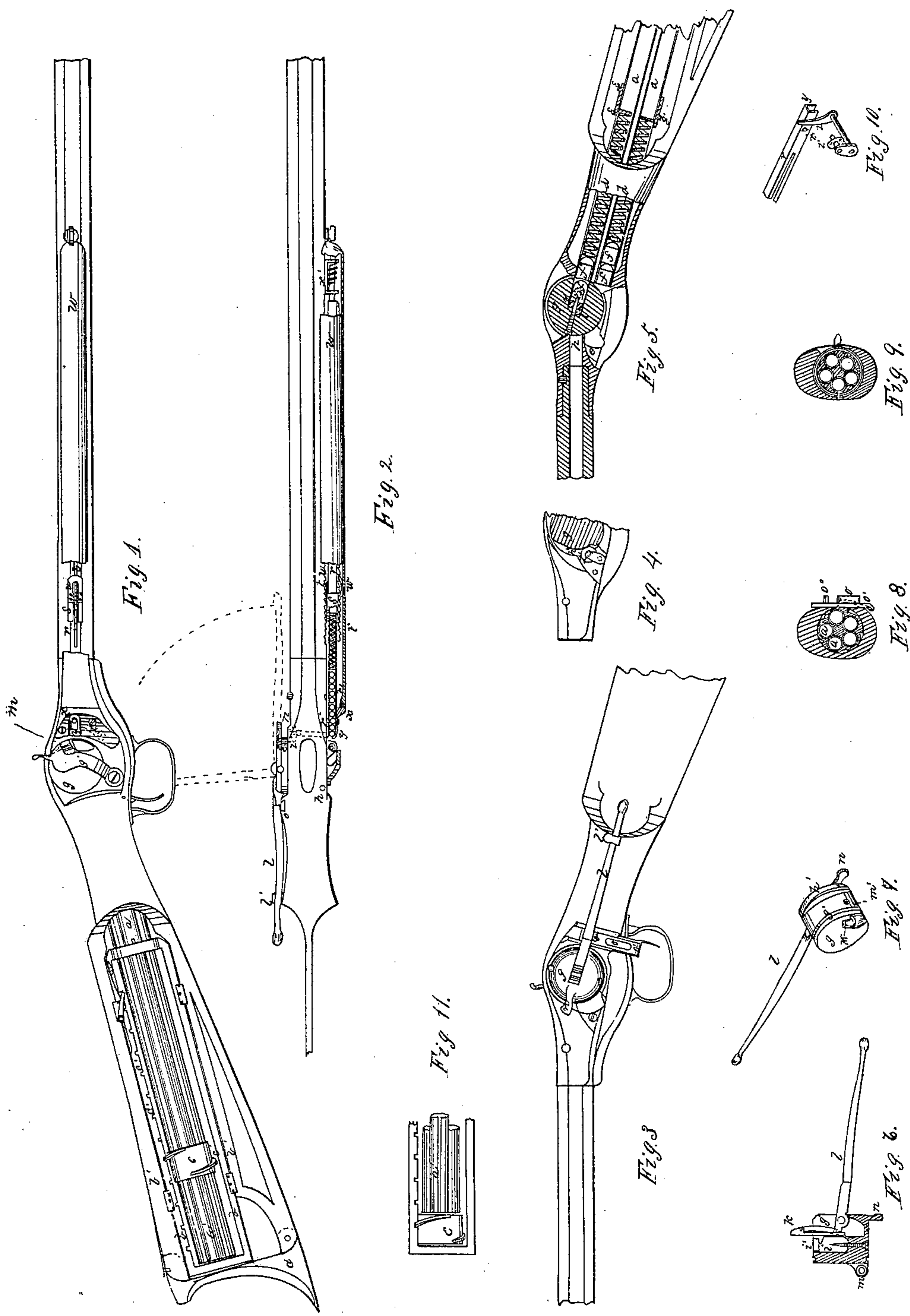


T. COOK.
FIREARM.

No. 10,520.

Patented Feb. 14, 1854.



UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN FIRE-ARMS.

Specification forming part of Letters Patent No. 10,520, dated February 14, 1854.

To all whom it may concern:

Be it known that I, THOMAS COOK, late of England, but now of the city, county, and State of New York, have invented certain new and useful Improvements in Repeating and Self-Loading Fire-Arms; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being made to the annexed drawings, making a part of this specification, which are fully referred to herein, and in which similar letters refer to similar parts throughout.

My invention is for certain improvements in self-loading fire-arms. The general appearance and main features of my invention are similar to that class of repeating arms in which the magazine is contained within the breech in tubes arranged in a cylindrical cluster and capable of revolving, the load being transferred to the barrel by a carrier operated by the marksman.

These improvements I have made consist in the manner of constructing the magazine, in transferring the loads to the barrel, and in a new description of primer or cap-magazine.

In Figure I the breech is in skeleton, showing the position of the magazine-tubes. Fig. V is a section in continuation, the tubes being also in section, and showing the manner of feeding the ammunition to the conveyer, together with its internal construction.

The magazine consists of several tubes, *a*, bound together in a cluster, five being the number represented, and as shown in the cross-section, Figs. VIII and IX. The tubes have also a long slot on the outer side, cut up about two-thirds their length from the bottom, as seen at *a'*, Fig. I. The tubes are held within a metal frame, *b*, in which they revolve upon an axis. This frame may be withdrawn from the breech of the gun by letting down the shoulder-piece *c*, which allows the frame to be drawn out in a convenient manner to recharge the tubes. The frame is held in place when within the breech by the narrow pieces *b'* set up for slides.

In the interior of each tube is a feeder consisting of a spiral spring, as seen at *d*, Fig. V, the lower end of which is made fast to a slider or flat ring, which encircles the whole cluster of tubes, as seen at *e*, and it is by the movements of

this slider along the cluster of tubes that the charges are propelled within the cavity of the conveyer, whence they are to be delivered into the barrel, as will more fully appear. On the outside of the slider *e* is a screw-thread, *e'*, making a single turn. This engages in the notches *e'*, Fig. I, so that, as the tubes are revolved, the slider while revolving is also carried along upon them, and thus pushes the springs *d* in the same manner.

The pitch of the screw *e'* is such that in one revolution of the cluster of tubes the slide will have been carried along a distance equal to the space occupied by a load for the gun. Five shots are fired to each revolution of the cluster of tubes; therefore, at each load they move round one-fifth of a revolution.

To charge the magazine, the tubes are taken out by removing the frame *b*, the slider *e* is sent down to the bottom, and the tubes are filled with the prepared ammunition, similar to that shown at *f*, Fig. V. The ammunition may be crowded in so as partially to compress the springs *d*. To accomplish this the cluster of tubes themselves may be drawn a short distance out of the frame *b*, the ring *e* remaining at the bottom, and this removes the springs still farther down. This done, the magazine is put back again. The extreme ends of the tubes strike against the abutment, as seen in Fig. V, before the frame *b* is fully within the breech. The pushing of this along causes the cluster of tubes to pass through the ring *e* until their ends reach the end of the frame *b*, and thus produce a compression of the springs by making the distance between their ends resting against the shot and the ring less than before. This done, the magazine is put back again, and the charges are then ready for transmission to the barrel, which operation is accomplished by the parts now to be described.

At *g* is the conveyer. This is a cylindrical piece of metal fitting with a close joint in a circular hole cut transversely through the head of the breech-piece just back of the place where the barrel is attached. To keep it in place a groove, *g'*, Fig. VII, cut round, as shown, has the point of a screw, *h*, Fig. II, set down through the breech, entering it for that purpose. There is another irregularly-shaped

groove at h' , which connects with the cap-primer, to be described farther on. A circular cavity is cut in the circumference between the two grooves, deep enough to receive the charge, and shown at i , Figs. V and VI. In Fig. V it is shown in the position to receive the charge and ready to convey it to the barrel. At the bottom of the cavity there is a steel point near the letter i , Fig. VI, the object of which is to puncture a hole in the paper cap covering the powder in the ammunition, in the manner shown in Fig. V. This is accomplished the moment the cavity i comes round opposite the mouth of a tube, for then the force of the spring d sends the ammunition in (the powder end being first) with sufficient force to make the hole, as shown.

Within the cavity there is a follower, which is capable of being moved back and forth by its connection with a slide, k , Fig. VI, moving in a channel cut in the conveyer alongside of the cavity. The follower has, also, a hole in its center, to permit the punch to stick through, as seen in Fig. V. It is designed, however, in certain cases to fix this point upon the center of the follower, especially where the bore of the gun is less than that of the cavity, for then it will require some force to send the charge in, and the point in being withdrawn would not be able to draw it back by reason of the adhesion to the side of the barrel.

It will now be seen that it is by means of this follower that the charge is ejected from the chamber into the barrel of the gun. This movement, as well as the movements requisite for turning the conveyer, and also rotating the magazine-tubes, is accomplished by a handle or lever attached to the conveyer, and shown at l in the several Figs. II, III, VI, and VII. The inner end of the lever is attached by a link to the slide k , holding the follower i' , as seen in Fig. VI, wherein is also shown the manner of moving it back and forth.

m is the nipple for holding the percussion-cap. This has a crooked touch-hole leading round so as to come out at the circumference opposite to the hole in the charge when the latter is properly within the barrel. It is seen at m' , Fig. VII. This part of the conveyer then forms the solid breech-plate to receive the reacting shock at the moment of firing.

At n , Figs. II, III, VI, and VII, is a projection or stud, fast to the conveyer, and which strikes against a slide, connecting with the magazine-tubes at a certain part of the revolution, and moves the latter onward the proper distance at each time of loading. The slide referred to is at o , and it is immediately opposite to the spot where the tubes end on the inside of the breech. The slide is kept in place by working in a groove cut in the metal of the breech. On its under side a spring-pawl (seen partly in dotted lines in Fig. VIII) passes through and presses upon a ratchet of five teeth cut on the ring inclosing the ends of the magazine-tubes, as seen in the last-named figure. The revolving, therefore, of the conveyer

in one direction brings the stud n so as to strike upon the under side of the projection o'' on the slide, and to move the latter up. This again, through the action of the pawl, pushes round (a stop interfering to prevent too much motion) the cylinder of tubes to the given distance at the moment the cavity i has come opposite to the hole in the breech leading to a tube, and, as before mentioned, a charge is then sent in by the force of the spring.

In Figs. II and III the conveyer is in the position to receive a load, the lever l being parallel with the side of the gun and lying in its rest l' . To carry the load to the barrel, the lever must be raised and pushed forward, thus turning the conveyer in its socket until the cavity i comes opposite to the chamber connecting with the barrel at p , Fig. V. During the progress of the conveyer around, the stud n , attached to said conveyer, is brought to strike the projection o'' on the slide, and thus turn the cluster of tubes so as to bring the next one opposite the hole in the breech, ready for depositing the charge in the cavity on its return. To send the charge to the barrel, it is only necessary to throw the lever l out so that it will stand at right angles to the side of the gun, as shown in the dotted lines, Fig. II, and in the detached view, Fig. VI, in which latter figure the position of the follower i' is shown to be by that movement at the mouth of the cavity and, of course, has ejected the load into the barrel of the gun. The next movement is to bring the lever back parallel to the side of the gun and reverse it, as before, to receive another charge. In the act of reversing, the lever strikes upon the upper side of the projection o'' on the slide o , and sends that down to its first position, that the point of the pawl o' may enter the next notch in the ratchet on the end of the cylinder of tubes.

Fig. IX shows a modification for the slide o . This consists of a metal ring passing round the ends of the tubes freely, so as to allow of the play of a pawl between, a projection through the side of the breech allowing for the action of the lever l and stud n , the same as in the former instrument.

I now pass to the opposite side of the gun, to describe the priming and the method of firing the load. The primer or cap-magazine consists of a long and narrow metal case, of a square form in the transverse section, the interior of which is of sufficient size to receive a cap. The case is shown at r , Figs. I and II, partly in section. The caps are put in with their open ends downward, and form a single row, as seen at r' . The magazine is large enough to hold as many caps as there are charges in the breech, or even more, to allow for false ones. They are fed down toward the mouth, and kept in position to be taken on the nipple one after the other by the movements of a slide placed upon the cap-case, and connected to a spring-follower on the inside by a slot along the side, similar

to the slide of a pencil-case. The slide and its interior spring-follower are seen at *s*, Figs. I and II.

The manner in which the slide is made to traverse from one end to the other is by the action of two sets of ratchets and spring-pawls, the latter connected with the slide. One of the ratchets is fixed, and may be cut on the side of the barrel, as seen at *t*, Fig. II. The other is upon the surface of the cap-case *r* at *t'*, Fig. II. The slide has a pawl at *u*, taking into the ratchet *t* upon the barrel, and another at *u'*, taking into the ratchet *t'*.

To produce the required movement in the slide, the case *r* must itself have a movement of its own. This it has, being a series of short vibrations back and forth parallel with the gun-barrel, each vibration being to a distance equal to the space occupied by a cap within it. Let the cap-case be pushed along toward the letter *w* on the shield. The slide *s* would be carried along with it were it not for the pawl *u* bearing against the ratchet *t*. This keeps it in place, and accordingly the case *r* slips through. Now, on allowing the case to come back again, the slide *s* would be brought back with it were it not for the pawl *u'* engaging in the ratchet *t'*. Thus the two pawls work alternately in the ratchets, the one to hold it in place when the case is pushed back, and the other to bring it forward again on its return for a new hold, and thus the follower is kept urging out the caps at the proper times for their delivery.

The cap-case is supported at the end near the nipple by passing through a hole or box, *x*, fitted to hold it, and at the other end by a rod, on which there is a recoil-spring, passing through holes in two ears of a plate, as seen at *x'*, Fig. II. This plate may be detachable from the gun-barrel, and by this means the cap-case can be taken off, since the opposite end can be readily drawn out of the strap holding it.

The manner of producing the movements of the case at the proper time for feeding the cap to the nipple is thus: By the description of the manner of forcing the caps along by the slide, it is evident there is a continuous pressure by the spring-follower upon them, tending to push them out at the open end. To prevent this there is a slender spring, as seen at *y*, Figs. I, II, and X. The end is bent round so as to partially close the mouth. It also stands off from the end of the case the distance of the diameter of a cap, as in the usual cap-primer. There is always a cap held here, and kept from falling out by mere pressure of the follower-spring acting against the mass. The end of the cap-magazine is kept a short distance away from the range of the nipple as it sweeps round with the conveyer; but by means of a delicate lever, *z*, Figs. I, II, and X, working in the inside, the cap-case is allowed to slide forward and bring the spring end *y* directly in the way of the nipples as the conveyer is being turned back after having placed its charge in the barrel. The open

end of a cap is therefore held, as it were, in suspension directly over it, so that the point enters and takes the cap on in the same manner as if it were placed there by the fingers. The moment this occurs, as the nipple moves on, the same lever which permitted the case to come forward now pushes it back, the spring *y* opening to let the cap out, while another is forced immediately into the place thus left vacant. The manner in which this is performed is as follows: In Fig. X is a view of the pieces for regulating and effecting the movements of the cap-case. This consists of a lever or finger, *z*, attached to a small shaft, on the opposite end of which is another lever or finger containing a roller, *z'*. This piece lies under the forward part of the conveyer and cross-wise of the gun, as seen in dotted lines Figs. I and II. The point of the finger *z* comes up and plays against a stud, *z''*, on the back of the cap-case, as seen in Figs. I, II, and X, so that its vibrations effect the pushing back of the cap-case. The roller in the opposite end plays in a groove, *h'*, before named, in the conveyer, as seen more clearly in Fig. IV. In a proper place in this groove is a recess, which allows the roller to fall back, and this permits the finger *z* also to move, and thus the cap-case slides back (being pushed by its spring at *x'*) and feeds a cap upon the nipple. The roller, as the conveyer goes on, rides out of the recess, and, moving the finger *z*, causes the case to be pushed back again, relieved of a cap, as before described, and also moving the slide *s* in the manner heretofore stated. As the conveyer is carried onward the nipple goes up and terminates under the head of the hammer, pressing so hard against that as to set it back and allow it to rest wholly upon the nipple. This effects the proper pushing down of the cap upon the nipple, and also holds it on. The load may now be fired by cocking and pulling the trigger in the usual manner.

To clean off the shells of the exploded caps from the nipple, the inner edge of the hammer is roughened or rasped, as shown at *g'*. Thus while the nipple is retreating by the revolution of the conveyer *g* it is scraped against this rasp, inasmuch as the hammer follows the nipple a short distance, which motion brings the rasped part in contact with the nipple, thus taking hold of the shell and throwing it off.

What I claim as of my own invention, and desire to secure by Letters Patent of the United States, is—

1. Cutting slots in the tubes of the magazine, and combining with each tube a spring connected with a ring moving on the outside for feeding up the spring and maintaining the compressed position given at the time of charging the tubes with ammunition, as described, whereby I am enabled to force such charge into the conveyer by a power independent of gravity, and to pierce the hole communicating with the powder in the manner described; and this I claim whether the feed-ring *e* be combined

with a screw exteriorly placed or within the interior of the cluster of tubes, or whether the same effect be produced by or in any manner analogous.

2. I claim combining the tube-magazine with the conveyer in such manner that it will be revolved so as to bring each tube of the series successively opposite to the hole through which the charge is fed to the conveyer whenever and as often as a charge has been transferred to the barrel, in the manner described.

3. I claim the follower *i'*, in combination with the cavity of the conveyer and the lever for ejecting the charge into the barrel, as described.

4. I claim the cam-groove *h'*, in combination with the finger-levers *z z'* and the cap-case to regulate the feed, as described.

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Witnesses:

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S. H. MAYNARD.