D. DAVISON.

Breech-Loading Ordnace.

No. 162,807. Patented May 4, 1875.

Fig: 1

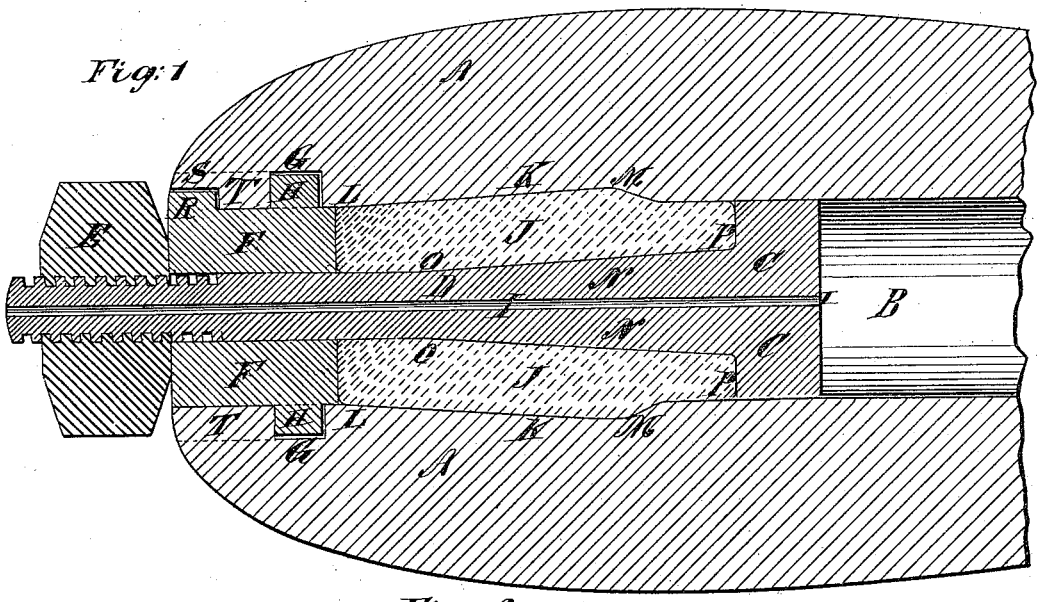


Fig: 2

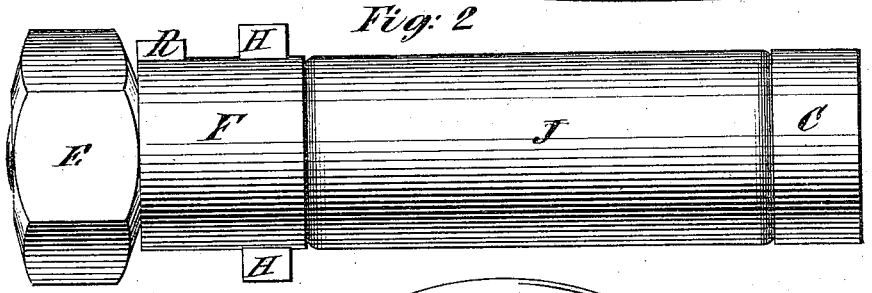
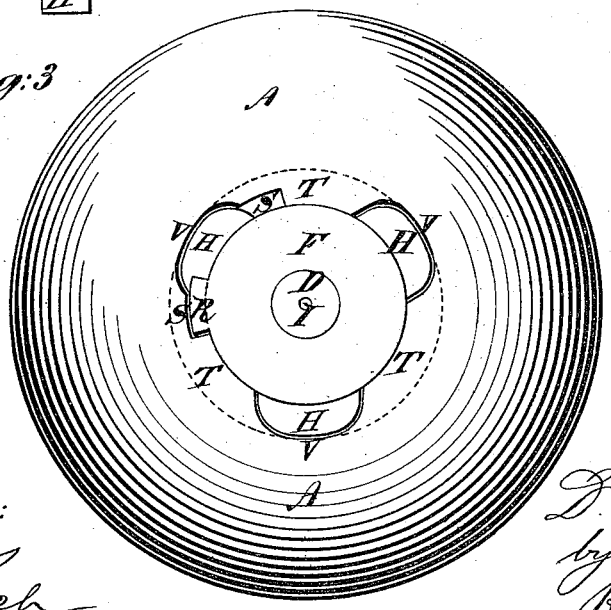


Fig: 3



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UNITED STATES PATENT OFFICE.

DARIUS DAVISON, OF NEW YORK, N. Y.

IMPROVEMENT IN BREECH-LOADING ORDNANCE.

Specification forming part of Letters Patent No. **162,807**, dated May 4, 1875; application filed March 25, 1875.

To all whom it may concern:

Be it known that I, DARIUS DAVISON, of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Ordnance; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification.

This invention, which is applicable either to breech-loading or muzzle-loading ordnance, relates to the novel construction of an elastic breech plug and locking-ring for the same, and of the breech part of the gun for the reception of such plug and ring, whereby provision is made for more effectually securing the said plug in place, and preventing it from being blown out of or moved bodily backward in the bore of the cannon when a charge of powder is exploded therein.

In the accompanying drawing, Figure 1 represents a longitudinal section of a portion of the breech end of a cannon, with the bore run through and a section of the breech-plug adjusted therein. Fig. 2 is an exterior view of the breech-plug, as adjusted to be shoved into the bore of a cannon for use. Fig. 3 is a rear-end view of a cannon and the lock-ring.

A represents a portion of the breech of a cannon; B, the bore; C, a metal piston-head; D, a piston or spindle made in connection with said head, with screw-thread on the outer end; E, screw-nut fitted to said screw-thread; F, lock-ring; G, cylindrical channel in the breech of the gun; H, projections or lugs on the lock-ring to be turned into and hold in the channel G when adjusted for use; I, aperture through the spindle D, through which the charge of powder can be ignited by any suitable primer in the outer end of the spindle; J, hollow vulcanized-rubber cylinder; K, gradually enlarged conical chamber in the bore of the cannon; N, conical portion of the spindle; R, lug or stop on the lock-ring F, to stop the lock-ring from turning more than one-third around in either direction when inserted in its place in the cannon, to secure its ready insertion and removal, and to hold it in its proper position for use when the nut E is screwed up; S, recess in the rear end of the bore of the cannon for the lug R to be turned into in either direction, backward or forward, in its insertion, or withdrawal, or accurate adjustment in the breech of the cannon; T, lugs in the breech end of the cannon for the lugs H on the lock-ring F, to bear against when the lock-ring is turned in its place in the bore, to hold the same firmly in the bore of the breech; V, channels in the bore from the outside of the breech cut into the circular channel G, of a shape corresponding with the lugs H, and with sufficient play to admit of the lock-ring being easily inserted in and withdrawn from the cannon when adjusted on the plug for use.

To construct or alter cannon to adapt them to my invention, the bore is run a uniform size through the cannon. A conical cavity is then turned in the bore of the cannon about in the position, shape, and proportion to the parts of the plug, as shown in Fig. 1. The small end of such cone-shaped cavity commences at about the inner surface of the lock-ring as adjusted in the bore, and is thence regularly increased in diameter toward the nozzle to about the point marked M, producing an increase in diameter in or about a straight line, and then gradually and easily curved down to the regular bore of the cannon, meeting said regular bore a short distance inside of the point at which the inside surface of the piston-head is drawn back when screwed up in the bore, and at a point beyond which the inside surface of the piston-head will be forced back, in compressing the rubber by the force of the explosion of the largest charge of powder that may be fired therein, the small end of the cone-shaped bore being toward the rear end of the cannon.

D represents the spindle, which is made of a uniform diameter from the back end thereof to about the point O, and from thence to the piston-head is cone-shaped, being gradually increased in diameter in or about a straight line, and about parallel with the profile of the cone-surface of the increased diameter of the bore. The spindle D has a screw-thread on the outer end, and a nut, E, engages therewith to properly screw up and compress the rubber cylinder to any required degree of compactness in the bore. The nut E has a bearing against the ring F, only near its cen-

ter, in order to lessen the resistance of friction in screwing up the same. The lock-ring F is provided with peculiarly shaped and proportioned lugs H, having rounded corners for passing through channels V in the sides of the bore of the cannon at the breech, which channels V are cut with rounded corners to correspond with the shape of the lugs H. The ring F is also provided with a stop-lug, R, to limit the movement of the lock-ring in turning it in either direction when in the bore of the cannon.

The channel G has its sides at about right angles to the bore, and is made otherwise in a true circle of any required depth and width, and any suitable distance in the cannon from the rear end thereof. The exterior of the rubber cylinder J, is made of about equal diameter throughout its whole length, and about equal diameter with the regular bore of the cannon. The hole through its center is made conical to correspond in shape to the spindle D, on which it is placed, and of a size to be placed easily thereon. The corner edges of such rubber cylinder, at each end, are slightly rounded off to prevent such edges from being abraded when forced to move against the surface of the bore under pressure. Through the aperture I, in the spindle D, the charge of powder in the cannon is ignited by any suitable primer exploded in the rear end thereof. The portion of the spindle D in contact with the inside of the rubber cylinder is designed to be lubricated with any suitable material, to cause the spindle to slip easily with little friction in the rubber cylinder, to produce the best wedging and lateral expanding effect on the rubber cylinder.

The hollow rubber cylinder may be made of any required length, and the other portions of the plug and the enlarged bore in the cannon proportioned thereto, as hereinbefore described.

The plug when put together to be inserted in the bore, is in all its parts of about uniform diameter with the bore, so as to slide easily therein, and turn therein one third around with the lock-ring, when the lug R will rest against the end of the recess S, and the nut E can then be screwed up to any required degree of tightness. By screwing up the nut E, the piston-head is drawn backward and compresses the rubber J longitudinally. The conical portion of the spindle is also drawn backward in the center of the rubber cylinder, and aids to expand it laterally by wedging the rubber laterally into the enlarged bore of the cannon until it fills such enlarged bore completely, at a pressure and tenacious hold on the surface of the bore, aided by the strength of the lock-ring, to prevent the plug from being blown out of or forced back bodily in the bore of the cannon, by the force of the explosion of the largest charge of powder that it may be practicable to use therein.

After a charge of powder is fired in the cannon, by a suitable wrench the nut E is loosened, the rubber cylinder elongates into a uniform diameter of the bore, and then the whole plug, including the lock-ring, is given a turn backward one-third its diameter, the lug R strikes and rests against the end of the recess S, and the whole plug is in line to be easily withdrawn from the cannon. When the plug is used in a cannon as a breech-loader, these operations, before described, are repeated at each charging and firing.

The lock-ring F when adjusted in the cannon, as before described, acts as an immovable bearing for the rubber cylinder to be compressed against both when screwed up, and when further compressed by the explosive force of the powder acting on the head of the piston, which yields and eases the shock and strain on the base of the bore, and transfers such strain into a lateral pressure on the bore in contact with the rubber through the elasticity thereof. The rubber cylinder thus compressed longitudinally, and expanded by the conical piston laterally, is wedged and jammed into the conical cavity, and against the surface of the bore in contact therewith in the breech, with such force, friction, and tenacious hold, that but a small part of the force of the explosion, acting on the piston-head at the base of the bore, is transmitted to, reaches, or acts upon the lock-ring to tear it out of the cannon. It is used chiefly as a firm base of action and security in holding the elastic plug in the bore, under all circumstances.

One of the chief advantages of this invention is its adaptability to the alteration of present smooth-bore muzzle-loading cannon into rifled breech-loaders, diffusing and distributing the strain of the explosion of the charge of powder therein, so that such cannon, thus altered, can stand the charge of powder necessary to fire rifled shot or shell therefrom, as well as to the construction of new cannon on the plan of this invention.

I claim—

1. A cannon having the conically-shaped enlarged bore K, at or near the breech of the gun, with its smallest end toward the rear, in combination with the elastic cylinder and conical spindle, substantially as and for the purposes described.

2. The combination, with the piston-head C, and elastic cylinder J, of the spindle D made conical shaped, with its largest diameter at or near the inside face of the piston-head, substantially as and for the purposes described.

3. The locking ring F, constructed or provided with locking-lugs H, and stop-lug R, in combination with the channels V G, and recess S, substantially in the manner and for the purpose herein described.

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Witnesses:

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