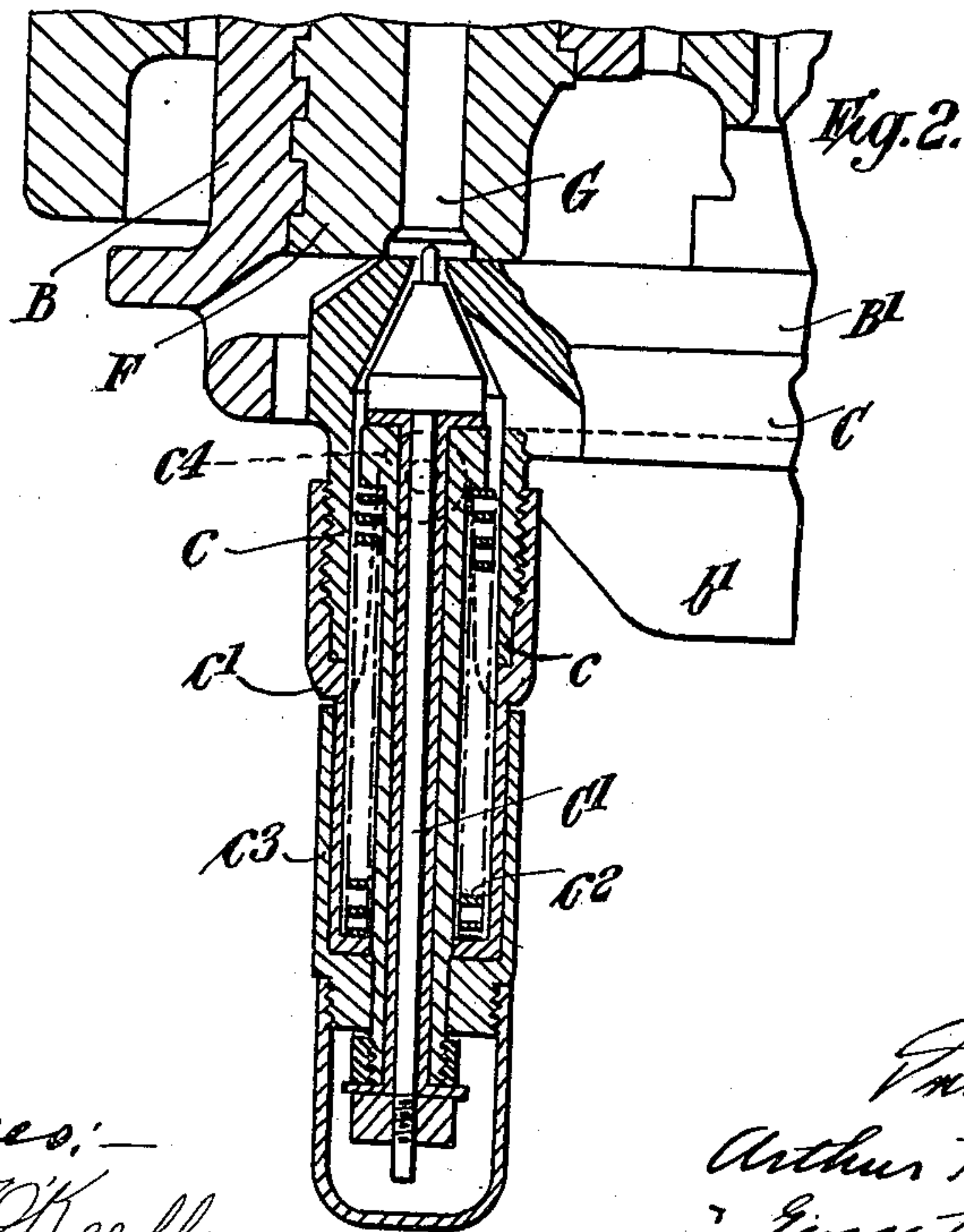
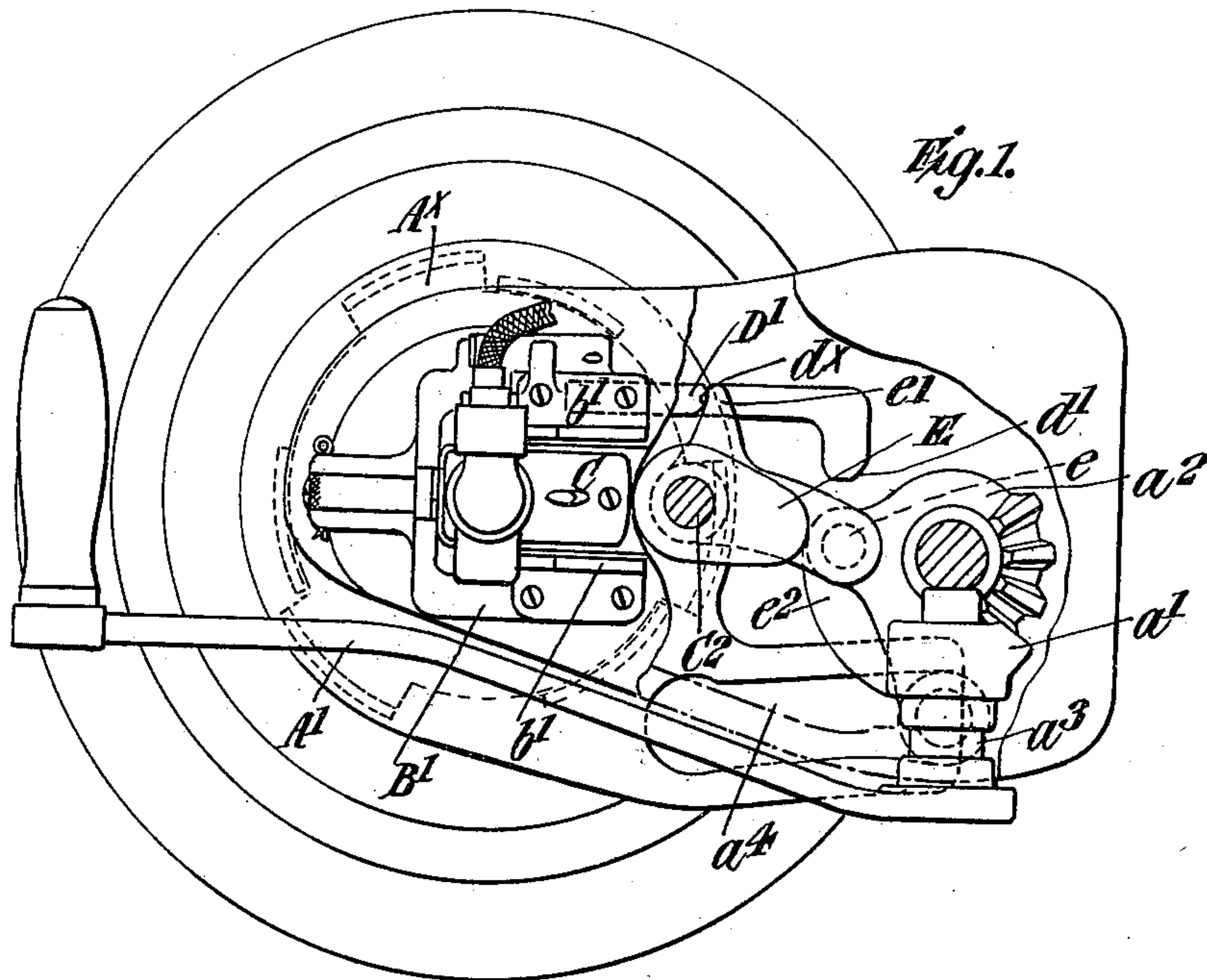


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FIRING MECHANISM OF BREECH LOADING GUNS.
APPLICATION FILED MAR. 7, 1910.

994,702.

Patented June 6, 1911.

2 SHEETS—SHEET 1.



Witnesses:
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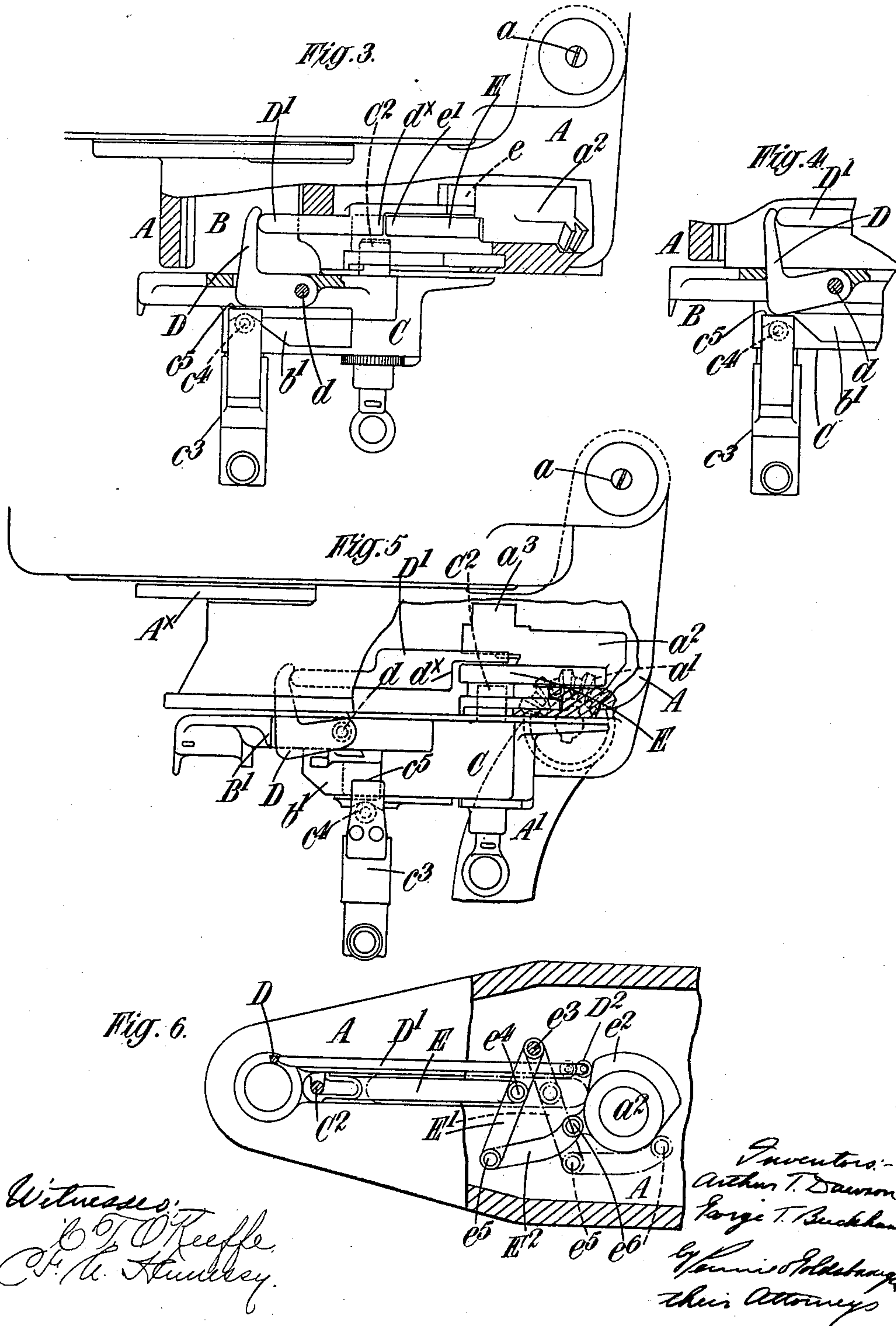
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UNITED STATES PATENT OFFICE.

ARTHUR TREVOR DAWSON AND GEORGE THOMAS BUCKHAM, OF WESTMINSTER, LONDON, ENGLAND, ASSIGNORS TO VICKERS SONS & MAXIM, LIMITED, OF WESTMINSTER, ENGLAND.

FIRING MECHANISM OF BREECH-LOADING GUNS.

994,702.

Specification of Letters Patent.

Patented June 6, 1911.

Original application filed May 6, 1908, Serial No. 431,098. Divided and this application filed March 7, 1910. Serial No. 547,751.

To all whom it may concern:

Be it known that we, ARTHUR TREVOR DAWSON and GEORGE THOMAS BUCKHAM, both subjects of the King of Great Britain, residing at 32 Victoria street, Westminster, in the county of London, England, have invented certain new and useful Improvements in Firing Mechanism of Breech-Loading Guns; of which the following is a specification.

This invention relates to the firing mechanism of breech loading guns of the class wherein the breech screw is opened and closed by means of a hand lever adapted to impart a partial rotation in one direction or the other to a pinion carried by a swinging carrier and arranged to transmit through a suitable connection a corresponding movement to the breech screw and a lateral movement to a slide which normally covers the axial vent of the gun when the breech is closed. In mechanism of this class it is customary to mount the striker or firing pin upon the aforesaid slide, and to utilize the lateral movement thereof simultaneously to retract the striker to its cocked position, this operation being effected by projections on the striker which engage with cam surfaces on the frame in which the slide works when the hand lever is operated to withdraw the slide to uncover the axial vent.

It has been found in practice that when the aforesaid projections and cam surfaces become worn, a sufficient movement of the slide takes place before the commencement of the retraction of the striker to break or materially damage the same in the event of its end being embedded in the head of the primer.

The present invention consists in connecting the aforesaid pinion with the slide and with the striker in such a manner that it causes the latter to be partly retracted before it imparts any movement to the slide, the completion of the retracting movement being effected by the cam surfaces in the manner already described, the connection between the pinion and the slide being so arranged that a comparatively small amount of movement is transmitted to the slide by a comparatively large amount of movement of the pinion, thereby rendering the invention particularly applicable for use in con-

nection with heavy guns in which a large amount of movement of the pinion is required for opening the breech.

In order that the said invention may be clearly understood and readily carried into effect, the same is described with reference to the accompanying drawings, in which:—

Figure 1 is an end elevation of a gun breech showing the ordinary mechanism for actuating the same, and mechanism actuated by the sector pinion for retracting the striker. Fig. 2 is a horizontal section of part of Fig. 1, drawn to an enlarged scale. Fig. 3 is a plan of a gun breech part of which is shown in section. Fig. 4 is a fragmentary sectional plan showing the position of the retracting lever for withdrawing the striker preparatory to the lateral movement of the slide. Fig. 5 is a similar view to Fig. 3 showing the position of the parts when the slide has completed its lateral movement for uncovering the axial vent. Fig. 6 is an end elevation of a portion of the swinging carrier partly broken away to show the improved mechanism for diminishing the amount of movement transmitted from the pinion to the above mentioned slide.

The following is a description of an existing type of breech mechanism to which the invention is applied.

A represents the swinging carrier which is hinged at *a* to one side of the breech end of the gun and supports the breech screw *A*^x.

*A*¹ is the breech actuating hand lever to which is connected a sector pinion *a*¹ gearing with a similar sector pinion *a*² pivoted on the carrier. This pinion is provided with a roller crank pin *a*³ which engages with a groove *a*⁴ formed in a projection extending from a portion of the breech screw, so that a partial rotary motion is imparted to such screw by the pinion *a*² when the hand lever is moved in a direction away from the breech with the result that a threaded portion of the breech screw is disengaged from a corresponding threaded portion in the gun, whereupon the breech screw can be opened by continuing the movement of the hand lever in the direction above mentioned. Mounted on the carrier *A* is a piece of mechanism technically termed a "slide box" one portion *B* of which embraces the spindle *F* of the axial vent and another portion *B*¹

constitutes a slide bed for a slide C. Projecting from the latter is a hollow boss c Fig. 2, on which is mounted a casing c^1 and situated within these parts is the striker C^1 and spring c^2 for actuating the same. The striker is connected to a sleeve c^3 which is slidably mounted on the casing c^1 and carries projections or rollers c^4 adapted to be brought into engagement with projections b^1 on the slide bed B^1 for retracting and cocking the striker when the slide C is moved laterally toward the right to uncover the axial vent. This movement is effected by a bolt C^2 which passes through such slide and forms a pivot for one end of a link E the other end of which is connected to a crank pin e on the sector wheel a^2 . When the breech is closed, the slide is moved by the aforesaid bolt C^2 and link E to bring the end of the striker C^1 into line with the axial vent as shown in Fig. 2. In this view the end of the striker is shown embedded in the head of the primer G and it will be readily understood that if any wear takes place between the roller c^4 and the projection b^1 on the slide bed B^1 the slide will move before the commencement of the retraction of the striker and the latter will be damaged or broken.

According to this invention instead of relying solely upon the projecting surfaces b^1 for retracting the striker, the slide C is connected with the sector pinion a^2 in such a manner that during the initial movement of the latter the slide remains motionless and the initial movement of the sector pinion is utilized for actuating mechanism for partly retracting the striker before any movement of the slide takes place.

In the arrangement shown in Figs. 3 to 6, D represents a retracting lever pivoted at d to the slide bed B^1 in such a manner as to be capable of engaging with a projection c^5 on the striker sleeve. The free ends of the lever is arranged to occupy a position adjacent to the end of a rod D^1 which is provided at its opposite end with a projection d^1 for engagement with a segmental flange e^2 formed on the sector pinion a^2 to lock the rod D^1 in its forward position when required. The link E is formed with a tooth e^1 adapted to engage with a shoulder d^x formed on the rod D^1 and during the initial movement of the sector pinion a^2 the tooth e^1 moves the rod D^1 to retract the striker before the link E imparts any movement to the slide C. In the arrangement shown in Fig. 6 the projection d^x on the rod D^1 is dispensed with and the end of such rod is provided with a roller D^2 for engagement with a segmental flange e^2 formed on the sector pinion a^2 , the said flange in this case imparting endwise movement to the rod instead of merely serving as a locking device. The aforesaid link E is connected at one end to the guide bolt C^2 and at the opposite end to a lever E^1 at some

point e^4 intermediate of its length. One end of this lever is pivoted at e^3 to the swinging carrier A the other extremity e^5 of such lever being connected to a link E^2 which is hinged at e^6 to the sector pinion a^2 . By this arrangement any required reduction in the amplitude of movement that is imparted to the slide C from the sector pinion a^2 can be obtained by varying the position of the point at which the link E is connected to the lever E^1 so that the larger amount of movement performed by the sector pinion in heavy guns can be provided for. When the parts are in the position shown by the full lines in Fig. 6, the breech is fully closed and locked; to effect the opening of the breech, the sector pinion a^2 is rotated in an anti-clockwise direction whereupon the parts assume the position shown by the dotted lines. At the initial part of the opening movement, the link E^2 turns about its pivotal connection e^5 with the lever E^1 without however actuating it. This idle movement thus gives time for the segmental flange e^2 of the sector pinion a^2 to operate the rod D^1 and the retracting lever D, before the said sector pinion performs sufficient angular movement to operate the slide actuating link E through the pull it exerts on the link E^2 .

Figs. 1 and 3, illustrate the normal position of the slide and the striker retracting mechanism when the breech is closed. In Fig. 4 the sector pinion a^2 has been partly rotated to advance the rod D^1 against the retracting lever D which then acts upon an extension c^5 on the striker sleeve and partially withdraws the striker preparatory to any movement of the slide C. In Fig. 5, sufficient rotary motion has been imparted to the sector pinion a^2 to withdraw the slide C to the right so as to uncover the axial vent. During this movement the striker is raised to its cocked position by the roller c^4 traveling up the inclined projection b^1 which then retains the striker in its cocked position until the gun is fired.

What we claim and desire to secure by Letters Patent of the United States is:—

1. In firing mechanism of the character described, the combination with the slide, the striker, the striker retracting lever, the rod for actuating the same, and the sector pinion, of means for directly actuating the rod of the striker-retracting lever from the sector pinion, and a connection between the slide and the sector pinion so arranged that a large amount of movement of the sector pinion transmits a comparatively small amount of movement to the slide.

2. In firing mechanism of the character described, the combination with the slide, the striker, the striker retracting lever, the rod for actuating the same, and the sector pinion, of a segmental flange on said sector pinion for actuating the rod of the striker-

retracting lever, and a connection between the slide and the sector pinion so arranged that a large amount of movement of the sector pinion transmits a comparatively small amount of movement to the slide.

3. In firing mechanism of the character described, the combination with the slide, the striker, the striker-retracting lever, the rod for actuating the same, and the sector pinion, of a segmental flange on said sector pinion for actuating the rod of the striker retracting lever, and a link and lever connection between the slide and the sector pinion.

4. In firing mechanism of the character described, the combination with the slide, the striker, the striker retracting lever, the rod for actuating the same and the sector pinion, of a segmental flange on said sector pinion for actuating the rod of the striker retracting lever, a lever pivoted at one end to a fixed point, a link connecting the other end of the lever with the sector pinion and a link connected at one end to the slide and at the other end to some intermediate part of the lever.

5. In firing mechanism of the character described, the combination with the slide, the slide box having inclined projections thereon, the striker, the striker sleeve, the striker retracting lever, the rod for actuating the same, and the sector pinion, of a segmental flange on said sector pinion for actuating the rod of the striker retracting lever, a projection on the striker sleeve arranged to be actuated by the retracting lever to retract the striker, rollers carried by the striker sleeve to engage with the projections on the slide box, a lever pivoted at one end to a fixed point, a link connecting the other end of the lever with the sector pinion, and a link connected at one end to the slide and at the other end to some intermediate part of the lever.

In testimony whereof we affix our signatures in presence of two witnesses.

ARTHUR TREVOR DAWSON.
GEORGE THOMAS BUCKHAM.

Witnesses:

HENRY KING,
C. A. SEARLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
