3 Sheets—Sheet 1.

J. DEELEY & J. S. EDGE, Jr.

Breech-Loading Fire-Arm.

No. 212,593. Patented Feb. 25, 1879.

FIG I

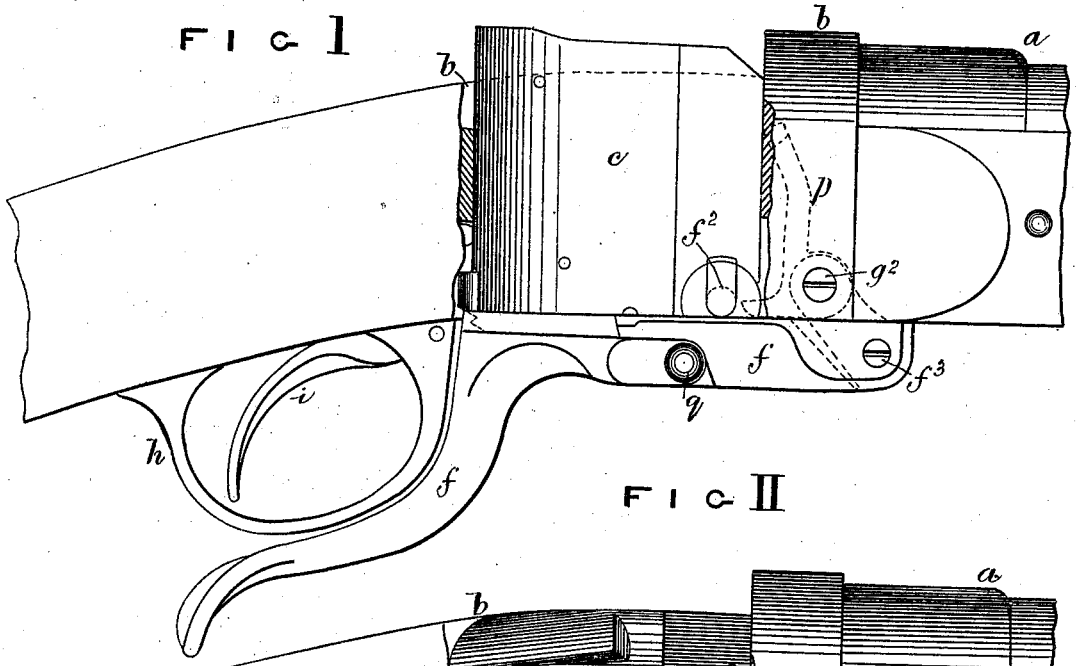
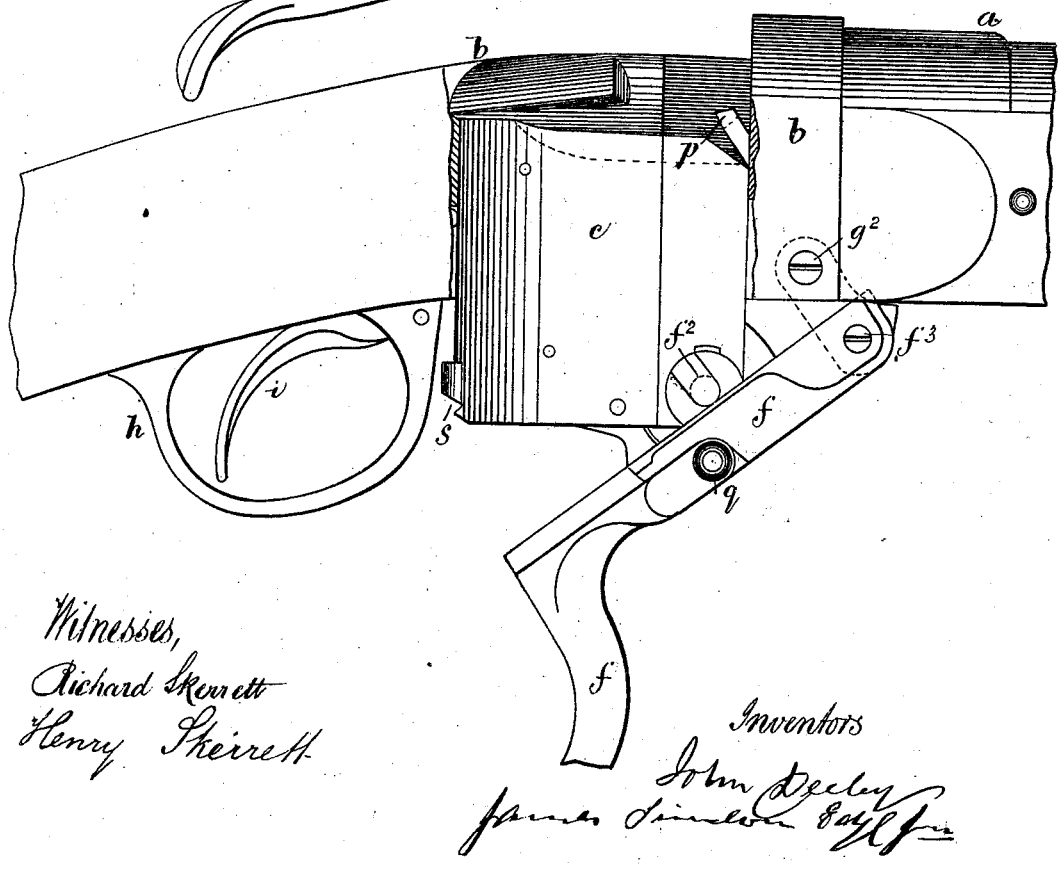


FIG II



Witnesses,
Richard Skerrett
Henry Skerrett

Inventors
John Deeley
James Sinclair Edge Jr.

3 Sheets—Sheet 2.

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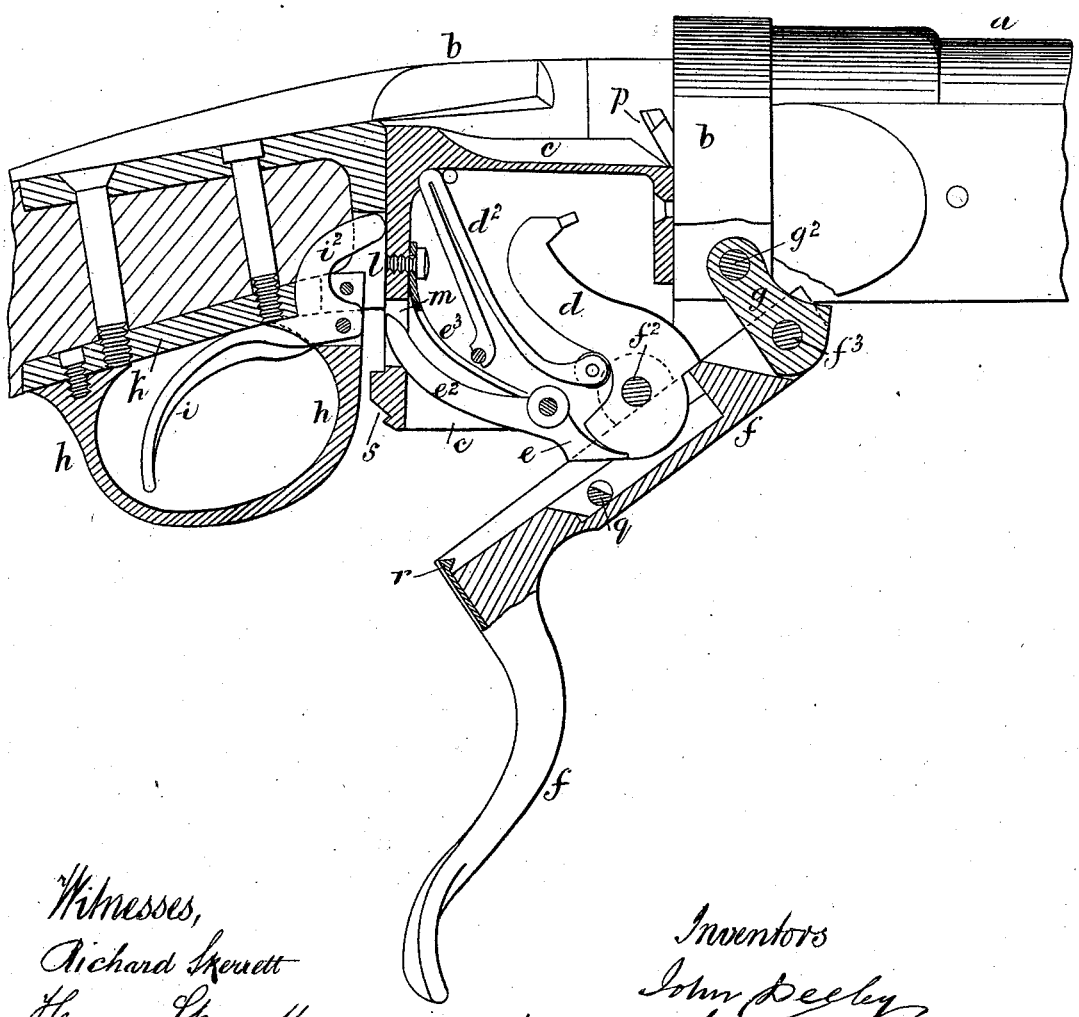
FIG III



Witnesses,
Richard Skerrett
Henry Skerrett

Inventors
John Deeley
James Simon Edge Jrs

3 Sheets—Sheet 3.

J. DEELEY & J. S. EDGE, Jr.

Breech-Loading Fire-Arm.

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FIG IV

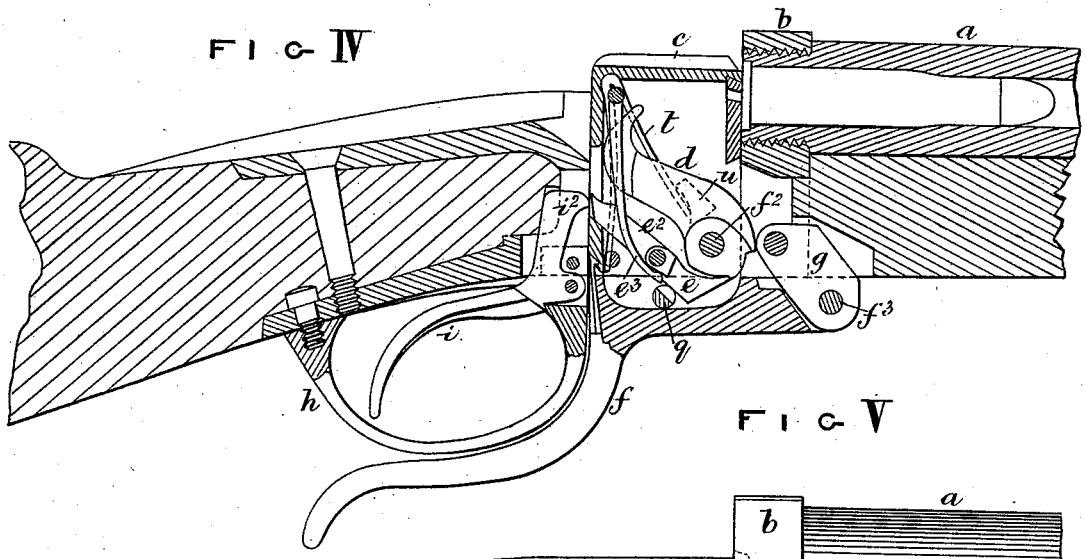

FIG V

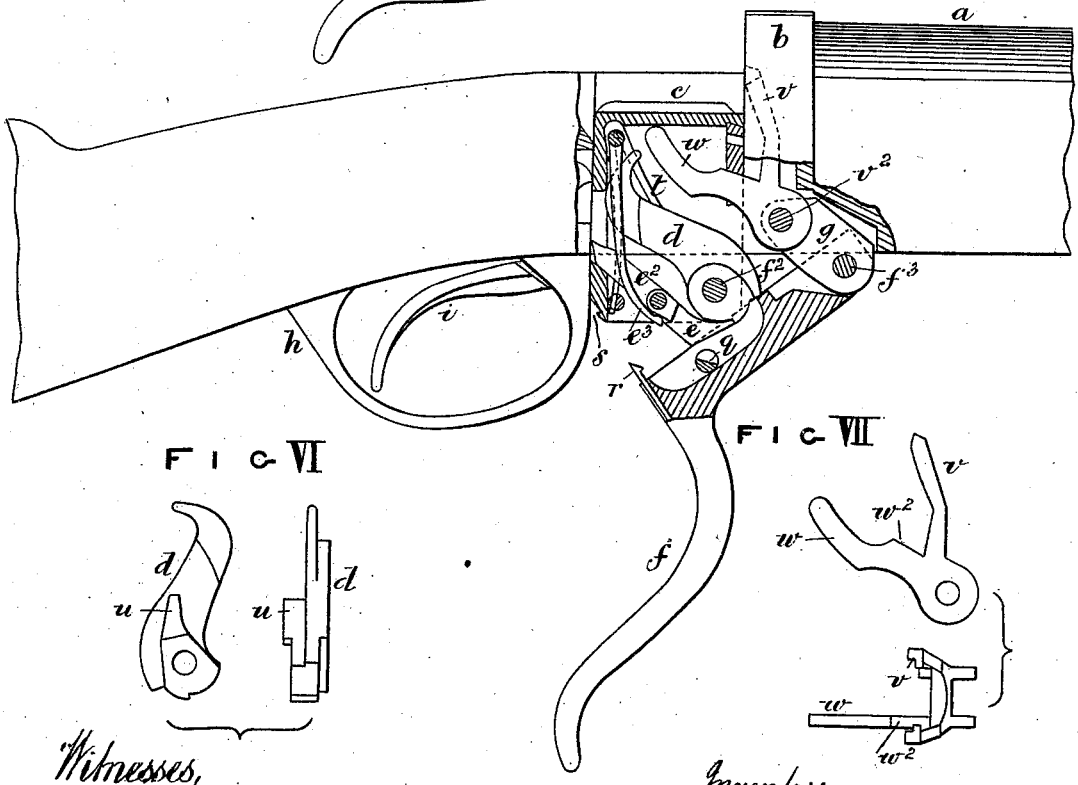

FIG VI

FIG VII

Witnesses,
Richard Skerrett
Henry Skerrett

Inventors
John Deeley
James Simeon Edge Jr

UNITED STATES PATENT OFFICE.

JOHN DEELEY, OF BIRMINGHAM, AND JAMES S. EDGE, JR., OF YARDLEY, ENGLAND.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. **212,593**, dated February 25, 1879; application filed October 4, 1878; patented in England, March 13, 1873.

To all whom it may concern:

Be it known that we, JOHN DEELEY, of Birmingham, in the county of Warwick, gun manufacturer, and JAMES SIMEON EDGE, the younger, of Yardley, in the county of Worcester, England, mechanical engineer, have invented new and useful Improvements in Breech-Loading Small-Arms, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

Our invention consists of the improvements hereinafter described in breech-loading small-arms, in which the breech is opened and closed by a vertically-sliding block; and our said invention has reference in part to the sliding-block guns described, represented, and claimed in the specification of Letters Patent granted to us in the United States on the 2d day of June, 1874, No. 151,478.

In the sliding-block guns described and represented in the specification of the patent referred to, the breech-block is raised and lowered by a trigger-guard lever, which lever is jointed at its middle to the sliding block and at one end to the shoe or body of the gun, the trigger being situated within the guard of the trigger-guard lever and carried by the sliding block.

According to one part of our present invention, we dispense with the trigger-guard lever, and use in place thereof a hand-lever, which is jointed to the body of the gun and to the sliding breech-block in the manner described with respect to the trigger-guard lever, and we arrange the trigger-guard and the trigger at the rear of the shoe or body in which the sliding block works, the trigger-guard being fixed to a guard-plate forming a prolongation of the shoe or body of the gun. This change of position of the trigger with respect to the sliding block necessitates the following modification in the arrangement of parts for discharging the gun: The short arm of the trigger is made to work in and project through a slot in the rear end of the shoe, and the sear which engages with the bent in the hammer to hold the said hammer in its cocked position is made in the form of a lever having nearly equal arms, the said sear-lever being jointed at the middle of the sliding block and near the lower edge thereof. The extreme end of the rear arm of the sear-lever works in a slot or opening at the back of the breech-block in a position to be operated upon by the short arm of the trigger when the latter is pulled. The front arm of the sear-lever engages, when the hammer is cocked, with the bent in the said hammer in the usual way.

These improvements may be applied to sliding-block guns in which a tumbler or tumbler-lever is used instead of a hammer.

By constructing and arranging the parts of sliding-block guns in the manner described the manipulation of the breech mechanism is simplified, and there is a less number of projecting parts on the under side of the block for the dress of the user of the gun to engage with or catch in.

Our invention consists, further, of the following improvement in the cocking mechanism of vertically-sliding-block guns: Instead of making the mainspring of the hammer bear against the back of the hammer, as usual, we make the mainspring act upon the hammer at the side thereof. For this purpose we make at the side of the hammer a projection, upon which one of the limbs of the mainspring bears. When the hammer is cocked on the descent of the sliding block the said hammer descends on the side of the compressed mainspring instead of compressing the limb of the mainspring before it as it descends, as in the ordinary arrangement. By this means we are enabled to use a much shorter block and shoe than when the mainspring bears against the back of the hammer, as usual.

Our invention consists, further, of the following improvements in constructing and working the extractors of vertically-sliding-block guns: The forked extracting-levers of the said guns are ordinarily worked by the bottom of the sliding block when it has fully descended in the shoe, striking the said lever and turning it on its joint.

In constructing the said forked extracting-levers according to our invention we provide the said levers with an additional arm, situated nearly in the same plane as one of the forked arms of the lever, and having nearly

the same length. The additional or rear arm of the extracting-lever is situated within the hollow sliding block of the gun, the front of the said block being furnished with a slot, which works upon the said additional arm on the rising and falling of the block.

When the block has been depressed in its shoe sufficiently far to open the breech the top of the block strikes against the top of the additional rear arm of the extracting-lever, and turns the said lever on its center and causes its fork to extract the empty cartridge-case in the usual way.

Instead of operating the extracting-lever described by the action of the top of the block on the additional arm, the said extracting-lever may be operated by a pin or stud on the inside or outside of the block acting upon the additional arm of the extracting-lever.

We will now proceed to describe, with reference to the accompanying drawings, the manner in which our invention may be performed.

Figures 1 and 2 represent side elevations, with a portion of the breech-shoe removed, of a vertically-sliding-block gun constructed according to the first part of our invention, Fig. 1 representing the sliding breech-block raised in its shoe and the gun ready for discharge, and Fig. 2 representing the said breech-block depressed in its shoe and the breech open for loading and the hammer cocked. Fig. 3 represents a longitudinal section of the gun, Fig. 2, taken through the breech-block.

The same letters of reference indicate the same parts.

a is the barrel of the gun, and *b* is the body or shoe, in a mortise or opening in which the hollow breech-block *c* slides. The said breech-block *c* contains or incloses the hammer *d*, its mainspring d^2, and the sear-lever *e* e^2, and its spring e^3.

The breech-block *c* is raised and lowered in the shoe *b* and the hammer *d* cocked by the hand-lever *f*, jointed at f^2 to the front end of the block *c*, and also at f^3 to the swiveling arm or link *g*, the latter being jointed at g^2 to the body or shoe *b* of the gun.

The hammer *d* is carried by the hand-lever *f*, the said hammer turning on the same joint-pin or center, f^2, as that by which the breech-block *c* is jointed to the said hand-lever *f*. (See Fig. 3.)

When the hand-lever *f* is depressed for lowering the block *c* and opening the breech, the hammer *d*, by the descent of the hand-lever, is brought into its cocked position, and held in that position by the sear-lever *e* engaging with the bent in the said hammer, the parts remaining in the relative positions described until the breech is fully opened, as seen in Fig. 3.

On lifting the hand-lever *f* for closing the breech the cocked hammer is carried with it, and is liberated by the action of the trigger, in the manner hereinafter described.

The trigger-guard *h* and trigger *i* are situated at the rear of the body or shoe *b*, the said trigger-guard *h* being fixed to the guard-plate *k*.

The short arm i^2 of the trigger *i* has the form represented in Fig. 3, and works in a slot, *l*, in the rear of the breech-shoe.

The sear-lever *e* e^2, upon which the trigger acts to discharge the gun, is carried by and has the position in the block *c* represented in Fig. 3. Its short arm, *e*, engages with the bent in the hammer *d*, and its other and longer arm, e^2, passes to the rear end of the breech-block *c*, and its end works in a slot, *m*, in the said rear end of the block.

When the block *c* is raised in the shoe *b* for closing the breech preparatory to the discharge of the gun, the end of the arm e^2 of the sear-lever *e* e^2 is situated immediately in front of the short arm, i^2, of the trigger *i*, and when the trigger *i* is pulled its short arm, i^2, raises the long arm, e^2, of the sear-lever, thereby disengaging its short arm, *e*, from the bent in the hammer *d*, and the latter falls by the action of its mainspring and discharges the gun. *p* is the extracting-lever, operated by the falling block *c* when the latter has descended sufficiently far to open the breech. A safety-bolt at *q*, on the side of the hand-lever *f*, the acting part of which bolt is situated under the short arm, *e*, of the sear-lever, is used for preventing the lifting of the sear-lever and the accidental discharge of the gun. The hand-lever *f* is fastened in its raised position against the under side of the breech-block *c* by the spring-catch *r* taking into a notch, *s*, at the rear end of the block. (See Fig. 3.)

The gun is opened for charging by depressing the hand-lever *f* into the position represented in Figs. 2 and 3. The breech is thereby opened, the hammer cocked, and the empty cartridge-case extracted. After a fresh cartridge has been introduced into the barrel the hand-lever *f* is raised into the position represented in Fig. 1. The breech-block containing the cocked hammer is thereby raised in the breech-shoe and the breech closed, and the gun is ready for discharge.

The construction and arrangements of parts described and represented in Figs. 1, 2, and 3 may be applied to sliding-block guns in which a tumbler or tumbler-lever is used instead of a hammer.

Fig. 4 represents in longitudinal section, and Fig. 5 in elevation, partly in section, the breech end of a vertically-sliding-block gun of the kind described and represented, provided with the cocking and extracting mechanisms hereinbefore described as constituting the second and third parts of our invention. In Fig. 4 the gun is represented ready for firing, and in Fig. 5 the breech opened for charging. Fig. 6 represents the hammer separately, and Fig. 7 represents the extracting-lever separately.

Instead of making the mainspring *t* bear against the hammer *d* at the back thereof, as in the previously-described arrangement, we give the mainspring the position in the breech-

block represented, and we make one of the limbs of the said mainspring *t* bear upon a projection, *u*, at the side of the hammer. When the hammer *d* is cocked and the breech opened by the depression of the hand-lever *f*, the said hammer descends on the side of the said mainspring *t*, compressing the said spring by the action of the side projection *u* upon it, as will be understood by an examination of Fig. 4 of the drawings. By thus arranging the mainspring with respect to the hammer a shorter block and shoe can be used than when the mainspring bears against the back of the hammer.

v is the forked extracting-lever, turning on the center v^2, and situated at the mouth of the barrel, as usual. The said extracting-lever is represented separately in Fig. 7. It has at its rear end an additional arm, *w*, the position of which, with respect to the fork *v*, is best seen in Fig. 7. The additional arm *w* of the extracting-lever *v* is situated within the hollow sliding block *c*, as seen in Fig. 5, the front of the said block being furnished with a vertical slot, which works upon the said additional arm *w* on the rising and falling of the said block. When the breech-block *c* is depressed in its shoe sufficiently far to open the breech the top of the said block strikes against the top of the additional rear arm, *w*, of the extracting-lever, as illustrated in Fig. 5, and turns the said lever on its center v^2 and causes its fork *v* to start the empty case. As the block farther descends the top of the slot in the front of the said block strikes the arm *w* at w^2 near the center on which the extractor turns, and thereby causes the extracting-fork *v* to complete the extraction of the empty cartridge-case from the barrel.

The additional rear arm, *w*, of the extracting-lever may be operated by a pin or stud on the inside of the breech-block instead of by the top; or the additional rear arm, *w*, may be situated outside the breech-block, and be operated on the descent of the said block by pins or studs on the outside of the said block.

The parts of the gun, Figs. 4 and 5, which we have not described are constructed, worked, and act in the manner described with respect to the gun, Figs. 1, 2, and 3, and corresponding parts are marked with the same letters of reference.

Although we have shown our arrangements for compressing the mainspring of the hammer and for extracting the empty cartridge-case in combination with a vertically-sliding-block gun constructed according to our invention, yet we wish it to be understood that the said arrangements may be applied to vertically-sliding-block guns generally.

Having now described the nature of our invention and the manner in which the same is to be performed, we wish it to be understood that we claim as our invention of improvements in breech-loading small-arms of the kind called "vertically-sliding-block guns"—

1. As an improvement in the fire-arm patented to us by Letters Patent dated June 2, 1874, and numbered 151,478, the sliding breech-block-operating lever jointed to the breech-block and to the body or shoe of the gun in substantially the manner therein described, curved outward at its free end, in combination with the trigger and stationary trigger-guard, located back of the sliding block on the body or stock of the gun, substantially as herein set forth, the curved portion of said hand-lever conforming to the shape of the trigger-guard, as specified.

2. As an improvement in said fire-arms having vertically-sliding breech-blocks which carry the hammer and sear-lever, and in combination with said parts, the stationary trigger-guard, fixed to the gun-stock or body back of the sliding block, and arranged to protect the trigger pivoted on the gun-stock, the said trigger being adapted to operate the sear-lever carried by the sliding block, substantially as set forth.

JOHN DEELEY. [L. S.]
JAMES SIMEON EDGE, JR. [L. S.]

Witnesses:
RICHARD SKERRETT,
HENRY SKERRETT,
Both of 37 Temple Street, Birmingham.