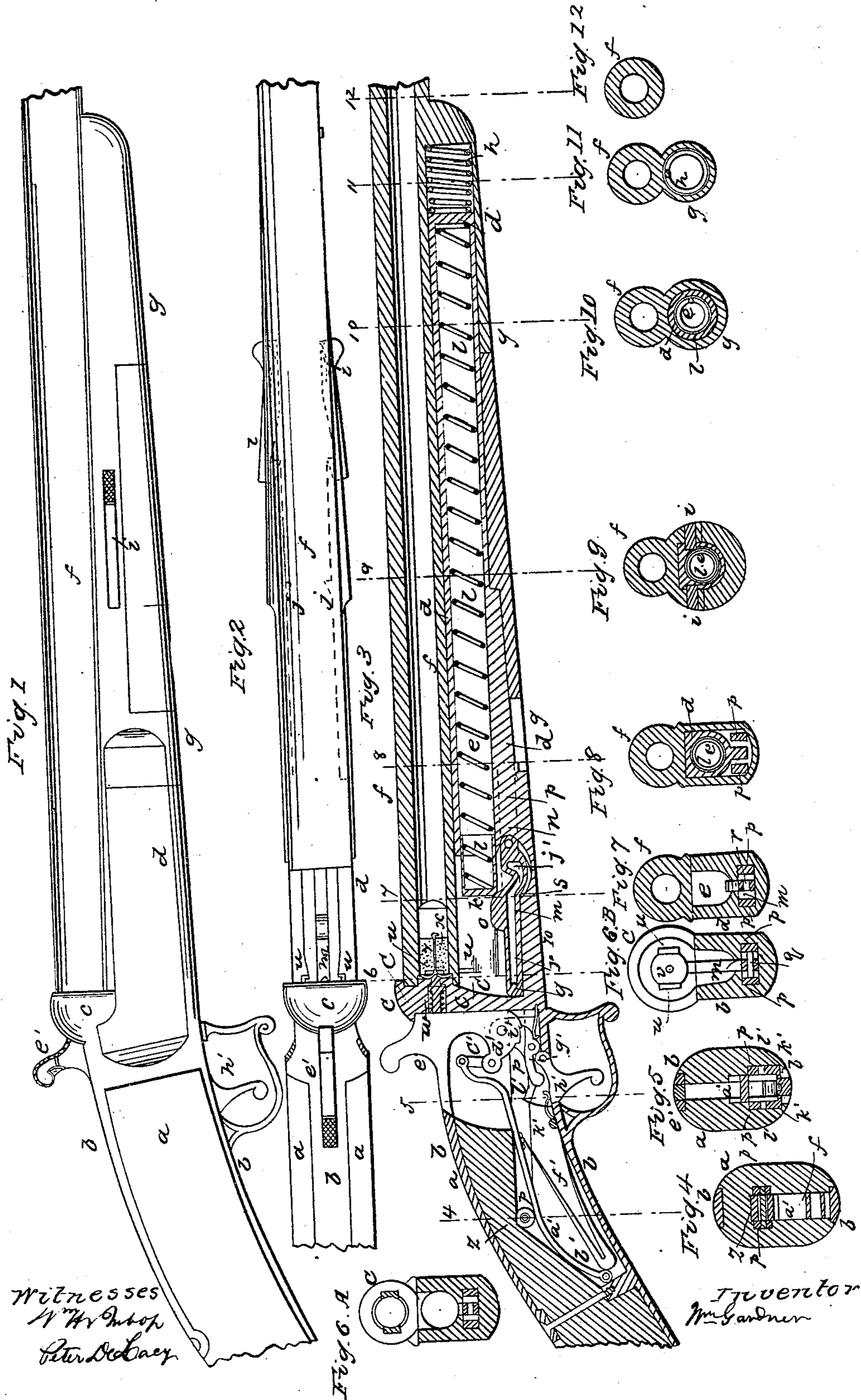


W. GARDNER.
Magazine Fire Arm.

No. 87,038.

Patented Feb. 16, 1869.



Witnesses
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN MAGAZINE FIRE-ARMS.

Specification forming part of Letters Patent No. **87,038**, dated February 16, 1869; patented in France, August 5, 1868.

To all whom it may concern:

Be it known that I, WILLIAM GARDNER, of Toledo, in the State of Ohio, have invented certain new and useful Improvements in Fire-Arms; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation; Fig. 2, a top view; Fig. 3, a longitudinal vertical section; and Figs. 4, 5, 6, 6^A, 6^B, 7, 8, 9, 10, 11, and 12, cross vertical sections taken at the lines in Fig. 3 correspondingly numbered.

The same letters indicate like parts in all the figures.

In the accompanying drawings my said invention is represented as applied to a musket, and from these any skilled armorer will be enabled to apply it to other classes of arms.

My said invention relates to improvements in that class of fire-arms having a tubular magazine, from which the charges are, one by one, transferred to the barrel.

In the accompanying drawings, *a* represents the stock, to which the lock-frame *b*, made of metal, is secured in the manner represented, or in any other suitable manner. This metallic frame *b* extends upward to form the recoil-shield *c*, and forward, as at *d*, to form the tubular magazine *e* and to constitute the support of the barrel *f*, which is fitted to slide thereon longitudinally, the metal of the barrel extending down and around it, as at *g*, and properly fitted thereto, so as to slide freely but accurately.

A helical spring, *h*, is interposed between the forward closed end of the magazine and the downward-projecting part of the metal of the barrel *g*, which spring tends constantly to force the barrel forward from the recoil-shield *c*.

In Fig. 2 of the accompanying drawings the barrel is represented as in the forward position for the reception of a cartridge, and in Figs. 1 and 3 as in its rear position, with a cartridge inclosed and the breech in contact with the recoil-shield. It is held in this latter position, ready for firing the charge, by means of two spring catch-levers, *i i*, that work in mortises, one on each side of the metal *g* of the barrel.

When the barrel is drawn back, as in Figs. 1 and 3, the catches of these levers enter notches *j j* formed in the extension *d* of the lock-frame.

When a charge is to be inserted in the barrel, the two catch-levers *i i* are operated by the thumb and fingers of the left hand, and as soon as liberated the barrel is drawn forward by the tension of the spring *h*, and after a cartridge has been lifted up from the magazine, as will be presently described, the barrel is drawn back by the left hand until locked by the spring catch-levers *i i*. The rear end or breech of the barrel is open and the bore enlarged for a short distance, and fitted to enter an annular groove formed in the face of the recoil-shield *c*, as represented in Fig. 3 of the drawings.

The bore of the magazine is cylindrical, and of a diameter sufficient to receive the cartridges freely.

As represented in the drawings, the arm is adapted to the use of metallic-cased cartridges having a projecting flange at the rear end, and hence, for the use of such cartridges, the bore of the magazine must be of a slightly greater diameter than the flanges of the cartridges.

It will be understood, however, that the arm may be adapted to cartridges without a flange.

To the bore of the magazine is fitted a follower, *k*, (see Fig. 3,) which slides therein freely, and made of a sufficient length to slide without binding, and hollow, to avoid too much weight.

One end of a helical spring, *l*, is attached to this follower, and the other end to the outer closed end of the magazine. The follower is pushed forward, compressing the spring *l* by the act of putting in the cartridges, and, when charged, the tension of the spring forces the cartridges back every time the rear one is transferred to the barrel.

At the rear part the magazine, for a distance a little more than the length of a cartridge, is open at top, and formed with parallel sides, as represented in Figs. 6 and 7 of the drawings, so that the rear cartridge can pass when lifted up to be brought in line with the barrel. In Fig. 7 this opening for the passage

of the cartridge is covered over by the barrel, the under part of which is flat, to cut off all communication with the magazine when the barrel is drawn back in the position for firing the charge.

Below that part of the magazine in which the cartridge to be transferred is received there is a lifter, *m*, which is a short lever, the forward end of which works on a fulcrum-pin, *n*. It works in a slot in the lower part of the magazine, and it has a curved projection, *o*, to act on the lower part of the cartridge, and it is operated to lift the cartridge up from the magazine into line with the barrel by the act of pushing the barrel forward. To effect this, there are two parallel rods, *p p*, represented in the cross-sections, Figs. 4, 5, 6, 7, and 8, and partly by full and partly by dotted lines in Fig. 3. These rods are attached by their forward ends to the downward projection *g* of the barrel below the magazine, and they are placed each side of the lifter *m*, and there is a pin, *q*, secured to them, and fitted to work in a slot, *r*, in the lifter, which slot, for the greater part of its length, is straight and in line with the sliding motion of the rods, so that in sliding the barrel forward the lifter will not be moved by the pin *q*; but so soon as the breech or rear end of the barrel has been moved from the recoil-shield a distance equal to the length of a cartridge the pin *q* reaches the part *s* of the slot *r*, which inclines downward, so that, by continuing the forward movement of the barrel, the pin *q*, passing in this inclined part of the slot, throws up the lifter, by which the cartridge is lifted to the position *t*, in line with the barrel. The cartridge is held in that elevated position by the friction of two ways, *u u*, attached to the face of the recoil-shield, which overlap the flange at the rear end of the cartridge.

To aid in holding the elevated cartridge in line with the barrel, the rear end of the cartridge is formed with a central recess to receive the conical end of a rod, *v*, which slides in a hole made in the recoil-shield *c*, and which is pressed against the rear end of the cartridge by the tension of a coiled spring, *w*. As the barrel is drawn back to inclose the elevated cartridge the lifter is depressed by the reversed movement of the pin *q*.

The rod *v* is used for the purpose of firing the cartridges, which are made, as represented in Fig. 3, with fulminate priming in the forward part of the charge of powder, and resting against the rear face of the shot.

A small rod, *x*, extends from the rear of the cartridge-shell to within a very short distance of the fulminate, so that when the hammer *e'* of the lock strikes the sliding rod *v*, above described, that drives the rod *x* within the cartridge against the fulminate and fires the charge.

The hammer *e'* of the lock is cocked by the same forward motion of the barrel by which the cartridge is lifted from the magazine to

the line of the barrel, and for this purpose a roller, *z*, is mounted on a journal-pin, which connects the two rods *p p* at their rear end, and when these rods are moved forward by the barrel the roller *z* acts on the upper inclined surface of a lever, *a'*, the rear end of which turns on a fulcrum-pin, *b'*, the forward end of the said lever being connected by a joint-link, *c'*, with an arm, *d'*, of the hammer *e'*, so that the forward travel of the roller *z* depresses the lever *a'*, and thereby compresses the main-spring *f'* and elevates the hammer until the sear *g'* of the trigger *h'* takes into the proper notch of the tumbler *i'* to hold the hammer in the required elevated position, ready to be discharged by the pull of the trigger to fire the charge.

The slot *r* in the lifter *m* is extended in an upward direction, as at *j'*, beyond the inclined part *s*, so that the lifter can be depressed by hand while the barrel is in a forward position, to admit of inserting the cartridges in the magazine; but the projection *o* on the lifter is slightly above the line of the lower part of the magazine, to prevent the follower *k* from being carried too far back.

To prevent the charge from being fired when the barrel is not drawn back and locked against the recoil-shield, the trigger *h'* is formed with two cheek-pieces, *k' k'*, which are directly under the two rods *p p*, which are formed with recesses *l' l'* in their under faces, so located that when the barrel is drawn back and locked they will permit the cheek-pieces *k' k'* of the trigger to work up into them; but when the barrel is not locked, (and it cannot be locked unless its breech is in close contact with the recoil-shield,) the lower edges of the rods *p p* will act as stops, to prevent the trigger from being drawn back to liberate the hammer.

From the foregoing it will be seen that by simply compressing the spring catch levers *i i* the barrel is forced forward, a cartridge transferred, and by simply drawing back the barrel the elevated cartridge is inclosed, the barrel locked, and the hammer cocked, ready for firing the charge, the shell of a previously-fired cartridge having been discharged by the lifting of the new cartridge; and, as the magazine for a musket can be readily made of sufficient length to contain ten cartridges, ten shots can be fired successively in a shorter space of time than by any other arm known, and with entire safety, because, in view of the use of metallic-shell cartridges and the manner in which the communication between the barrel and the magazine is closed, it will be impossible for fire to communicate from the charge which is being fired with the charges in the magazine.

I am aware that it has been attempted to make fire-arms with a tubular magazine to contain a series of charges below and parallel with the bore of the barrel, provided with mechanism for transferring the charges, one by one, from the magazine to the barrel; but

all such attempts have failed of practical results, for obvious reasons, not necessary to be stated herein.

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

1. The tubular magazine for containing a series of charges, arranged so as to extend forward of the recoil-shield and under the barrel, substantially as described, in combination with the sliding barrel, the breech or rear end of which is closed, when drawn back in contact with the recoil-shield, to inclose a cartridge, and which is open to receive a cartridge when pushed forward from the recoil-shield, substantially as described.

2. The mechanism, substantially as described, for cocking the hammer by the sliding of the barrel.

3. The spring for drawing the barrel forward from the recoil-shield, in combination with the two catches for locking the barrel when its rear or breech end is drawn back in

contact with the recoil-shield; but this I only claim when the said catches are located, as described, so as to be operated by the forward hand, substantially as described.

4. The mechanism, substantially as described, for holding the cartridge in line with the barrel while the barrel is being drawn back to inclose it and the lifter is being depressed, as set forth, the said mechanism consisting of the ways which inclose the flange of the cartridge, in combination with the sliding rod which makes pressure against the center of the rear end of the cartridge.

5. The mechanism, substantially as described, for preventing the trigger from being drawn back to fire the charge unless the barrel is in the right position and locked, as set forth.

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Witnesses:

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