R. GRAHAM.

Muzzle-Loading Fire-Arm.

No. 43,881. Patented Aug. 16, 1864.

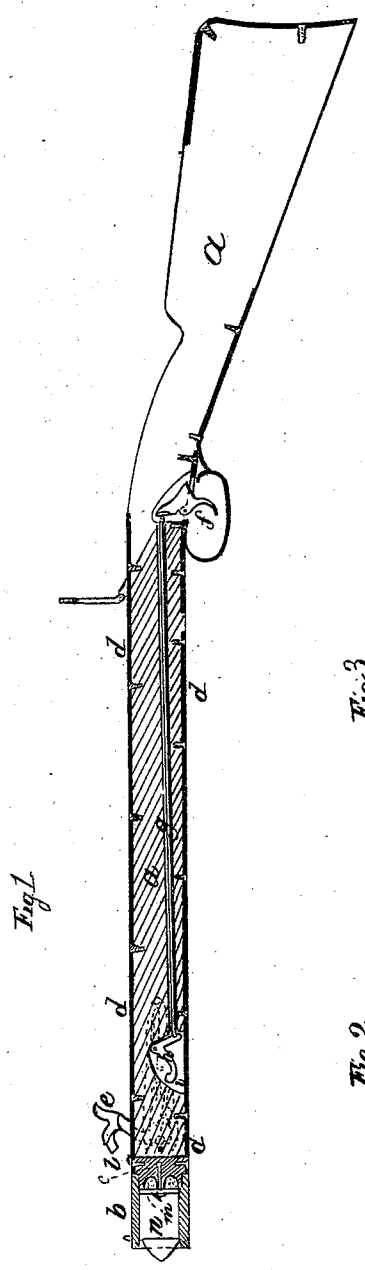


Fig. 1.

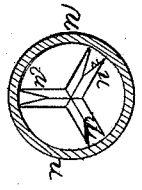


Fig. 3.

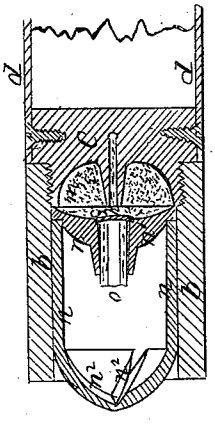


Fig. 2.

Witnesses

Lemuel W. Serrell

Thos. Geo. Hazard

Ralph Graham

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

RALPH GRAHAM, OF BROOKLYN, NEW YORK, ASSIGNOR TO HIMSELF AND SAMUEL BOOTH, OF SAME PLACE.

IMPROVEMENT IN FIRE-ARMS.

Specification forming part of Letters Patent No. **43,881**, dated August 16, 1864.

To all whom it may concern:

Be it known that I, RALPH GRAHAM, of Brooklyn, E. D., in the county of Kings and State of New York, have invented, made, and applied to use a certain new and useful Improvement in Fire-Arms for Projecting Grenades or Small Bomb-Shells; and I do hereby declare the following to be a full, clear, and exact description of my said invention, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a longitudinal section of my improved arm. Fig. 2 is a section in larger size of the barrel, and Fig. 3 is a cross-section of my projectile or shell.

Similar marks of reference denote the same parts.

Heretofore a nipple has been employed projecting within the barrel at the breech to perforate a cartridge and to convey the fire to the same, and fire-arms and cannon have been made with a chamber containing the powder at the rear of the barrel containing the ball.

I have discovered that a heavy ball can be discharged from a hand-arm, provided the barrel be shortened in proportion—for instance, a musket of an ordinary caliber with the usual ball can be fired with ease from the shoulder; but if the ball were, say, six times the ordinary weight, the musket could not be fired from the shoulder with the same length of barrel, whether of the same or of an increased caliber; but if the barrel be shortened in proportion, and enlarged, say, to one-sixth of the size, the arm could be fired with safety from the shoulder. The general principle involved I believe to be that the projectile is propelled by the powder acting against the inertia of the arm, and the ball escaping and relieving the pressure before that pressure has the opportunity to propel the barrel and stock back as the ball goes forward. I have availed of this general condition in constructing a hand-arm with a short barrel adapted to throwing small grenades or bomb-shells without injurious recoil to the person.

My said invention consists in a hand fire-arm composed of a short barrel adapted to the reception of a grenade or small shell.

I connect the hammer at the barrel in such a manner with the trigger that the latter may occupy its usual position on the stock while the hammer itself is at a considerable distance away, contiguous to the short barrel.

I have found that with a short barrel mounted in this manner, and having a parabolic-shaped breech with a central touch-hole, a small shell, about the size shown in the drawings, can with safety be projected several hundred yards without inconvenience to the person using the same, and I have found that the same sized shell with a similar charge of powder, if introduced in a barrel adjoining the ordinary trigger and hammer, would be liable to produce injury to the face and eyes of the person using the same, and if a longer barrel were employed, so that the muzzle would be farther away from the person, the recoil would be so great that the weapon could not be used by hand; and I find practically that the range of projection is not materially lessened by shortening the barrel; hence I have associated in my arm the conditions necessary for a hand-weapon for throwing shells or grenades, adapted to storming fortifications or rifle-pits, boarding vessels, &c.

In the drawings, *a* is a stock of suitable size and shape, at the forward end of which is mounted the short barrel *b*, secured to or formed with the breech-block *c*, which block *c* is connected to the stock by suitable straps, *d d*. *e* is the hammer, actuated by any ordinary main-spring and lock. (See dotted lines in Fig. 1.) *f* is the trigger in the usual place on the stock, and in order to reach the sear of the hammer I provide a rod, *g*, that is pushed endwise by the trigger, and, acting on a bent lever, *h*, moves the sear *i* of the lock.

The barrel *b* and breech-block *c* are shown in about full size in Fig. 2 for an arm adapted to hand use, and in which the results aforesaid will be accomplished.

The fire is communicated through the cone or pipe *k* from the nipple *l*, and ignites the powder at the center, as said powder is contained within the chamber *m* in the breech-block *c*. The fire radiates from this point of ignition, near the base of the projectile *n*, and acts with uniformity all around the base of the same, to project the ball in a straight line, without depending entirely on the barrel for the guiding and giving direction to the ball,

and a small amount of powder compared with the weight of ball is efficacious, and, acting as aforesaid, produces but little recoil.

The projectile I employ is a cylinder with a slightly concave base and with a tapering or pointed forward end. I make said projectiles of iron, type-metal, or similar metals or alloys, and I form the case in two parts for convenience of casting, whereby each part can be made in a metallic mold.

n' is the base of the projectile n, and the two are to be united by solder. The point of the projectile is partially divided by grooves, as at n^2, Fig. 3, by means of which the explosion will cause the point to separate in several pieces.

The fuse o is to be of any usual character; but to prevent the same from being driven in I make use of an arched plate of brass, s, or other metal, with a small hole therein, which is sufficient for the flame to ignite the fuse, but does not allow of a sufficient passage of the gases (before relieved of pressure) for blowing in the fuse.

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

1. A hand fire-arm adapted to projecting grenades or small bombs, consisting of a barrel sufficiently short to prevent injurious recoil against the person, as set forth.

2. The hammer e, rod g, and trigger f, in combination with the short barrel mounted at the end of the stock, as and for the purposes specified.

In witness whereof I have hereunto set my signature this 6th day of October, 1863.

RALPH GRAHAM.

Witnesses:

LEMUEL W. SERRELL,

THOS. GEO. HAROLD.