(No Model.)

S. B. DEAN

BREECH LOADING ORDNANCE.

No. 258,386. Patented May 23, 1882.

Fig. 1.

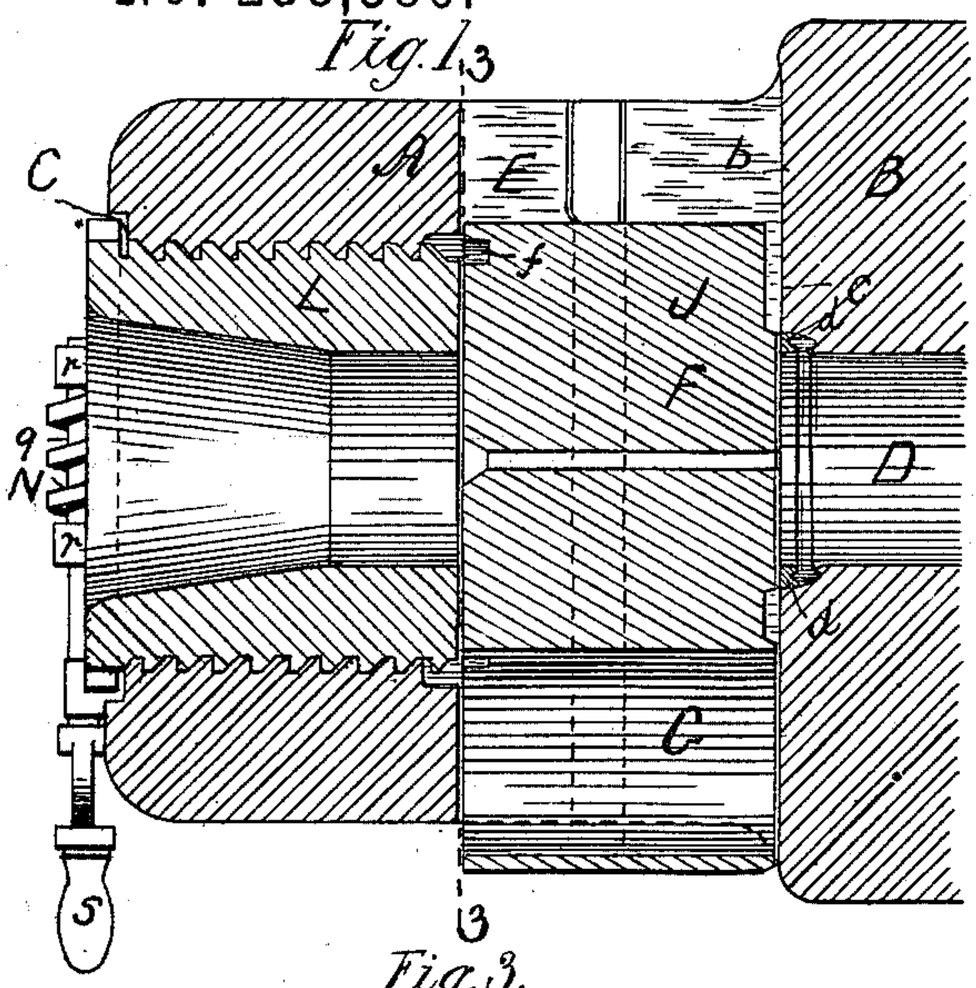

Fig. 2.

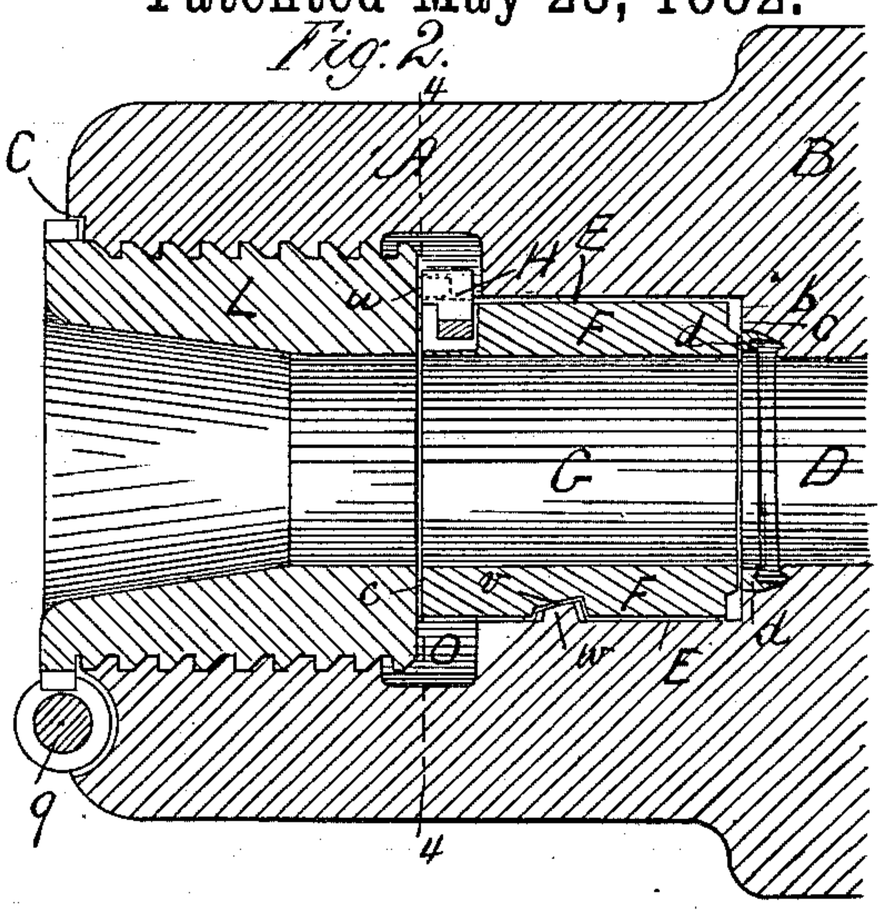

Fig. 3.

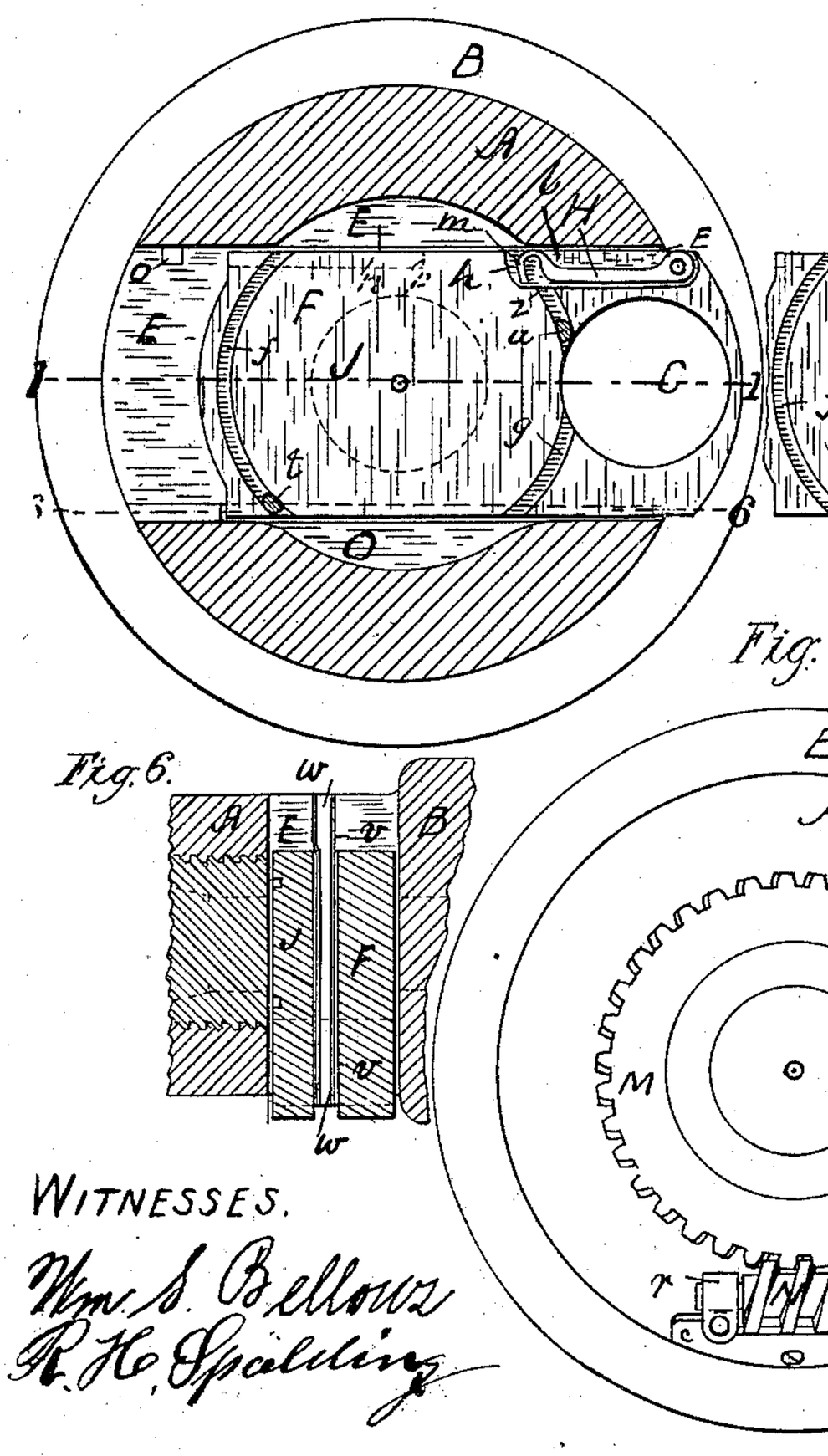

Fig. 4.

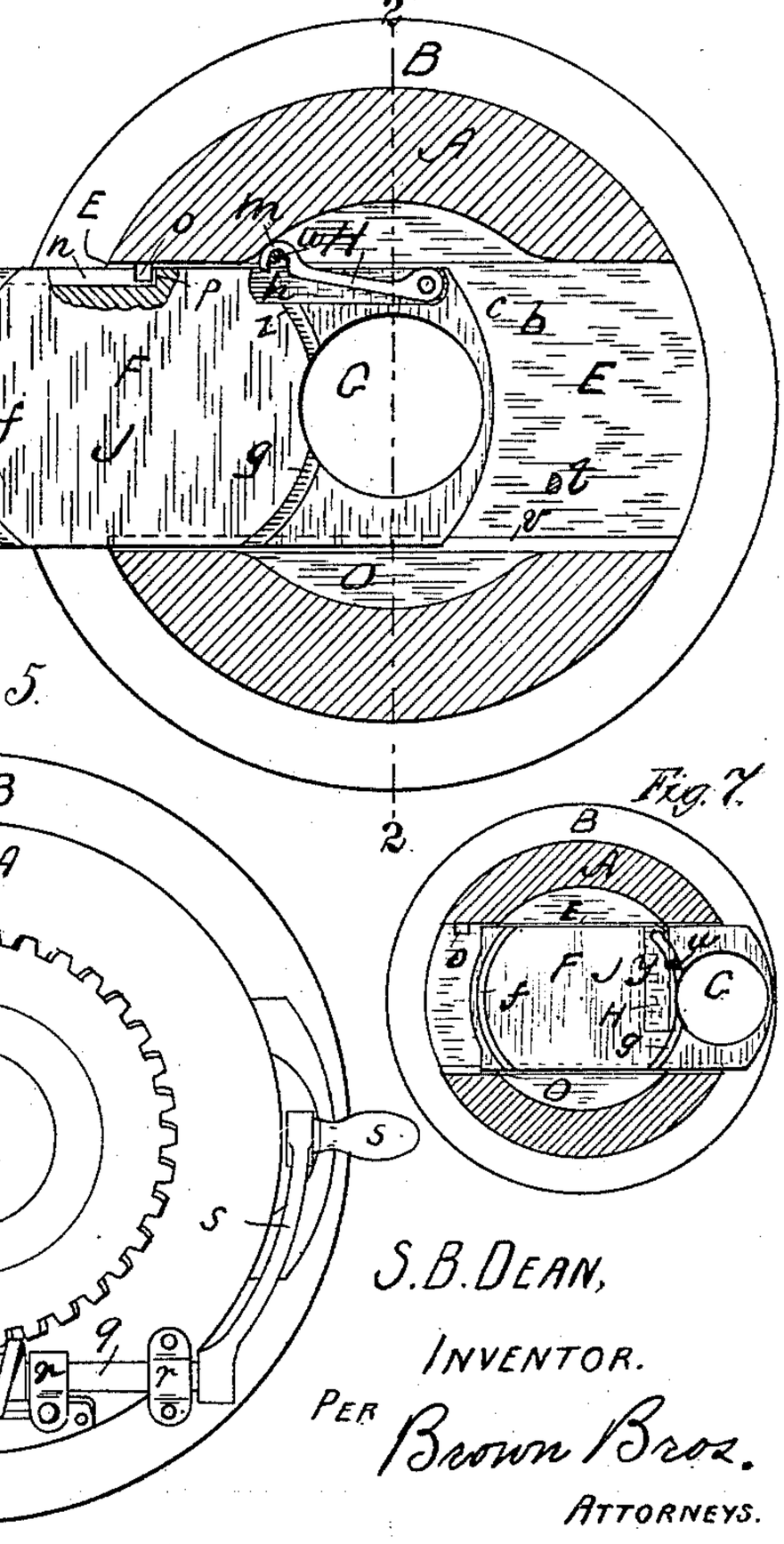

Fig. 6.

Fig. 7.

WITNESSES.

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UNITED STATES PATENT OFFICE.

SAMUEL B. DEAN, OF BOSTON, MASSACHUSETTS.

BREECH-LOADING ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 258,386, dated May 23, 1882.

Application filed August 15, 1881. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL B. DEAN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Breech-Loading Guns, of which the following is a full, clear, and exact description.

This invention relates to that class of breech-loading guns in which the breech is provided with a block for opening and closing it by a movement of the block in a direction across and at right angles to the longitudinal axis of the gun. As an illustration, see the Letters Patent of the United States issued to E. A. Sutcliffe, dated August 18, 1863, No. 39,596.

The invention consists principally of a breech-block which has an opening or loading-opening through it equal at least to the diameter of the bore of the gun, and at one side of said loading-opening a solid portion having an area sufficient to overlap the edge of and close the breech end of the open bore of gun, and is arranged to be moved forward and backward, running at right angles to the longitudinal axis of the gun, through a transverse slot, open at either or both ends, and back of and adjoining the open breech end of the gun, in combination with a hollow breech-screw plug, arranged to turn in a screw-socket of the gun, which is back of said breech-block, and has its axis coincident with the axis of the gun, the two being relatively constructed and connected together for the breech-plug as it is turned in either direction to move the breech-block across the gun, whereby either said loading-opening or said solid part of said breech-block, as may be desired, can be placed in position relative to the bore of the gun to open or close the same, all substantially as and for the purpose hereinafter particularly described and shown.

The invention further consists of improvements in the detail construction of said breech-block and said breech-screw not only as to each other, but also as to the slotted opening or passage-way of the breech-block in relation to the bore of the gun, all substantially as will hereinafter fully appear.

In the accompanying plate of drawings the present improvements in breech-loading guns are illustrated, Figure 1 being a horizontal longitudinal section on the axis of the bore of the gun with the breech end of the bore closed; Fig. 2, a vertical longitudinal section on the axis of the bore of the gun with the breech end of the bore opened; Fig. 3, a transverse vertical section on line 3 3, Fig. 1; Fig. 4, a transverse vertical section on line 4 4, Fig. 2; Fig. 5, an elevation at the breech end of the gun; Fig. 6, a horizontal section on line 6 6, Fig. 3, but on a smaller scale; Fig. 7, a transverse section on the same plane as Fig. 3, but on a smaller scale, and showing a modification in construction, as will hereinafter appear.

In the drawings, A represents the breech of a gun, B. This breech A, at its rear end, has a circular opening, C, through it in line and concentric with the bore D of the gun, and of a larger diameter than such bore D. This opening C, at its inner or forward end, opens to a slot, E, of square or rectangular shape in cross-section. This slot E runs from side to side of the gun in a direction parallel with the radius and at right angles to the longitudinal axis of the bore D or projectile-chamber proper of the gun, and it crosses the opening C for a portion of its length at its inner or forward end, and it is open at either or both sides of the gun. The slot E, at its forward or inner face or side, *b*, terminates at the open or breech end of the bore D, and it there forms a shoulder, *c*, about and around and outside of the gas-check ring *d* there located, as usual.

F is a breech-block of a shape in transverse section corresponding to the shape of the slot E in same direction, but slightly smaller in width than the width of said slot, and from its front to its rear side it has a circular opening, G, (to be hereinafter called a "loading-tube,") through it of a diameter corresponding to the diameter of the gun-bore, and in a position and direction to correspond and be in an exact line therewith when suitably placed therefor by sliding the block F across the slot, but otherwise, as to this loading-tube G, the breech-block F at its part J is solid and of such area as to more than cover the open bore of the gun at its breech end, and thus fully close the same when the breech-block is properly moved in the slot E therefor. The central perforation or opening in the breech is of a diameter slightly less than the internal diameter of the gas-check,

which permits the insertion into the bore of the gun of a ramrod, sponge, cartridge, and shot without liability of marring, disturbing, or injuring the inner edge or periphery of the gas-check, because the central opening is close to the gas-check, and, being continuous with it, covers the same in such manner that in use the implements mentioned above barely touch it, if at all, and on the withdrawal of the rammer or sponge from the bore of the gun the closeness and continuity of the central opening at the breech prevent the canting, tilting, or displacement of the gas-check.

f and *g* are grooves in rear face of breech-block at one side of loading-opening or opening G. These grooves run in a circular direction across the width of the breech-block, and have a corresponding radius and a common center, the latter being coincident with the central longitudinal axis of the gun when the loading-tube of the breech-block is coincident with said axis. One, *g*, of these grooves is intersected by the loading-tube, (see Figs. 3 and 4,) and at its upper end, *z*, it terminates and opens to a recess or depression, *h*, in the upper surface, *l*, of the breech-block. In this recess *h* is hung a lever or latch, H, (to be called hereinafter a "draw-bar,") having a hook end, *m*, which hook, when the draw-bar is at rest in its recess, is in line with the upper termination of the circular groove *g*. The draw-bar H and the recess *h* are relatively shaped for the draw-bar to lie wholly within the recess when at rest and in its normal position.

n is a groove in upper side of breech-block, and running lengthwise of same—that is, at right angles to the longitudinal axis of the gun—and *o* a pin on gun entering the groove *n*. This pin *o* and the end wall, *p*, of the groove *n* are located in relation to each other and the loading-tube of the breech-block F, to arrest the slide of the breech-block in its slot in one direction, so as to stop it when its loading-tube is in exact line and coincident with the bore of the gun. The circular opening C through the breech of the gun is screw-threaded, and it receives a similar screw-threaded breech-plug, L, which has a worm-gear wheel, M, at its breech end meshing into a worm-screw, N, of a shaft, *q*, arranged to turn in bearings *r* of the gun and to be operated by a crank-handle, *s*. This breech-plug L is hollow from end to end, and at its front end it has two studs or pins, *t u*, which project therefrom in such lines that when it (the breech-plug) is turned they will enter and travel in the circular grooves *f g* of the breech-block F, if the breech-block be in the proper position therefor; or, in other words, if the loading-tube be coincident with the gun-bore, the pin *u*, from the turning of the screw-plug L in the proper direction, will enter the hook end of the draw-bar H. The pins *t u* are situated on opposite sides of the breech-plug, and so that when the pin *u* is interlocked with the draw-bar H the pin *t* will be out of its groove and in the enlarged extension O of the screw-threaded opening at the breech of the gun. The turn of the breech-plug L in one direction places its pin *u* in the hook *m* of the draw-bar H, and its continued turn in such direction acts through such draw-bar to draw or slide the breech-block in one direction along the length of the slot, and the turn of the breech-plug in the other direction, and its continued turn in such direction acts through the draw-bar to draw or slide the breech-block along the length of the slot in the other and opposite direction. In the first instance (standing with the solid part of the breech-block F across the bore of the gun, which is its position when the engagement of the breech-plug pin *u* and draw-bar H begins) the breech-block is moved away from the bore of the gun, its breech is thus opened, and the loading-tube placed in line with the bore of the gun. In the second instance the solid part of the breech-block is moved toward the bore of the gun, and thus the breech of the gun is closed.

The coincident position of the loading-tube G and the bore of the gun is insured by and through the abutment of the wall *p* of the groove *n* in the breech-block F against the pin *o* of the gun. The gun at its breech being opened and closed as above described, it obviously, as the breech-screw is hollow, can be loaded as desired, and after being loaded closed. In closing the breech A by the slide of the breech-block, as described, such movement of the breech-block ceases when its groove becomes concentric with the axis of the gun, even though the rotation of the breech-plug be then continued, and under a continuation of such rotation the pins *t u* enter their respective grooves and offer no obstruction to the forward movement or turn of the breech-plug, enabling such plug to be jammed and forced against the breech-block F, and such block in turn against the shoulder *c* at the open breech end of the gun-bore. The interlock of the two pins of the breech-plug with the two grooves of the breech-block holds such block firmly against sliding, and the simple disengagement of either from its groove secures no movement of the breech-block, but when in such disengagement either one passes into and engages with a draw-bar, H, of the breech-block F, as described, then under a continued turn of the breech-screw the breech-block is moved along the slot. The under side of the breech-block F has a groove, *v*, running in the direction of its movement in the slot E, and the bottom face of this groove *v* bevels or inclines toward the rear of the gun, making it higher or deeper at its front than at its rear side or edge, and corresponding to it in shape and direction and location is a rib, *w*, on the lower face or side of the slot. This rib *w* and the groove *v* act as a guide to the slide, herein described, of the breech-block F through the slot.

To permit the breech-block F to be moved forward in the slot, and thus jammed against the breech end or bore of the gun, as herein described, when the rib and groove-guide described are used the rib along its length in its

part then within the groove is made narrower than the groove by a removal upon its rear side or edge of a part of its width, and this narrowing of the rib *w* also, as is obvious, allows the block to recede from its contact with the gas-check and shoulder or front face of the breech-slot when the block is being moved into and out of position to open and close the breech of the gun, as described, thus preventing friction upon and abrasion of the gas-check in such movement of the block. The rib in a part of its length is made of a width equal to the width of the groove, and thus it tightly fits the groove, insuring the movement of the block along its slot without friction or rub upon, and free of contact with, the front face of the slot.

The location of the loading-tube so that the groove *g* of breech-block intersects it reduces the length of movement of the breech-block necessary to open and close the breech, and in that respect it is advantageous. However, if it is so arranged, it is essential to have the groove *g* and its corresponding pin, as described; but otherwise such groove and pin may be dispensed with. The groove *n*, which by its end wall limits the slide of the breech-block in one direction, is open at the other end, so that by simply detaching the draw-bar H from its fulcrum-pin, when the breech-block is in suitable position therefor, it can, if then so desired, be removed from its slot.

The draw-bar may be hung, substantially as described, upon the bottom side in lieu of upon the top side of the breech-block. Again, the draw-bar H may be arranged, as shown in Fig. 7 at *y*, to slide, in lieu of swinging upon the block.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with a gun having a breech-screw, L, provided with a central opening and a transverse guide-slot, E, of a breech-block, F, composed of a loading-opening, G, and a solid part, J, said breech-screw and said breech-block being interlocked, substantially as described, so that the turning of the breech-screw will cause the breech-block to slide in said guide-slot, as and for the purpose specified.

2. A breech-block, F, with its loading-opening G, a solid part, J, circular running groove *g*, and draw-bar H, and a transverse slot, E, at open breech end of gun, in combination with a breech-screw, L, with its central opening, and pin, *u*, said screw being arranged to turn in a screw-socket of the gun, all substantially as described, for the purpose specified.

3. A breech-block, F, provided with a loading-opening, G, solid part J, two circular running grooves, *f g*, and draw-bar H, and arranged in a transverse guide-slot, E, at the open breech end of the gun, in combination with a breech-screw, L, provided with an opening, and two pins, *t u*, arranged to turn in a screw-socket, C, of the gun, all substantially as and for the purpose described.

4. The combination, with a transverse guide-slot, E, having a rib or tenon at the breech end of the gun, of a breech-block, F, composed of a loading-opening, G, and a solid part, J, and having a groove to fit said rib, said rib and said groove serving, in the movement of the breech-block in said guide-slot by the narrowing of the rib, substantially as described, to move the breech-block to and away from the inner face, *b*, of the said guide-slot, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

SAML. B. DEAN.

Witnesses:

EDWIN W. BROWN,

WILLIAM S. BELLOWS.