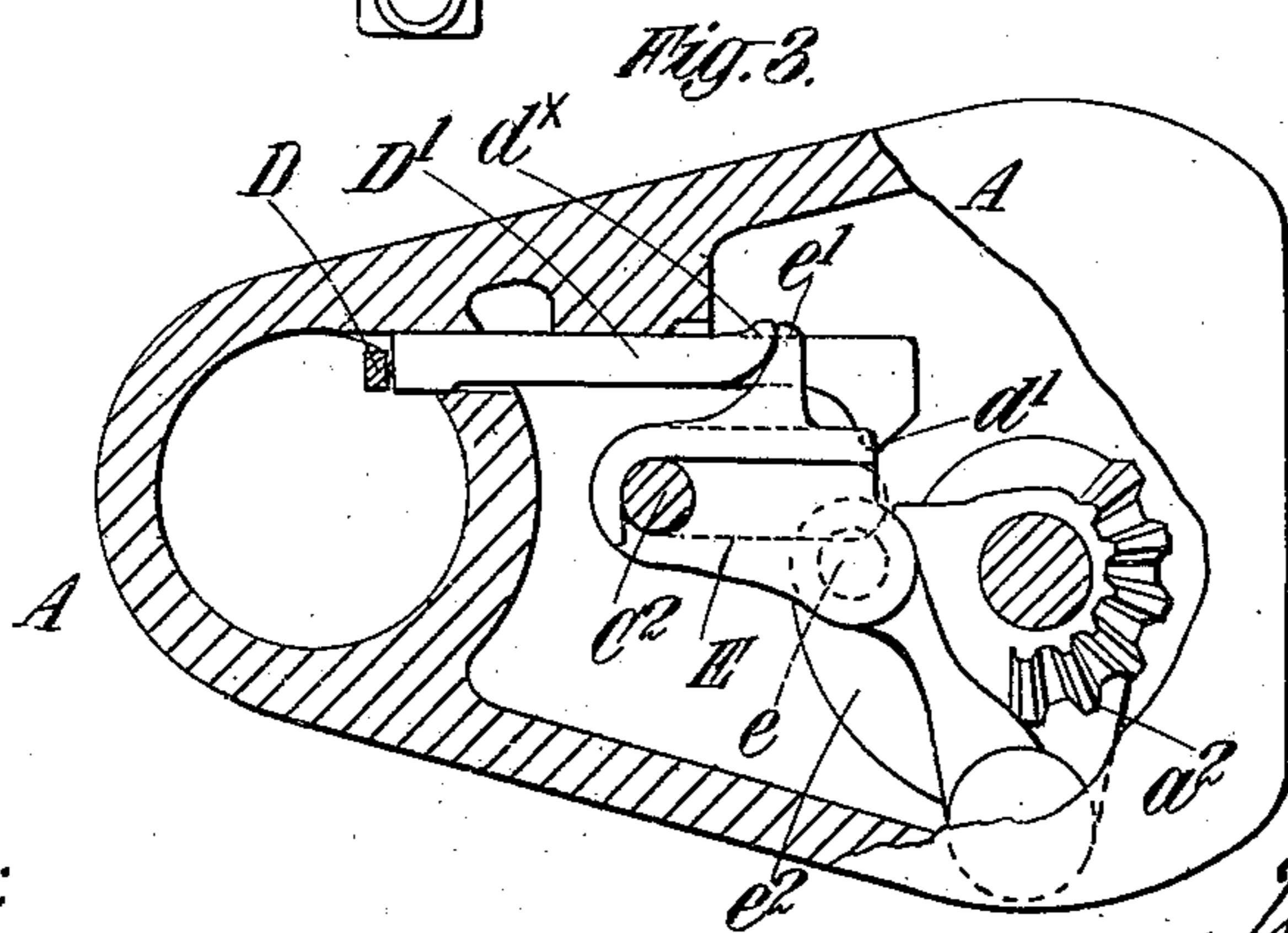
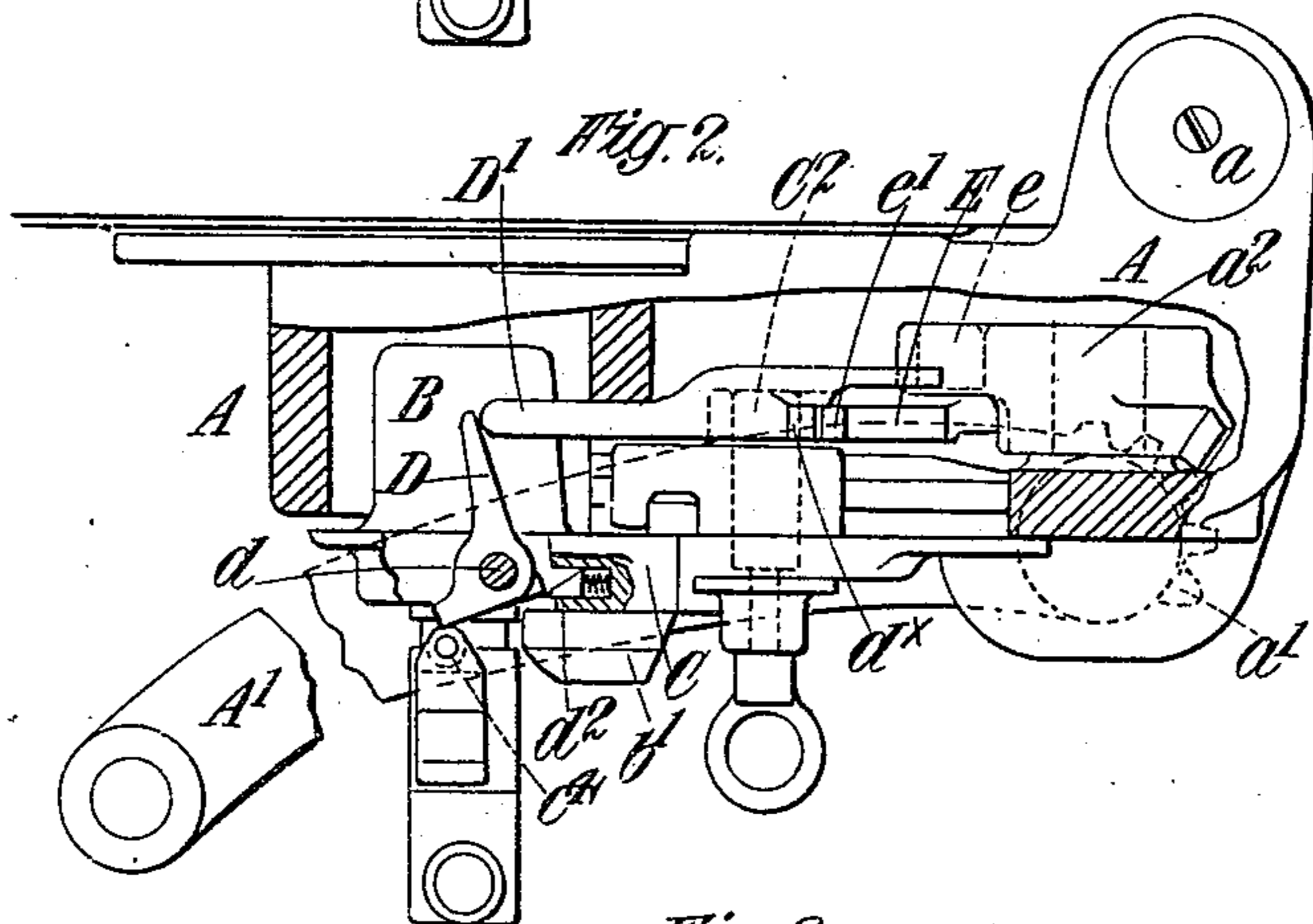
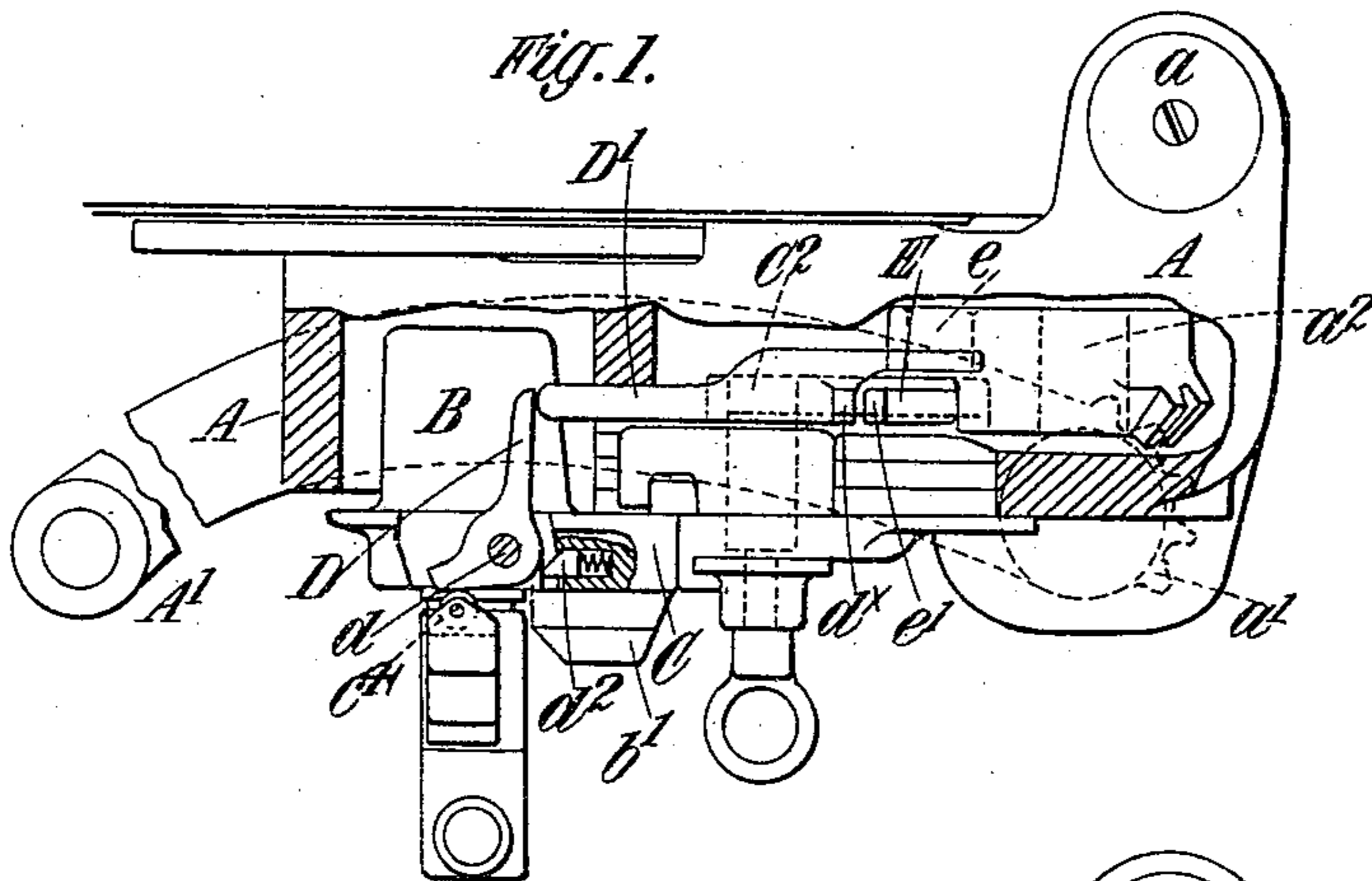


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FIRING MECHANISM OF BREECH LOADING GUNS.  
APPLICATION FILED MAY 6, 1908.

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2 SHEETS—SHEET 1.



Witnesses:  
F. E. Nares.  
G. Balaban

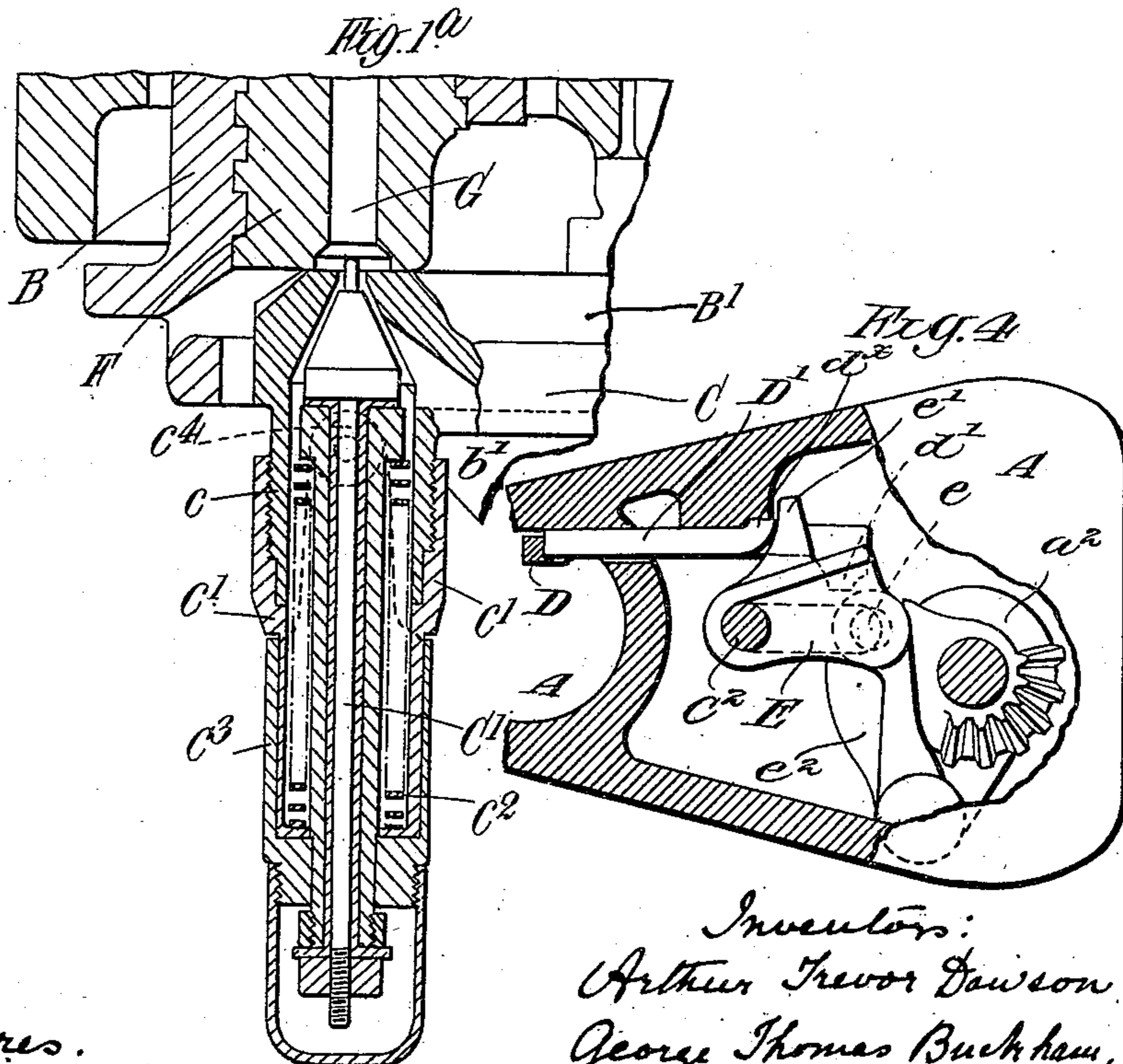
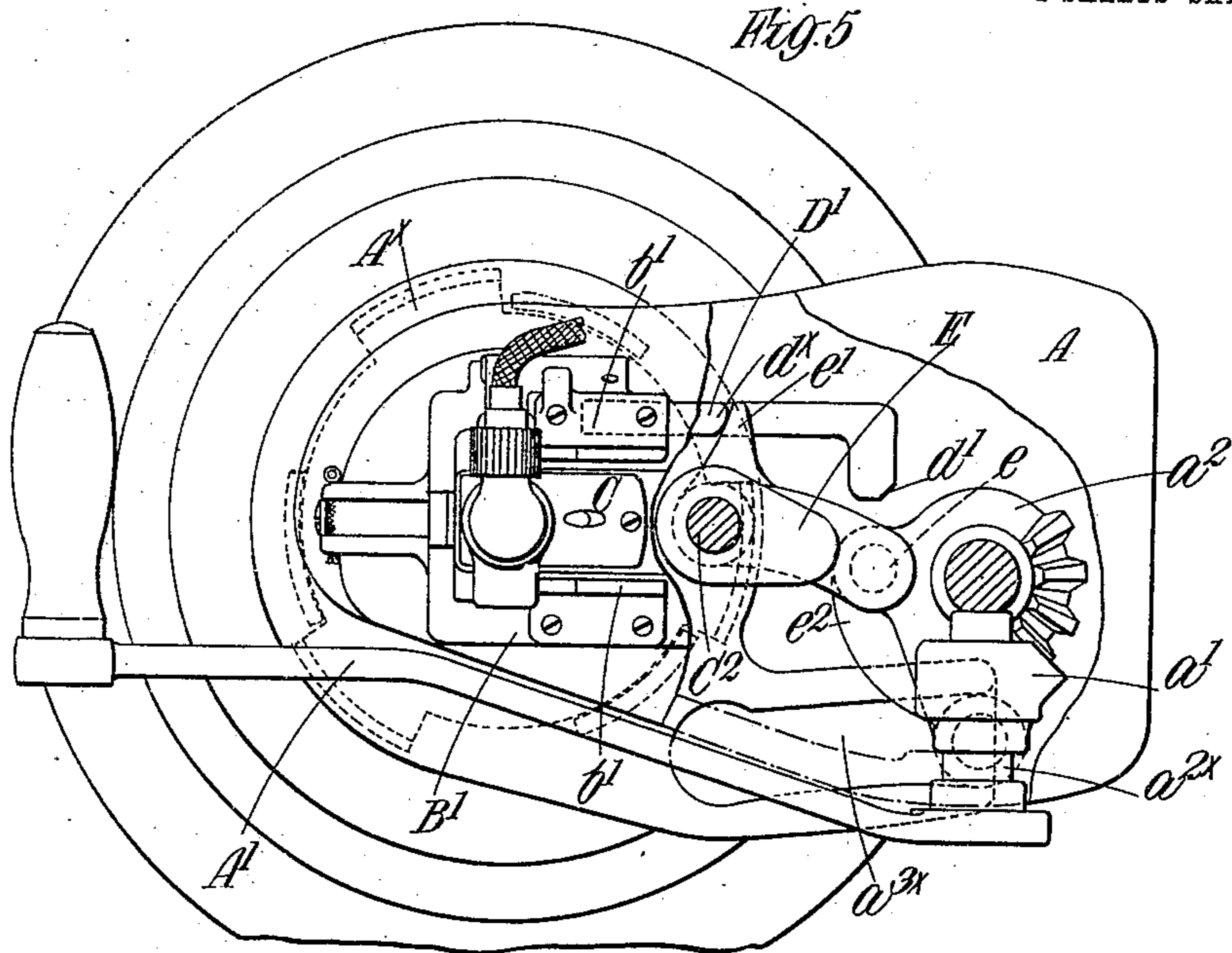
Inventors:  
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George Thomas Buckham,  
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2 SHEETS—SHEET 2.



Witnesses:  
J. E. Nares.  
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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 LONDON, ENGLAND.

FIRING MECHANISM OF BREECH-LOADING GUNS.

973,482.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed May 6, 1908. Serial No. 431,098.

*To all whom it may concern:*

Be it known that we, ARTHUR TREVOR DAWSON, lieutenant, Royal Navy, director and superintendent of ordnance works, and  
5 GEORGE THOMAS BUCKHAM, engineer, 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 Improve-  
10 ments in the Firing Mechanism of Breech-Loading Guns, of which the following is a specification.

This invention relates to the firing mechanism of breech loading guns, particularly  
15 mechanism of the type in which there is a box-slide mounted in the swinging carrier and a lock-frame which is capable of moving laterally in the box-slide to uncover the vent axial for the removal of the expended  
20 primer or sealing tube and introduction of a fresh one. With firing mechanism of this type the lateral movement of the lock-frame in the box-slide and the retraction or "cocking" of the firing pin or striker have been  
25 effected by a link which actuates the lock-frame, the link having a guide bolt engaging with a cam slot in the crank pinion forming part of the breech actuating mechanism. The movement of said crank during  
30 the unlocking and opening of the breech causes the said link to move the lock frame in the box slide and to retract or cock the striker by projections on the latter riding over suitably arranged inclined ribs or  
35 safety slides on the box slide, or by the said projections engaging with cocking levers which are actuated by suitable faces on the aforementioned inclined ribs. Several objections exist with respect to this manner  
40 of actuating the lock frame and retracting the striker. For example, it is possible that, after severe wear, the cocking slides or levers may become comparatively ineffective and delay retraction of the striker to such  
45 an extent that the lock frame commences its lateral movement prior to the retraction of the striker which, by still lying in contact with the primer, is subjected to a transverse stress that is liable to damage or break it.  
50 Again, in the case of a primer being hard to extract, the stress on the guide bolt that engages with the cam slot in the crank, is considerable when the lock frame is being laterally shifted, and there is a liability of

this guide bolt, due to the incomplete support it receives from the cam slot, also becoming damaged or broken during the working of the mechanism under the aforesaid conditions.

It is the chief object of this invention to avoid these objections.

According to our invention we provide means whereby in the act of opening the breech, the striker is initially retracted prior to the commencement of the lateral  
65 movement of the lock frame to uncover the primer. For this purpose we employ a retracting lever pivoted to a suitable part of the box slide and adapted to be operated through the intervention of a retracting rod.  
70 This rod is actuated from the said crank by a link situated between the crank and the aforesaid guide bolt. The parts are so arranged that during the early part of the  
said crank's movement, the retracting rod  
75 will be operated and the said lever caused to retract the striker, the continued movement of the crank causing the lock frame to move laterally in the box slide and bring  
projections on the striker to bear upon the  
80 aforesaid inclined ribs of the box slide.

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

Figures 1 and 2 are sectional plans showing one form of our improved firing mechanism applied to the breech mechanism of a comparatively light gun, the former of these  
90 figures indicating the parts in the position they occupy when the breech is closed and locked and the latter of the said figures indicating the position the parts assume at the initial movement of the breech-actuating  
95 handle in opening the breech. Fig. 1<sup>a</sup> is a horizontal section of part of Fig. 1 with the parts drawn on a larger scale. Figs. 3 and 4 are sectional elevations of the two figures  
above described. Fig. 5 is an end elevation  
100 of a gun breech showing the connection between the ordinary breech mechanism and the firing mechanism last referred to.

Like letters of reference indicate similar parts in all the figures.

A is the swinging carrier which carries the breech screw A<sup>x</sup> and is hinged at  $\alpha$  to one side of the breech end of the gun.

A' is the breech-actuating hand lever which operates the breech mechanism in the usual manner through the intervention of the hand lever pinion  $a'$  and the pinion crank  $a^2$ . The latter is provided with a roller crank pin  $a^{2x}$  which engages a groove  $a^{ax}$  formed in a projection extending from a portion of the breech screw  $A^x$  so that when the hand lever A' is moved away from the breech, a partial rotary movement is imparted to the pinion crank  $a^2$  and to the crank pin  $a^{2x}$  (Fig. 5<sup>A</sup>) with the result that the breech screw is turned into such a position that it can be withdrawn from the breech by further movement of the hand lever.

B is the box slide formed with a slide bed B' and mounted in the swinging carrier by the ordinary means.

C is the lock frame slidably mounted in the slide bed B', C' the striker and C<sup>3</sup> the striker sleeve, the said lock frame being adapted to move laterally to cover and uncover the opening into which the primer is inserted as is well understood.

C<sup>2</sup> is the guide bolt carried by the lock frame and through which the lateral movement is directly or indirectly imparted to the lock frame from the pinion crank  $a^2$  as will be hereinafter described.

D is the retracting lever which is pivoted at  $d$  to the box slide and D' is the retracting rod for actuating the said lever, E the lock actuating link and F the vent axial for the reception of the primer G.

The lock actuating link E is directly connected with the pinion crank  $a^2$  at a point  $e$  out of alinement with the guide bolt C<sup>2</sup>, so that during the initial movement of the pinion crank in unlocking and opening the breech, the said link will turn about the axis of the guide bolt without shifting it laterally. During this initial movement of the link, its point of connection  $e$  with the pinion crank is carried into alinement with the guide bolt (see Fig. 4) and at the same time causes a tooth or projection  $e'$  thereon to act upon a heel-piece or projection  $d^x$  on the retracting rod D', thus imparting longitudinal movement to the latter and actuating the retracting lever to the requisite extent to retract the striker C' (Figs. 2 and 4). The striker C' is situated within the hollow boss  $c$  (Fig. 1<sup>a</sup>) and casing  $c'$  and is normally caused to occupy the position indicated in the above mentioned figure by the spring  $c^2$ . The striker is connected to the sleeve C<sup>3</sup> and such sleeve is slidably mounted on the casing  $c'$  and carries projections or rollers  $c^4$ . The continued movement of the pinion crank carries the point of connection  $e$  of the link therewith, beyond the position of alinement

with the guide bolt C<sup>2</sup>, said point  $e$  continuing to move in a circular path. This movement has the effect of causing the link E to move the guide bolt C<sup>2</sup> laterally and shift the lock frame C into its uncovering position relatively to the primer. At the same time the projections or rollers  $c^4$  on the striker bear against the inclined ribs  $b'$  on the box slide, whereby the retraction of the said striker is completed and it is supported in its retracted position by the said ribs in the usual manner. During the above stated movement of the pinion crank, a segmental flange  $e^2$  thereon is brought behind a curved toe-piece  $d'$  on the retracting rod D', thus retaining it in its advanced or actuating position. In the return movement of the pinion crank in closing the breech, the said segmental flange  $e^2$  becomes disengaged from the tooth or projection  $d'$  on the link thus liberating the retracting rod D' and permitting it, together with the retracting lever D, to resume the normal position under the influence of a spring plunger  $d^2$  acting on the retracting lever.

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 striker, lock frame, box slide, and pinion crank operatively connected with the lock frame, of means whereby in the act of opening the breech, the initial movement of the pinion crank causes the striker to be retracted prior to the commencement of the lateral movement of the lock frame in the box slide.

2. In firing mechanism of the lock and box-slide type, the combination with the striker, of a lever carried by the box-slide for retracting the striker, a sliding rod for actuating said lever, a pinion-crank operated by the breech actuating mechanism, and means for operating the said rod from the said pinion-crank.

3. In firing mechanism of the lock and box-slide type, the combination with the striker, the striker-retracting lever, the rod for actuating the same, the pinion crank, the lock frame and its guide bolt; of a lever link, adapted to serve the double purpose of actuating the sliding rod appertaining to the striker-retracting lever and of actuating the lock frame through its guide bolt.

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

ARTHUR TREVOR DAWSON.  
GEORGE THOMAS BUCKHAM.

Witnesses:

HENRY KING,  
ALFRED PEAKE.