

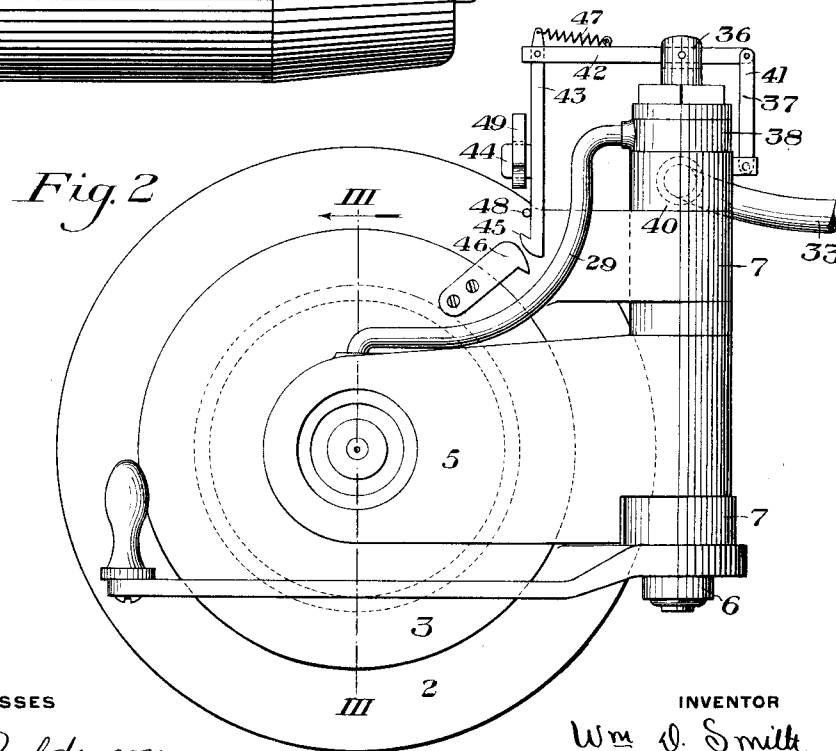
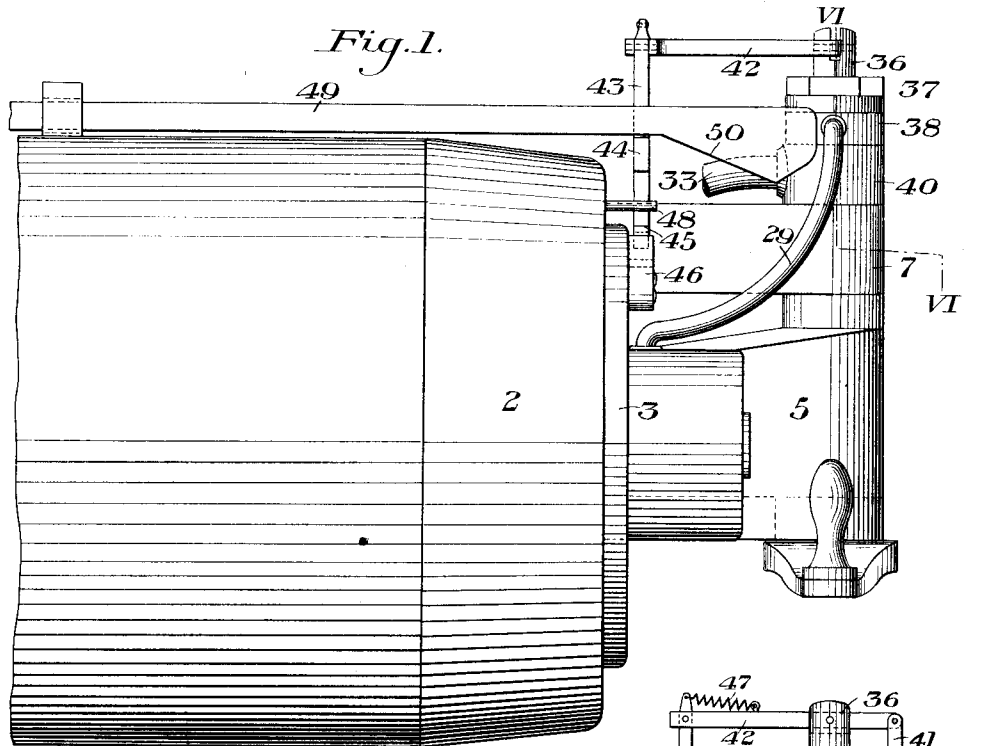
W. D. SMITH.
ORDNANCE.

APPLICATION FILED AUG. 22, 1910. RENEWED OCT. 5, 1912.

1,055,822.

Patented Mar. 11, 1913.

3 SHEETS-SHEET 1.



WITNESSES

R. A. Balderson
W. J. Harris

INVENTOR

Wm. D. Smith,
by Baker, Byrnes & Carmichael,
his Attys.

ORDNANCE.

APPLICATION FILED AUG. 22, 1910. RENEWED OCT. 5, 1912.

1,055,822.

Patented Mar. 11, 1913.

3 SHEETS—SHEET 2.

Fig. 3.

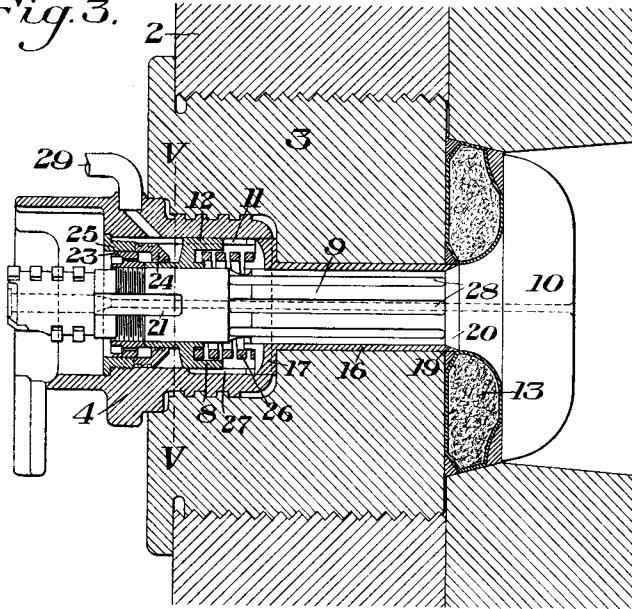
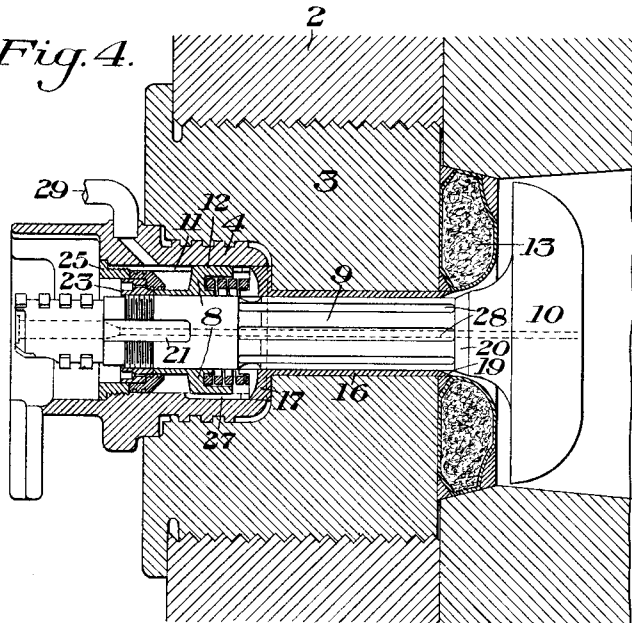


Fig.4.



WITNESSES

RA Balderson
W. Famariss

INVENTOR

Wm. O. Smith,
by Bahwell, Byrnes & Carmichael,
his Attys

W. D. SMITH.
ORDNANCE.

APPLICATION FILED AUG. 22, 1910. RENEWED OCT. 5, 1912.

1,055,822.

Patented Mar. 11, 1913.

3 SHEETS—SHEET 3.

Fig. 5.

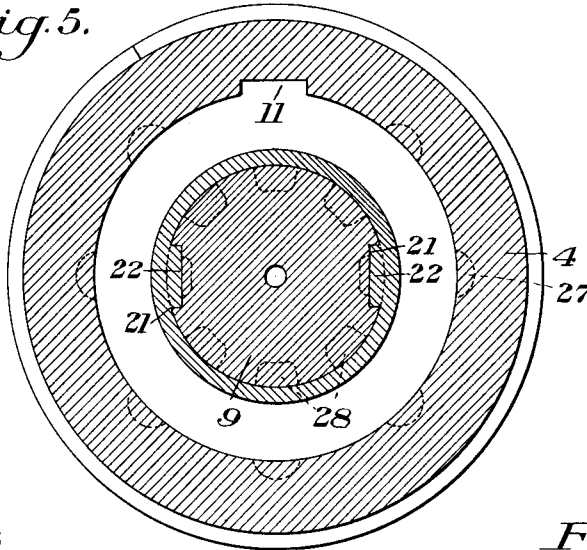


Fig. 7.

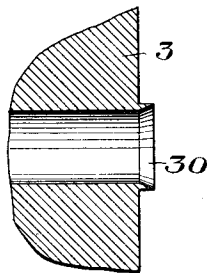
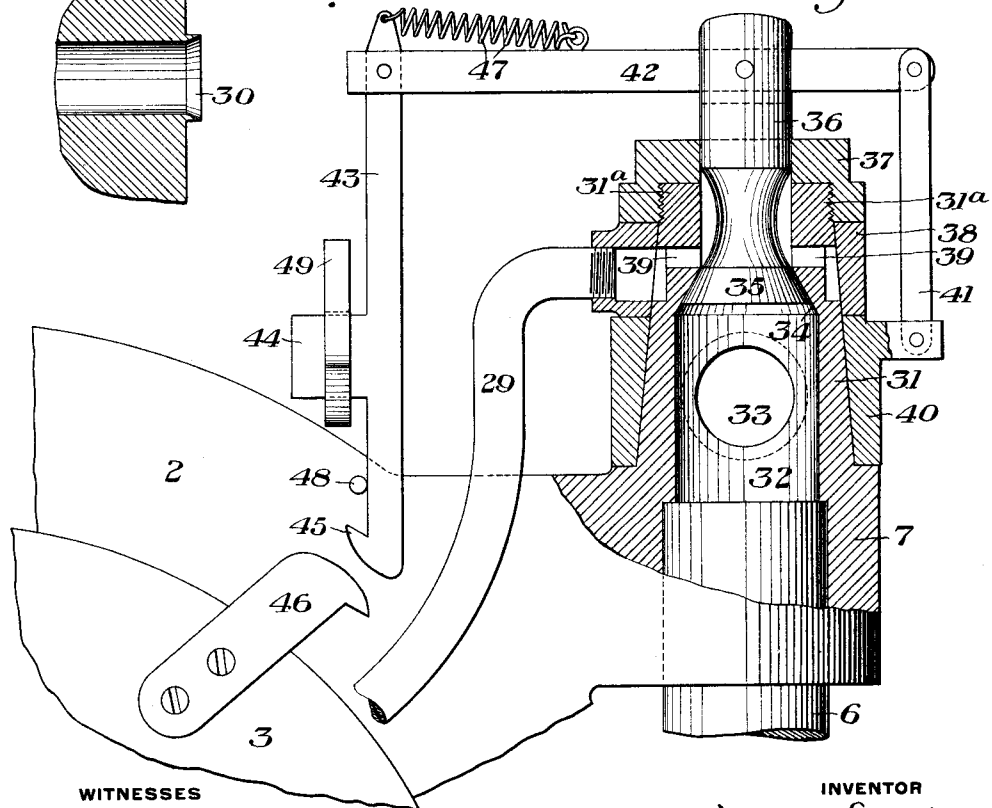


Fig. 6.



WITNESSES

R. A. Balderson
W. Samaras

INVENTOR

Wm. D. Smith
by Baker, Byrnes & Parmelee,
his Attys.

UNITED STATES PATENT OFFICE.

WILLIAM D. SMITH, OF WASHINGTON, DISTRICT OF COLUMBIA.

ORDNANCE.

1,055,822.

Specification of Letters Patent.

Patented Mar. 11, 1913.

Application filed August 22, 1910, Serial No. 578,383. Renewed October 5, 1912. Serial No. 724,195.

To all whom it may concern:

Be it known that I, WILLIAM D. SMITH, a resident of Washington, in the District of Columbia, have invented a new and useful
5 Improvement in Ordnance, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figure 1 is a side elevation of the breech portion of a gun equipped with one form of my improved apparatus for flushing the gun after its discharge. Fig. 2 is an end view. Fig. 3 is a sectional view on the
15 line III—III of Fig. 2 of the breech portion of the gun, showing the parts in the position they occupy before the gun is fired. Fig. 4 is a similar view showing the parts in the position they occupy while the gun is
20 being flushed. Fig. 5 is a sectional view on the line V—V of Fig. 3. Fig. 6 is a detail sectional view on the line VI—VI of Fig. 1. Fig. 7 is a sectional view through a portion of the breech of the gun showing
25 a modified arrangement for admitting the fluid pressure to the breech of the gun.

This invention relates to ordnance of the breech-loading type, provided with a gas
30 check to prevent the escape of the gas rearwardly.

The object of my invention is to provide means for admitting a large volume of air, or other fluid between the gas check and the
35 the mushroom head, and without materially changing the construction of the guns now in use.

Another object of my invention is to provide means for preventing the flushing fluid
40 from entering between the gas check and the breech block.

Still another object is to provide means for conveying the fluid pressure to the air
45 chamber in the breech block by means of a pipe having a connection which will permit the translation of the breech block without breaking the joint in the pipe.

Another object of my invention is to provide a pressure chamber within the breech
50 of the gun, containing a piston which is connected to the mushroom head and adapted to be advanced by the pressure in the chamber to advance the mushroom head into the bore of the gun to admit fluid pres-
55 sure to flush and cool the gun.

The present invention will be more fully understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various
60 changes may be made in the details of construction and arrangement of parts, without departing from the spirit and scope of my invention, as defined in the appended claims.

In the drawings, the numeral 2 designates the breech portion of the gun, having a
65 screw-threaded orifice in which is seated a breech block 3.

4 is a carrier sleeve which is seated in the breech block 3, and formed integrally
70 therewith is a carrier 5, which is pivoted to a pin 6 in the projections 7, extending from the breech of the gun.

The carrier sleeve is bored out for the reception of a piston 8, which is connected
75 to the stem 9 of a mushroom head 10, and which is arranged to move longitudinally therewith, in the manner hereinafter described. The bore in the carrier sleeve is provided with a longitudinal key seat 11,
80 in which is seated a key-portion 12 on the piston 8, which will allow a longitudinal movement of the piston, but prevent rotation with relation to the carrier sleeve.

13 is the gas check, within the bore of the gun, between the mushroom head and
85 the breech block. Surrounding the spindle or the mushroom head and within the bore in the breech block is a sleeve 16, having a flanged end 17, within the bore in the carrier sleeve. The forward end of the sleeve
90 16 extends beyond the breech block to a point within the gas check. The inner face at the front end of the sleeve is beveled, as shown at 19, and the mushroom head spindle is also provided with a corresponding
95 bevel 20 which is adjacent thereto when the mushroom head is in its rearmost or firing position.

The spindle of the mushroom head is provided with diametrically opposed key seats
100 21, in which are seated keys 22 on the inner face of the mushroom piston.

23 is a nut on the spindle of the mushroom head and which is arranged to rigidly
105 secure the piston to the stem 9. Surrounding the reduced portion of the mushroom piston and within the bore of the carrier sleeve is an air check ring 24, and 25 is a nut seated in the bore of the carrier sleeve
110 for retaining the air check ring in posi-

tion in the sleeve. Surrounding the spindle of the mushroom head and interposed between the flange 17 of the sleeve 16 and the mushroom piston 8 is a coil spring 26, which is adapted to retain the sleeve 16 in the position shown in the drawings and also to move the mushroom head and piston rearward after it has been advanced and is free to be returned as hereinafter described.

It will be readily understood from the foregoing description that all of the various parts in the breech block are held from rotation with relation to each other, but the breech block can be rotated within the breech of the gun, and also around the various parts therein.

27 are longitudinal grooves in the inner face of the carrier sleeve, which extend from a point slightly in advance of the front of the mushroom piston to the front end of the said sleeve. Extending longitudinally along the periphery of the spindle 9 of the mushroom head are the grooves 28, which extend from a point back of the flange on the sleeve 16 to the beginning of the bevel 20, the inner end of each of these grooves being beveled at an angle slightly greater than the angle of the bevel 20.

29 is a pressure pipe opening into the bore in the carrier sleeve back of the mushroom piston for supplying fluid pressure therein, and for convenience, this portion of the bore will be termed the pressure chamber.

Immediately after the gun is fired, pressure is admitted to the pressure chamber, as hereinafter described, and as soon as the pressure in the gun is sufficiently reduced so that the pressure in the pressure chamber, acting on the mushroom piston is sufficient to overcome the tension of the spring 25, the piston and the mushroom head will be advanced to uncover the grooves 28, and air will be admitted between the mushroom head and the gas check to flush and cool the gun. It will readily be seen from the drawings that by extending the sleeve 16 within the gas check to a point where the curved surface in the bore of the gas check begins and by beveling its inner edge and providing the spindle of the mushroom head with a corresponding bevel, a large opening for the admission of air to the breech of the gun is obtained with a slight movement of the mushroom head. This feature might also be obtained by providing the inner face of the breech block with a hollow projection, as shown at 30 in Fig. 7.

The upper projection 7 on the breech of the gun is provided with an upward extension 31, the outer surface of which is tapered, and having on its upper end a screw-threaded portion 31^a. 32 is a fluid chamber within this projection, and 33 is a pressure pipe leading from any suitable fluid pressure supply into said chamber.

34 is a valve seat in the upper portion of the chamber, and 35 is a valve arranged to seat thereon, and provided with an upwardly extending stem 36 extending through the reduced opening in the upper end of the projection 7 and a nut 37 on the screw-threaded portion 31^a.

38 is a rotatable sleeve on the tapered portion of this projection 7, and extending through the projection beneath the sleeve are the ports 39 which are open to the chamber 32 when the valve 35 is depressed.

One end of the previously described pressure pipe 29 which is in communication with the pressure chamber in the carrier sleeve 4 extends into the sleeve 38 and is in communication with the ports 39, and when the valve 35 is depressed, fluid pressure will be admitted into the bore of the gun to cool and flush it, as previously described.

Rigidly mounted on the projection 7 below the sleeve 38 is a collar 40, and extending upwardly therefrom is a link 41. Pivotaly connected to the upper end of this link is a lever 42, which is connected to the valve stem 36.

43 is a rod which is pivotaly attached to the outer end of the lever 42, having a cam projection 44 between its ends, and a hook 45 on its lower end. Connected to the breech block 3 is a latch member 46 which is arranged to be engaged by the hook 45 when the rod 42 is depressed.

47 is a spring arranged to force the hook 45 into and retain it in engagement with the latch 46, and 48 is a stop on the breech of the gun which limits the outward movement of the lever 43.

Rigidly connected to any stationary portion of the gun or its carriage is a rod 49, having a cam 50 near its end in line of movement of the cam projection 44 when the gun recoils.

The operation is as follows: During the recoil of the gun after it has been fired, the cam projection 44 will pass along the cam face 50 which will depress the rod 43 so that its hook 45 will engage the latch 46. The movement of the rod 43 will depress the one end of the lever 42 and the valve 35 which will permit fluid pressure to flow from the chamber 32 to the pressure chamber in the carrier sleeve through the pipe 29, and flush the gun as previously described. As soon as the gun has been thoroughly flushed, the operator will rotate the breech block 3 in the direction of the arrow shown in Fig. 2, to unlock the breech block, and as soon as the breech block has been rotated a sufficient distance to clear the latch 46 from the hook 45, the valve will be closed by pressure in the chamber 32, which will return all of its various connections to the position shown in Fig. 6. After the

breech block has been unlocked it is translated and is swung on the pivot pin 6, the sleeve 38 is also rotated with the carrier 5 through the medium of the pipe 29 and thereby permitting translation without disconnecting the pressure pipe.

The advantages of my invention result from the provision of means for supporting a portion of the gas check without engaging the stem of the mushroom head, and thereby providing means for readily admitting fluid pressure between the breech block and the mushroom head with but a slight movement of the mushroom head. By supporting a portion of the gas check in this manner, the fluid inlet ports are below the gas check and do not contact therewith. This overcomes all danger of injuring the gas check by contact with the ends of the ports and also provide means for preventing the fluid from entering between the breech block and the gas check.

Another advantage results from the provision of a pressure chamber within the breech block containing a piston for advancing the mushroom head when pressure is admitted therein after the discharge of the gun.

Still another advantage results from the provision of means for permitting the translation of the breech block, without disconnecting the fluid pressure pipe.

Other advantages also result from the valve operating mechanism whereby the fluid pressure is automatically admitted to the gun after the explosion and is cut off and the valve mechanism returned to its normal position before the breech block is unlocked.

What I claim is:

1. In a breech loading gun, a removable breech block having a fluid pressure chamber therein, the breech block being rotatable upon the wall of said chamber for unlocking, a mushroom head having a stem projecting rearwardly into said chamber and carrying a piston therein, means for admitting fluid pressure behind the piston, a spring interposed between the piston and inner wall of said chamber, and air passages leading from said chamber to the interior of the gun, said passages being normally closed by the piston; substantially as described.

2. In a breech loading gun, a breech block, a mushroom head, a gas check between the mushroom head and inner end of the breech block, and means carried by the breech block independent of the mushroom head for supporting the inner portion of the gas check; substantially as described.

3. In a breech loading gun, a breech block, a mushroom head having a stem extending within the breech block, a gas check between the mushroom head and the front end of the

breech block, and means for supporting the inner rear portion of the gas check out of contact with the stem of the head; substantially as described.

4. In a breech loading gun, a breech block, a mushroom head having a stem extending within the breech block, said stem having a beveled portion, and the breech block having a support for the inner rear portion of the gas check, said support forming a seat for the beveled portion of the stem; substantially as described.

5. In a breech loading gun, a removable breech block, a chambered member seated in the breech block upon which the block can be rotated for unlocking, a mushroom head having a stem extending into said chamber, means for preventing the rotation of the stem and head, a piston carried by the stem within the chamber, means for supplying fluid to said chamber behind the piston, and ports for permitting fluid to escape from said chamber into the bore of the gun when the mushroom head is advanced, said ports being normally closed by the piston, and opened by forward movement thereof; substantially as described.

6. In a breech loading gun, a breech block, a mushroom head having a stem extending into the breech block, a piston carried by said stem, and means for admitting fluid pressure to the rear of said piston, the stem having a plurality of ports formed therein and arranged to be put into communication with a fluid pressure space behind the piston, and means for supporting the inner rear portion of the gas check out of contact with the discharge end of said ports; substantially as described.

7. In a breech loading gun, a breech block having a swinging support, means for flushing the bore of the gun through the breech block after explosion and before the breech block is unlocked, a valve at the axis of the swinging support for controlling the supply of the flushing fluid, and means for opening said valve after the gun has been discharged; substantially as described.

8. In a breech loading gun, a removable breech block, means for admitting fluid pressure through the breech block into the bore of the gun after explosion and before the block is removed, a valve controlling the supply of fluid pressure, means operated by the recoil of the gun for automatically opening said valve, and means for holding said valve in its open position, said means being arranged to be released during the unlocking movement of the breech block; substantially as described.

9. In a breech loading gun, a removable breech block having a fluid pressure chamber therein, together with means whereby fluid pressure may be admitted from the pressure chamber to the bore of the gun, a

valve controlling the supply of said pressure, means operated by the recoil of the gun for opening the valve, and means for holding said valve in its open position, said means being arranged to be released during the unlocking movement of the breech block; substantially as described.

10. In a breech loading gun having a removable breech block and means for admitting a flushing fluid through the breech block after the explosion and before the breech block is rotated, a supply pipe for the flushing fluid leading into the breech block, a valve controlling the supply to the said pipe, and a cam arranged to open the valve during the recoil movement of the gun; substantially as described.

11. In a breech loading gun, a breech block, a mushroom head, a gas check between the mushroom head and the breech block, there being fluid inlet ports arranged to admit pressure between the gas check and the mushroom head, means to supply fluid pressure to said ports, and means to prevent fluid pressure from entering between the gas check and the breech block; substantially as described.

12. In a breech loading gun, a breech block, a mushroom head, a gas check between the mushroom head and inner end of the breech block, means carried by the breech block independent of the mushroom head for supporting the inner rear portion of the gas check, and means for admitting fluid pressure between the gas check and the mushroom head, the support for the inner rear portion of the gas check being arranged to prevent fluid pressure from entering be-

tween the gas check and breech block; substantially as described.

13. In a breech loading gun, a breech block, a mushroom head having a stem extending through the breech block, a sleeve interposed between the stem of the mushroom head and the breech block, a gas check between the mushroom head and the breech block there being fluid inlet ports along the periphery of the stem of the mushroom head arranged to admit fluid pressure between the gas check and the mushroom head, means to supply fluid pressure to said ports, and means to advance the mushroom head to permit the fluid pressure to enter between the gas check and the mushroom head, the sleeve between the spindle of the mushroom head and the breech block being arranged to prevent fluid pressure from entering between the gas check and the breech block; substantially as described.

14. In a breech loading gun of the character described, a breech block, a mushroom head having a spindle extending through the breech block, a gas check between the mushroom head and inner end of the breech block, and a sleeve interposed between the stem of the mushroom head and the breech block, said sleeve extending beyond the rear portion of the gas check; substantially as described.

In testimony whereof, I have hereunto set my hand.

WILLIAM D. SMITH.

Witnesses:

W. I. PLANT,

FRANK E. MANNING.