut.

In the accompanying drawings my invention is illustrated as applied to a Mauser bolt-gun of the class known as a "single-loader."

In the drawings, Figure 1 is a fragmentary vertical axial section of those parts of the breech-case of a gun to which my present invention relates, the bolt being shown partially in axial section and the firing-pin and small lock being in side elevation. The parts are shown in the position occupied after firing and when the bolt-handle is turned up. Fig. 2 is a fragmentary rear elevation of the bolt alone. Fig. 3 is a vertical cross-section of the bolt, small lock, and firing-pin cut in the line

3 3 in Fig. 1 and looking in the direction of the arrows. Fig. 4 is a rear elevation of the small lock and firing-pin. Fig. 5 is a front elevation of the small lock and firing-pin detached, the forward end of the firing-pin being in vertical section. Fig. 6 is a fragmentary axial section of the bolt and small lock detached, showing the firing-pin in elevation and its pin-nut in section. Fig. 7 is a fragmentary side elevation of the bolt detached and looking in the opposite direction to Fig. 1. Fig. 8 is a fragmentary plan of the under side of the bolt, looking in the direction of the arrow 8 in Fig. 7. Fig. 9 is a fragmentary plan of the under side of the bolt, small lock, and pin-nut, the bolt being in the locked position. Fig. 10 is a fragmentary vertical axial section of the bolt, small lock, and firing-pin, the bolt being in the locked position. This view shows a modified form of coupling between the bolt and small lock. Fig. 11 is a fragmentary view of the construction shown in Fig. 10, the bolt being in section and the small lock and firing-pin being in elevation. The bolt is shown in the unlocked position in this view.

Referring to the drawings, A represents the breech-case of a gun; B, the barrel thereof; C, the trigger; D, the trigger-beak; *a*, the bolt; *b*, the firing-pin; *c*, the pin-nut, and *d* the small lock.

The bolt *a* is the well-known oscillatory bolt having the handle *a'*, and constructed to travel longitudinally in the breech-case A during the loading and unloading operations. The firing-pin *b* works inside of the bolt *a*, and is actuated by a coil-spring therein in the usual manner. The small lock *d* engages the rear portion of the firing-pin *b*, and is constructed with a neck *d'* extending forwardly and coupled by a swivel-connection to the rear portion of the bolt *a*. I prefer to accomplish this connection by forming a groove *d²* in the end of the bolt *a*, and by constructing a lug *c²* on the neck *d'* of the small lock for engaging the groove *d²*, so that when the bolt and small lock are coupled together the bolt can be oscillated relatively to the small lock. The forward end of the neck *d'* serves as a bearing for the rear end of the spiral spring which actuates the firing-pin. The firing-pin

and small lock are preferably connected together by a pin-nut *c*, screwed on the rear end of the pin *b*, and fitting within a recess in the rear side of the small lock *d*. The pin-nut *c* carries on its lower side the usual nose *c'* for engaging with the trigger-beak *D*. This nose *c'* projects through a slot in the under side of the small lock *d* and extends into the usual groove in the breech-case *A*. This prevents any oscillatory movement of the small lock *d*, and permits the firing-pin *b* and its pin-nut to move longitudinally relatively to the small lock. The unscrewing of the firing-pin from its nut is prevented by the firing-pin being feathered in the neck *d'* of the small lock by means of its tongue *b'*, so that the pin cannot turn in the small lock, the nut being also held from turning by its nose *c'*. The circumferential groove *d²* in the rear portion of the bolt *a* is constructed with a stop *d³* on one side adapted to strike the projection *c²* on the neck of the small lock, and to prevent the further rotation in one direction of the bolt *a* relatively to the small lock when the parts are in the gun. For permitting the insertion of the neck *d'* into the bolt *a* a short longitudinal groove is cut in the bolt *a* and communicates between groove *d²* and the end of the bolt, so that on inserting the neck *d'* the projection *c²* can enter through this groove until it reaches the annular groove *d²*. This short longitudinal groove is constructed in line with the handle *a'* of the bolt, so that the bolt and small lock must be coupled before the insertion of these parts into the breech-case, whereupon the small lock will be turned relatively to the bolt until its projections *c²* stands in the position shown in Figs. 1 and 3. The parts can then be inserted into the breech-case, after which they cannot be separated without again removing them from the gun, as any oscillatory movement of the small lock is prevented by the nose *c'* of the firing-pin, and the oscillatory movement of the bolt is not sufficient to bring the projection *c²* into line with the longitudinal groove, and thereby permit the withdrawal of the neck from the bolt.

According to my invention, I provide means whereby, when the bolt *A* is in the locked position, as shown in Fig. 6, the firing-pin can move forward sufficiently to fire the gun when its nose *c'* has been released by the trigger-beak *D*, and means whereby the firing-pin will be prevented from reaching the cartridge, so that the gun cannot be fired, as soon as the bolt *a* is oscillated from its locked position. I also provide means for locking the bolt *a* and the small lock *d*, when the bolt is in the unlocked position, so that oscillatory movement of the small lock relatively to the bolt will be prevented when the parts are retracted. This I accomplish by means of reciprocal provisions carried by the bolt and the small lock or the bolt and the firing-pin, and so constructed that when the bolt is in

the locked position the firing-pin can strike the cartridge, and when it is in the unlocked position the firing-pin is withdrawn from the cartridge and is locked to the bolt in such manner that neither it nor the small lock can oscillate relatively thereto, but the firing-pin can be moved longitudinally rearwardly therefrom. This I prefer to accomplish by constructing the rear end of the bolt *a* with notches or recesses *a²* and *a³*, which are adapted to receive the beveled forward end of the nose *c'* of the firing pin nut *c*. The recess *a²* is so constructed that when the bolt *a* is locked and its arm *a'* is turned down to the right, as indicated in Fig. 6, the recess *a²* will lie directly in line with the nose *c'* of the firing-pin, and when this nose is released by the trigger-beak *D* it can advance and enter the recess *a²*, which latter is deep enough to permit it to move forward until the firing-pin has struck the cartridge and fired the gun. The recess *a²* is constructed with a beveled face on one of its sides so arranged that when the bolt *a* is oscillated by turning up its handle *a'* the beveled face of the recess *a²* will engage the beveled part of the nose *c'* and push the latter rearwardly against the tension of the spring until it rides against the end of the bolt. The notch *a³* is so constructed that when the bolt *a* reaches the unlocked position this notch will be in line with the beveled end of the nose *c'*, and the latter can snap into the notch, whereupon it will be retained therein by the spring of the firing-pin and will prevent lateral movement of the small lock relatively to the bolt during the reloading operation. The notch *a³* is shallower than the notch *a²* and is so constructed that when the nose *c'* is in engagement with it the firing-pin *b* cannot reach the cartridge, and consequently the gun cannot be fired. Preferably the bolt *a* is provided with an annular rearward extension, in which the notches *a²* and *a³* are formed, and which engages a suitable groove in the forward face of the small lock *d*; but this is not essential.

In operating a gun constructed according to my invention, after the firing operation the bolt *a* will be oscillated, and will thereby slightly retract the firing-pin *b*, and when it reaches the unlocked position the nose *c'* of the firing-pin will snap into the recess *a³* in the rear of the bolt, so that the firing-pin *b* cannot reach the new cartridge and the bolt *a* cannot be oscillated relatively to the firing-pin *b* or the small lock *d* without the exertion of force sufficient to spring the nose *c'* out of the notch *a³*. The bolt will then be retracted, carrying back with it the firing-pin and the small lock. When the cartridge has been expelled and a new one inserted, the bolt will be pushed forward until its breech-block locks the cartridge in the barrel. As the bolt moves forward the nose *c'* will be caught by the trigger-beak *D*, and thus the firing-pin will be held retracted, while the bolt and small lock *b* will continue forward until in the ex-

treme forward position. If the trigger should be accidentally pulled during this time and before the bolt is locked, the nose c' of the firing-pin would strike against the notch a^3 in the end of the bolt and be prevented from reaching the cartridge, so that the gun could not be fired. As soon as the bolt reaches the forward position it is oscillated by turning its arm a' down to the right, thereby locking it and bringing its notch a^2 into the path of the nose c' , so that the gun can be fired upon pulling the trigger, thereby releasing the nose of the pin-nut, which will travel forward with the firing-pin and enter the notch a^2 as the pin strikes the cartridge. The spring of the firing-pin is compressed, after the nose c' is stopped by the trigger-beak D, by the forward movement of the bolt to close the breech. It will be seen that the small lock d does not move with the firing-pin b and its pin-nut c , as the latter advances to fire the gun, but remains stationary during this time. The independence of the small lock d is an important improvement, as it reduces the mass carried with the pin, and consequently lessens the shock of the firing-pin as the gun is fired, so that greater accuracy of aim can be attained, and it permits of the use of a lighter driving-spring than when the small lock and firing-pin are united. By causing the nose c' of the firing-pin to enter the recess a^3 of the bolt during the reloading operation the forward end of the firing-point of the pin is held flush with the front face of the bolt, and thus the possibility of prematurely exploding the cartridge is prevented, even if the bolt is pushed forward against it with great force and very suddenly.

In the construction shown the bolt is provided with two shoulders on its front end, which engage recesses in the breech-case, in order to hold the breech-block against the barrel when the bolt is locked; but my invention can be applied to bolts having any other construction of breech-closing device—such, for example, as those in which the handle a' of the bolt bears in closing the breech against a shoulder on the breech-case.

It will be understood that my invention can be applied to various constructions of bolt-guns, and that the details of construction of my improvements can be variously altered or modified without departing from the essential features of the invention. For example, the swivel-connection between the bolt a and the small lock d can be accomplished in any well-known way, and it is immaterial whether the notches a^2 and a^3 be constructed in the rear end of the bolt and the projection entering the same be constructed on the firing-pin, or whether these parts be reversed; also, certain features of my invention can be used independently of the other features.

Figs. 10 and 11 show a modified form of swivel-connection between the bolt and small lock. According to this construction the neck

d' of the small lock is constructed with a male screw-thread, which engages a corresponding female screw-thread in the end of the bolt a . The parts are screwed together before being placed in the breech-case, and after being placed therein they cannot be unscrewed because of the nose c' of the firing-pin, which prevents rotary movement of the small lock relatively to the bolt.

What I claim is the following defined novel features and combinations in breech-loading fire-arms of the class known as "bolt-guns," substantially as hereinbefore specified, namely:

1. The combination, with the breech-case and an oscillatory bolt working therein and a firing-pin working in said bolt, of a small lock connected to said bolt, but restrained from axial motion, and engaging the rear end of said pin, said small lock and pin being so constructed that the latter can be moved independently of the small lock, and said small lock and bolt being connected together by a rotative connection.

2. The combination of the breech-case, an oscillatory bolt working therein, and a firing-pin working in said bolt, with longitudinal guides in the breech-case engaging the rear end of said pin to prevent rotative movement of the pin, and a small lock connected to the bolt by a rotative connection, to be moved longitudinally thereby without participating in its axial motion, and connected to the firing-pin by longitudinal guiding-surfaces, whereby it is restrained from rotative movement, while the firing-pin is movable longitudinally independently of the small lock.

3. The combination, with the breech-case, an oscillatory bolt working therein, and a firing-pin working in said bolt and constructed with a nut c on its rear end, said nut constructed with the trigger-nose c' for engagement with the trigger of the gun, of a small lock engaging the rear end of said pin and secured thereon by said nut, said small lock being connected to said bolt by a rotative connection, and being so connected to said pin that the latter is movable longitudinally relatively thereto.

4. The combination, with the breech-case, an oscillatory bolt therein, and a firing-pin working in said bolt, of a small lock engaging the end of said firing-pin and so constructed that the latter can move longitudinally relatively thereto, said small lock having guiding-surfaces restraining it from rotative motion and formed with a screw-threaded neck d' on its forward side adapted to enter the bore of said bolt, and said bolt constructed with a screw-thread in its inner end to receive said threaded neck, whereby when said threads are in engagement while in use the said bolt and small lock are connected together by a rotative connection.

5. The combination, with the breech-case, an oscillatory bolt working therein constructed with notches a^2 a^3 in its rear end, a

firing-pin working in said bolt, and a small lock engaging the end of said firing-pin and connected to said bolt by a rotative connection, of the nut *c* on said pin having a forward
5 projection adapted to enter one or the other of said notches, whereby when said bolt is in the locked position said projection can enter the notch *a*² and the gun can be fired, and when said bolt is in the unlocked position

said projection will enter the notch *a*³ and the gun cannot be fired.

This specification signed by me this 2d day of September, 1889.

PAUL MAUSER.

Witnesses:

EDMUND GRONCKI,
THEODORE ABENHEIM.