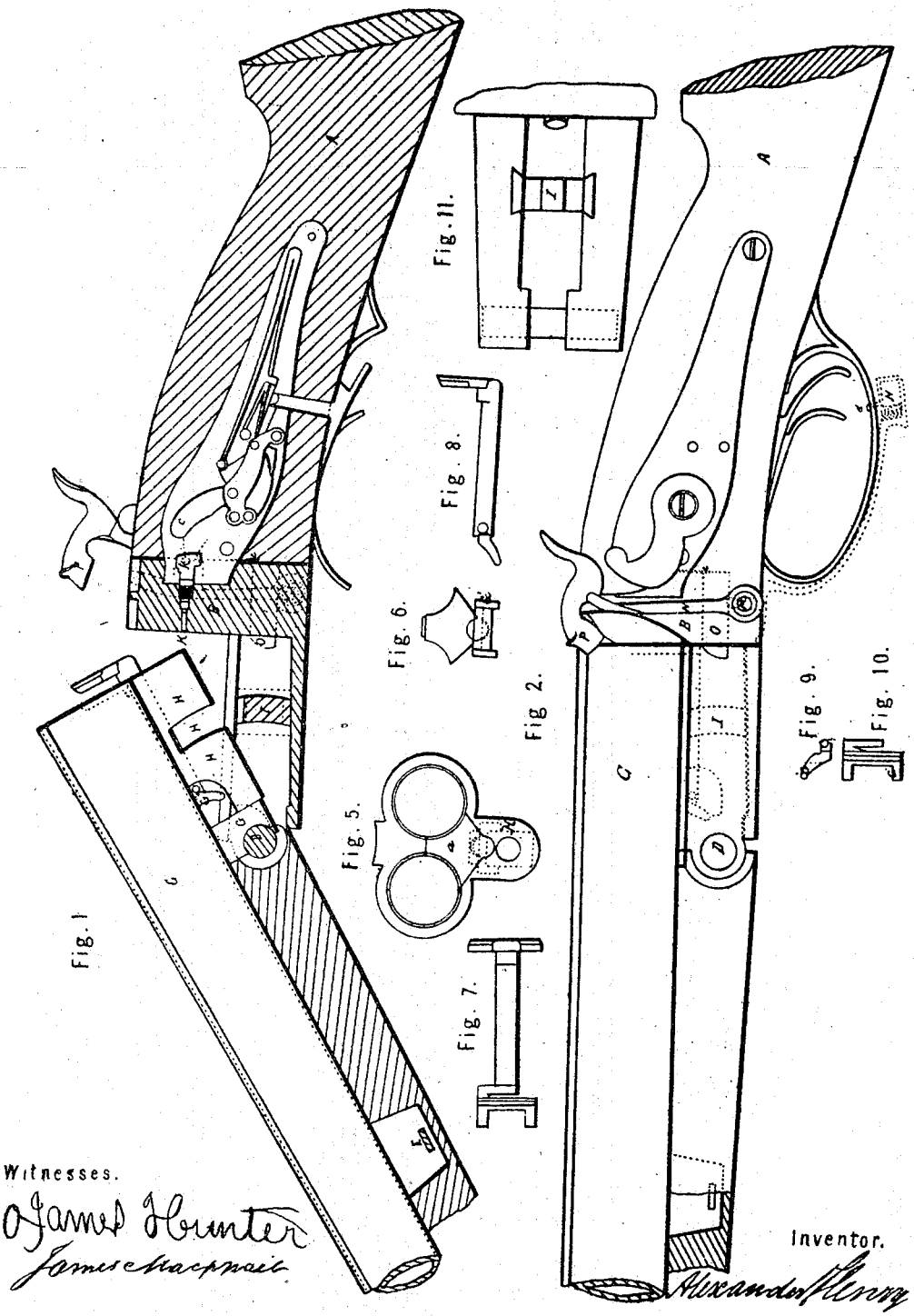
2 Sheets—Sheet 1.

A. HENRY.

Breech-Loading Fire-Arm.

No. 52,654. Patented Feb 13, 1866.



Witnesses.

James Hunter

James Macpherson

Inventor.

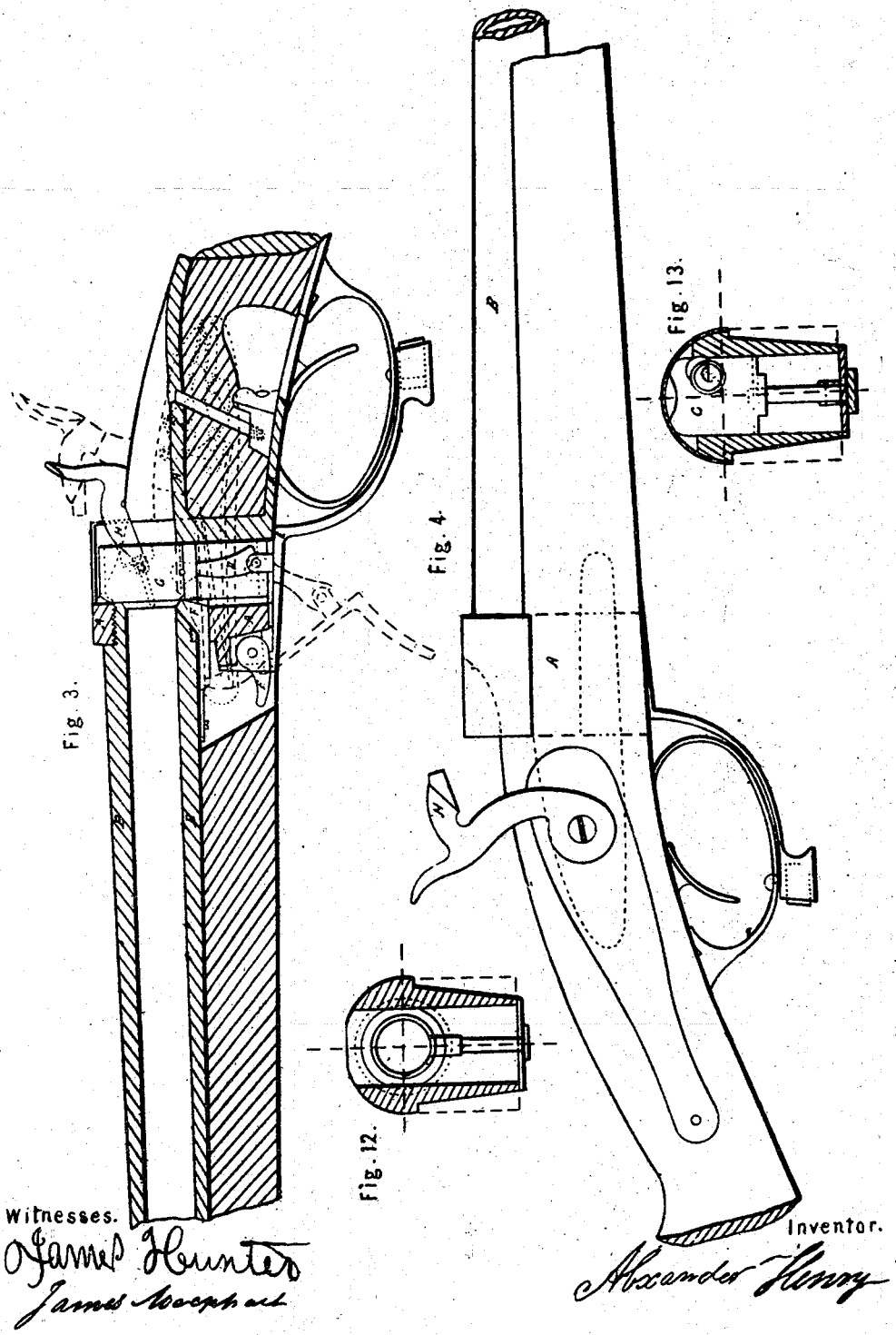
Alexander Henry

2 Sheets—Sheet 2.

A. HENRY.

Breech-Loading Fire-Arm.

No. 52,654. Patented Feb 13. 1866



Witnesses.

James Hunter

James Macpherson

Inventor.

Alexander Henry

UNITED STATES PATENT OFFICE.

ALEXANDER HENRY, OF EDINBURGH, NORTH BRITAIN.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. **52,654**, dated February 13, 1866.

To all whom it may concern:

Be it known that I, ALEXANDER HENRY, of Edinburgh, in the county of Mid-Lothian, North Britain, have invented certain new and useful Improvements in Fire-Arms; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings.

This invention relates to certain improvements in breech-loading fire-arms, which improvements are particularly applicable to center-fire guns and rifles, and, with certain slight modifications, such as the elongation of the face of the cocks, or by using an ordinary lock, applicable to the pin-cartridge principle.

One feature of this invention consists in using a tumbler with an elongated back or shoulder, which portion of the tumbler (as the tumbler itself is moved by the ordinary spring-action of the lock) strikes against a piston, instead of causing the cock or hammer to strike on a nipple, as formerly. This motion, communicated by the tumbler to the piston, produces a direct blow on the latter instead of a diagonal one, thus producing an advantageous effect.

The arrangement of lock used under the present invention permits the piston or pistons to lie concealed and out of the way of being injured by dirt or a damp atmosphere, owing to the piston being contained within the lock-case, and situated concentrically, or thereabout, with the barrel or barrels. If desired, the piston may be united to the tumbler by means of a movable pin-joint, in which case the hole in the breech-piece must be made taper, so as to admit of the partly radial and horizontal motion of the piston, in which case no spring is required to keep the piston back when the gun is out of use.

Another part of the improvements comprehended under this invention consists in passing the bar of the cartridge-case extractor through a solid lump of metal fixed underneath the barrels, the back face of the extractor itself being formed with a curved face, which, as the barrels are tilted, moves another piece of metal of a quadrantal form arranged in the stock, and, being placed eccentrically with the center on which the barrels oscillate, causes the extractor to be moved forward. The curved face of the extractor is formed with a dovetail and pin parallel to each other, by both of which it is held in the pin and capable of easy removal, when required. An axle or shaft which actuates a sliding bolt passes through the bottom of the "break-off," to which levers are attached, standing in such a position in front of the cocks as to prevent the barrels being unbolted until the cocks have been moved to half-cock; and, therefore, if the bolt which locks the barrels is not fully forward when the fire-arm is ready for being fired, the breast of the cock as it moves forward, striking upon the levers, completely bolts the gun before the piston reaches the cap, and, in the case of a pin-cartridge, before the cock or hammer reaches the pin. An eccentric piece of metal is fixed on the axle, which acts in a recess formed in the bolt, and as the shaft partly revolves the bolt which holds the breech end of the barrel is moved forward; or instead of using a lever or levers to be partly acted upon by the hammer or cocks, as hereinbefore described, a single lever may be employed, which works underneath, and when not in use is held by a spring-catch underneath the guard.

Another improvement consists in using a solid piece of steel of a circular form, fitted, by dovetails, across the body of the stock. This piece of steel corresponds to a curved opening made in the solid metal beneath the barrels. This piece of steel may be easily removed, if necessary, for rejointing the breech after long wearing, when a new piece would render the joint again perfect.

Another improvement under this invention consists in the construction of a breech-piece with a strap or projection for fixing it to the stock. Into the front part of this piece the barrel is screwed. An opening is left between the end of the barrel and the front of the breech-piece, and through this opening the breech proper passes, being moved vertically, and held in position for firing by means a double-jointed lever. A piston is also fitted in the vertically-sliding breech-piece, which, when struck by the cock or hammer, is driven forward and explodes the cap of a central-fire cartridge.

A peculiar kind of extractor is employed in connection with this latter arrangement of my invention, situated underneath the barrel, and consists of a prong at the back end form-

ing the extracting portion. This is moved forward by the breech-lever as the latter is drawn down for reloading.

In the accompanying sheet of drawings, Figure 1 is a part longitudinal section and elevation of a breech-loading fowling-piece constructed under the first head of my said invention. Fig. 2 is a side elevation corresponding to Fig. 1. Fig. 3 is a longitudinal section of a breech-loading rifle under the second form of my invention, Fig. 4 being a corresponding section thereof. Figs. 5, 6, 7, 8, 9, 10, 11, 12, and 13 are details, and are hereinafter more fully referred to.

In Figs. 1 and 2 the stock is marked A, the break-off B being made of iron, extending to a short length under the barrels. The barrels C are jointed to the stock by the hinge at D, the smaller end of what would be the stock in an ordinary muzzle-loading gun being, in this instance, detached from the stock proper and held to the barrel by the bolt E, so as to form the other half of a hinge-joint at D.

In the upper end of the part B the circular or quadrantal piece of metal G is situated, upon which the corresponding end G′ of the extractor moves as the barrels are tilted for reloading, and the cartridge-case is thus extracted when loaded, and the barrels are tilted back into the position for firing, the face of the extractor is brought into contact with the face of the breech, and is then, with the cartridge, forced fully into the barrels.

At Fig. 5 is shown the position of the extractor *a* relatively with the barrels; the dotted portions show the curved end fitted into the sliding bar of the extractor and the curved piece of metal over which the curved end slides.

In the solid piece of metal H, situated at the lower side of the barrels, a transverse opening, H′, is formed, of a segment shape, the center of the curve being the center of the pin upon which the barrels tilt, the piece of metal I, Figs. 1 and 2, and seen in plan in Fig. 3, being that upon which the barrels catch when they are brought into firing position. Thus the whole force of the explosion is against the breech-face and the inner edge of the piece I. This piece of metal I is, as hereinbefore referred to, dovetailed into the body so as to be easily removed when necessary, for repairing, &c.

The part of the extractor which is considered new in this arrangement is the mode of attaching the curved face G′, as shown in detail in Figs. 5. 6, 7, 8, 9, and 10.

On again referring to Fig. 1, the piston K is kept out of contact with the cartridge previous to the gun being fixed, by a small spiral spring, *g*, and as soon as it is desired to discharge the gun the trigger is pulled as usual, when the tumbler is released and its extended part *e* strikes the inner end of the piston, as shown by the red lines in Fig. 1. This brings the outer end of the piston in contact with the cartridge-cap, and the charge is immediately fired. One great object gained by this method of igniting the cartridge-cap is that the extended portion of the tumbler does not strike the piston until the former has attained its highest velocity; therefore the piston does not commence to move until the tumbler has nearly reached the limit of its movement. By this means the cap is struck with the highest possible velocity of the piston, and thus its ignition by percussion is rendered more certain. In Figs. 1 and 2 is also shown the arrangement by which the barrels are locked in firing position. Extending through the lower part of the body is the shaft M, at either end of which a lever, N, is fitted, and at its central part another short lever is situated, the end of which fits into an opening made in the bolt O. By drawing the lever N back the bolt O is also withdrawn, when the barrels are left free for being tilted. A spring, *e*, at the back, sends the bolt forward when the levers N are released.

On referring to Fig. 2 it is obvious that the barrels cannot be unbolted until the hammers P are brought to half-cock, for the reason that the levers N, if slightly moved back, abut against the neck of the cock; and it is further evident that unless the barrels are brought into the true firing position an explosion of the charge cannot take place, for in the event of the trigger being drawn the cocks would strike against the lever N, which could not be driven forward unless the barrels are in position, that the bolt O may slide into its proper receptacle, for the same reason that the barrels cannot be discharged unless the gun is fully bolted; for should it occur, through any casualty, that the bolt O was not fully driven forward previous to firing, the action of the cock striking on the lever N must fully bolt the gun before the explosion can take place.

Instead of using levers N on either side of the gun a single central lever, N′, may be used, as shown in blue lines in Fig. 2, and which is kept in position in being attached by the spring-catch *d* in the shield, on releasing which the lever may be brought down and the bolt O withdrawn ready to allow of the tilting of the barrels. Lefacheaux levers can also be employed for the same purpose of locking the barrels.

I now proceed to describe my second arrangement, which is more particularly applicable to single-barrel guns and rifles, as shown at Figs. 3, 4, 12, and 13. The breech-piece A, in these figures, is formed with a long strap, A′, by means of which it is united to the rifle-stock. The barrel B is screwed into the breech-piece, as more particularly seen at Fig. 1, the after part of the breech-piece A being hollowed out so as to allow of the cartridge being passed into the barrel. The space between the end of the barrel A and the front of the breech-piece is hollowed out, and a movable breech, C, slides therein in such manner as to close over the cartridge. This movable breech C is jointed, by means of the link D, to

the lever E, which, on being released from the trigger-guard and pulled down, at the same time draws down the breech-piece into the position shown in blue lines in Fig. 3. When the breech is thus pulled down the barrel is ready for being reloaded. At the same time that the breech-piece is drawn down the inner end of the lever E presses against the cartridge-case extractor F and presses it outward, thus freeing the barrel of that portion of the cartridge remaining therein after firing.

The piston G, by which the cartridge is ignited, is contained within the breech-piece C and driven forward by the end of the hammer or cock H, and in order that too severe an impulse may not be imparted to the piston G, a portion of the hammer is left projecting at the side, which catches against the side of the breech-piece. With this arrangement of breech either a bar-lock may be used, as shown in red lines in Figs. 3 and 4, or an ordinary lock may be used, as shown in black outline in Fig. 4. Fig. 12 shows the opening in the breech-piece for the reception of the movable breech, and Fig. 13 shows the breech C with the piston G placed therein.

I claim—

1. The construction of the curved face of the extractor, with a dovetail and pin for fixing it to the extractor-bar, substantially as hereinbefore described, and shown in the figures of the annexed sheet of drawings.

2. The employment of a lever for actuating the movable bolt for locking the barrel, in combination with the hammer, under the arrangement hereinbefore shown and described, so as to prevent the barrel from being unbolted until the hammer shall have been moved to half-cock, and to secure the complete locking of the barrel before the piece can be discharged, substantially as set forth.

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

ALEXANDER HENRY.

Witnesses:

JAMES HUNTER,

JAMES MACPHAIL.