

No. 841,637.

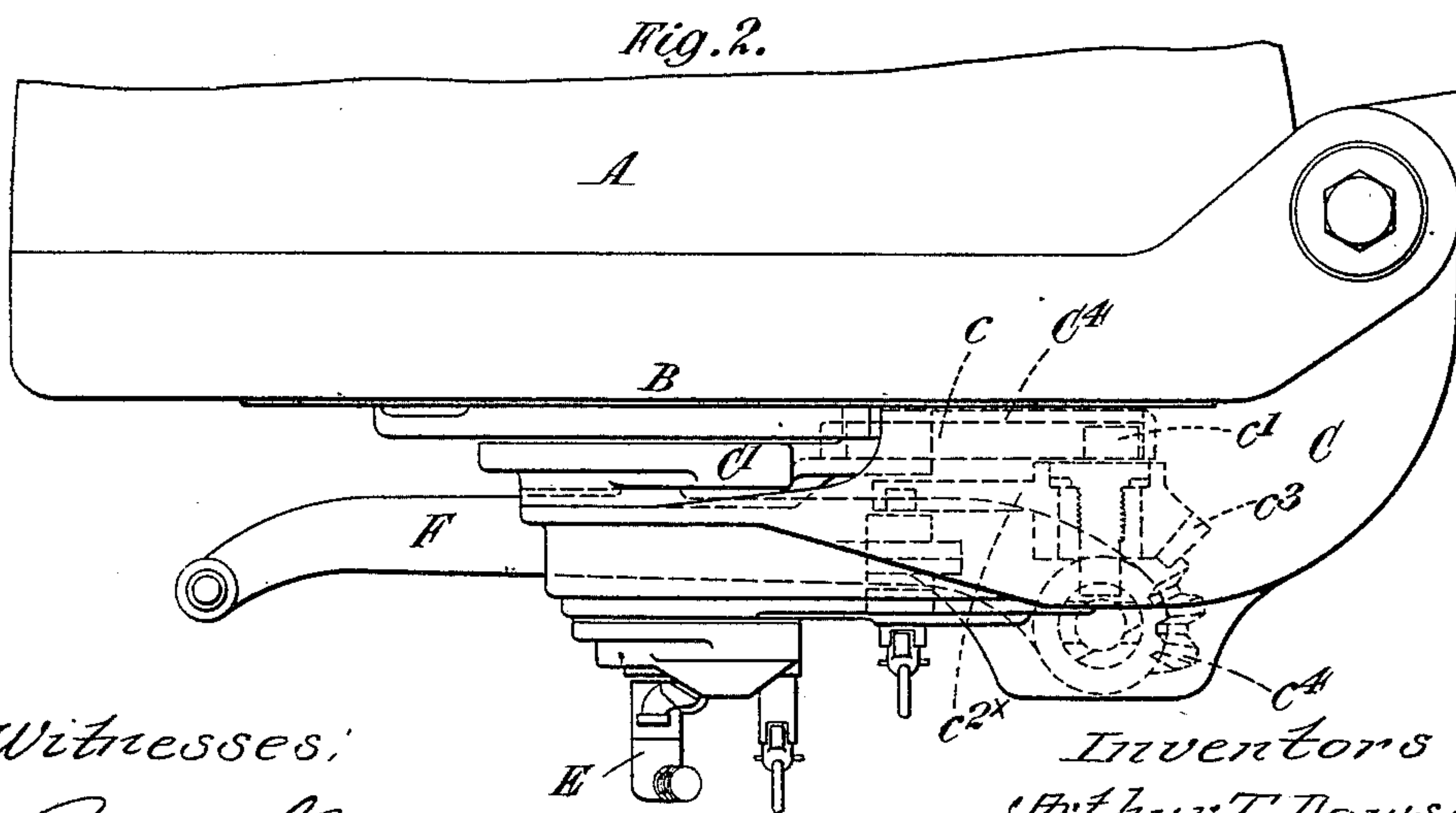
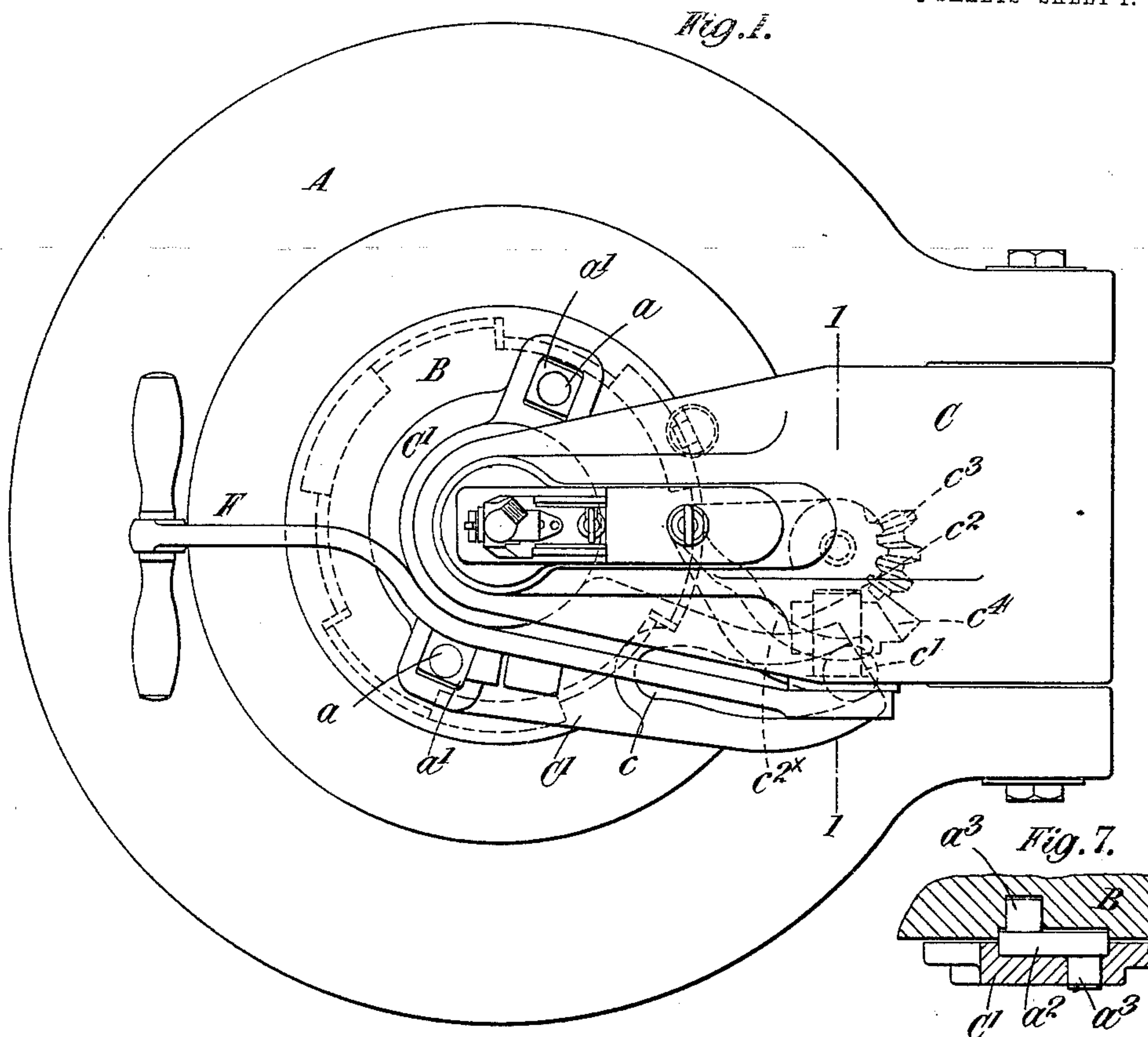
PATENTED JAN. 15, 1907.

A. T. DAWSON & G. T. BUCKHAM.

BREECH LOADING ORDNANCE.

APPLICATION FILED MAR. 29, 1904.

3 SHEETS—SHEET 1.



Witnesses:

*James L. Norris, Jr.*  
*Chas. Kessler*

Inventors

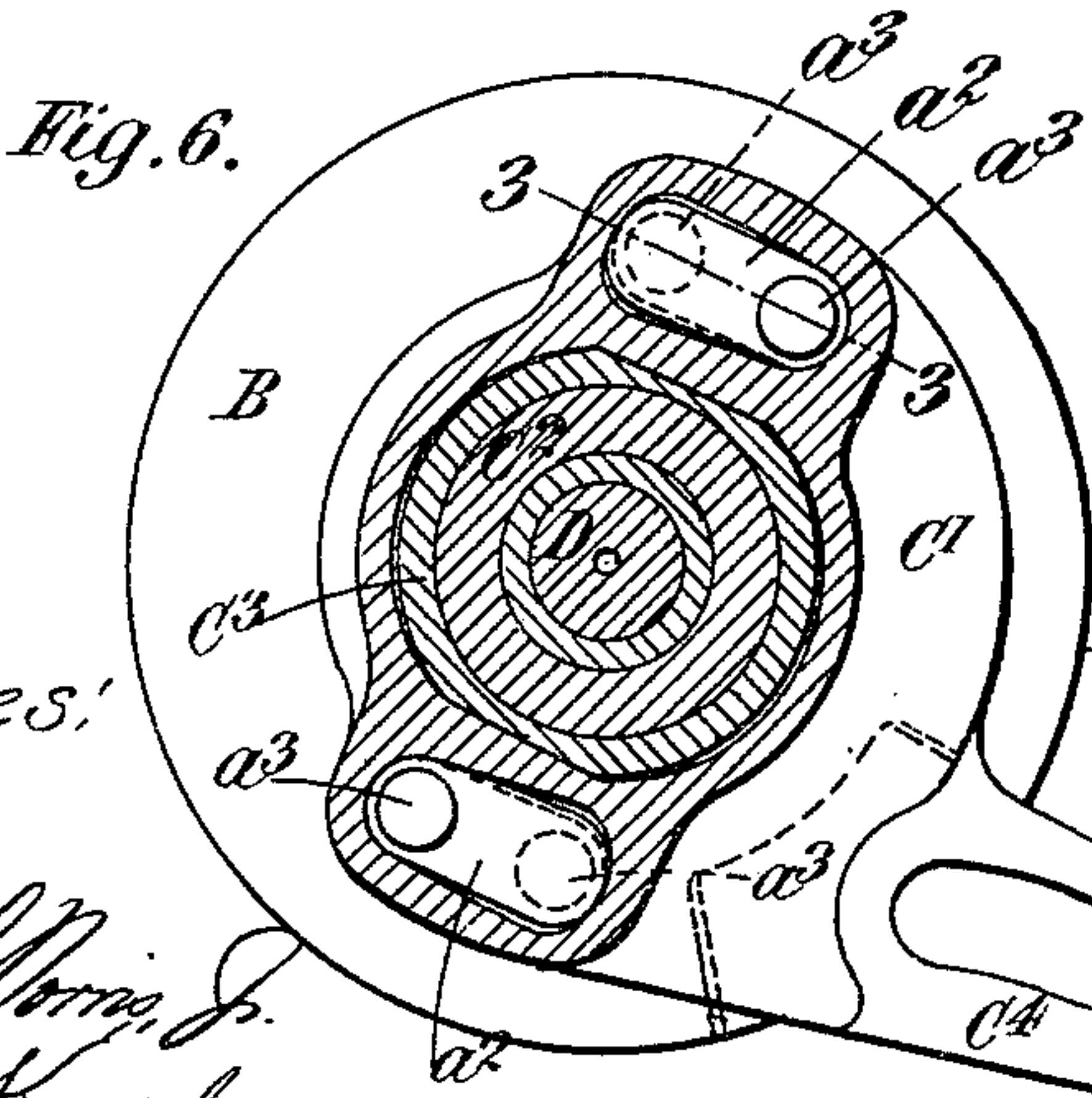
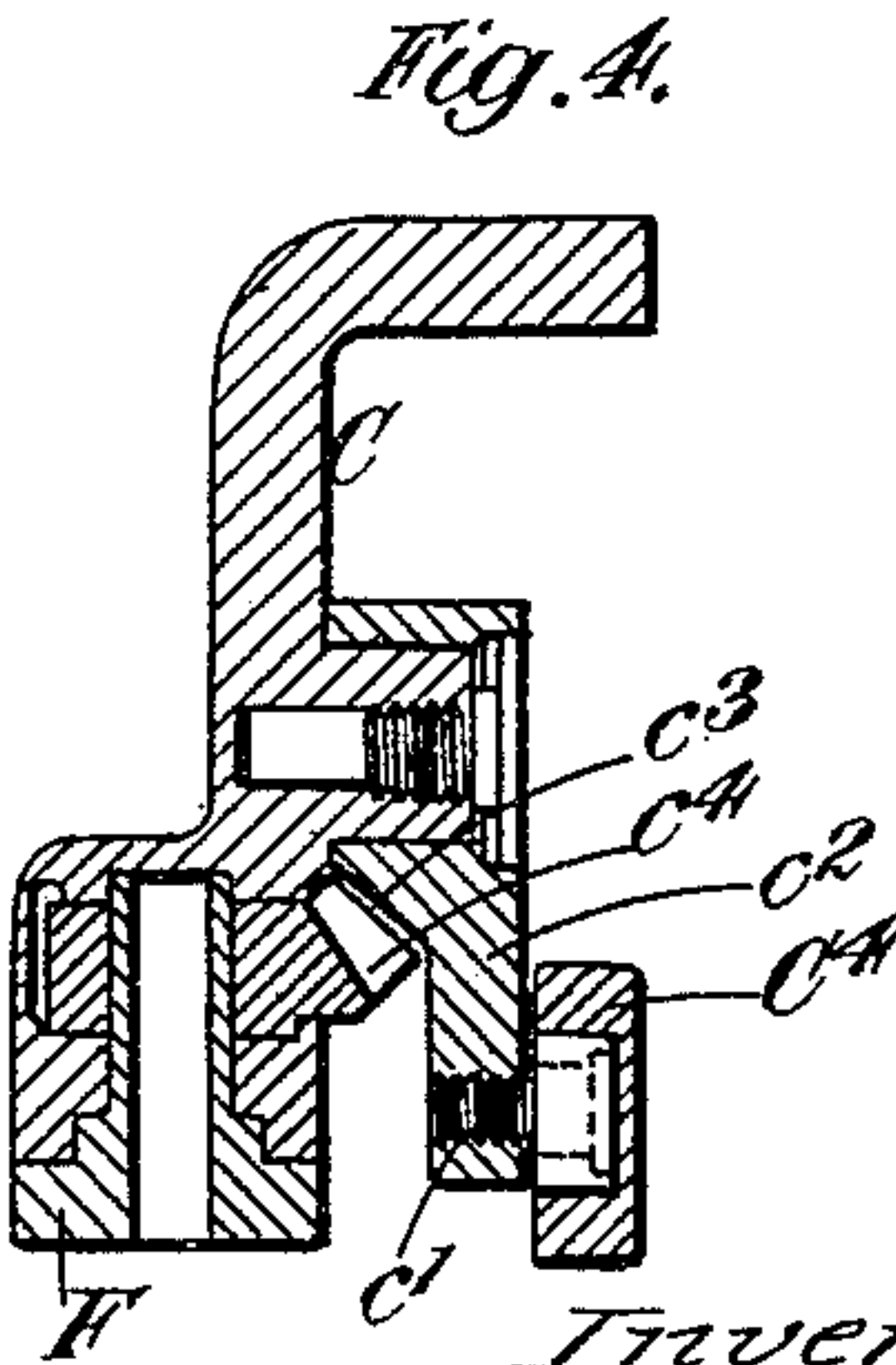
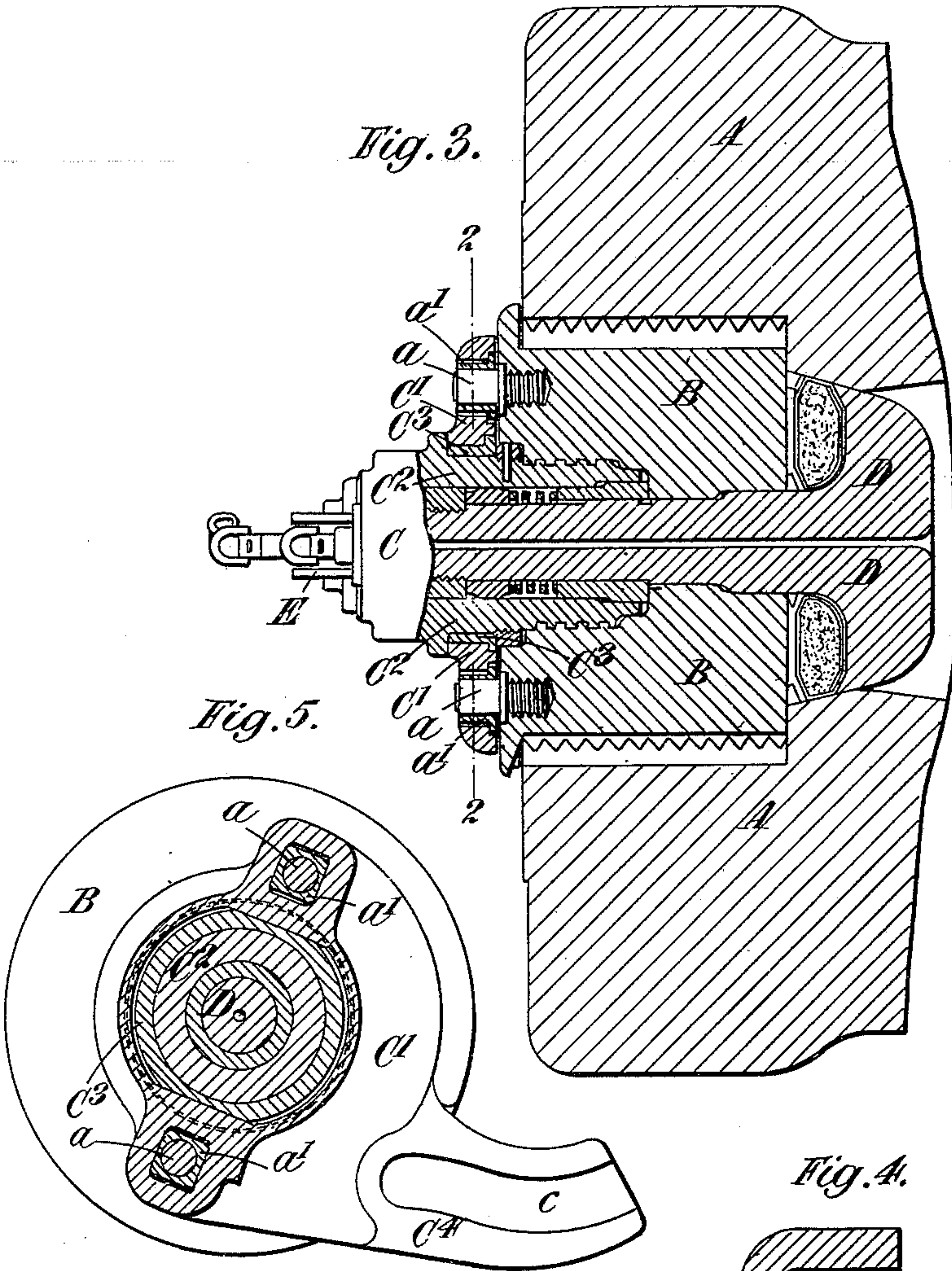
*Arthur T. Dawson*

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3 SHEETS—SHEET 2.



Witnesses:

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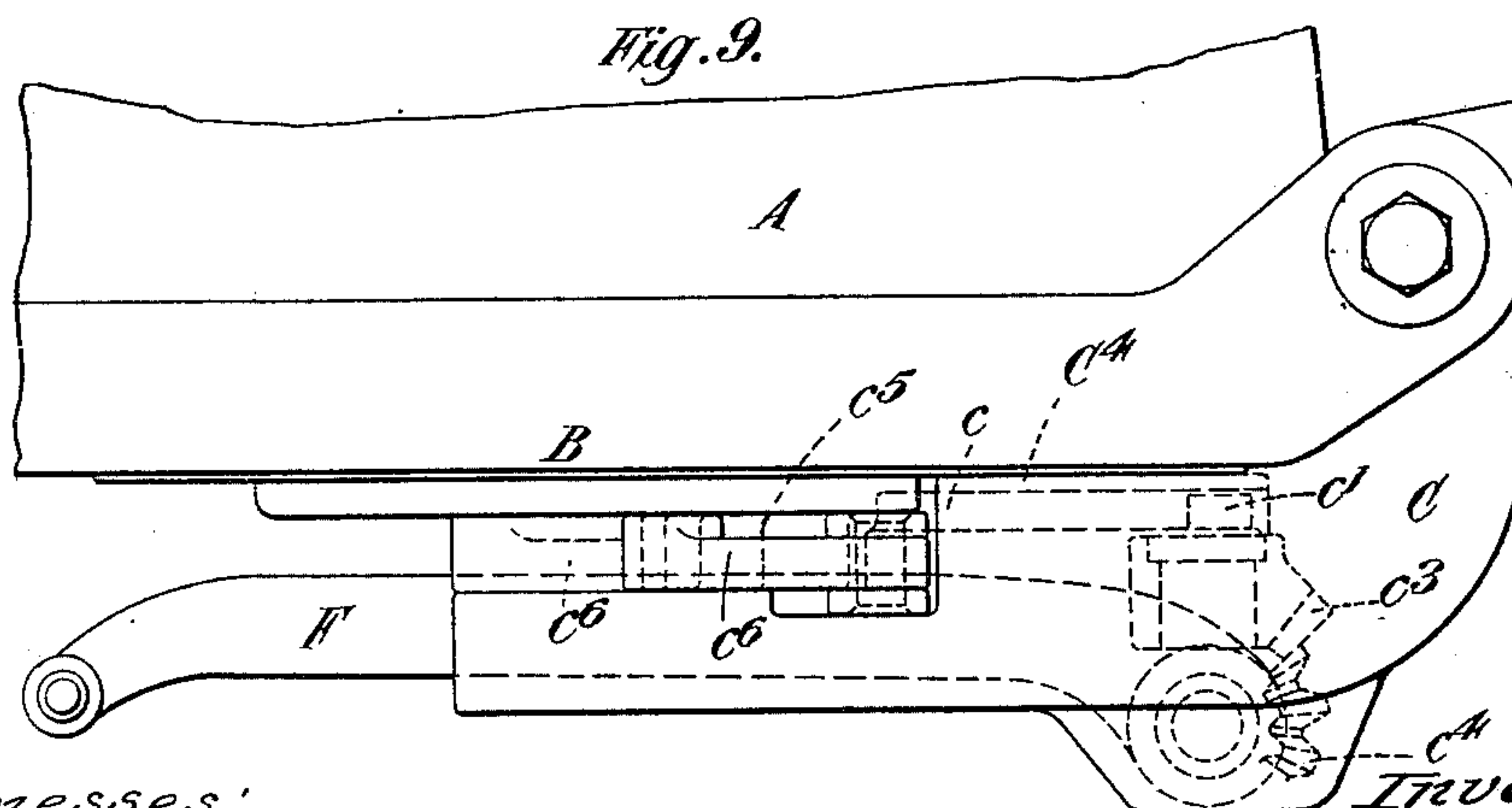
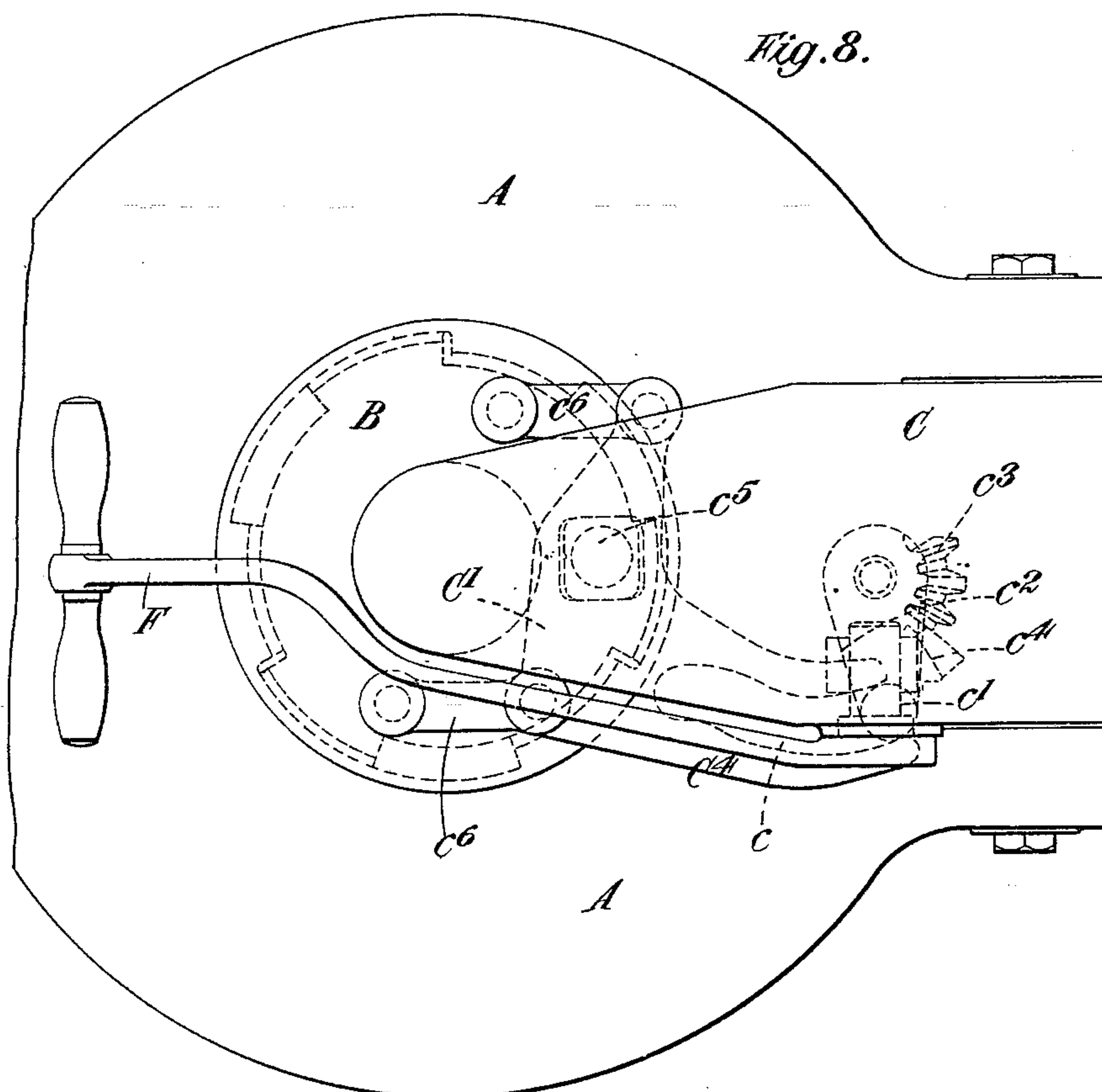
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3 SHEETS—SHEET 3.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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

## BREECH-LOADING ORDNANCE.

No. 841,637.

Specification of Letters Patent.

Patented Jan. 15, 1907.

Application filed March 29, 1904. Serial No. 200,591.

*To all whom it may concern:*

Be it known that we, ARTHUR TREVOR DAWSON, lieutenant of the Royal Navy and director and superintendent of Ordnance Works, and GEORGE THOMAS BUCKHAM, engineer, subjects of the King of Great Britain, residing at 32 Victoria street, Westminster, London, England, have invented certain new and useful Improvements in Breech-Loading Ordnance, of which the following is a specification.

Our invention relates to the breech mechanism of guns of the kind in which the breech-screw has interrupted screw-threads and is rotatably mounted in a swinging carrier pivoted to the gun, the said mechanism being so arranged that the continuance of the same action that unlocks the breech-screw from the interrupted threads of the breech-chamber also withdraws it by swinging the carrier about its pivot.

The chief object of our invention is to so construct the mechanism that a considerable increase in the power employed for angularly displacing the breech-screw in the breech-chamber is obtained as compared with that existing in other kinds of breech mechanism in common use. Hitherto the angular displacement of the breech-screw has generally been obtained by mechanical devices that give the breech-screw a simple turning moment around its axis.

According to our invention we so arrange the breech mechanism that the forces for angularly displacing the breech-screw are applied in the form of a "couple" which, as will be obvious, will not tend to laterally displace the axis of the breech-screw, and therefore will not give rise to undesirable friction between the threads of the breech-screw and those of the breech-chamber due to such cause, so that the whole of the available turning moment (except the ordinary friction of the screw-threads) that can be brought to bear on the screw is utilized in the useful work of unseating or seating the obturator in the gun.

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—

Figure 1 is an end elevation, Fig. 2 a plan,

and Fig. 3 a vertical section, of breech mechanism constructed in accordance with our invention. Fig. 4 is a vertical section taken approximately on the line 1 1 of Fig. 1. Fig. 5 is a vertical section taken approximately on the line 2 2 of Fig. 3. Fig. 6 is a section similar to Fig. 5, showing a modification; and Fig. 7 is a detail cross-section taken approximately on the line 3 3 of Fig. 6. Fig. 8 is an end elevation, and Fig. 9 a plan, showing a further modification of the breech mechanism.

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

A is the wall of the breech-chamber of the gun; B, the breech-screw; C, the swinging carrier in which said breech-screw is rotatably mounted; D, the obturator; E, the firing-gear, and F the hand-lever for actuating the breech mechanism.

Referring more particularly to Figs. 1 to 5, the rear face of the breech-screw is provided with two rearwardly-projecting studs  $a$ , arranged diametrically opposite each other and equidistant from the axis of the breech-screw. Around these studs may be fitted two sliding blocks  $a'$ , which engage with corresponding cavities or pockets in an angularly-displaceable plate  $C'$ , which is mounted pivotally on the carrier C and coaxial with the breech-screw. The said plate  $C'$  is not pivoted directly to the stem  $C^2$  of the carrier on which the breech-screw rotates, but is mounted upon a sleeve  $C^3$ , which in turn surrounds part of the stem of the carrier. The central hole in the plate  $C'$  is preferably slightly elongated with respect to the outside diameter of the sleeve  $C^3$ , and the cavities or pockets in the plate  $C'$  for the reception of the blocks  $a'$  are made slightly longer radially than the blocks themselves. This arrangement insures that any inaccuracies in the manufacture of these parts of the mechanism automatically adjust themselves. It furthermore insures that although the breech-screw is turned about its axis through the medium of the studs engaging with the blocks, (which in turn engage with the plate  $C'$ ), the said breech-screw remains otherwise mechanically independent of the said plate, the result being that when a turning moment is applied to the said plate the breech-screw can center itself by means of the coned



seat of the obturator and the screw-threads of the breech-chamber, so that the said plate can properly operate to apply the forces to the breech-screw as a true couple. The said plate C' has an arm C<sup>4</sup>, formed with a groove or slot c, with which engages a roller on the crank-pin c' of a crank c<sup>2</sup>, pivotally mounted on the carrier. The form of the groove or slot c in said arm may be straight or of any desired shape for obtaining an augmentation in the leverage or turning moment at any desired position of the parts. The crank c<sup>2</sup> may be provided with bevel-teeth c<sup>3</sup>, gearing with a bevel-pinion c<sup>4</sup>, mounted on a stud or axle situated in a convenient position on the carrier and forming part of the hand-lever F, so as to be actuated thereby. This hand-lever is capable of swinging in a horizontal or approximately horizontal plane and when actuated it imparts the angular displacement to the breech-screw through the bevel-gear c<sup>3</sup> c<sup>4</sup>, the crank c<sup>2</sup>, the grooved or slotted arm C<sup>4</sup> of the plate C', and the projecting studs a a with which said plate engages as aforesaid. When the hand-lever has been swung far enough to give the requisite amount of angular displacement to the breech-screw, its continued swinging movement causes the whole of the breech mechanism, with the carrier, to be swung about the carrier-pivot in the ordinary well-known manner.

In the case of large breech mechanism we sometimes operate the crank c<sup>2</sup> that imparts motion to the plate C' by worm and worm-wheel gear instead of by a hand-lever, in which case the worm-wheel may be mounted on the carrier-pivot, which in turn may be geared with the bevel-teeth on the crank, the worm being carried by a bracket on the gun in the ordinary well-known manner.

Referring to Figs. 6 and 7, instead of employing two studs projecting rearwardly from the face of the breech-screw and entering sliding bushes, as explained in connection with the preceding figures, we use two short levers a<sup>2</sup> a<sup>2</sup> of equal length. Each of these levers has two studs a<sup>3</sup> a<sup>3</sup>, one projecting forward and the other rearward. The forwardly-projecting studs engage with cavities in the breech-screw and the rearwardly-projecting studs engage with the plate C'. Obviously the levers may be made to engage with studs on the breech-screw and plate C' instead of themselves having studs. The said levers may be situated in cavities or pockets formed either in the breech-screw or in the plate C', or partly in one and partly in the other. The employment of these short levers effects the same object as the sliding blocks a', hereinbefore described—that is to say, the turning forces are applied to the breech-screw as a true couple when said screw is being angularly displaced.

According to the other alternative arrange-

ment illustrated by Figs. 8 and 9 we pivot the angularly-displaceable plate C' to the carrier at a point c<sup>5</sup> which is eccentric with respect to the axis of the breech-screw and connect said plate to the breech-screw at diametrically opposite points by two levers c<sup>6</sup> c<sup>6</sup> of equal length, but somewhat longer than those employed when the pivot of the plate C' is concentric with the breech-screw. This arrangement is similar in its action to the arrangements already described above, and therefore needs no further explanation.

Although we have shown and described the points of connection between the angularly-displaceable plate and the breech-screw to be two in number and to be situated at diametrically opposite points, which is the arrangement we prefer, we wish it to be understood that the said points need not always occupy this position if more than two be used, nor need they necessarily engage with the face of the breech-screw. They may sometimes engage with the periphery thereof.

Any suitable form of firing-gear may be used in conjunction with our improved breech mechanism and may be actuated from a cam c<sup>2x</sup> of the aforesaid crank c<sup>2</sup>, as is well understood.

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

1. In gun-breech mechanism, the combination with the breech-screw rotatably mounted on a swinging carrier of an angularly-displaceable plate movable in a plane parallel with the rear face of the breech-screw and engaging with the latter at a plurality of points situated at equal distances from the axis of the breech-screw, an arm on said angularly-displaceable plate, and means for actuating said arm in the operation of opening and closing the breech for the purpose specified.

2. In gun-breech mechanism, the combination with a breech-screw rotatably mounted on a swinging carrier, of an angularly-displaceable plate mounted on the said carrier and engaging with the face of the breech-screw at two diametrically opposite points situated at equal distances from the axis of said breech-screw, an arm on said angularly-displaceable plate, gearing for actuating the said arm, and a hand-lever for operating said gearing and swinging the carrier substantially as described.

3. In gun-breech mechanism, the combination with a breech-screw rotatably mounted on a swinging carrier, of an angularly-displaceable plate mounted on said carrier and engaging with the breech-screw at two diametrically opposite points situated at equal distances from the axis of the latter, an arm on said angularly-displaceable plate, a crank on said swinging carrier engaging with said arm, gearing for actuating said crank, and a hand-lever for operating said gearing and swinging the carrier substantially as described.



4. In gun-breech mechanism, the combination with a breech-screw rotatably mounted on a swinging carrier, of an angularly-displaceable plate mounted on said carrier parallel to the face of the breech-screw and engaging with the latter at two diametrically opposite points situated at equal distances from the axis of the breech-screw, a grooved arm on said angularly-displaceable plate, a crank mounted on said swinging carrier with its crank-pin engaging with said grooved arm, toothed gearing on the swinging carrier for actuating said crank, and a hand-lever for operating said toothed gearing and swinging the carrier substantially as described.

5. In gun-breech mechanism, the combination with a breech-screw rotatably mounted on a swinging carrier, of an angularly-displaceable plate loosely mounted on a sleeve carried by the swinging carrier, connecting-pieces coupling the said angularly-displaceable plate with the face of the breech-screw at two diametrically opposite points situated at equal distances from the axis of the breech-screw, an arm on said angularly-displaceable

plate, and means for actuating said arm in the operation of opening and closing the breech substantially as described.

6. In gun-breech mechanism, the combination with a breech-screw rotatably mounted on a swinging carrier, of an angularly-displaceable plate mounted on said carrier at a point eccentric with respect to the axis of the breech-screw, lever-like connecting-pieces coupling the said angularly-displaceable plate with the face of the breech-screw at two diametrically opposite points situated at equal distances from the axis of the breech-screw, an arm on said angularly-displaceable plate, and means for actuating said arm in the operation of opening and closing the breech substantially as described.

In testimony whereof we have hereunto set our hands, in presence of two subscribing witnesses, this 17th day of March, 1904.

ARTHUR TREVOR DAWSON.

GEORGE THOMAS BUCKHAM.

Witnesses:

HENRY KING.

E. D. LANE.