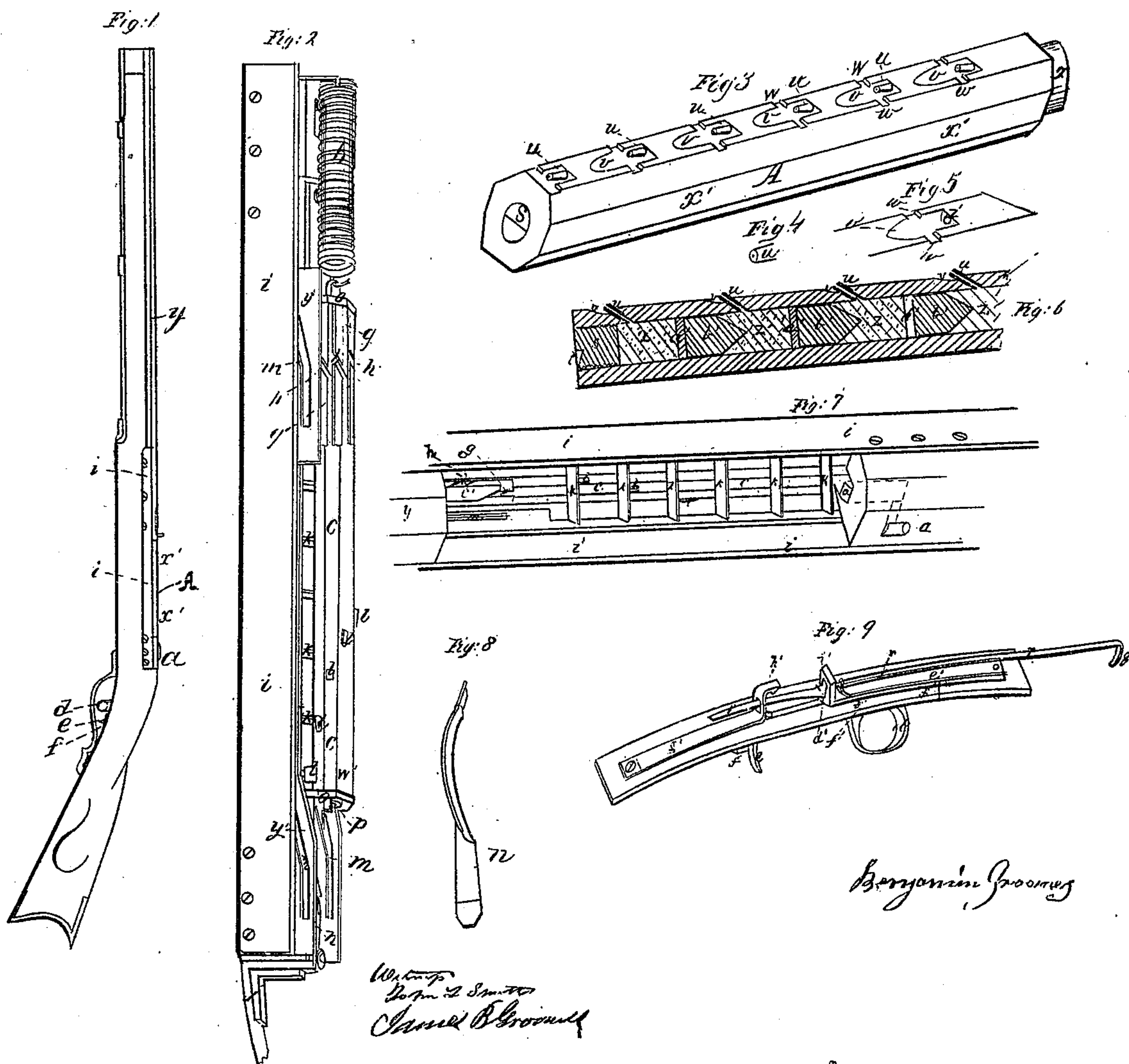


B. GROOMES.
Muzzle-Loading Fire-Arm.

No. 14,017.

Patented Jan. 1, 1856.



UNITED STATES PATENT OFFICE.

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PENNSYLVANIA.

IMPROVEMENT IN REPEATING FIRE-ARMS.

Specification forming part of Letters Patent No. 14,017, dated January 1, 1856.

To all whom it may concern:

Be it known that I, BENJAMIN GROOMES, of Cumberland township, in the county of Greene, State of Pennsylvania, have invented a new and Improved Method of Loading and Discharging Fire-Arms; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification, in which—

Figure 1 is a view of the entire fire-arm, the section *x'*, Fig. 3, being represented in color; *a*, the thumb-spring; *d* and *e*, the triggers, and *f* the set-slide.

Fig. 2 is a perspective view of the side plates and the exploding apparatus, letter *b* showing the spiral spring; *c c*, the revolving shaft; *g g*, the longitudinal grooves, and *h h h* the spiral grooves; *i i y' y'*, the side plates; *j*, the breech-piece; *k k k*, the steel strips; *l l l*, the knots or pins on the revolving shaft; *m m*, the sliding grooves in the side plates, *y'*; *n*, the register-spring; *o o*, the head-blocks; *p*, the hole in the head-block for the insertion of the hook *q* on the end of the rod *r*, Fig. 9.

Fig. 3 is a perspective view of the section *x'* of the barrel; *s*, the breech-pin; *t*, the catch fitted to receive the thumb-spring *a* of Figs. 1 and 7. *u u u* are the tubes; *v v v*, the conical niches, and *w w w* the cross-grooves; *x*, a circular tenon fitting into the end of the barrel at *y*, Fig. 7.

Fig. 4 is a perspective view of one of the tubes.

Fig. 5 is a perspective view of the conical niche, cross-groove, and cavity for the insertion of the tube.

Fig. 6 is a longitudinal section of part of Fig. 3, showing the position of the loads; *s*, the breech-pin, and *t* the catch; *z*, the powder; *a'*, the circular pieces of sole-leather; *b*, the balls; *u u u*, the cap-tubes.

Fig. 7 is a perspective view of part of Fig. 1 with section *x'* removed; *c c*, the revolving shaft; *a*, the thumb-spring; *c'*, the guiding-spring working in the longitudinal and spiral grooves *g* and *h*; *i*, the side plates; *k k k*, the steel strips; *l l l*, the knots or pins on the revolving shaft.

Fig. 8 is the register-spring.

Fig. 9 is a perspective view of the triggers; *q*, the hook; *r*, the rod; *d'*, the catch; *e'*, the retaining-spring; *f'*, the slide moved by the trigger *d*; *e*, the set-trigger; *f*, the set-slide; *h*, the catch of the detaching-spring *g'*; *i'*, the top of the slide *f'*.

My invention refers to repeating fire-arms in which several cartridges are placed one upon another in a removable chamber, and discharged one after another, in quick or varied succession, by an apparatus possessed of a double motion of translation and rotation, which I term the "discharging-hammer." The invention lies in the mechanism for rotating this hammer during its reciprocating rectilinear movement, consisting of a stationary spring stud or dog and two series of grooves formed in the hammer-shank, one series straight and the other helical, so that as the hammer is drawn back the spring-dog will so act on the grooves as to rotate the hammer-shank and bring the discharging-pin in position to perform its function on release of the hammer, as will be fully set forth.

To enable others skilled in the art to construct and use my invention, I will proceed to describe its construction and operation.

I construct my fire-arm in any of the known forms; but in order to facilitate the firing of the pieces an indefinite number of times in quick or varied succession, I take a section of the barrel of an indefinite length, as shown in Fig. 3 in the accompanying drawings. In this section I make six (more or less) conical niches, in the base of which I drill holes, as seen at *z'*, Fig. 5, and insert cap-tubes inclined to the plane of the sections, as shown at *u u u*, Fig. 3. Across these conical niches I cut cross-grooves, as shown at *w w*, Fig. 5. This section I charge in the usual known manner of loading a fire-arm; but I put one load upon another, having the powder closely packed, and place between the powder and ball of each load a circular piece of sole-leather made to fit close in the bore of the section, as shown at *a'*, Fig. 6. I place upon the aforesaid cap-tubes the percussion-caps, which are known and in common use, and place the section in its position, where it is received by means of a thumb-spring, as shown at *a*, Fig. 7. In order to keep the percussion-caps firm in their places, and to pre-

vent the escape of power through the tubes, I place thin strips of steel across the side plates, as shown at *k k*, Figs. 2 and 7, so as to press close against the caps when the said section is in its place; and in order to explode said caps I make a three, four, five, six, or more sided shaft, on each side of which I place a knot or pin so arranged as to strike each of the steel cross-pieces immediately opposite the cap in as rapid succession as desired, said shaft revolving the knot or pin to its proper position at each pull of the trigger. This shaft and the machinery which operates it I call the "exploding apparatus," and to construct it I make a shaft of the required number of sides, with one end round and cut with longitudinal and spiral grooves acting as switches, as shown at *g g h h*, Fig. 2. This shaft is placed, by means of a circular tenon on each end, into two head-blocks, between which it is caused to revolve by means of a stationary guiding-spring, (shown at *c'*, Fig. 7.) These head-blocks are made to slide in inclined grooves in the side plates, *y' y'*. (Shown in Fig. 2.) The said shaft and pins are caused to strike the steel strips *k k*, Figs. 2 and 7, with sufficient force to explode the caps by means of a spiral spring, (shown at *b*, Fig. 2. The revolving shaft is drawn back by a hook and slide attached to the trigger, as shown at *q* and *f'*, Fig. 9, and revolves as it is drawn back just a sufficient distance to cause each respective pin to strike its respective cap.

In order to prevent accident from the turning of the revolving shaft after all the loads in the section have been discharged, thus endangering the firing of the wrong load, there is a register-spring, (shown at *n*, Fig. 2, and at large, Fig. 8.) On the under side of the revolving shaft, and opposite the letter *w'*, Fig. 2, the last pin comes in contact with said register-spring, and prevents said shaft from revolving and the trigger from moving until the section is removed. Then, when the same or a similar section is replaced, it is again ready for action.

The hook *q* on the end of the rod *r*, Fig. 9, catches in the hole *p*, Fig. 2, of the head-block

o. The notch *d'* on the rod *r* catches in the slide *f'*, Fig. 9, and is held in its place by the retaining-spring *e'*, which is made the same shape and screwed upon the top of the slide *f'*. The catch *d'* of rod *r* of Fig. 9 is thrown from its hold on the slide *f'* by the detaching-spring *g'*, which is raised to the proper height by the set-trigger *e*, by which means the shaft is released, and is then drawn forcibly back by means of the spiral spring *b*, Fig. 2.

When the first load is discharged, by slipping the trigger *d*, Fig. 9, back to its former position, the notch upon the rod *r* is again caught, and it is ready for a second discharge, &c. The set-trigger *e*, Fig. 9, is designed to release the top *i'* of the slide *f'* from the catch *h'* upon the spring *g'*, which arrangement is designed to secure an easy and quick release of the revolving shaft and pin when it is desired to discharge the loads at leisure and with a steady aim.

I do not claim the method of loading repeating fire-arms by placing a number of cartridges one upon another in a separate cylindrical chamber, as such has been done before. Neither do I claim revolving hammers for exploding in succession the different percussion-caps of repeating fire-arms, as such have been used before, though actuated by means other than I employ.

What I do claim as new and of my own invention, and desire to secure by Letters Patent, is—

The mechanism for rotating the hammer during its reciprocating rectilinear movements, or rearward motions, as described, consisting of the spring dog or stud, the series of straight grooves, and the series of helical grooves formed in the hammer-shank, and arranged with respect to each other so that the spring-dog may operate in them, substantially as specified.

BENJAMIN GROOMES.

Attest:

JOHN L. SMITH,
JAMES B. GROOMES.