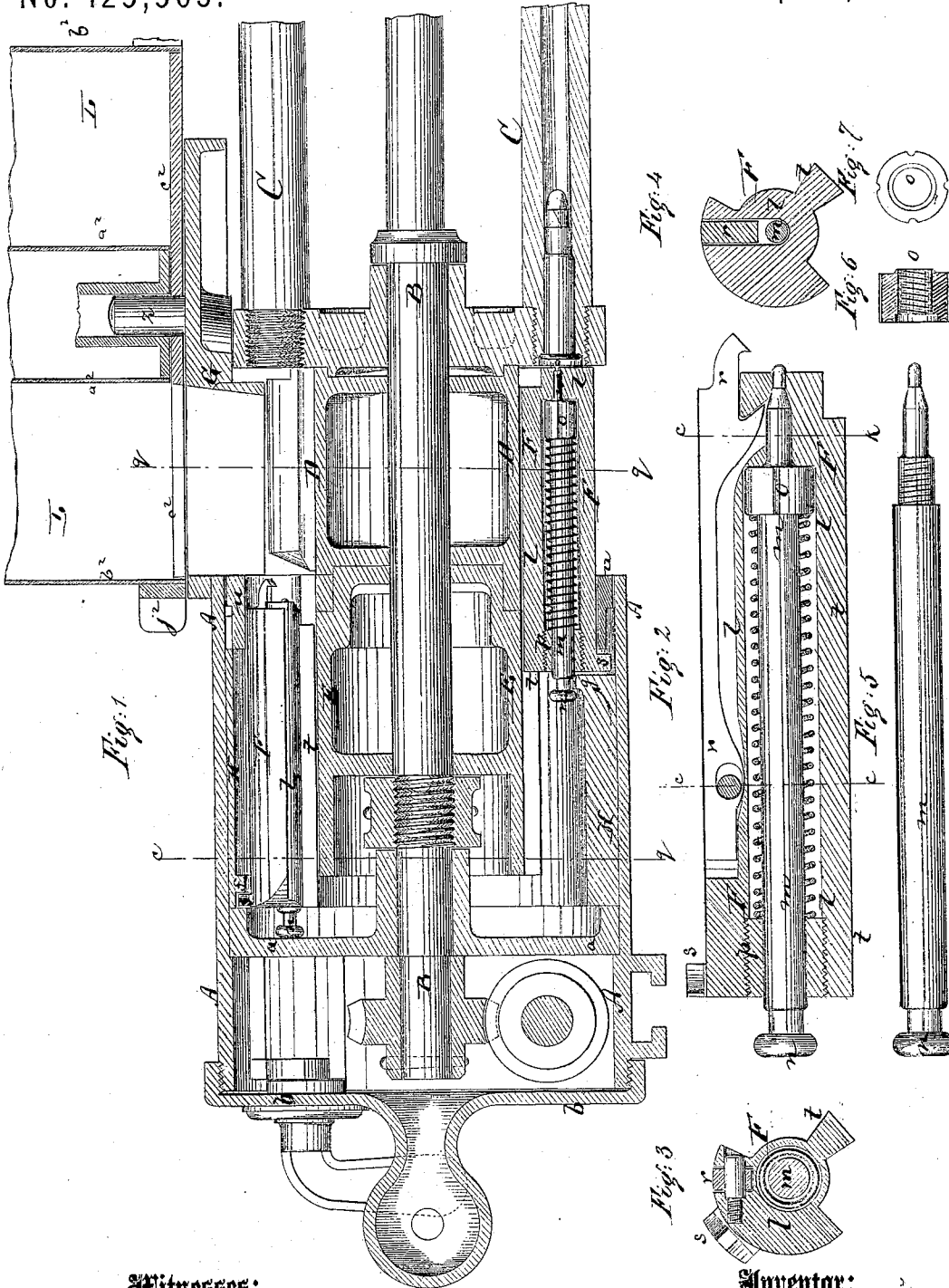


R. J. GATLING.

Improvement in Revolving Battery Guns.

No. 125,563.

Patented April 9, 1872.



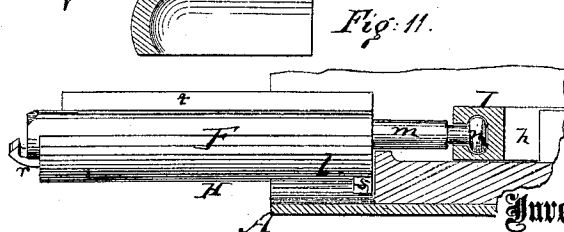
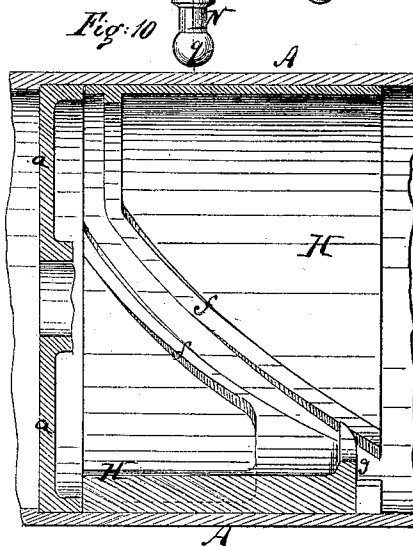
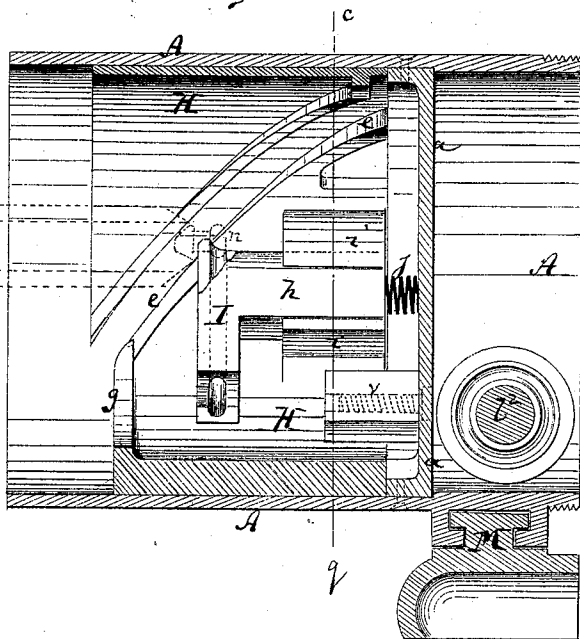
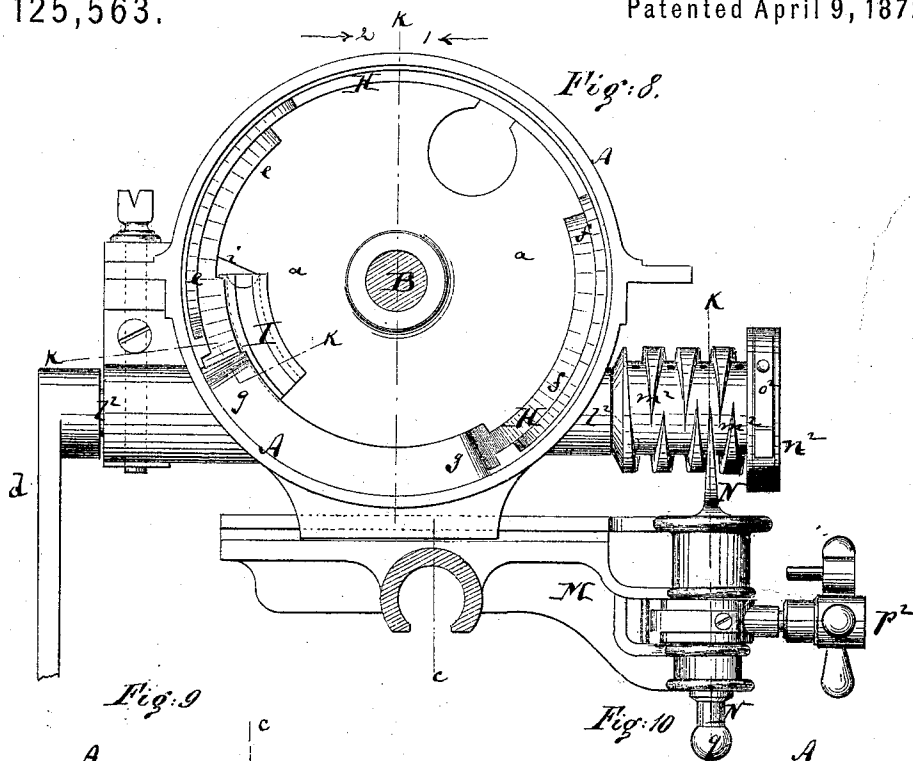
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Fig: 12.

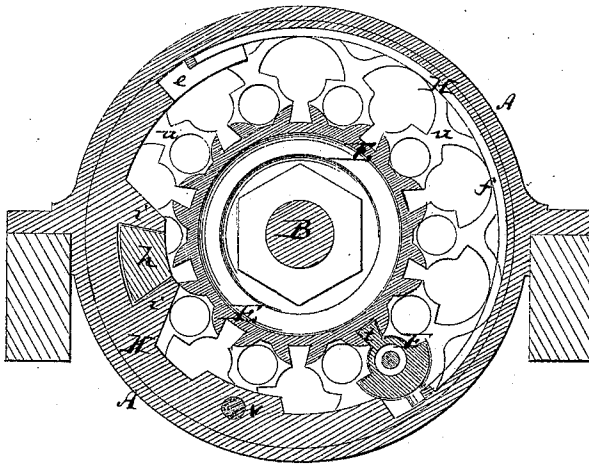
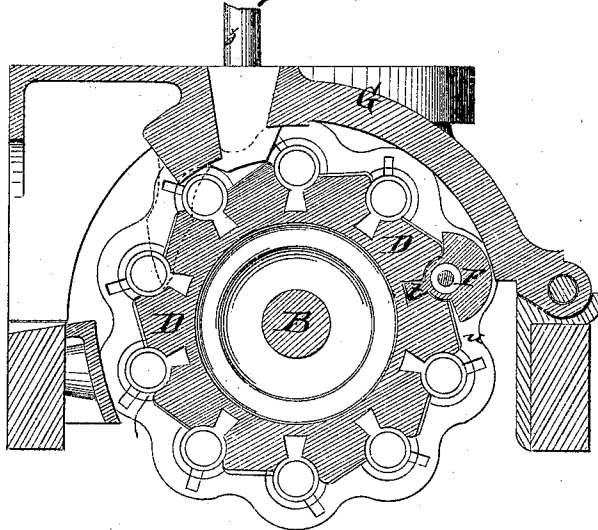


Fig: 13.



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UNITED STATES PATENT OFFICE.

RICHARD J. GATLING, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN REVOLVING-BATTERY GUNS.

Specification forming part of Letters Patent No. 125,563, dated April 9, 1872.

Specification describing an Improved Revolving-Battery Gun, invented by RICHARD JORDAN GATLING, of Hartford, in the county of Hartford and State of Connecticut.

This invention relates to several improvements on the "Gatling Revolving-Battery Gun," for which two Letters Patent of the United States, numbered 47,631 and 112,138, were respectively granted on the 9th day of May, 1865, and 28th day of February, 1871. The object of the present invention is principally to reduce the length of lock and consequent length of breech-case, and thereby diminish the weight, expense, and difficulty of manufacture of the entire gun. In this case I employ a detaining device provided with a transverse groove to receive the knobs on the rear end of the lock-hammers or firing-pins, and prevent them moving forward with the locks themselves, so that when said knobs, in consequence of the continued circular movement of the locks, escape from said groove, the spiral spring encircling the firing-pins shall cause them to deliver a sudden and powerful blow against the butt of the cartridge, and thus occasion the desired explosion and consequent discharge. The construction of the lock itself is modified in conformity with the aforementioned mechanism by providing the lock-hammer with an interior shoulder for the spring to bear against, and with a knob at the outer end for the grip of the detaining-cam. My invention also consists in an improved construction of the breech-case, lock-cylinder, and also of the carrier-block, with the view of adapting the same for the reception of the improved locks, the carrier-block being made hollow to reduce weight and cost of material.

In the accompanying drawing, Figure 1 represents a longitudinal section of the breech part of the gun, showing the improved arrangement of parts. Fig. 2 is a longitudinal section of the lock. Figs. 3 and 4 are transverse sections of the same on the lines *cc* and *kk*, Fig. 2, respectively. Fig. 5 is a detail side view of the lock-hammer. Fig. 6 is a transverse section, and Fig. 7 an end view of the head, which is screwed upon the lock-hammer. Fig. 8 is a front-end view of the breech-case, with the lock-cylinder and appendages removed. Figs. 9 and 10 are longitudinal sections of the same on the line *kk*, Fig. 8, look-

ing in the direction of the arrows 1 and 2, respectively. Fig. 11 is a detail transverse section on the line *kk*, Fig. 8, showing how the lock-hammer or firing-pin is held back in the detaining-cam. Fig. 12 is a vertical transverse section of the lock-cylinder and breech-case, the line *cc* in Figs. 1 and 9 indicating the plane of section. Fig. 13 is a vertical transverse section of the carrier-block, the line *qq* in Fig. 1 indicating the plane of section.

Similar letters of reference indicate corresponding parts.

A in the drawing represents the cylindrical breech-case, secured upon the frame of the gun, which is mounted in suitable manner either upon a gun-carriage, tripod, or other suitable support. In this breech-case is the diaphragm *a* and cascabel-plate *b*, between which a chamber for the reception of the worm and worm-wheel is formed. B is the axial shaft of the gun. It is hung substantially as described in my former patents, and serves to hold the barrels C C, the carrier-block D, and the lock-cylinder E, which revolve with it whenever it is turned by means of the crank-handle *d*, which imparts motion to the worm. F F are the locks, and G is the hopper-plate or cover of the carrier-block, with an aperture through which the cartridges are supplied to the latter. Within the breech-case are arranged the stationary spiral or inclined cams *e* and *f*, for forcing the locks forward and back. These cam-grooves or tracks are formed on a cylindrical shell, H, which is fitted within the breech-case and secured thereto by a longitudinal screw, *v*, that passes through the diaphragm *a*. By means of this screw the shell, with its cams, is held securely to its place. *e* is the cam-groove or track, whereon the locks are forced forward. Its front end is, by a non-spiral portion, *g*, joined to the front end of the retracting-cam *f*. Directly behind the junction of *e* and *g* is arranged the detaining-cam I. The same is a curved plate having a dovetail shank, *h*, which enters a corresponding groove in an inwardly-projecting ear or block, *i*, of the shell H. A spring, *j*, placed between the diaphragm *a* and shank *h*, serves to force the detaining cam forward, so that the upper end of its curved face will come against the cam *e*, but permits the same to move backward for purposes hereinafter specified. The face of the detaining-cam I has a countersunk

groove, of such cross-section as most conveniently to receive the knob at the end of the lock-hammer, and as indicated in Fig. 11. Each lock F consists of a shell, *l*, and lock-hammer *m*, as principal parts. The lock-hammer or firing-pin has the firing-pin formed at its front end, as is clearly shown in Fig. 5, and a knob, *n*, at its rear end, said knob being intended to fit the countersunk grooves of the detaining-cam. A spiral spring is placed within the shell *l* and around the lock-hammer or firing-pin, between a shoulder or head, *o*, on the latter, and a screw-plug, *p*, at the back end of the shell. The head *o* is screwed upon the lock-hammer or firing-pin, and is by the spiral spring held against the front end of the chamber in the shell. If the knob *n* is taken hold of and drawn back the spring will be contracted to violently propel the firing-pin forward whenever the knob is released. *r* is the cartridge-shell extractor, applied to the lock, and *s* the projecting lug on the lock, that moves along the cams *e f*, and thereby causes the forward and backward motion of the lock. *t* is a dovetail tenon on the lock-shell, fitting into corresponding grooves of the lock-cylinder and carrier-block, as indicated in Figs. 12 and 13. The carrier-block as well as the lock-cylinder, it will be seen, are cast or formed hollow, with supporting disks or arms that hold them to the shaft. Considerable weight and material are thereby economized. From the front end of the lock-cylinder projects a flange, *u*, perforated to admit the locks, and made circular at the outer edge to fit and support the breech-case. The locks, when held by the grooved lock-cylinder, are with their projecting lugs *s s* in such contact with the cams, tracks, or grooves *e f*, respectively, that they will, when revolved by the rotation of the lock-cylinder, be also moved forward and backward in the requisite manner to push the cartridges into the barrels, explode the charges, and withdraw the shells, substantially as specified in my former Letters Patent. When a lock approaches (along the cam *e*) its foremost position the knob *n* of its lock-hammer or firing-pin enters the upper end of the groove in the detaining-cam I. This cam is held against *e* and beveled at its upper end, that the knob may conveniently enter its groove. As the lock continues to advance, the cam I, however, detaining the knob *n* in the same vertical plane, it is evident that the firing-pin will be automatically drawn back within the lock and the spring contracted. As soon as the lock arrives in line with the inner or lower end of the detaining-cam I the knob is released by the latter and the lock-hammer or firing-pin propelled forward to explode the charge. In this manner the charges of the barrels are successively fired with the utmost precision and regularity. The cam I

may, if desired, be continued more or less far around, at such a distance from the tracks *e f* as to hold the point of the firing-pin slightly drawn in, except when in the act of firing. When the shaft is turned in the wrong direction the knobs will strike the face of the cams I and push it back against the spring *j*, the detaining-cam being prevented thereby from cocking. The plate or face *g* braces the back ends of the locks at the moment of firing, and takes their recoil, being made strong and large for this purpose, as shown.

The arrangement of the automatic detaining-cam in place of the cocking apparatus formerly in use is of great advantage. It permits the dispensing of half the length of lock and breech-case, and consequent reduction of expense and increase of carrying facility. It is not in the way of the proper function of the other mechanism, and is positive in its action.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A firing-pin detainer, when located or arranged in the breech-case of a revolving gun, between the transverse vertical planes bounding the terminations of lock-guides or tracks, substantially as described, for the purpose of economizing space and operating the locks, as specified.

2. The combination of the detainer I with the cams, tracks, or guides *e* and *g*, as shown and described, whereby the locks are caused to advance while their firing-pins traverse and are held back in the groove of said detainer until liberated to explode the cartridges, as set forth.

3. The lock F, consisting essentially of a shell, *l*, provided with a lug, *S*, and with a tongue adapted to fit and operate as a guide in a groove of the revolving cylinder, and the firing-pin having a knob or its equivalent on its projecting rear end, substantially as specified.

4. A rotary-battery gun, provided with revolving locks whose firing-pins are held back by means of the rear or knob ends of the same engaging with a detaining device, substantially as described.

5. In a revolving-battery gun the combination of the spring *j* with the detainer, whereby it is adapted to yield backward, as shown and described.

6. The combination of the locks F, provided with lugs *s*, and lock-hammers or spring firing-pins *m n*, with the guides *e, f*, and *g*, and grooved detaining device I, all constructed, arranged, and operating as specified.

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