

No. 708,884.

Patented Sept. 9, 1902.

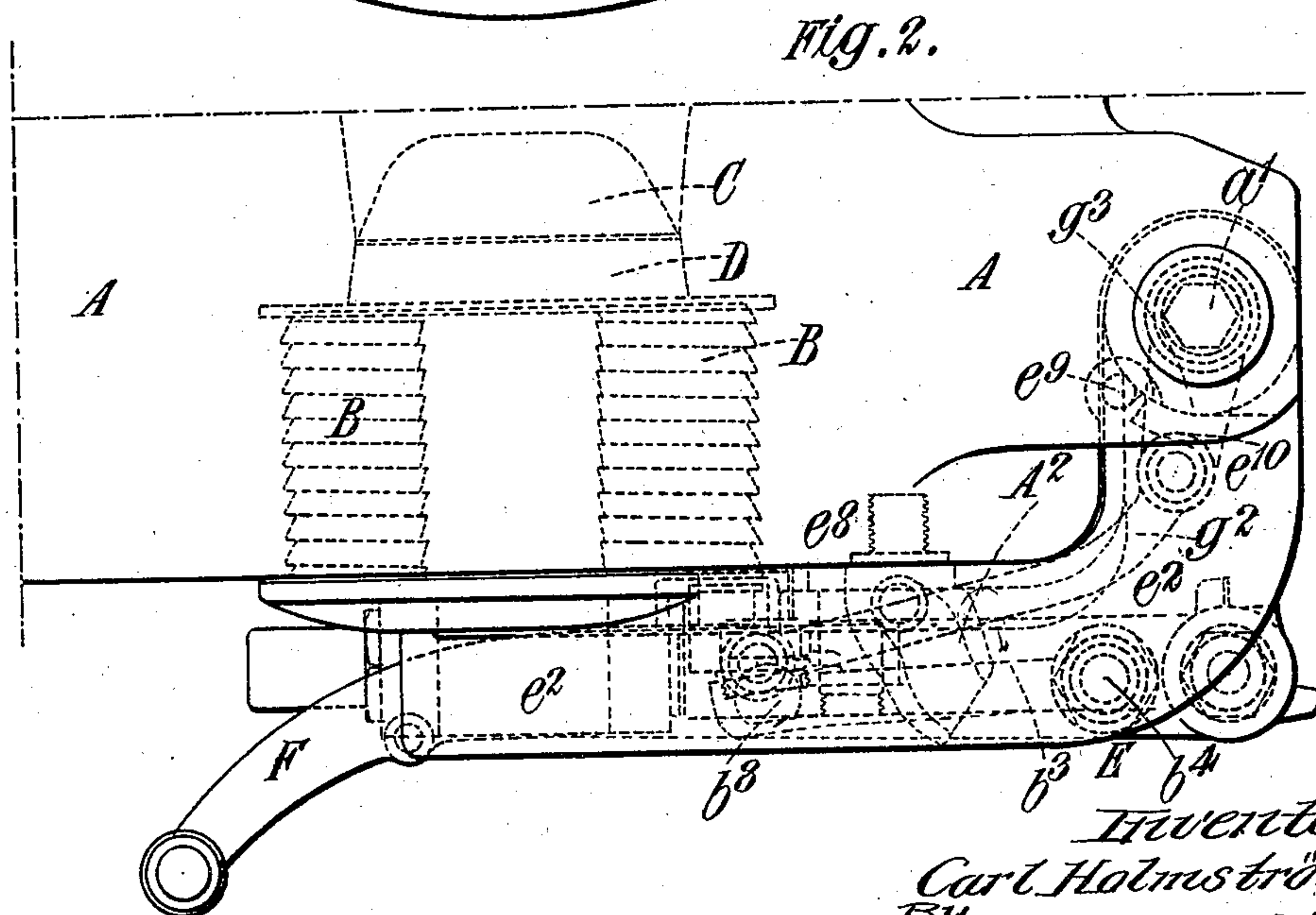
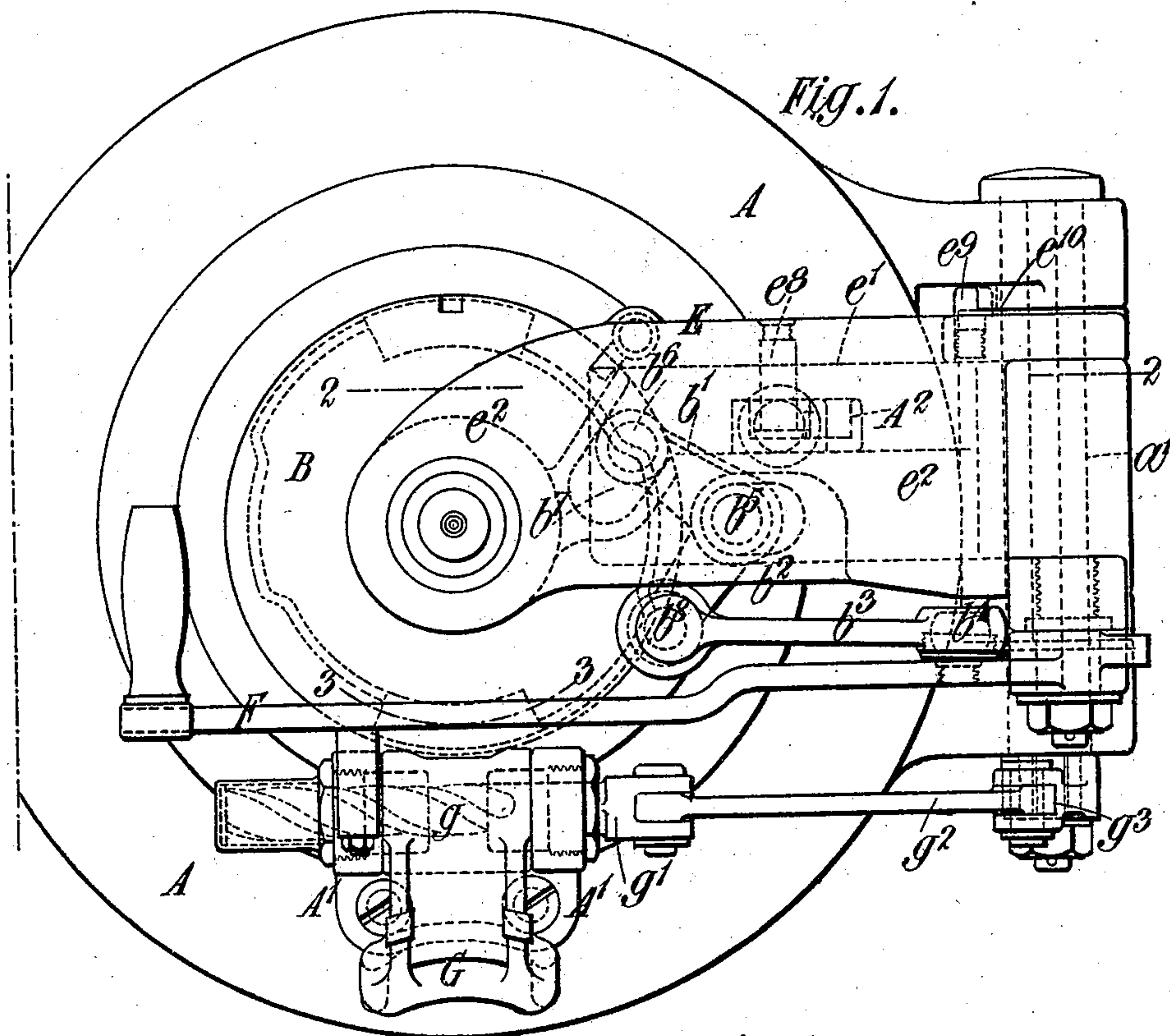
C. HOLMSTRÖM.

BREECH MECHANISM FOR ORDNANCE.

(Application filed Jan. 8, 1902.)

3 Sheets—Sheet 1.

(No Model.)



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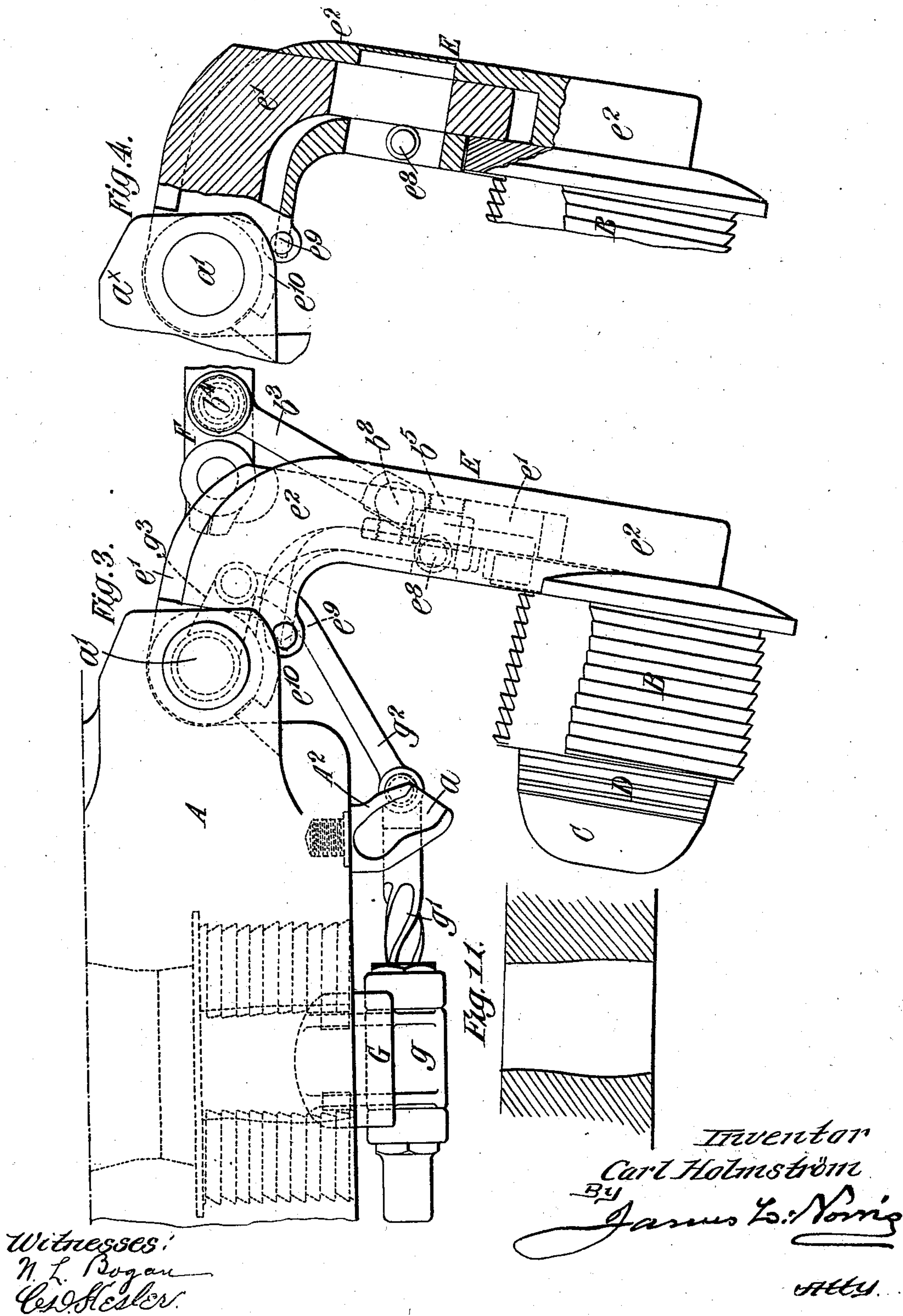
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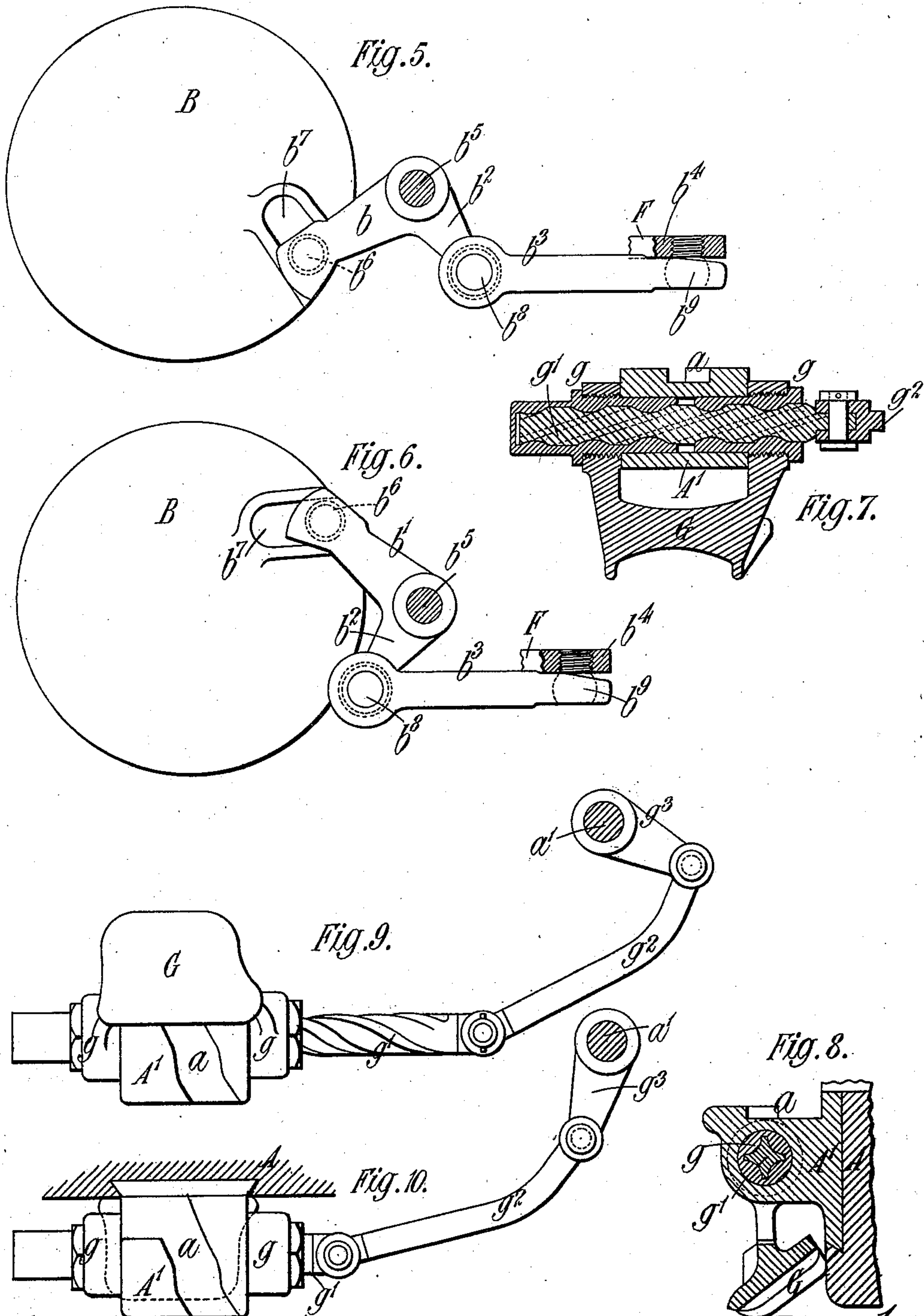
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

CARL HOLMSTRÖM, OF GLASGOW, SCOTLAND.

BREECH MECHANISM FOR ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 708,884, dated September 9, 1902.

Application filed January 8, 1902. Serial No. 88,939. (No model.)

To all whom it may concern:

Be it known that I, CARL HOLMSTRÖM, engineer, a subject of the King of Sweden and Norway, residing at Parkhead Forge, Rolling Mills and Steel Works, Glasgow, Scotland, have invented certain new and useful Improvements Relating to the Breech Mechanism of Ordnance, of which the following is a specification.

10 This invention relates to the breech mechanism of ordnance, and has reference more particularly to the class of such mechanism in which the breech-block is provided with a "de Bange" obturator and is rotatably
15 mounted in a swinging carrier pivoted at one side of the gun-breech.

According to one part of my invention I employ an obturator-pad having the minimum amount of taper, and I so mount the breech-
20 block in its swinging carrier that without cutting away the threads of the block or breech-chamber said block can be inserted in or withdrawn from the breech-chamber by the swinging movement of the carrier. For this purpose I provide on the breech end of the gun
25 or within the breech-chamber a cam-path, along which a pin or projection on the breech-block or on a part moving therewith is adapted to travel, and I construct the said carrier
30 of two members or parts, which are capable of movement relatively to each other independently of the swinging movement of the said carrier. The outer one of such members or parts—i. e., the one that is remote from the
35 pivotal axis about which the carrier swings—carries the block. These members or parts are so arranged and the cam-path is so formed that during the time the said pin or projection is traveling along the said cam-path the
40 block will first be caused to travel a short distance in a curved path coinciding with an arc of a circle described from the axis of the pivot. It will then be caused to move a distance in an approximately straight path or in
45 a direction to cause its threads to be clear of the threads of the breech-chamber, and it will then continue its movement in a curved path coinciding with an arc of a circle described from the axis of the pivot. This
50 movement of the block enables an obturator with the minimum amount of taper to be em-

ployed, as aforesaid. Suitable means are provided for retaining the said members or parts of the carrier in the position they assume during this operation.

Another part of my invention has reference to the lever mechanism employed for actuating the breech-block and its carrier in the opening and closing of the breech; and it consists in hinging to the carrier a bell-crank
60 lever, one limb of which engages with a slot in the block, the other limb being connected to a short arm projecting from the hand-lever near its fulcrum by means of a link having
65 universal joints.

Another part of my invention has reference to the device by which the threads of the breech-chamber are protected during the insertion of the projectile into the gun, said device being generally termed a "shot-guide."
70 The object of this part of my invention is to so arrange said shot-guide that it will automatically assume its protective position as the breech is opened and will move away from such position as the breech is closed.

In order that my said invention may be clearly understood and readily carried into effect, I will proceed to describe the same more fully with reference to the accompanying drawings, in which—

80 Figure 1 is an elevation of the breech end of a gun provided with my improved breech mechanism. Figs. 2 and 3 are plans of the same, showing the breech in its closed and open position, respectively. Fig. 4 is a horizontal section taken approximately on the line 2 2 of Fig. 1. Figs. 5 and 6 are sectional
85 elevations showing the mechanism for turning the breech-block, the former figure representing the block locked and the latter representing the block unlocked. Fig. 7 is a longitudinal section, and Fig. 8 a transverse section, of the shot-guide. Figs. 9 and 10 are detail plan views of the said shot-guide and the means employed for actuating it, Fig. 9
90 representing the said shot-guide raised and Fig. 10 representing it lowered. Fig. 11 is a detail section taken through the lower gap of the breech-chamber on the line 3 3 of Fig. 1.

In all the figures like letters of reference
100 indicate similar parts.

A is the breech end of the gun; B, the

breech-block; C, the obturator; D, the obturator-pad; E, the swinging carrier, and F the actuating hand-lever.

e' e^2 are the two parts or members of the swinging carrier, which are capable of sliding relatively to each other, the portion e' being keyed to the vertical pivot-pin a' , which is capable of turning in the lugs or bearings a^x a^x on the gun in the ordinary manner.

The breech-block is rotatably mounted in the part e^2 , which is made of box form—*i. e.*, with an internal recess to receive the part e' . The inner face of the part e^2 is also formed with a cavity into which the cam-grooved projection or extension A^2 on the breech end of the gun enters to engage with a pin e^8 , projecting from the said sliding part e^2 . The cam groove or path a in the projection or extension A^2 is curved at its ends, and the intermediate portion joining said curved ends is straight and inclined, the curved ends being arcs of circles described from the axis of the pivot-pin a' . By means of this pin and cam-groove the sliding part of the carrier is caused to move relatively to the other part e' during the early portion of the outward-swinging movement of the carrier, whereby the block is caused first to move in a circular path concentric with the pivot a' to free the obturator from its seat, then in an approximately rectilinear course or in such direction that the threads clear the threads in the gun, then in a circular path around the pivot a' , after which the block will have been withdrawn far enough to permit of its being freely swung out of the breech-chamber by the movement of the carrier about its pivot without colliding with the threads of the said chamber. In order to retain the sliding part in its shifted position as the carrier swings the block to and from the breech-chamber, the sliding part is furnished with a lug e^9 , Fig. 4, which bears against and travels along the fixed cam-piece e^{10} , formed on one of the brackets a^x .

The angular displacement of the block to lock and unlock it in the breech-chamber is effected by means of the bell-crank lever b' b^2 , Figs. 5 and 6, and the link or rod b^3 , connected to the short arm b^4 of the hand-lever F. The said bell-crank lever is pivoted at b^5 to the part e' of the carrier and is adapted to move in a vertical plane. The member b' of said bell-crank lever is furnished with a stud or roller b^6 , engaging with an inclined slot b^7 in the rear end of the block. The other member b^2 of said bell-crank lever is pivotally connected with the aforesaid link or rod b^3 through a ball-and-socket joint b^8 . This link or rod b^3 is also pivotally connected through a ball-and-socket joint b^9 with said short arm b^4 of the lever F. Said link or rod can thus participate in a vertical as well as a horizontal movement, as required by the movement of the said bell-crank lever and the arm b^4 in different planes. The inclination of the aforesaid slot b^7 and the position of the bell-crank lever and of the connecting-rod are such that

when the breech-block is in its locked position the said slot lies approximately at a tangent or a right angle to the member b' of the bell-crank lever, so that it is in the best position for resisting any tendency of the block to shift angularly in the breech-chamber, and thereby unlock itself under the stress of discharge of the gun, and even if any tendency then existed to turn the bell-crank lever about its pivot such tendency would be overcome by the inability of the rod b^3 to change its position by reason of its lying at the dead-center of the movement of the crank b^4 of the hand-lever F; but the position of these parts is such that when the hand-lever is actuated to unlock the block they will cause a powerful turning movement to be exerted on said block, with the result that the unlocking of the block can be effected with a lever-handle shorter than that usually found necessary for affording the requisite leverage for satisfactorily working the breech mechanism.

G is the shot-guide, formed with bosses g g , Figs. 7 to 10, through which extends a spirally-grooved rod g' , the said bosses being mounted to turn in the bracket or rearward extension A' . This rod is also fitted to slide longitudinally in the said bosses and is coupled by a connecting-rod g^2 to a crank-arm g^3 on the lower end of the pivot-pin a' , so that as the carrier swings in opening and closing the breech the said rod g' will be caused to slide longitudinally, and thereby impart rotary motion to the shot-guide in such manner as to cause it to assume the position represented in Figs. 1, 2, 8, and 10 when the breech is closed and the position represented in Figs. 3 and 9 when the breech is open.

In some cases the aforesaid cam-surfaces for controlling the movement of the block may be located in one of the unthreaded gaps of the breech-chamber, as represented in Fig. 11, and then the aforesaid cam-slot a may be dispensed with.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In breech mechanism for guns, the combination with a swinging carrier formed of two members one of which is capable of independent movement relatively to the other, of a block rotatably mounted on the independently-movable member, of a projection on the independently-moving member adapted to travel along a cam-path on the gun and to impart to the block during the swinging of the carrier, a movement first in a curved path, then in an approximately straight path and then again in a curved path, and of a stationary cam-surface with which another projection on the independently-movable member engages during the swinging movement of the carrier substantially as and for the purpose specified.

2. In breech mechanism for guns, the combination with a swinging carrier, a block rotatably mounted thereon, and a hand-lever for actuating said carrier; of a bell-crank le-

ver pivoted to the carrier and engaging with a slot in the block, and of a rod connecting the bell-crank lever to the said hand-lever at a point near to the fulcrum of the latter and
 5 in a manner to permit of said rod moving in both a vertical and a horizontal plane, substantially as and for the purpose specified.

3. In breech mechanism for guns, the combination with a swinging carrier, a block rotatably mounted thereon, and a hand-lever for actuating said carrier; of a bell-crank lever pivoted to the carrier so as to operate in a vertical plane and engaging with a slot in the block, of a short arm located near the fulcrum of the hand-lever, and of a rod connecting the bell-crank lever to said short arm through universal joints substantially as and for the purpose specified.

4. In breech mechanism for guns, the combination with a swinging carrier, a block rotatably mounted thereon, and means for actuating said block by a hand-lever; of a shot-guide hinged to the gun, of a sliding quick-threaded rod engaging with corresponding
 25 threads in the boss of the hinged shot-guide, and of means for imparting a rectilinear movement to said quick-threaded rod as the carrier is swung in opening and closing the breech, substantially as and for the purpose
 30 specified.

5. In breech mechanism for guns, the com-

bination with a swinging carrier, a block rotatably mounted thereon, and means for actuating said block by a hand-lever; of a shot-guide hinged to the gun at a point below the
 35 breech and adapted to turn in a vertical plane, of a sliding quick-threaded rod engaging with corresponding threads on the boss of the shot-guide, and of means for imparting a rectilinear movement to said quick-
 40 threaded rod as the carrier is swung in opening and closing the breech, substantially as and for the purpose specified.

6. In breech mechanism for guns the combination with a swinging carrier, a block rotatably mounted thereon and means for actuating said block by a hand-lever; of a shot-guide hinged to the gun at a point below the
 45 breech and adapted to turn in a vertical plane, of a sliding quick-threaded rod engaging with corresponding threads on the boss of the hinged shot-guide of a crank on the carrier-pivot of a bar connecting said quick-threaded rod with said crank, substantially
 50 as and for the purpose specified.

In testimony whereof I have hereunto set my hand, in presence of two subscribing witnesses, this 27th day of December, 1901.

CARL HOLMSTRÖM.

Witnesses:

T. SELBY WARD,

WALTER J. SKERTEN.