J. L. FOLLETT.

SPRING-GUN.

No. 192,751. Patented July 3, 1877.

Fig. 1.

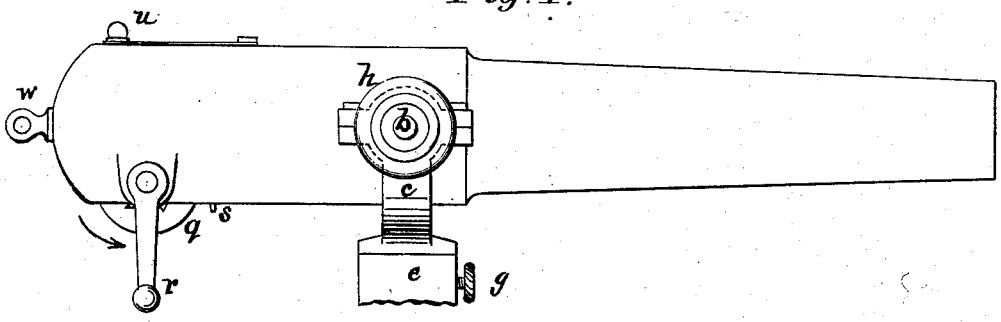

Fig. 2.

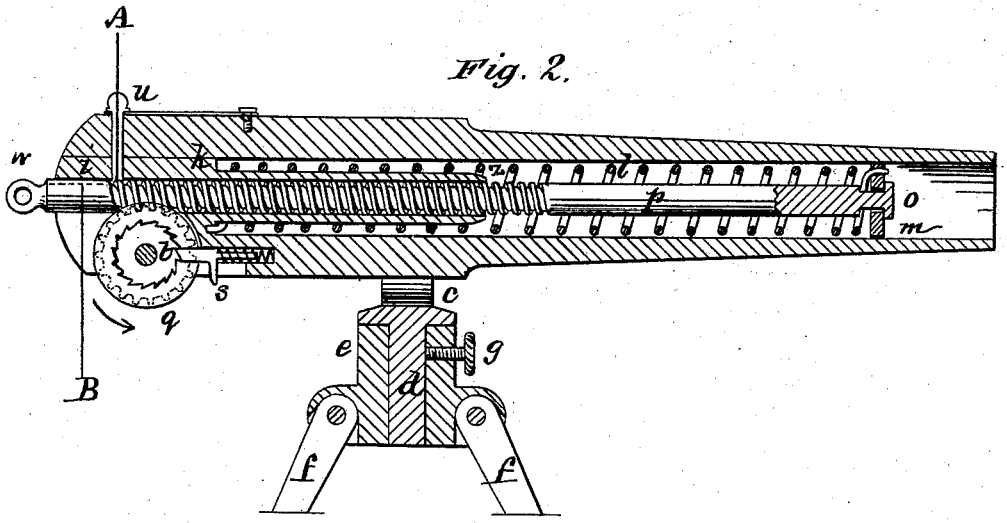

Fig. 3.

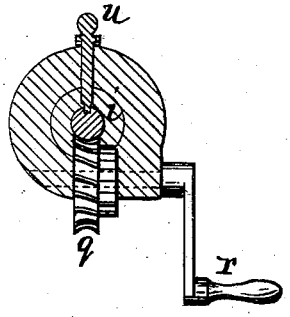

Fig. 4.

Attest:

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UNITED STATES PATENT OFFICE.

JOSEPH L. FOLLETT, OF NEW YORK, N. Y.

IMPROVEMENT IN SPRING-GUNS.

Specification forming part of Letters Patent No. **192,751**, dated July 3, 1877; application filed June 18, 1877.

To all whom it may concern:

Be it known that I, JOSEPH L. FOLLETT, of the city, county, and State of New York, have invented certain new and useful Improvements in Spring-Guns, of which the following is a specification:

Safety appliances in cases of fire or shipwreck, or to cross dangerous passes in mountains, or in cases of freshets or floods, are generally thrown, according to distances, by hand or by machinery. Hand-thrown safety appliances can be used only at short distances, and require skill and steady nerve, which, in case of danger and excitement, is not always at command.

Mechanical means have therefore been employed most generally—that is to say, a ball carrying the line to which the safety appliance is attached has been thrown by power created either by the ignition of powder in a gun or by the sudden release of compressed air, and perhaps, although I am not aware of it, by the release of a powerful spring.

It has been found that the use of gunpowder is attended with danger in the vicinity of any conflagration, and, on the other hand, is liable to become ineffective should it get wet, as it is very apt to be during a storm along the sea-shore, or by the spurting of fire-engines in the vicinity of a fire.

Air-guns are too delicate of construction and too liable to get out of order to admit of their application to the purposes of this invention.

The spring-gun appears to combine the elements of safety, the facility and accuracy with which the projectile carrying the line or safety device can be thrown, the comparative non-liability of getting out of order, the containing within itself all the instrumentalities necessary for its operation—indeed all the elements necessary to insure success, provided a spring with sufficient power can be combined with a powerful spring-compressing mechanism easily operated, and a means for the ready discharge or release of the spring.

The object of my invention, therefore, is to contrive such a mechanism, whereby alone a spring can be used with effect as a means of throwing projectiles for the purpose before indicated.

The manner in which I have carried out my said invention will be understood from the following specification, reference being had to the accompanying drawing, in which—

Figure 1 is a side elevation of a spring-gun constructed in accordance with my invention; Fig. 2, a longitudinal section of the same, and Fig. 3 a transverse section on line A B in Fig. 2. Fig. 4 is a detail view.

The gun may be constructed of any suitable material. Inasmuch as no explosive material is used within said gun, and the mechanism exerting no laterally expansive force, it may be made of any material which admits of the finishing of the bore, which, as in other guns, acts as the director for the projectile. It may be made of a steel or other metal tube, incased or not, and re-enforced in certain parts or not, as the case may be, according to the judgment of the constructer. It may also be made of wood, properly strengthened by hoops or otherwise; or it may be made of a combination of materials, so as to be light and portable, and yet strong enough to resist the jars to which it is necessarily subjected, and to firmly hold in their places the parts of the mechanism hereinafter described.

I prefer to give it a shape shown in the drawing, which is that of a piece of artillery with trunnions *b*, by which it is mounted in a yoke or forked support, *c*, terminating in a central spindle or swivel, *d*, which is capable of revolution in a socket, *e*, which forms the head of a tripod, *f*, of which only the upper part is shown in the drawing.

By this means of mounting the gun it can be firmly established at any point and at any place, and is capable of being pointed in any direction deemed necessary.

After the tripod is placed in position the gun may be turned upon the spindle *d* horizontally in any given direction. The position thus given may be secured by a set-screw, *g*. The gun may then be pointed up or down by working the hand-wheel *h* on the right-hand trunnion to elevate or depress the same.

The breech *i* is made solid with the barrel or the re-enforced rear end of the gun, and is composed of a hollow cylinder having a greater thickness in the rear end thereof, or a shoulder, *k*, against which the spring abuts.

The spring may be (as shown in the drawing) a powerful helically-coiled steel wire, *l*; or it may be composed of a band of iron or steel which has been coiled upon a mandrel

and tempered; or it may be made of a tapering band, with the helical coils diminishing in diameter, so as to enable the said spring to be compressed within a very short space. The seat of the spring, or the abutting end, is against the shoulder *k*, as before said. The outer extremity or free end of the spring is secured to a disk, *m*, of a diameter but slightly smaller than that of the bore of the gun. This disk has an elongated slot, *n*, through which passes the head or button *o* on the extremity of a shaft or rod, *p*, by which the spring is compressed.

This shaft is of a length to extend from the rear of the gun, where it, or a ring appended to it, projects from the gun, to the head or disk *m* of the spring *l*, when the same is entirely free or uncompressed. Upon the rear end of the shaft is cut a thread, which extends around the shaft, and may be annular or preferably continuous—that is to say, helical—but always so as to present in every part of it a rack-surface, into which a suitable gear-wheel, *q*, may mesh. Rotation, which may be given to the gear-wheel, by means of the crank *r*, in the direction of the arrow, will forcibly withdraw the shaft from the gun by pushing it out at the rear end thereof. The button *o* of the shaft, having by quarter-rotation become engaged with the disk *m*, will now compel said disk to follow its movement, and thus compress the spring.

Any degree of compression can in this way be given to the spring, the maximum being when the disk strikes the cylinder or tubular projection Z. In order to lock the spring at any given point, or any degree of tension, I provide a spring-bolt, *s*, which engages with a toothed wheel, *t*, fast or keyed onto the shaft of the gear-wheel and crank.

So long as the crank is rotated in the direction of the arrow, the spring-bolt will ride over the teeth of the wheel *t;* but when the rotation is stopped, then the bolt will, actuated by its spring, lock in with any tooth that may be opposite, and thus hold the spring-winding mechanism and shaft securely locked so long as the elongated button *o* is in a position transverse to the similarly-shaped elongated slot *m*.

It will be understood that it is important, therefore, for the purpose of compressing the spring, and to hold it so locked, that the shaft should not rotate.

To this end it is grooved longitudinally on one side of it, and a pin, *u*, passing through the breech of the gun, engages in said groove and prevents the shaft from rotating. To discharge the gun, or to suddenly release it, it will only be necessary to lift the pin *u* high enough to become disengaged from the groove in the shaft. The tendency of the shaft, if the rack be screw-threaded, is to rotate on its axis; but, whether such be the tendency or not, the shaft can be easily rotated by the insertion of a small bar in the eye *w* in the shaft *p*.

When the shaft in its rotation turns the button so as to come opposite to and coincide with the slot *m* in the disk *o*, the latter will no longer be restrained by the button, and will fly out with all the power due to the release of a highly-compressed spring. If a ball or projectile be in front of the disk it will be shot out with such power in a direction given to it by the position of the barrel. To again compress or charge the gun it is only necessary to apply the thumb to the spring-bolt *s*, disengaging it from the toothed wheel *t*, while with the other hand the shaft is propelled forward by turning the gear-wheel *q* in the opposite direction of the arrow.

The shaft being thus pushed forward until it shall have passed the disk, it is then rotated to lock the disk, and the pin *u* is dropped into the groove to so hold it.

From the above description it will be obvious that my said invention is susceptible of many modifications and changes without departing from the principle thereof, according to the special uses to which my said gun is applied. Among such uses, in addition to those already mentioned, I have conceived the application of spring-guns in connection with projectiles and lines as a means of conveying mails or other communications at sea and elsewhere.

What I claim, and desire to secure by Letters Patent, is as follows:

1. The combination of a spring and the gear-operated spring-compressing shaft with means, substantially as herein shown and described, for disconnecting the spring from the shaft by rotation, substantially as herein set forth.

2. The combination, in a spring-gun, of a disk by which the projectile is ejected from the gun with a buttoned shaft capable of rotation, for locking in with or unlocking from said disk, substantially as described.

3. The combination, with the spring, its slotted disk, and the rotating locking-shaft, provided with the groove, of the locking-pin, or the equivalent thereof, to maintain the shaft locked with the spring and disk, as set forth.

4. In combination with the spring and its compressing-shaft, the helical or equivalently-formed rack and gear-wheel, all operating substantially as and for the purposes set forth.

5. The combination, with the spring, its compressing-shaft, and gear-wheel, of the spring-bolt and toothed wheel, to lock the shaft at any stage of compression of the spring.

In testimony whereof I have hereunto signed my name this 15th day of June, A. D. 1877.

JOSEPH L. FOLLETT.

Witnesses:
OSCAR HOCHSTADTER,
THOMAS F. COEN.