

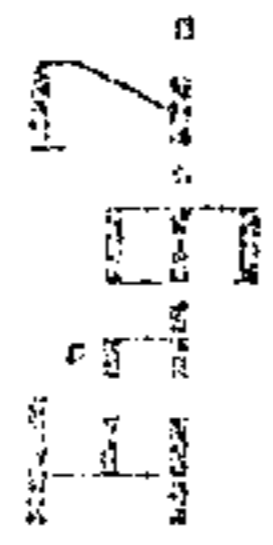
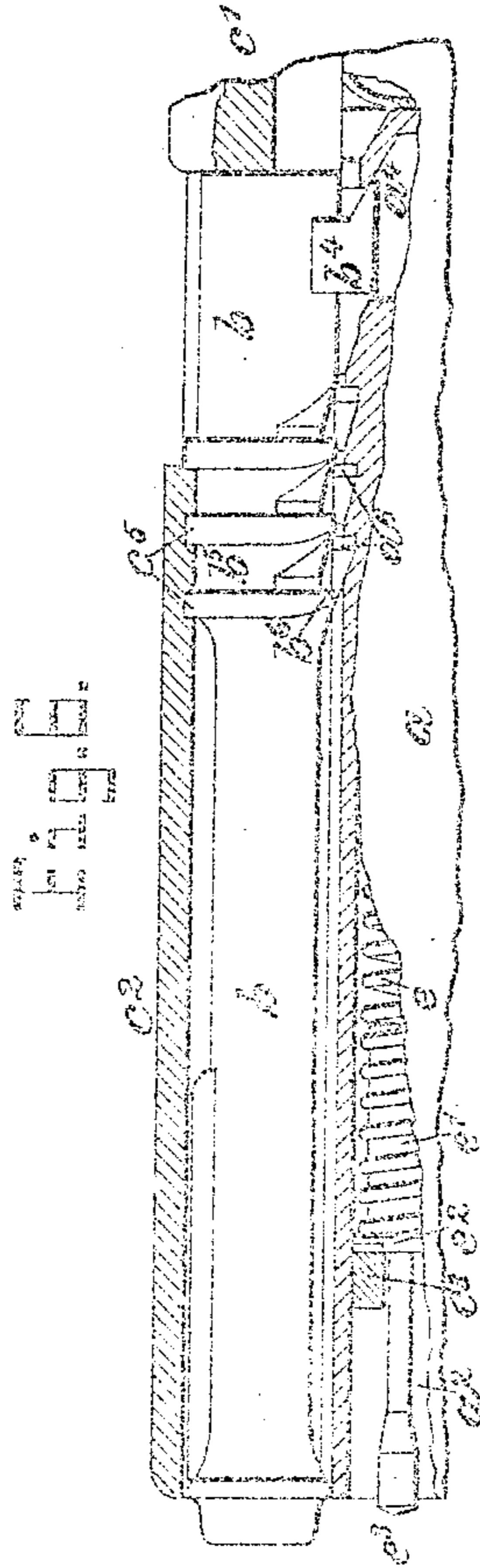
No. 808,003.

PATENTED DEC. 19, 1905.

J. M. BROWNING.
FIREARM.

APPLICATION FILED MAY 25, 1905.

2 SHEETS--SHEET 2.



Witness
S. C. ...
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Inventor
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UNITED STATES PATENT OFFICE.

JOHN M. BROWNING, OF OGDEN, UTAH.

FIREARM.

No. 808,003.

Specification of Letters Patent.

Patented Dec. 19, 1905.

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To all whom it may concern:

Be it known that I, JOHN M. BROWNING, a citizen of the United States, residing at Ogden, in the county of Weber and State of Utah, have invented certain new and useful Improvements in Firearms, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

10 This invention relates to automatic firearms of that description in which the several operations—such as the opening of the breech after firing a shot, the ejection of the empty cartridge-shell, the cocking of the hammer, 15 the presentation and introduction of a loaded cartridge to the chamber of the barrel, and the closing and locking of the breech—are automatically effected through or by the energy of the recoil of the breech-block or that 20 part which at the time of firing the shot closes the breech of the barrel, and the invention more especially relates to firearms of this description in which in firing the barrel and the breech-block are interlocked and re- 25 coil some distance together, and during this rearward movement the barrel has another movement imparted to it, whereby it is unlocked from the breech-block, and after its release the movements of the barrel are ar- 30 rested, while the breech-block continues to recoil until the breech is fully opened and in which during the opening movement of the breech-block energy is stored in a spring, the reaction of which is utilized to effect the re- 35 turn or closing movement of the breech-block. It is essential for the proper operation of firearms of this class that the breech-block and the parts connected and moving with it should be made as heavy as is practi- 40 cal, so that it may store a maximum amount of energy in the short period of time during which on firing the rearward pressure of the powder-gases in the barrel acts upon the breech-block and initiates its recoil, and so 45 that the breech-block may continue to recoil under its momentum alone to complete the opening of the breech and the compression of the reaction-spring after the gas-pressure has ceased because relieved by the 50 exit of the bullet from the barrel. On account of the limited total weight practical for a small-arm, and especially for a pistol, it is necessary in order to be able to give a maximum weight to the breech-block that the 55 other parts of the arm be constructed as light as possible. This is especially important re-

garding the barrel of this class of arms, for the additional reason that at the commencing of the recoil the light barrel may readily yield to and move rearward with the breech- 60 block while it remains interlocked therewith and in order that when unlocked from the breech-block and the movements of the barrel are arrested the stress caused by this sudden stopping may not be too great to be ab- 65 sorbed without injury to either the barrel or the frame of the arm. The importance of these relations as to their weight between the breech-block and the barrel remains the same when the caliber and weight of the pro- 70 jectile and the powder charge are increased; but experience has shown that in a small-arm of this class of large caliber intended to fire powerful charges of powder—the additional strength required in the barrel in its con- 75 nections with and attachment to the frame, and especially in the parts of the barrel and frame by which the movements of the one upon the other are arrested, is so much greater in proportion to the weight of these 80 parts that the constructions heretofore used in arms of this class of smaller caliber cannot be relied upon as perfectly safe.

One object of the present invention is to provide in a firearm of this class a simple but 85 strong and reliable means of attachment and connection between the barrel and the stationary frame of the arm which shall leave the barrel free to recoil a limited distance interlocked with the breech-block and which 90 shall during this rearward movement guide the barrel and impart to it at the same time another movement by which it will be unlocked from the breech-block and which shall 95 at the last of the return or forward movement of the breech-block guide the barrel while it is moved forward by the breech-block and impart to it another movement by which the barrel and the breech-block will be interlocked when they arrive at the forward 100 firing position.

Another object of the invention is to provide in a firearm of this class a means which shall positively limit the rearward movement of the barrel with the breech-block, arrest the 105 movements of the barrel as soon as the same has become unlocked from the breech-block, and which shall be adapted in form and in strength to transmit to the frame the stress due to the sudden arrest of the movements of 110 the barrel without injury resulting therefrom to either the barrel or the frame.

Another object of the invention is to provide in a firearm of this class a simple but strong and reliable means for securing the breech-block on the frame of the arm by positively limiting the movements of the breech-block on the frame and for causing the breech-block to be engaged by the reaction-spring, but which shall allow the breech-block to be at will and readily disengaged from the reaction-spring and to be removable from the frame without requiring the use of any tools for its disengagement and removal.

These objects are attained by mechanism of simple and practical construction, which is efficient, perfectly safe, and not liable to get out of order.

The embodiment of my improvements represented in the accompanying drawings is a magazine-pistol, such as is shown and described in the United States Patent No. 580,924, granted to me April 20, 1897; but it will be understood that I do not intend to restrict the present invention to a magazine-pistol, nor to any particular kind of firearm, nor to the combination of the several features in a single structure.

In the accompanying drawings, Figure 1 is a left-hand side elevation of the pistol with the breech closed, but showing the breech-slide and the forward portion of the frame in section and the lower portion of the grip as being broken away. Fig. 2 is a view similar to Fig. 1, but with the breech-slide in its open rearward position. Fig. 3 represents a vertical cross-section of the barrel on the line 3 3 of Fig. 1 looking forward. Fig. 3^a represents a vertical cross-section of the frame on the line 3' 3' of Fig. 1 looking rearward. Fig. 4 represents a vertical cross-section through the breech-slide, barrel, and frame on the line 4 4 of Fig. 1 looking rearward, with the barrel in the raised position locked to the breech-slide, exposing to view the stop-shoulders on the barrel and on the frame. Fig. 5 represents a side elevation of the barrel with a portion of the frame in section, showing a modification in the connection between the barrel and the frame. Figs. 6 and 7 illustrate another modification of the connection between the barrel and the frame of the arm. Fig. 6 represents a side elevation of the barrel and a section of the forward portion of the frame and of the breech-slide with the breech closed. Fig. 7 represents a cross-section of the barrel in rear of the front collar looking forward.

Similar letters refer to similar parts throughout the several views.

In the pistol represented in the drawings the barrel *b* is attached to the top of the frame *a* at the front by a lug *b'*, which projects downward from the barrel near the muzzle. The rear face of the lug *b'* inclines downward and rearward and engages a correspondingly-inclined surface *a'* under the top

of the forward part of the frame, interlocks the barrel with the frame, and when the barrel is moved rearward forces the forward end at the same time to move downward toward the frame. At its rear end the barrel *b* has another depending lug *b²*. This is divided by a central longitudinal groove, in which one end of the link *b³* is fitted and pivotally attached to the barrel by a transverse pin. The lower end of the link *b³* is pivotally secured to the frame by a similar pin. When the barrel is in the forward firing position, the link *b³*, standing nearly vertically, holds the barrel above the top of the frame and allows it to move rearward. During the rearward movement the link causes the rear end of the barrel to move downward toward the frame. Thus the inclined lug *b'* at the front and the link *b³* at the rear impart to the barrel at both extremities substantially the same double movement. On the top of the frame the breech-slide *c* is fitted to slide rearward and forward. The rear part of the breech-slide forms the breech-bolt *c'*, adapted to close the chamber of the barrel, and the forward part *c²* of the breech-slide extends in semitubular form and incloses the barrel. The sides of the breech-slide overlap those of the frame. Longitudinal ribs and grooves on the slide engaging corresponding grooves and ribs on the frame serve to hold the breech-slide to the frame and to guide it thereon. The barrel is provided on the top with locking-ribs *b⁵*, and the breech-slide has corresponding recesses *c⁵*, whereby the breech-slide and the barrel are securely interlocked when in the forward firing position. When on firing a shot the breech-slide moves rearward under the energy of recoil and draws the barrel rearward, the simultaneous downward movement of the barrel, due to the inclined lug *b'* and to the link *b³*, causes the disengagement of the locking-ribs *b⁵* from the recesses *c⁵* and allows the rearward movement of the barrel to be arrested, while that of the breech-slide continues, thus opening the breech.

Beneath the barrel the reaction-spring *e* is seated in a longitudinal chamber *a²* in the frame *a*, and a transverse key *c³* is inserted through rectangular recesses in the sides of the breech-slide and passes transversely through the chamber *a²* in the frame, normally projecting slightly from each side of the breech-slide. A longitudinal slot *a³* through the frame allows the key *c³* to travel freely therein. The rear end of the slot *a³* forms an abutment for the key, positively limits the rearward movement of the breech-slide on the frame, and prevents the breech-slide from flying back from the frame. Through the key *c³* the reaction-spring *e* acts upon the breech-slide to return it and the breech-bolt to the forward closed position after the recoil has moved them to the rear. The rear end of this spring *e* bears against the

rear end of the chamber a^2 in the frame, and the forward end of the spring e is fitted upon a piston e' , the head e^2 of which bears against the key e^3 , a slight recess in the rear face of the key providing a seat for the head e^2 , and thereby securing the key e^3 against accidental displacement.

In rear of the barrel the frame a forms the receiver and has an opening for the ejection of the cartridge-shells. The breech-bolt c' is provided with a firing-pin and an extractor of usual construction, and an ejector g is fitted to the receiver. Below the receiver the frame a forms the grip or handle, in rear of which the hammer and other parts of the firing mechanism are mounted in the frame, while the trigger is located in front of the grip. The interior of the grip forms the seat for the cartridge-magazine, in which cartridges are held one upon the other upon a spring-follower, by which they are fed upward to the receiver, the topmost cartridge being presented in front of the breech-bolt when the same is in the open position, and by the forward movement of the breech-bolt this cartridge is transferred from the magazine to the chamber of the barrel.

With one exception all the parts thus far referred to may be and are here shown as of the same construction and mode of operation, as is fully set forth in the said Letters Patent No. 580,924 and forming no part of the present invention require no further description or explanation herein. The exception is the substitution at the forward part of the barrel of the rearwardly-inclined lug b' , engaging the frame as the means of attaching and guiding the barrel, as hereinabove described, in the place of a link at the forward end of the barrel similar to that at the rear end serving this purpose, as shown and described in said Patent No. 580,924. The lug b' performs the functions of the link equally well, and it simplifies the construction considerably, as by its use the link and the two pivot-pins are dispensed with.

While I have shown in Figs. 1 and 2 the rear end of the barrel connected with the frame by the link b^3 , an inclined lug may be substituted for this rear link also. This modification is shown in Fig. 5, in which the rear lug b^4 depends from the barrel far enough forward of the rear end to allow an integral part a^4 of the frame to form a connecting-bar between the two sides of the frame in rear of the lug b^4 . The front face of this connecting-bar in the frame is undercut, inclining downward and rearward, and is engaged by the lug b^4 . When the barrel moves rearward, the lug forces the same to move downward toward the frame. Instead of thus providing both ends of the barrel with inclined lugs, so that both ends of the barrel will move to and from the frame while the barrel moves rearward and forward and so

that the axis of the barrel will remain always parallel to its normal position, it will be evident that the forward lug may be dispensed with and the front end of the barrel be allowed to rest and slide upon the frame, being held down thereon by the forward part of the breech-slide fitting over it. In that case the rear end of the barrel when the same is moved rearward or forward and at the same time is moved toward or from the frame swings on its front end, resting on the frame as on a fulcrum. This construction is illustrated in Figs. 6 and 7, in which the outside diameter of the collar on the barrel near the muzzle is equal to the distance between the top of the frame and the inside of the breech-slide, so that the breech-slide confines the front end of the barrel upon the frame. The periphery of the collar instead of being rectangular is rounded to allow the barrel to slide and to swing upon the frame on the bottom of the collar as on a fulcrum. On the top of the barrel a rib extends from the collar rearward for a distance somewhat greater than the length of the continued rearward movement of the breech-slide after the barrel has been stopped. The top of this rib is equal in height to the top of the collar, the rib filling the space between the breech-slide and the reduced part of the barrel in rear of the collar. The front lug of the barrel is left off, as is also the opening and seat for it in the frame. The rear lug b^4 and its connection with the frame at a^4 are substantially like those shown in Fig. 5. When the breech-slide continues to move rearward after the barrel has been stopped in the opening of the breech, the rib upon the barrel prevents the breech-slide from losing its hold upon the front end of the barrel, and while the barrel is free to slide upon the frame and to swing on the lower edge of the collar as on a fulcrum the front end of the breech-slide in all positions holds down the front end of the barrel upon the frame.

In the patent referred to, No. 580,924, the means for attaching the barrel to the frame and for imparting to it the movement to and from the frame is also depended on to provide the stop to arrest the double movement of the barrel at the proper time. In order to prevent the shock due to the sudden stopping of the barrel in its rearward movement from injuring either the barrel or the frame, I provide a separate independent means on the barrel and on the frame for positively arresting the movements of the barrel. On the under side of the barrel, vertically below the locking-ribs b^5 , is a series of ribs or stop-shoulders b^6 , the rear face of each rib being vertical and the front inclining downward and rearward. On the top of the frame is a series of recesses a^6 of corresponding shape. These ribs b^6 and the recesses a^6 serve as the stops for the barrel. When the barrel is in the raised forward position, Figs. 1, 4, and 5, the ribs b^6 stand

above and clear of the frame; but as the barrel moves rearward with the breech-slide and simultaneously moves toward the frame the ribs b^6 gradually enter the recesses a^6 until when the barrel is released from the breech-slide the ribs b^6 are fully seated in the recesses a^6 , Fig. 2, and further movement of the barrel is positively stopped without any strain being thrown upon the means of attachment and guidance of the barrel. The ribs b^6 are located at the strongest part of the barrel and are capable of sustaining the shock without injury to the barrel, while they positively protect the lugs b^1 and b^2 at the weaker extremities of the barrel from having to bear any part of the stress.

To enable the key c^3 to be at will and readily withdrawn from the frame and the breech-slide, and thereby to disengage the breech-slide from the reaction-spring, and to enable the slide and the spring to be removed from the frame, the head e^2 of the piston e' is provided with a stem e^3 , which projects forward sufficiently to stand at the open front end of the frame when the breech-slide, the key c^3 , and the piston e' are in the forward closed position. The front end of the stem e^3 is increased in diameter and is knurled to form a convenient hold by which rearward pressure may be exerted upon it and the piston e' sufficiently to overcome the tension of the reaction-spring e and to force back the piston-head e^2 out of the recess in the key c^3 . Thus released the key c^3 may be readily withdrawn, thereby enabling the breech-slide and the reaction-spring to be removed without requiring the use of any tools.

It will be evident that the piston e' might be dispensed with, if desired, the forward terminal coil of the spring e taking the place of the piston-head in the recess of the key and serving as a latch for the key, and from the coil forward a straight portion of the wire of which the spring is formed extending at right angles to the coil and below the key to the front of the frame, by means of which the spring may be pressed back to release the key; but I prefer the use of the piston, as shown and described. This arrangement while equally effective is much simpler and less expensive than are either of those shown and described for accomplishing the same objects in my prior patents covering similar firearms, No. 580,924, dated April 20, 1897, and No. 708,794, dated September 9, 1902. In the arms shown and described in these patents in both cases a plug a^8 closes the front end of the seat of the reaction-spring in the frame, and a pin a^9 , fitted transversely through the frame and the plug, secures the plug in its place in the frame. In the first of the patents referred to the breech-slide must be drawn rearward and a pin inserted through a hole in the bottom of the frame to intercept the piston and the reaction-spring and to

hold them back when the breech-slide is returned forward before the transverse key can be released and withdrawn. In the later patent referred to the front plug a^8 is fitted for a slight lengthwise movement and carries a rod extending from its rear, which when the plug is pressed rearward forces back the piston and the spring, and thus releases the key. In the present improved construction both the front plug and the pin securing it in the frame are dispensed with, thus making it simpler and less expensive and lightening the front end of the arm and facilitating the assembling of the arm and the taking it apart.

It will be evident that various features of this invention may be employed independently of the others and in firearms of a different kind from that which I have described herein and that various changes in form and arrangement may be made without departing from the spirit of the invention.

What I claim, and desire to secure by Letters Patent, is—

1. In a fire-arm the combination with the frame having a transverse recess, of a barrel connected at the breech end with said frame for a limited movement in the direction of its length and in the direction toward the frame, said barrel carrying near the breech end a stop-shoulder for entering the recess in said frame by the movement of said barrel toward the frame, whereby the movements of the barrel are arrested and the impact thereof transmitted to said frame at the strongest part of the barrel, substantially as specified.

2. In a firearm, the combination with a frame of a barrel, an inclined lug connection between said barrel and said frame, whereby said barrel may move lengthwise and toward and from said frame, a transverse recess in said frame and a stop-shoulder on said barrel for interlocking said barrel and said frame by the movement of said barrel toward said frame, substantially as shown and described.

3. In a firearm, the combination with a frame having a transverse recess, of a barrel having an integral inclined lug connecting said barrel with said frame to have a lengthwise movement and a movement toward and from said frame, a stop-shoulder on said barrel for entering the recess in said frame by the movement of said barrel toward said frame, and means for limiting the movement of said barrel from said frame.

4. In a firearm, the combination with a frame having a transverse recess, and a breech block mounted to slide upon said frame and having a locking-recess, of a barrel connected at the breech end with said frame for a limited movement thereon lengthwise and toward and from said frame, a locking-rib carried by said barrel and caused by the movement thereof toward and from said frame to release

and to engage the locking-recess of said breech block, and a stop-shoulder on said barrel near the breech end caused by the movement thereof lengthwise and toward said frame to enter the recess in said frame, substantially as and for the purpose specified.

5. In a firearm, the combination with a frame and a breech-block sliding on said frame, said frame having a transverse recess and said breech-block having a transverse groove, of a barrel, an inclined lug connection between said barrel and said frame, whereby said barrel may move lengthwise and toward and from said frame, transverse ribs projecting from opposite sides of said barrel, for interlocking said barrel with said breech-block by the movement of said barrel from said frame, and for interlocking said barrel with said frame by the movement of said barrel toward said frame.

6. In a firearm, the combination with a frame having a transverse recess, of a barrel attached at the breech end and near the muzzle to said frame for a limited movement thereon lengthwise and toward and from said frame, a stop-shoulder on said barrel located between said attachments and unconnected therewith, for entering said recess in the frame by the movement of the barrel toward the frame, whereby the movements of said barrel are arrested and the impact thereof is transmitted to the frame at a distance from the muzzle of said barrel, substantially as shown and specified.

This specification signed and witnessed this 16th day of May, A. D. 1905.

JOHN M. BROWNING.

In presence of—

C. J. EMBETS,
K. POWERS.