E. BURKINS.
BREECH LOADING CANNON.

5 Sheets—Sheet 3.

INVENTOR

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No. 649,433.

Patented May 15, 1900.

(No Model.)

WITNESSES:

Ralph

Weaver
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INVENTOR
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UNITED STATES PATENT OFFICE.

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

BREECH-LOADING CANNON.

Application filed June 18, 1899. Serial No. 720,118. (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 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. In Fig. 6 the breech is at the extreme open position just after being 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 55 is lowered to a position centrally axial to 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 movement against the 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 shrouds 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 rotate 85 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 rotate 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 level 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 V. A series of rubber-coated rollers W, arranged in a vertical row on each side of the case, are mounted to revolve in vertical bearings in the ends of the case, as indicated in Fig. 1. The shaft of each of these rollers 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 as 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 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.

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 ring C. 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 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 lazy-tongs movement project downward from the receiver, 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 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 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 to the breech-block by the sash-pieces I and V to connect the outer ends thereof with the breech-block. The sash-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 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 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 by the manual magazine. It is mounted upon 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 cannon to engage an annular notch at the base of the cartridge in the usual manner.

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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 revolvable screw-breech-block may 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 revolvable 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 line may be connected to the breech-block 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, 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 connecting 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 jour-nelled 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 there- 

by 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 

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 other 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.

Witnesses:

EUGENE BURKINS.

F. F. FAUST,

OSCAR SNELL.