

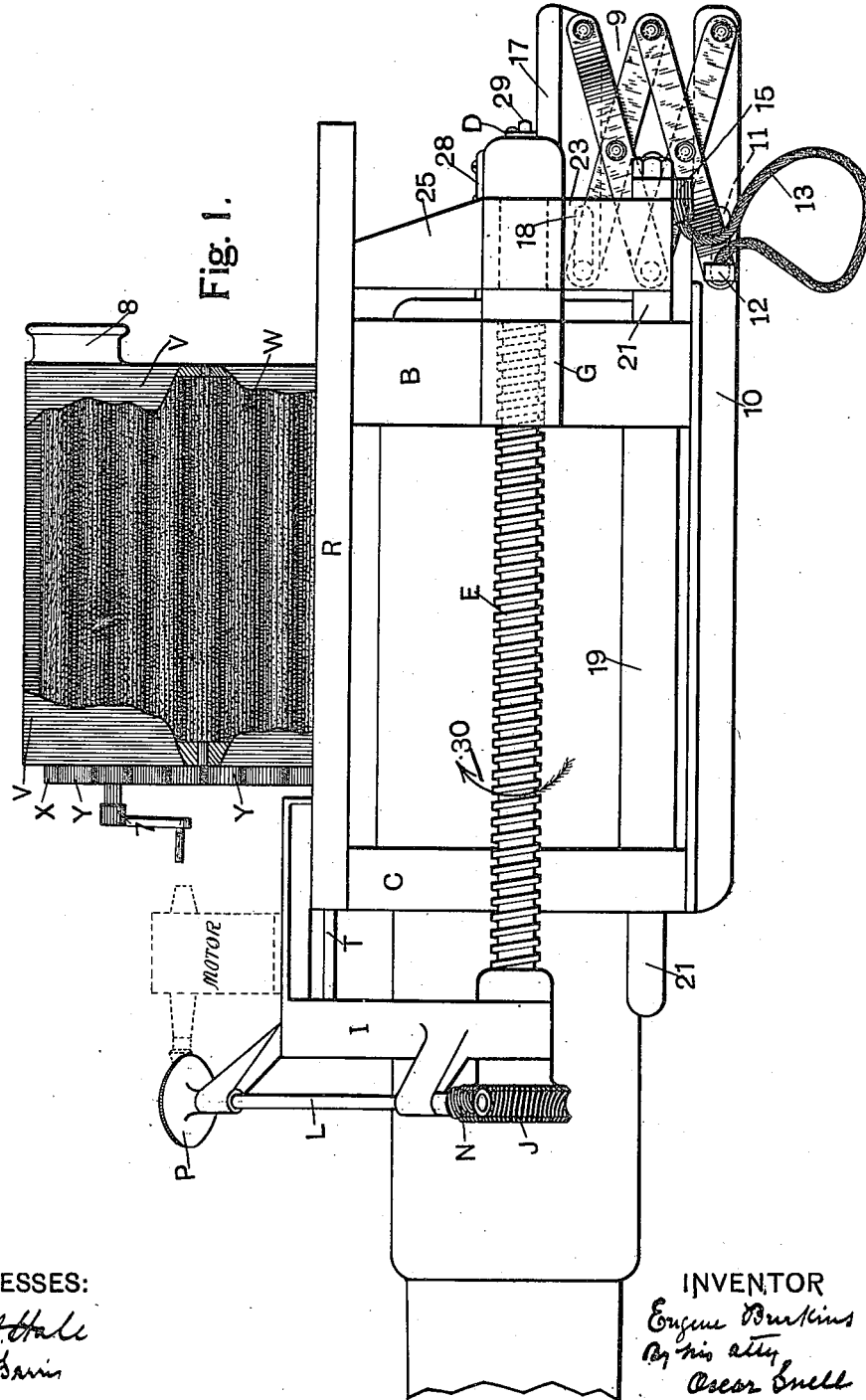
**No. 649,433.**

**Patented May 15, 1900.**

**E. BURKINS.**  
**BREECH LOADING CANNON.**

· (No Model.)

**5 Sheets—Sheet 1.**



WITNESSES:

H.A. Hale  
J.J. Davis

INVENTOR

Engine Perkins  
By his atty  
Oscar Snell

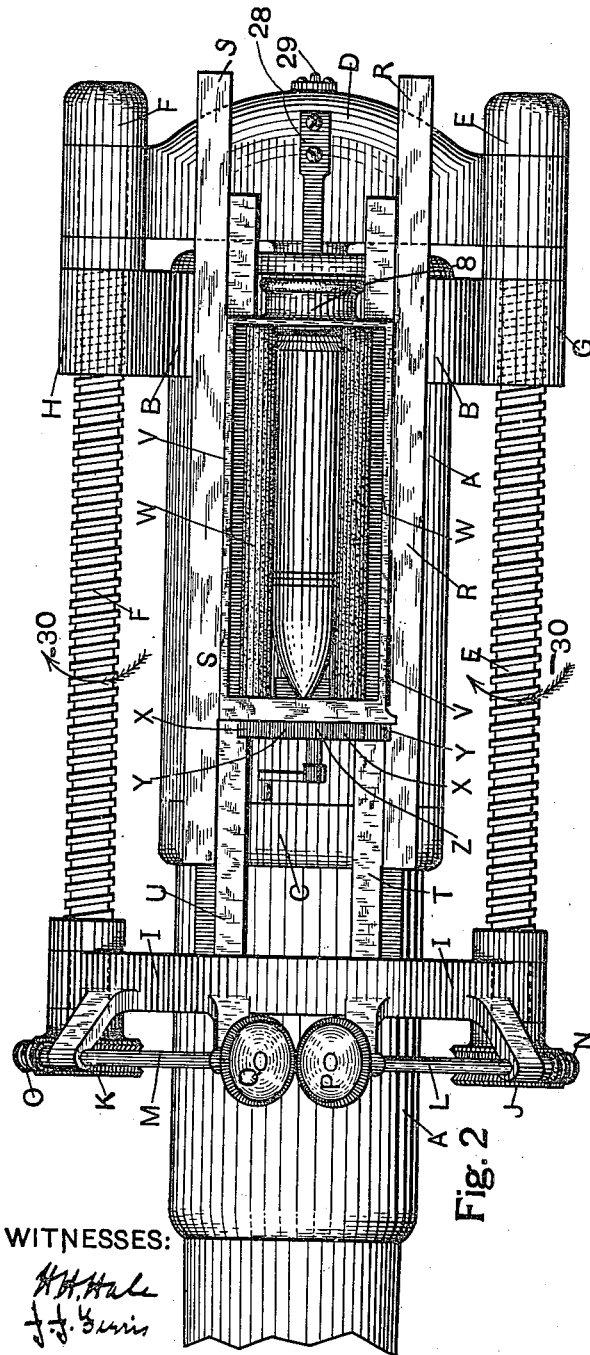
**No. 649,433.**

**E. BURKINS.**  
**BREECH LOADING CANNON.**

**Patented May 15, 1900.**

(No Model.)

**5 Sheets—Sheet 2.**



WITNESSES:

H.H. Hale  
J.J. Harris

2  
Lip

INVENTOR

Eugene Burkins  
 By his atty. Oscar Smith

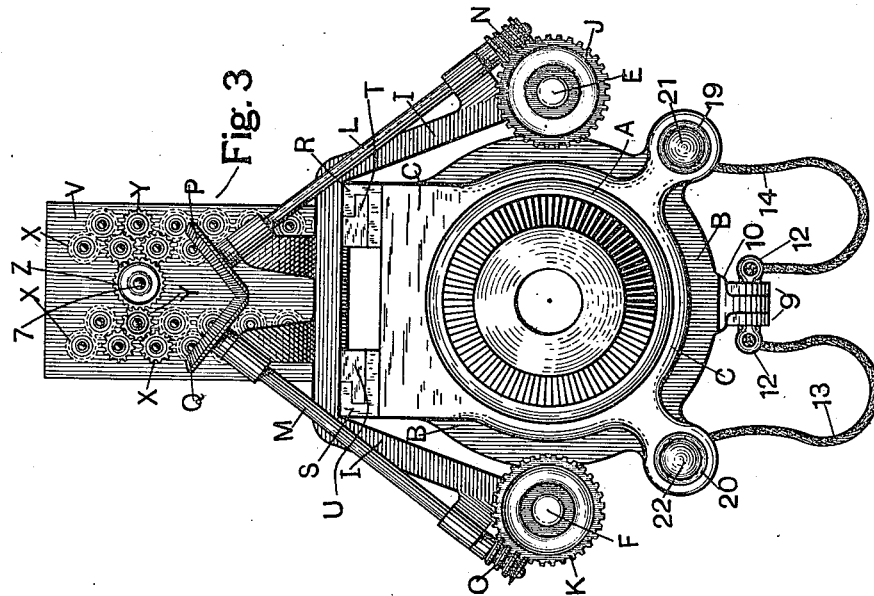
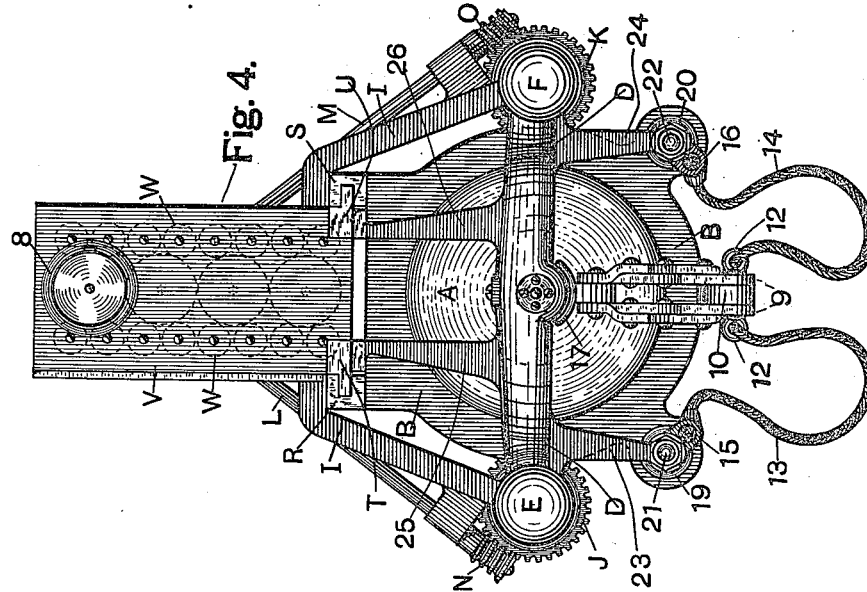
No. 649,433.

Patented May 15, 1900.

E. BURKINS.  
BREECH LOADING CANNON.

(No Model.)

5 Sheets—Sheet 3.



WITNESSES:

H. H. Hale  
J. J. Smith

INVENTOR

Ernest Burkins  
By his atty  
Oscar Snell

No. 649,433.

Patented May 15, 1900.

E. BURKINS.  
BREECH LOADING CANNON.

(No Model.)

5 Sheets—Sheet 4.

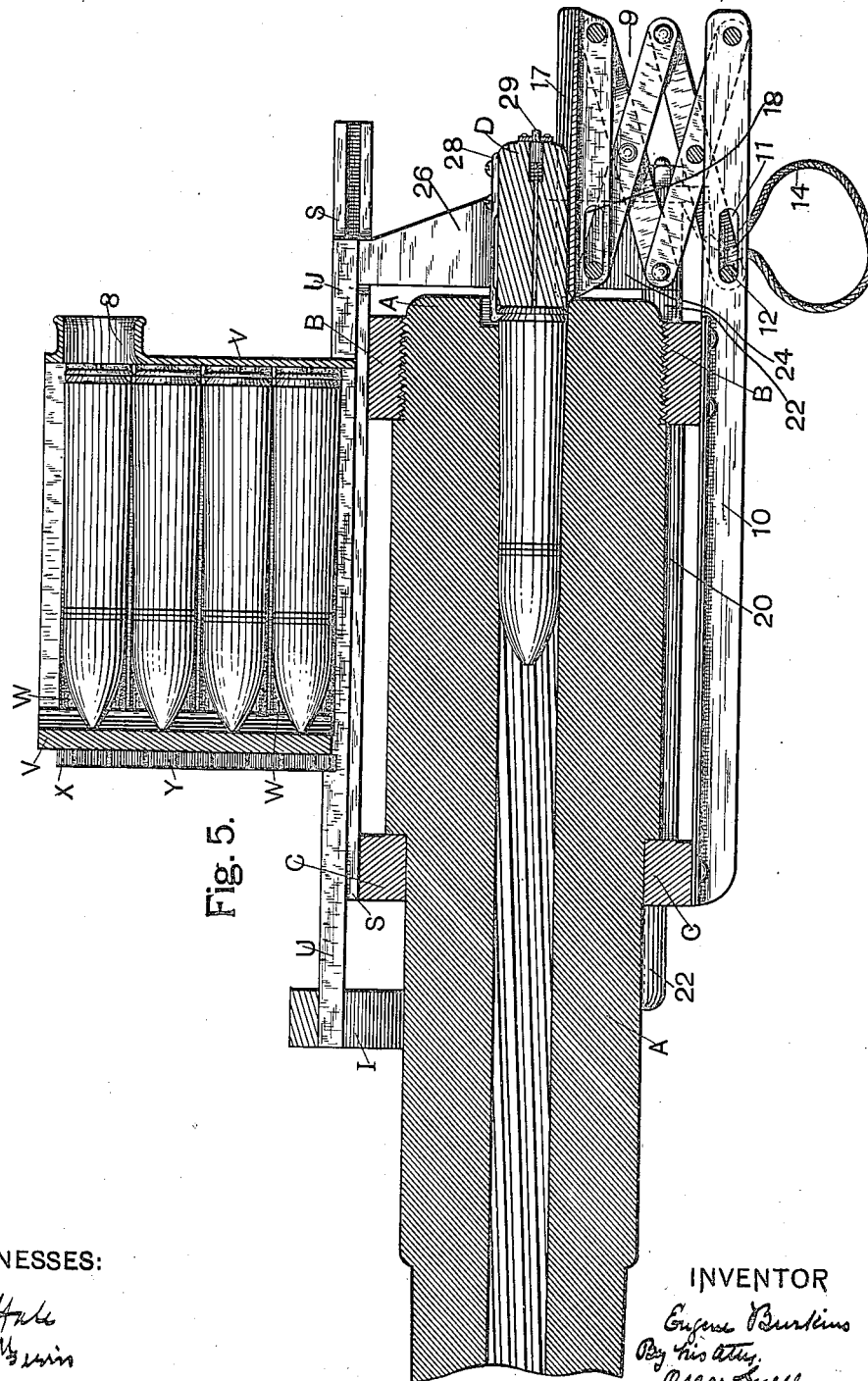


Fig. 5.

WITNESSES:

*A. H. Hale*  
*J. G. Burkin*

INVENTOR

*Ernest Burkins*  
*By his Atty.*  
*Osborn Small*

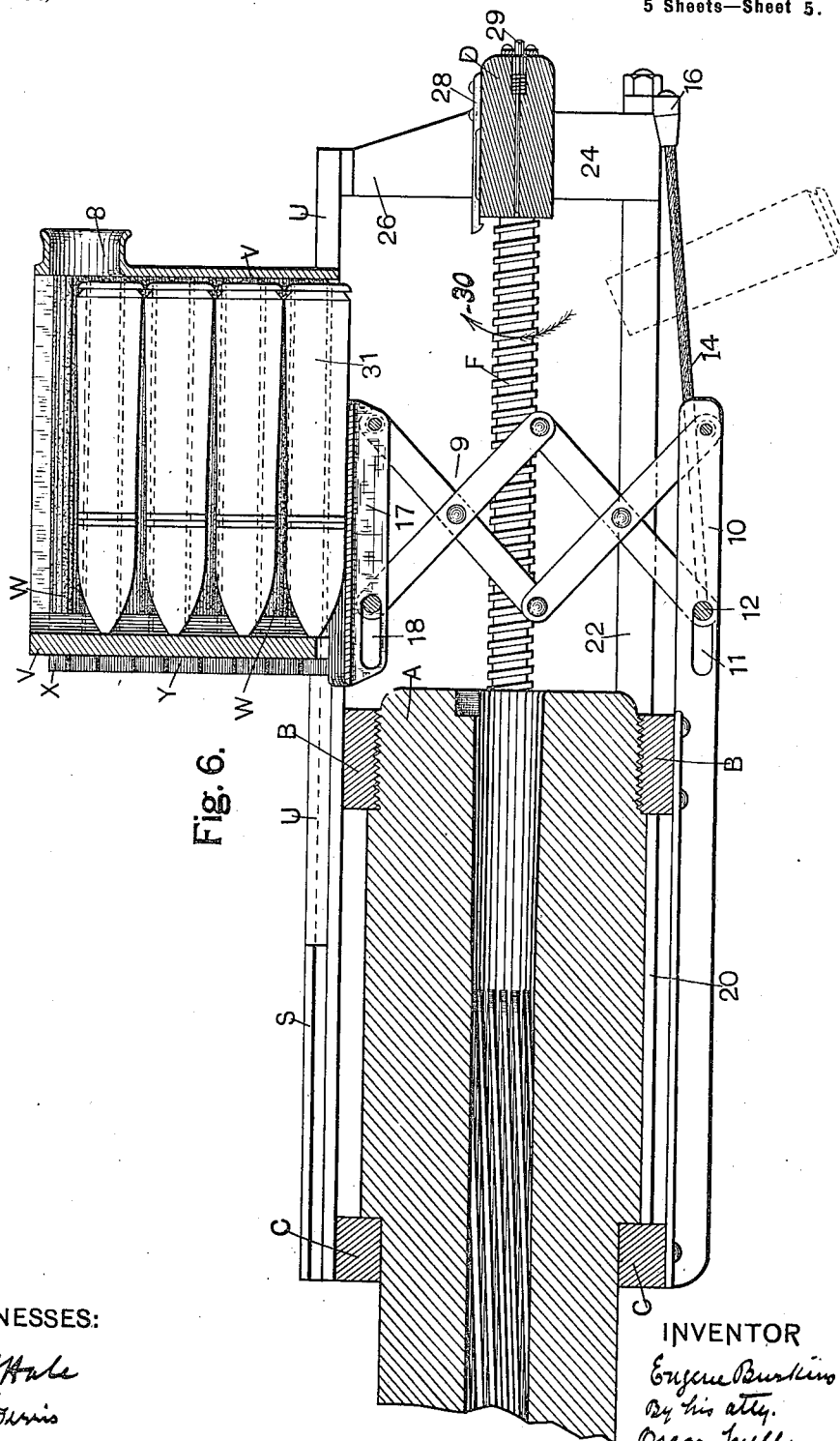
No. 649,433.

Patented May 15, 1900.

E. BURKINS.  
BREECH LOADING CANNON.

(No Model.)

**5 Sheets—Sheet 5.**



WITNESSES:

H. A. Hale  
J. J. Harris

INVENTOR

Eugene Burkins  
By his atty.  
Oscar Inell

# UNITED STATES PATENT OFFICE.

EUGENE BURKINS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO  
MARTIN B. MADDEN, OF SAME PLACE.

## BREECH-LOADING CANNON.

SPECIFICATION forming part of Letters Patent No. 649,433, dated May 15, 1900.

Application filed June 10, 1899. Serial No. 720,116. (No model.)

*To all whom it may concern:*

Be it known that I, EUGENE BURKINS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Breech-Loading Cannon, of which the following is a specification.

My invention relates to breech-loading cannon; and my object is to provide a construction particularly adapted to handling heavy ammunition so as to attain a much greater rapidity of fire than heretofore in guns of a caliber larger than are employed in the ordinary machine-guns, the same being more fully described hereinafter and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the breech portion of a cannon, upon which is mounted the mechanism in which my invention is embodied, the front portion of the cannon being shown broken away, and also a large portion of the right side of the case of the ammunition-magazine is shown broken away to illustrate a vertically-arranged series of rubber-covered rollers mounted to revolve on bearings at each end within the magazine-casing and adapted to convey the ammunition downwardly, as is particularly described hereinafter. Fig. 2 is a plan of the parts shown in Fig. 1. Figs. 3 and 4 are respectively front and rear elevations to illustrate the mechanism for operating and supporting the breech-block. Fig. 5 is an axial vertical section of the breech portion of the barrel of a cannon and of two rings mounted thereon for supporting the breech-loading mechanism. The breech-block is also shown in axial vertical section; but the cartridge-carrier has one side broken away to illustrate position of superimposed breech-block when the gun is in the closed position. The cartridge-magazine is shown in section on a vertical plane coincident with the axial centers of the cartridges shown therein in elevation. Fig. 6 is a vertical axial section similar to what is shown in Fig. 5, except that in Fig. 6 the breech is at the extreme open position just after having extracted and thrown out the discharged cartridge-shell, which is shown in a falling position in broken lines.

The cartridge-carrier in Fig. 6 is raised by the extreme outward movement of the breech-

block to the elevation shown, where it is in position to contact with and receive the lowest cartridge in the magazine, which cartridge is lowered to a position coaxially with the bore of the cannon and is forced into the cartridge-chamber, as shown in Fig. 5, by the forward motion of the breech-block, which latter serves the double purpose of rammer and breech-block and is locked in not only the closed position, (shown in Fig. 5,) but in all other positions of its movement against force applied upon it in a direction longitudinal of the bore of the gun.

Similar letters and numerals indicate like parts throughout the several views.

A is the breech portion of a cannon, and at B and C are heavy rings attached thereto and to which latter are secured and supported the operative mechanism.

The breech-block D consists of a heavy steel forging, and the outer lateral ends thereof terminate in eyes which form journal-bearings in this instance for the rear end of heavy side screw-shafts E and F, which are fitted with collars, so that the screws may rotate in the bearings of the breech-block without much longitudinal movement therein.

At G and H are heavy lugs projecting laterally from ring B, which latter is screwed upon the rear end portion of the gun, as indicated in Figs. 5 and 6. These lugs are screw-threaded to receive the screw-shafts E and F, which latter are mounted to revolve in bearings at the rear end at the lower ends of a saddle-piece I, and at the rear side of these bearings are collars, and at the opposite side are firmly secured to the ends of the screw-shafts worm-gears J and K. The two screw-shafts are connected to revolve in unison by means of two inclined shafts L and M, which are mounted in bearings at the outer ends of projections from the saddle-piece I, the lower ends of these shafts terminating in worms N and O, which engage with the worm-gears J and K. The upper ends of shafts L and M are connected by means of bevel cog-wheels P and Q, to either of which latter power may be applied to operate the mechanism, as indicated by the broken lines in Fig. 1.

Rings B and C extend upwardly at the top portion and terminate in a straight surface

upon which are firmly secured guide-rails R and S, which are grooved laterally in the opposite faces to receive slide-rails T and U, and upon the latter is mounted a magazine-case

5 V. A series of rubber-coated rollers W, arranged in a vertical row on each side of the case, are mounted to revolve in journal-bearings in the ends of the case, as indicated in Fig. 1. The shaft of each of these rollers  
10 projects through the front end of the magazine-case and is provided at the outer end with a cog-wheel X, and all the rollers in each vertical series are connected to revolve in unison by means of the connecting cog-wheels Y.

15 At Z, Fig. 3, is a cog-wheel which connects a vertical row of cog-wheels on one side with those on the opposite side, so that power being applied to the shaft 7 of cog-wheel Z, as by an ordinary crank, all the rollers in both  
20 series revolve simultaneously, the rollers in one side series revolving in an opposite direction to those at the opposite side.

At 8 is a hollow projection through which the magazine is loaded with ammunition.

25 At 9 is a pair of lazy-tongs, and each one of the pair has two of its lower arms pivotally attached to the rearward termination of a piece 10, which is secured to the lower portion of rings B and C.

30 At 11 is a slot through piece 10, in which is mounted a cross-pin 12, connecting the lower end of two other members of the lazy-tongs movement.

At 13 and 14, Figs. 3 and 4, are wire ropes  
35 having the front ends attached to the outer ends of pin 12 and the rear ends to short lugs projecting downward from lugs 15 and 16, which are attached to the breech-block.

Attached to the top ends of the top members of the lazy-tongs movement is a cartridge-receiver 17, which is concavo-convex in cross-section. At one end of the receiver the upper ends of the top members of the  
40 lazy-tongs movement are pivotally mounted, as shown, while the top ends of the other top members are connected through a slot at 18.

In Figs. 3 and 5 are plainly shown lugs which project downwardly and laterally from rings B and C, and these lugs support two  
50 pipes 19 and 20, which serve as slideways for two slide-rods 21 and 22, whose rear ends are secured to the lower ends of lugs 23 and 24 of the breech-block. Slide-rods 21 and 22 are for the purpose of assisting the screw-shafts  
55 to support the weight of the breech-block and magazine.

At 25 and 26 are two upwardly-projecting arms from the breech-block, which are secured at the top end to the slide-rails T and  
60 V to connect the outer ends thereof with the breech-block. The saddle-piece I is secured to and straddles the rear ends of the slide-rails T and U.

The breech-block is provided with a front  
65 cylindrical projecting portion 27, which enters the bore of the cannon, and a spring cartridge-extractor 28 is shown attached to

the top surface of the breech-block. The forward free end of this extractor is provided with a hook, which enters the bore of the  
70 cannon to engage an annular notch at the base of the cartridge in the usual manner.

A firing-pin is shown at 29, which may be operated in any usual manner.

It will be understood that this system of  
75 breech-loading mechanism is adapted to be operated so that one cartridge at a time may be placed on the receiver 17 by hand or be dropped from the magazine.

The magazine is filled when empty by introducing the cartridges through the orifice  
80 8 and applying power to shafts 7 of cog-wheel Z to cause them to successively descend and finally be disposed in the order shown in Fig. 5 and indicated in Fig. 4 by broken lines at  
85 the rear end of the magazine V.

In operation if the cannon is not loaded, but there is a supply of cartridges in the magazine, the screws E and F are rotated in the direction the reverse of that indicated by  
90 arrows 30, Figs. 1 and 2, when the breech-block will be carried by the screw-threads backwardly from the position shown in Figs. 1, 2, and 5 to the position shown in Fig. 6. In this action the breech-block will reach a  
95 position where the ropes 13 and 14 are straightened out to their full length, after which the pin 12 of the lazy-tongs movement 9 will be pulled rearwardly to the rear end of slot 11, and thereby move together the lower ends of  
100 the arms of the lazy-tongs movement and cause it to raise the cartridge-receiver to the position shown in Fig. 6, when by revolving the rollers W the cartridge 31 may be dropped upon the receiver 17. If now the screws E  
105 and F are revolved in a direction the same as that indicated by arrows 30, the breech-block will move inwardly and with it the ropes 13 and 14 and permit the cartridge-receiver, together with the cartridge 31, to descend  
110 until the cartridge registers with the bore of the cartridge-chamber. A continued inward movement of the breech-block will cause it to finally contact the rear end of the cartridge-case and force the same into the  
115 cartridge-chamber to the position shown in Fig. 5, when the breech will be closed and the cannon ready to fire by an ordinary means adapted to strike the firing-pin 29. After the cannon has been discharged power is  
120 again applied to either of the shafts L or M, so that side screws E and F are rotated the reverse of the direction indicated by the arrows 30, when the discharged cartridge-case will be withdrawn outwardly upon the top of  
125 the cartridge-carrier 17 and rearwardly so far that the heavy rear end of the cartridge-case will cause it to fall by virtue of gravity and detach itself from the extractor-hook and from contact with the carrier 17, and the series  
130 of actions occurs before the ropes 13 and 14 are straightened by the extreme rearward movement of the breech-block and consequent rise of the cartridge-carrier 17.

I do not confine myself to the exact construction hereinbefore shown and described, for it is obvious that in the breech-loading mechanism where the breech-block D is extended laterally, so as to engage with and be supported from backward movement by side screw, these rods may be stationarily secured to the cannon and a revoluble screw-threaded nut be mounted on the screw with the latter in engagement with the breech-block, or the rear ends of the screw-rods may be firmly secured to the breech-block and revoluble screw-threaded nuts be mounted on the cannon and adapted to receive the screw-threaded rods without altering the principle involved, which is embodied in the employment of screw-rods disposed substantially longitudinally with the bore of the cannon at the sides thereof and the rear ends of the screw-rods in engagement with the breech-block, which latter has lateral prolongations adapted to receive the rear ends thereof, the front ends of the screw-rods in either instance being engaged directly or indirectly with the body of the cannon at one end and with the breech-block at the opposite or rear end.

Therefore I claim as my invention—

1. The combination, with a breech-loading gun, of a bottomless magazine above the rear end thereof, a cartridge-carrier, means for moving the same between the bore of the gun and the magazine, and means for retaining the cartridges in the magazine and delivering them, one at a time, to the carrier.

2. The combination, with a breech-loading gun, of a bottomless magazine above the rear end thereof and between it and the breech-block when the breech-block is in its retracted position, a cartridge-carrier connected with the breech-block so as to be moved thereby between the bore of the gun and the magazine, and means for retaining the cartridges in the magazine and delivering them, one at a time, to the carrier.

3. The combination, with a breech-loading gun, of a magazine above the rear end of the same, lazy-tongs connected with the breech-block, a cartridge-carrier upon the tongs in position to be moved thereby between the bore of the gun and the magazine, and means for retaining the cartridges in the magazine and delivering them, one at a time, to the carrier.

4. The combination, with a breech-loading gun, of a magazine above the rear end of the same, lazy-tongs provided with a cartridge-carrier movable between the bore of the gun and the magazine, and means for connecting the tongs with the breech-block so as to operate them only at the limit of the rearward movement of the breech-block.

5. The combination, with a breech-loading gun, of a magazine in fixed relation to the breech-block and movable therewith, lazy-tongs provided with a cartridge-carrier in position to be moved between the bore of the gun and the magazine, and means for connect-

ing the lazy-tongs with the breech-block so as to be moved thereby.

6. The combination, with a breech-loading gun, of guide-rails secured to the top thereof, slide-rails on the guide-rails, a magazine upon the slide-rails, a cartridge-carrier, and means for connecting the rails and the carrier with the breech-block so that when the breech-block is retracted the magazine will be moved to the rear of the gun and the carrier will be moved from the bore of the gun to the magazine.

7. The combination, with a breech-loading gun, of rings upon the same, guide-rails secured to the rings, slide-rails in the guide-rails, the rear ends of which are secured to the breech-block, a magazine upon the slide-rails and movable therewith, and a cartridge-carrier connected with the breech-block, so as to be moved thereby between the bore of the gun and the magazine.

8. The combination, with a breech-loading gun, of rings upon the same, the top of each of which terminates in a straight surface, guide-rails secured thereto, the rear ends of which project beyond the rear end of the gun, slide-rails in the guide-rails, a magazine upon the slide-rails in position to be moved to the rear of the end of the gun, and a cartridge-carrier, connected with the breech-block so as to be moved thereby between the bore of the gun and the magazine.

9. The combination, with a breech-loading gun, of a ring upon the same, the opposite sides of which are each provided with a screw-threaded projection, a screw in each projection, the rear end of which is connected with the breech-block, and means for rotating said screws in unison.

10. The combination, with a breech-loading gun, of a ring upon the same, the diametrically-opposite sides of which are each provided with a screw-threaded projection, a screw through each projection, the rear end of which is connected with the breech-block, and intermeshing gear-wheels for rotating said screws in unison, a magazine above the rear end of the gun and a cartridge-carrier, connected with the breech-block so as to be moved thereby between the bore of the gun and the magazine.

11. The combination, with a breech-loading gun, of a ring secured thereto provided with screw-threaded perforations, a screw in each perforation, one end of each of which is connected with the breech-block, a saddle upon the other ends of the screws, two shafts journaled in the saddle, the upper ends of which are provided with intermeshing gear-wheels and the other ends are each provided with a worm-gear in engagement with the screws, means for rotating the shafts, a magazine above the rear of the gun and a cartridge-carrier connected with the breech-block, so as to be moved thereby between the bore of the gun and the magazine.



12. The combination, with a breech-loading gun, of two rings secured thereto, a magazine mounted on top of the gun, pieces secured to the rings under the gun, the rear ends of which project beyond the breech of the gun, a pair of lazy-tongs secured to the projecting ends of the pieces, a cartridge-carrier on the tongs, and means for connecting the tongs with the breech-block so as to be moved thereby between the bore of the gun and the magazine.

13. The combination, with a breech-loading gun, of pieces secured thereto, the rear ends of which project beyond the breech and are each slotted longitudinally, a pair of lazy-tongs secured to said pieces, the top member of each of which is slotted longitudinally, a cartridge-carrier upon the tongs, a flexible connector between the tongs and the breech-block, and a magazine on top of the gun.

14. The combination, with a breech-loading gun, of two rings secured thereto, each of which is provided with lugs, pipes in said lugs, a slide in each pipe, the rear end of which is secured to the breech-block, two screws upon opposite sides of the gun, the rear ends of which are connected with the breech-block, means for operating the screws in unison, a magazine at the rear end of the gun and a cartridge-carrier, connected with the breech-block so as to be moved thereby between the bore of the gun and the magazine.

15. The combination, with a breech-loading gun, the breech-block of which enters the bore of the gun and is provided with a catch, of a magazine connected with the breech-block and movable therewith, a cartridge-carrier, immediately below the breech-block when at rest, and means for withdrawing the breech-block to a distance beyond the carrier, whereby the empty shell is carried over half its length beyond the carrier and falls therefrom by gravity.

16. The combination, with a breech-loading gun, of a magazine-casing provided with a hollow projection, a series of rollers journaled in each side, of the casing, means for rotating the rollers in opposite directions, a cartridge-carrier, and means for moving the carrier between the bore of the gun and the magazine.

17. The combination, with a breech-loading gun, of a magazine-casing provided with a hollow projection, a series of yielding rollers journaled upon each side of the casing, means for rotating the rollers in opposite directions, a cartridge-carrier, and means for moving the carrier between the bore of the gun and the magazine.

18. In combination with a breech-loading gun, a magazine adapted to hold and transfer fixed ammunition, comprising two walls of rollers geared together so that the rollers in one of the said walls revolve in the opposite direction to that of the rollers in the opposite wall, each of said walls of rollers separated from the other sufficiently to permit cases containing fixed ammunition to be held or carried down between the said walls, substantially as and for the purpose hereinbefore stated.

19. In combination with a breech-loading gun, a magazine adapted to hold and transfer fixed ammunition, comprising two walls of elastic-surfaced rollers geared together so that the rollers in one of the said walls revolve in the opposite direction to that of the rollers in the opposite wall, each of said walls of rollers separated from the others sufficiently to permit of the reception of cases of fixed ammunition to be held or carried down between the said walls in the manner as and for the purpose stated.

EUGENE BURKINS.

Witnesses:

F. F. FAUST,  
OSCAR SNELL.