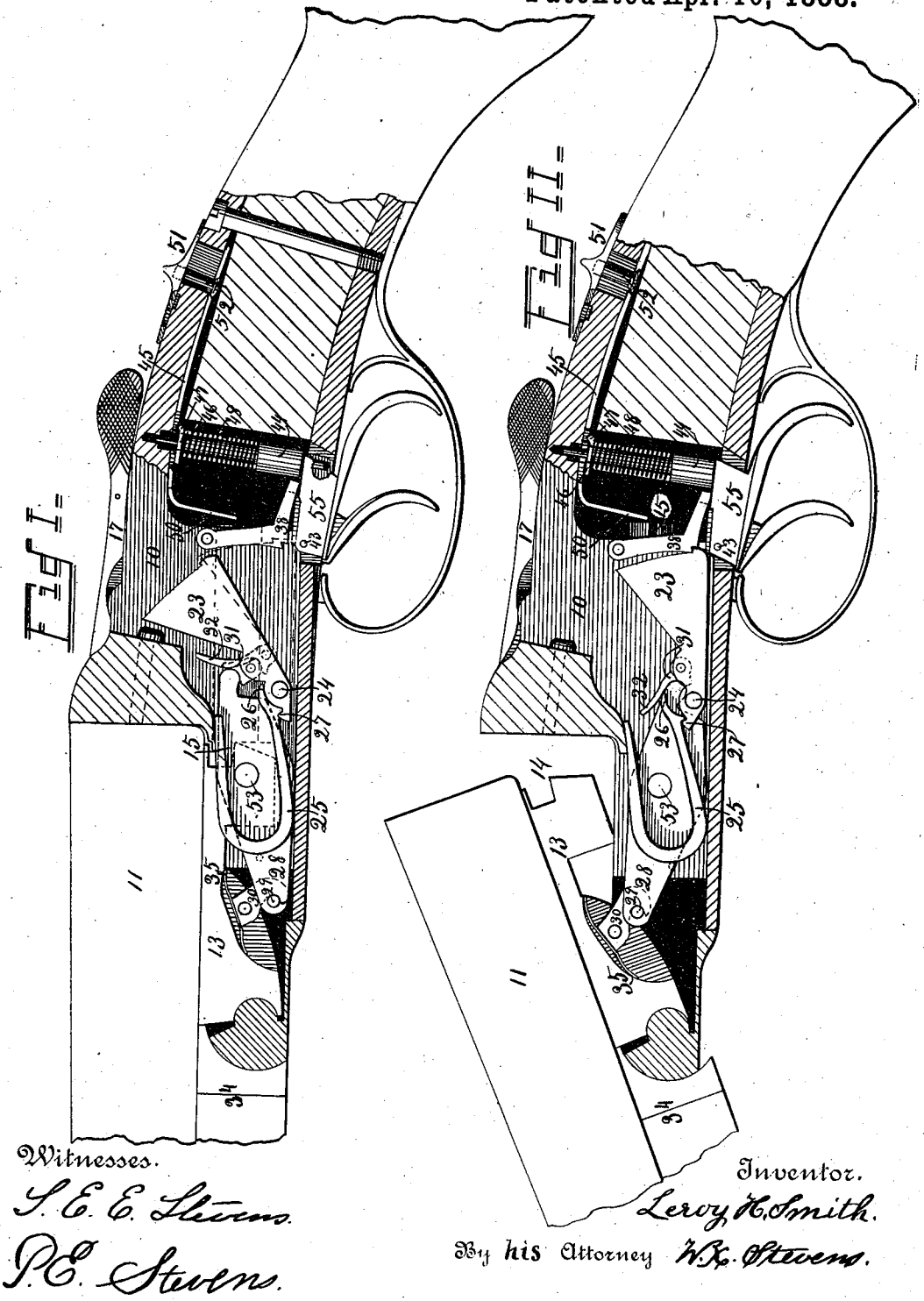
(No Model.) 2 Sheets—Sheet 1.

L. H. SMITH.

BREECH LOADING GUN.

No. 381,088. Patented Apr. 10, 1888.



Witnesses.
S. E. E. Stevens.
P. E. Stevens.

Inventor.
Leroy H. Smith.
By his Attorney W. E. Stevens.

(No Model.) 2 Sheets—Sheet 2.

L. H. SMITH.

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Fig III.

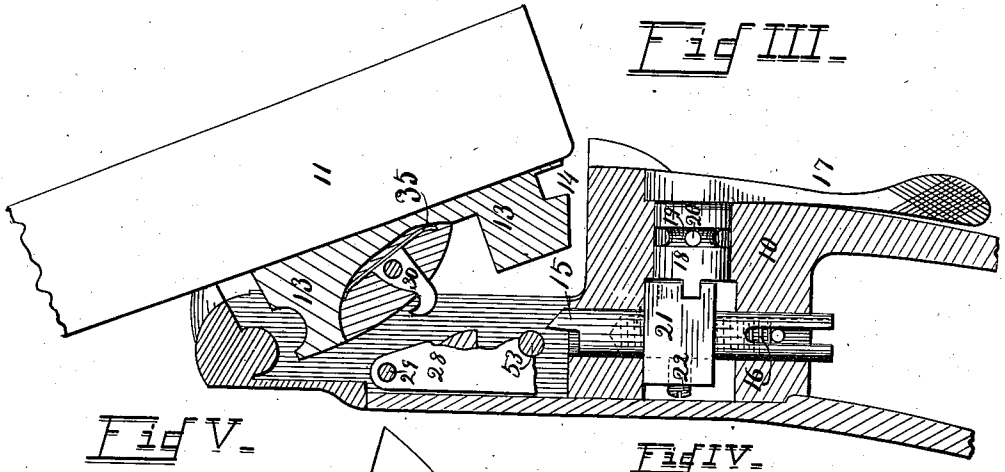


Fig V.

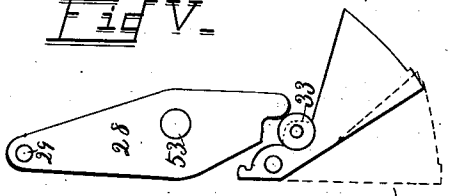


Fig IV.

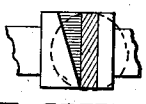


Fig VII.

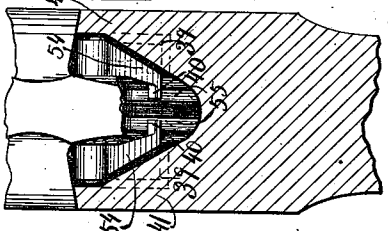


Fig VI.

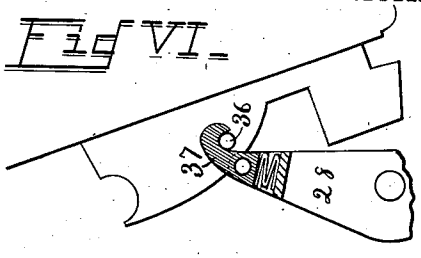


Fig VIII.

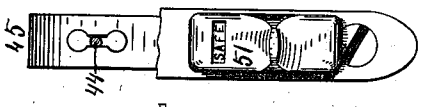
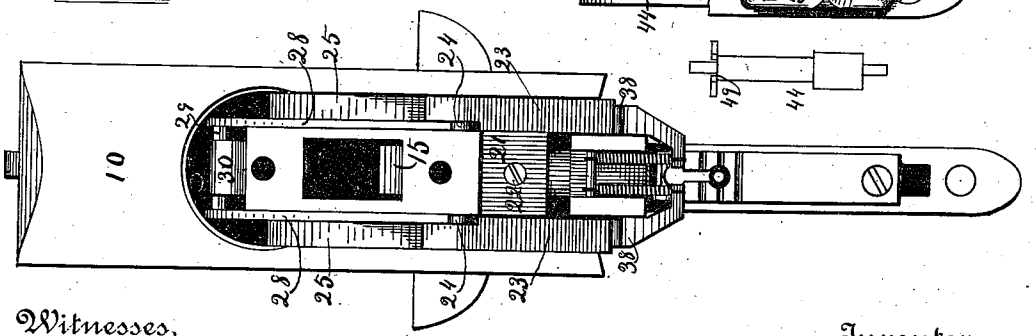


Fig IX.



Witnesses.
S. E. E. Stevens.
P. E. Stevens.

Inventor.
Leroy H. Smith.
By his Attorney W. X. Stevens.

UNITED STATES PATENT OFFICE.

LEROY H. SMITH, OF LISLE, NEW YORK.

BREECH-LOADING GUN.

SPECIFICATION forming part of Letters Patent No. 381,088, dated April 10, 1888.

Application filed January 6, 1888. Serial No. 259,960. (No model.)

To all whom it may concern:

Be it known that I, LEROY H. SMITH, a citizen of the United States, residing at Lisle, in the county of Broome and State of New York, and doing business at Ithaca, Tompkins county, have invented certain new and useful Improvements in Breech-Loading 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 that class of breech-loading guns called "breakdown, hammerless, double guns;" and it has for its object, first, to provide means whereby the act of breaking down the gun will cock both hammers; second, to provide means whereby the barrels will engage with the cocking mechanism by the usual act of placing the barrels on the frame of the gun and will disengage therefrom by the mere act of removal after the fore end has been removed; third, in means for operating the bolt to both lock and unlock the barrels by positive action, and, fourth, in means for locking the sears or triggers either by hand or automatically, to prevent accidental discharge of the gun.

To this end my invention consists in the construction and combination of parts forming a breech-loading gun, hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure I is a longitudinal vertical section of a portion of a gun, showing my invention with all parts at rest. Fig. II is a similar view to Fig. I, but showing the bolt drawn back, the gun broke down, the hammers cocked, and the triggers locked. Fig. III is a side elevation of a portion of a gun according to my invention in the act of disengaging the barrel from the stock. Fig. IV is a top view of the block 21, showing the lug of the body 18 in section. Fig. V is a detail view of a modification of the hammer and cocking-lever connection. Fig. VI is a detail view showing a modification of the connections between the barrel and cocking device. Fig. VII is a plan view of the sears, showing also a portion of the wooden stock in horizontal section. Fig. VIII is a plan view of the rear end of the upper tang, the thumb-piece thereon, and a portion of the safety-plate below it. Fig. IX is an under side view of the frame laid open and showing the remaining parts.

No. 10 represents the frame of the gun, to the rear end of which the stock may be attached in any usual manner, and to the forward end of which the barrels 11 are hung upon a breakdown hinge.

13 is the lug entering a longitudinal slot in the frame, and having the usual hook, 14, at its rear end to engage the locking-bolt 15, which is constantly pressed forward by a spring, 16, and is slanted on the upper side of its forward end, to be forced back by the descending hook 14, so that the act of closing the barrels into place pushes the bolt back and the spring 16 pushes it forward, when the hook registers with the bolt and locks the barrels closed.

17 is the bolt-retracting lever provided with a cylindrical body, 18, which is journaled vertically in the frame 10, and circumferentially grooved at 19 to receive the end of a stop-screw, 20. By this means the body 18 is retained in place after being inserted in its bearing at the top side of the gun, thus permitting the lever 17 and body 18 to be made integral or to be secured together permanently.

21 is a block placed upon the bolt 15 and provided with a set-screw, 22, whereby it may be fixed at any point along the bolt to adjust the bolt as to the amount it shall project into the hook 14. The block 21 is transversely slotted on its upper side, and the body 18 has a lug, 22, projecting down like a screw-driver into this slot. The slot is tapering to closely engage the lug at one end and to give freedom of motion to the lug at the other end, so that the block may be moved to and fro, and with it the bolt be projected or withdrawn by the act of turning the lever 17 from side to side. The block, impelled forward with the bolt by the spring 16, bears against the rear face of the lug 22 and brings the lever 17 in line with the gun. The adjustability of the block 21 upon the bolt permits the bolt to be set to the exact bearing in the hook desired at the same time that the lug and block bear together, as above described. This adjustability is of service also in case the parts wear by use. The lug 22 does the full operation of retracting the bolt by acting against the rear wall of the slot, and the

opposite wall engages the lug in order that the lever 17 may be used to force the bolt home in case the spring 16 should fail to work.

23 represents the hammers, pivoted at 24 in the frame and constantly impelled forward by back-acting springs 25, which are provided with ends 26, projecting beyond the pivots to give rebound to the hammers. Each hammer is provided with a toe, 27, projecting to engage a corresponding notch in the spring, whereby the end 26 of the spring is maintained always in the proper relation to the pivot 24, even though the spring be placed loosely in its receptacle in the frame. When the hammer strikes, it raises the end 26 of the spring a little, but not enough to throw the toe 27 entirely out of engagement with its notch.

28 represents a pair of cocking-levers permanently connected at their forward ends by a cross-bar, 29, with which a hooked stirrup, 30, depending from the lug 13, engages and hung midway upon pivots 53 to the frame. The rear ends of the cocking-levers are rounded to engage bearings in rockers 31, which rockers are journaled in the hammers 23. The act of breaking down the gun cocks both hammers by the stirrup 30 raising the forward ends of the cocking-levers, and thereby depressing their rear ends and the forward end of the rockers, thus bringing the cocking-lever and the rocker into line with a knuckle-joint action, forcing the hammers back on their pivots.

32 is an arm of the rocker, projecting above the bearing to guide the lever 28 into the bearing on its return to action after the disengagement caused by closing the gun and rocking the hammers, as shown in dotted lines, Fig. I.

A roller, 33, Fig. V, would serve as a modification of the rocker 31, provided the spring be in some way secured against longitudinal displacement. In this case there would be nearly the same knuckle-joint action as with the rocker, the hammer being forced to full-cock when the lever and roller are on line of centers. The forward end of the lug 13 has a semicircular bearing opening forward to engage the hinge-pin 12, which is fixed in the frame.

The hand-rest 34, called the "fore end," is removably secured to the barrels, its rear end being shaped as a portion of a bearing to fit and rotate upon the forward end of the frame, which is shaped in that locality as part of a cylinder concentric with the hinge-pin 12. The stirrup 30 is flattened at its upper end to permit a spring, 35, to bear both sides of center to return the stirrup to its normal position when relieved, after being swung either way therefrom. This stirrup is adapted to swing, in order that it may be pressed to one side by the cross-bar 29 when the barrels are being placed on the frame, and its spring 35 forces its hook into engagement with the bar when it passes the same, and the swing of the stirrup further permits it to follow the arc of the cocking-levers. So long as the barrels are securely hinged to the frame the stirrup remains hooked to the cross-bar; but when the fore end is removed half the hinge-joint is taken away, and the barrels may be moved backward and upward out of engagement with the hinge-pin 12, and this movement disengages the hook of the stirrup from the cross-bar, thus liberating the barrels without any special act being made to disengage therefrom the cocking device. For this purpose the hook of the stirrup is made with its open side forward and facing in the same direction as the open side of the bearing in the lug 13 of the hinge-pin 12. A fixed hook or pin, 36, on the lug, and a stirrup, 37, hung to the cocking-levers, as in Fig. VI, would be a mere transposition of parts and a modification of the above device, adapted to connect the barrels with the cocking device by the act of placing the barrel on the frame, and adapted to automatically disengage therefrom in the act of raising the barrel rearward from the hinge-pin. On whichever member the hook may be attached or formed, whether on the barrel or on the cocking device, the hook-opening must be at that side corresponding with the hinge-opening, so that parting the hinge will part the hook from the cross-bar. One very important result of this construction is that it enables the barrel to be removed without cocking the hammers, so that the gun may be parted for packing without leaving the hammers cocked; or, if it be an object, the hammers may first be cocked before the fore end is removed, and then the gun be parted, leaving the hammers cocked.

38 represents the sear which catches the hammer to hold it cocked. It is common to make the sears with a rectangular offset, as shown in dotted lines 39, Fig. VII; but I give them oblique offsets 54, to reach the arms 40, where the triggers 55 bear near the central plane of the gun, to prevent cutting away the wood of the stock and leaving thin cheeks 41.

55 represents the triggers pivoted at 43 in the frame.

44 is a push-pin journaled to slide vertically in bearings in the tangs of the frame, and located to stand upon the rear ends of the triggers.

45 is the safety-plate, slotted through to pass freely forward and back at both sides of the upper end of the push-pin.

46 is a shoe mounted freely on the push-pin, and having a tooth, 47, at one end to engage any one of three notches shown in the under side of the safety-plate.

48 is a spring acting between a shoulder of the push-pin and the shoe to keep the shoe-catch in frictional engagement with the safety-plate, and by pushing the push-pin down upon the triggers to serve as a spring for the latter. The slot in the safety-plate is narrow midway and enlarged at both ends, (see Fig. VIII,) and the pin is small enough along its upper portion to pass freely through the narrow portion of the slot; but it is enlarged below and

provided with a shoulder, 49, which will pass through the safety-plate only at the enlarged ends of the slot. When the safety-plate stands in its middle position, the pin will not rise through it, and its lower end standing on the triggers prevents their being worked and prevents the gun from being fired; but when the safety-plate is at either of its end positions the pin will pass up through it and permit the triggers to work. The forward end of the safety-plate has a downward offset, 50, crossing the path of the locking-bolt 15, in such relation thereto that when the bolt is pressed back by the act of closing the gun, both hammers having been cocked by the act of opening it, the safety-plate will be thereby pushed to its middle position, if it had before been forward, and prevent the release of the hammers.

51 is a thumb-piece on top of the tang, and connected with the safety-plate by a stud, 52, passing through a slot in the tang, whereby the safety-plate may be slid to and fro. In the thumb-piece 51 I place the conventional window through which the word "Safe," stamped in the tang, may be seen when the plate is in its middle position, the thumb-piece covering the word "Safe" when at either of the end positions. It would require only a slight change of position of the push-pin to adapt it to act on the sears exactly in the manner that it does now on the triggers. That would be a modification so evident that a special drawing of it is deemed unnecessary. And the ends of the push-pin may be bored to receive and slide upon stud-wires fixed in the tang instead of entering the tang, as they now do. If the block 21 were rigidly fixed on or integral with the bolt 15, and provided with the transverse tapering slot described, some of the advantages of this invention would be obtained, and it is evident that a parallel-sided slot in the block engaged by a tapering lug on the bolt-retractor would be an equivalent of my invention described, and that either style of slot might be made in the retractor to engage the corresponding style of lug made to project from the bolt-block by mere transposition of parts and correspond with the invention hereinbefore described. Since the slot is wider at one end than at the other merely to give free play at one side to the lug at that end, the same effect would be produced if the whole wall were cut away at the forward side, leaving only a stud standing to engage the lug at the narrow end. There is no novelty in the hinge joining the barrels with the frame, and any hinge whose mated halves may be parted as described will answer the purpose. If the safety-plate 45 were a mere guide to direct the push-pin to holes or to an abutment on the tang, its forward end offset into the path of the locking-bolt 15, as shown, would obtain some of the advantages of my invention.

Having thus fully described my invention, what I desire to secure by Letters Patent is the following:

1. The combination of a gun-frame, a barrel-locking bolt fitted to slide longitudinally therein, a bolt-retractor journaled in the frame at right angles to the bolt, a block adjustably secured upon the bolt, and means for engaging the block with the retractor, substantially as shown and described.

2. The combination of a locking-bolt for a breakdown gun, a block fitted to slide longitudinally upon the said bolt and adapted to engage a bolt-retractor, and a set-screw in the said block, substantially as shown and described.

3. The combination of a gun-frame, a barrel hinged at the forward end thereof to break down, a locking-bolt fitted to slide in the frame to engage the barrel, a spring fitted to impel the bolt constantly forward, a block longitudinally adjustable upon the locking-bolt and transversely slotted with a tapering slot on its upper side, a bolt-retractor vertically journaled in the gun-frame and provided with an external lever, and having a lug projecting into the said slot in the bolt-block, engaging the whole rear wall of the slot and one end of the front wall, substantially as shown and described, whereby parts may be adjusted to hold the barrel securely, and at the same time to hold the bolt-retractor lever in line on the gun-tang, as set forth.

4. The combination of a pivotal gun-hammer, having a toe projecting at one side of the pivot, and a return-bend spring therefor, having an upward bearing at its end against the frame of the gun and a downward bearing at its bend, and having a notch fitted to engage the said toe, the end of the said spring projecting beyond the said notch to engage the hammer beyond its pivot, whereby the hammer is first impelled to strike its blow and afterward caused to rebound and the spring is maintained in proper relation to the hammer, substantially as shown and described.

5. The combination of a gun-frame, a pair of hammers pivoted near their lower ends therein, a rocker journaled in each hammer above its pivot, a pair of levers permanently connected at their forward ends by a cross-bar and hung midway upon pivots to the frame, their rear ends being rounded to engage the said rockers, a pair of gun-barrels hinged to the forward part of the frame, and a hook having its open side forward connecting the barrels with the said cross-bar, substantially as shown and described.

6. The combination of a pair of gun-hammers pivoted near their lower ends, a pair of cocking-levers hung midway upon pivots forward of the hammers and having rounded rear ends, and a pair of rockers journaled in the hammers above the pivots thereof and provided with open bearings to receive the said rounded ends of the cocking-levers, and with an arm upon each rocker projecting above the said bearing, substantially as shown and described.

7. The combination, with a gun-hammer and a cocking-lever therefor, substantially as described, of a rocker pivoted to the hammer and provided with an open bearing to receive the end of the lever, and with a guiding-arm extending beyond the bearing at one side thereof.

8. The combination of a gun-frame having a hinge-pin fixed in its forward end, a pair of gun-barrels having a downward-projecting lug to engage the frame, the said lug having a bearing opening forward to engage the said hinge-pin, a pair of cocking-levers hung in the frame and connected by a cross-bar, and a hook depending from the said lug, with its open side forward to engage the said cross bar, substantially as shown and described.

9. The combination, with a gun-frame provided with a hinge-pin, a barrel or barrels hinged upon the said pin by a bearing opening at one side, and a cocking lever or levers hung in the frame, of a hook and cross-bar adapted to engage the barrels with the said levers, the said hook being open at that side which permits it to disengage the said cross-bar by the act of moving the barrel in the direction to remove its hinge-bearing from the hinge-pin, substantially as shown and described.

10. The combination of a gun-barrel, a lug projecting therefrom having an open or half-hinge bearing, and a hook and cross-bar adapted to engage each other to connect the barrels with a cocking device, the said hook being open on that side adapted to disengage the cross-bar, and thereby to disengage the barrel from the cocking device by the act of parting the said half-hinge from its mate, substantially as shown and described.

11. The combination of a gun-frame having one member of a hinge open at the rear side formed on its forward end, a barrel or barrels provided with a portion of the opposite member of the said hinge open on its forward side, a cocking device hung in the frame, a hook and a cross-bar connecting the barrels with the said cocking device, the two aforesaid members of the hinge and the said hook all being open on corresponding sides, whereby the two parts of the hinge may be disengaged from each other, and the hook may be disengaged from the cross-bar by moving the barrel rearward and upward, as set forth.

12. The combination of a gun-frame, one or more triggers pivoted therein, a push-pin journaled to slide in bearings in the frame and stepped near one end upon the triggers, and provided with an enlargement and a shoulder thereto near the other end, a safety-plate fitted to slide under the tang, and having a narrow slot to receive the small upper end of the said pin, the slot being enlarged at each end, the plate having also three notches in its under side, a shoe mounted freely on the push-pin, and having a tooth to engage either of the said notches in the safety-plate, and a spring acting between the push-pin and the shoe, substantially as shown and described.

13. The combination of the triggers, push-pins stepped thereon, the notched safety-plate at one end thereof, the shoe having a tooth to engage the said notches, and a spring between the shoe and pin, substantially as shown and described.

14. The combination of a gun locking bolt, triggers, the push-pin stepped on the triggers, and the slotted safety-plate fitted to slide past the end of the pin, and having an offset into the path of the bolt, substantially as shown and described.

15. The combination of a gun-locking bolt, triggers and a push-pin stepped thereon, and a plate fitted to slide beneath the tang and adapted to stop or release the pin from action, the said plate having an offset into the path of the locking-bolt, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

LEROY H. SMITH.

Witnesses:
P. G. ELLSWORTH,
FRANK M. LEARY.

Correction in Letters Patent No. 381,088.

It is hereby certified that Letters Patent No. 381,088, granted April 10, 1888, for an improvement in "Breech-Loading Guns," was erroneously issued to the inventor, "Leroy H. Smith, his heirs or assigns," as owner of said invention; whereas the patent should have been granted to *The Ithaca Gun Company, of Ithaca, New York*, its successors or assigns, the owner of the entire interest, as shown by the assignments of record in the Patent Office; that the proper correction has been made in the files and records pertaining to the case in the Patent Office, and should be read in the said Letters Patent that the same may conform thereto.

Signed, countersigned, and sealed this 17th day of April, A. D. 1888.

[SEAL.]

D. L. HAWKINS,
Assistant Secretary of the Interior.

Countersigned:

BENTON J. HALL,
Commissioner of Patents.

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