

No. 891,601.

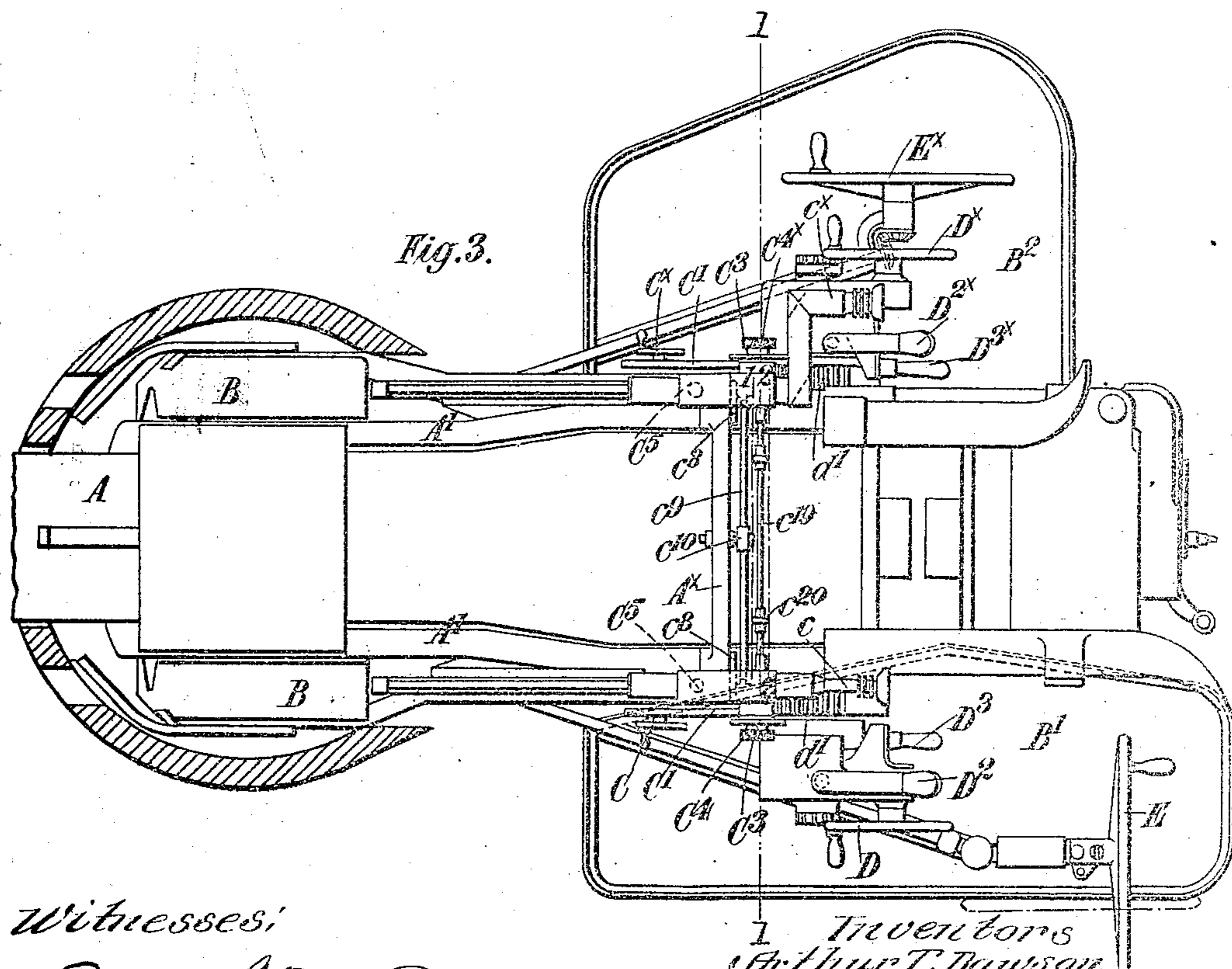
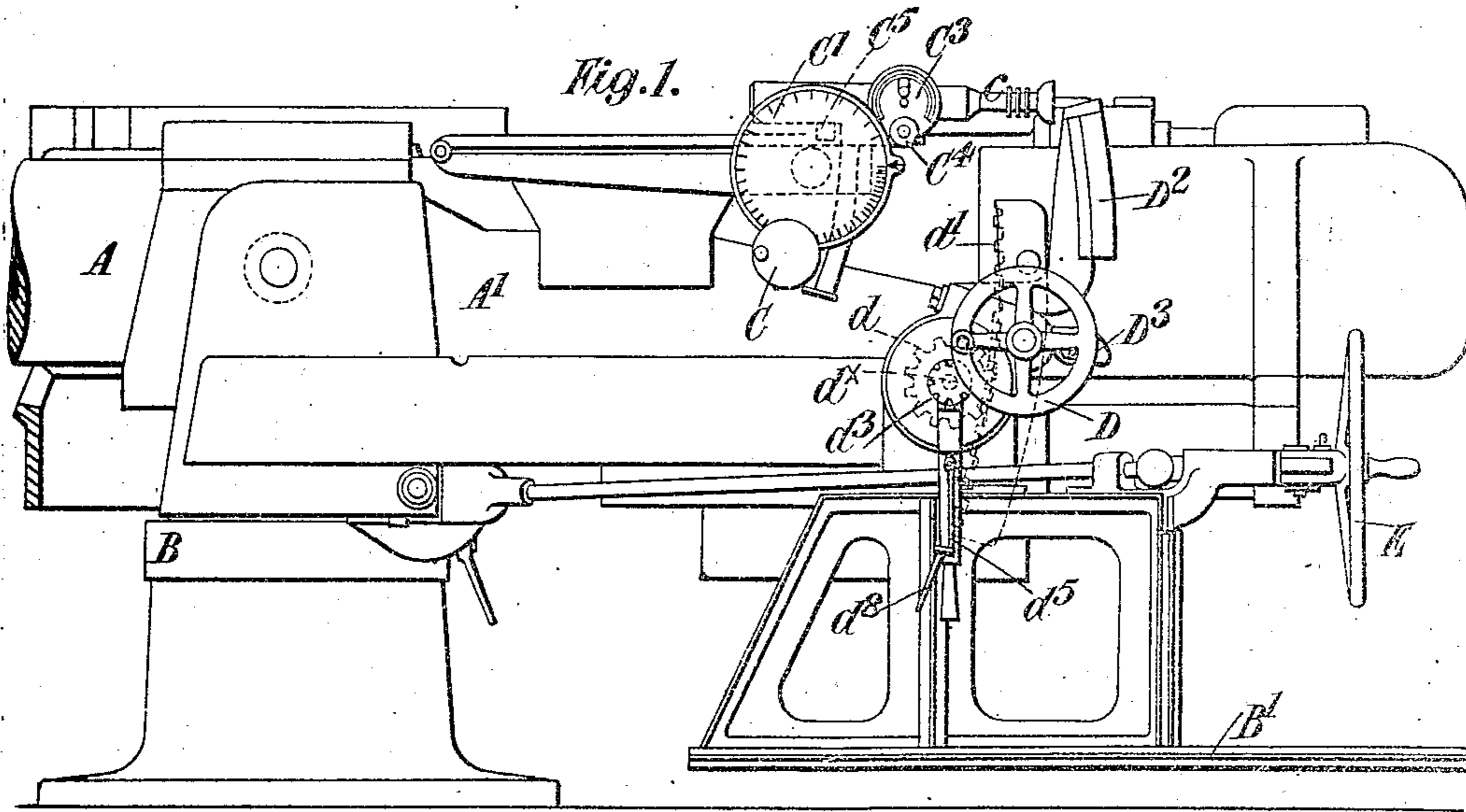
PATENTED JUNE 23, 1908.

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

DEVICE FOR SIGHTING AND TRAINING QUICK FIRING ORDNANCE.

APPLICATION FILED MAR. 14, 1904.

4 SHEETS—SHEET 1.



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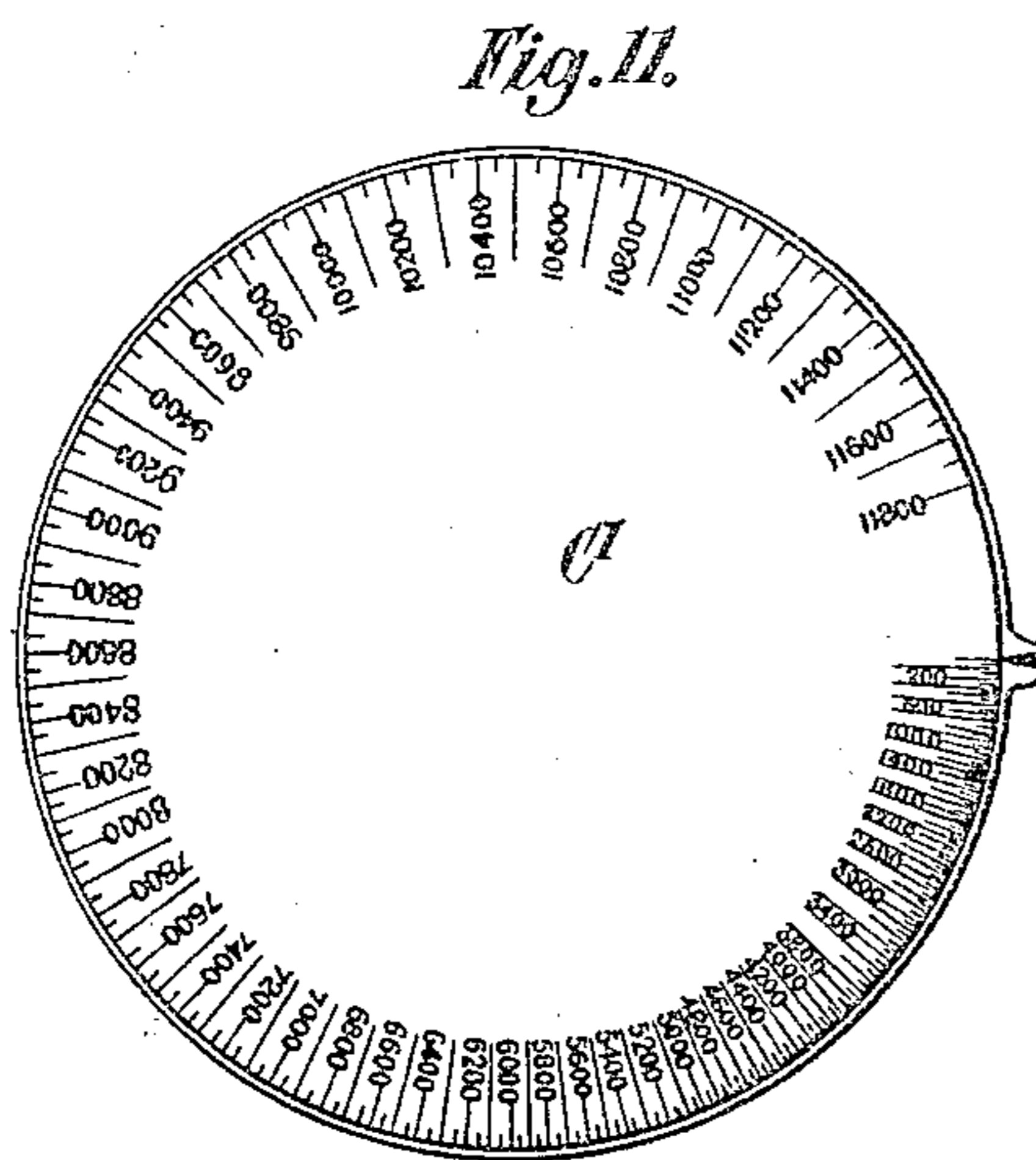
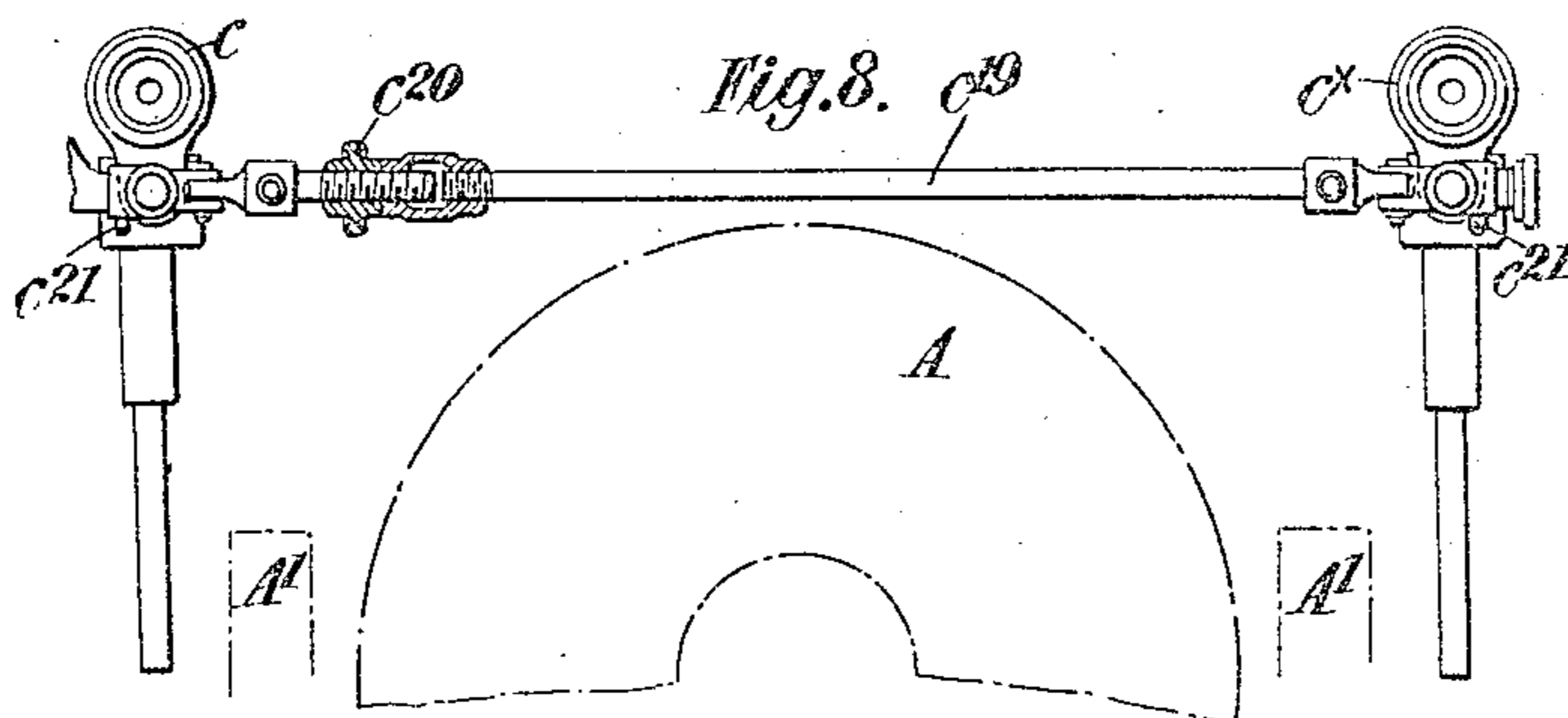
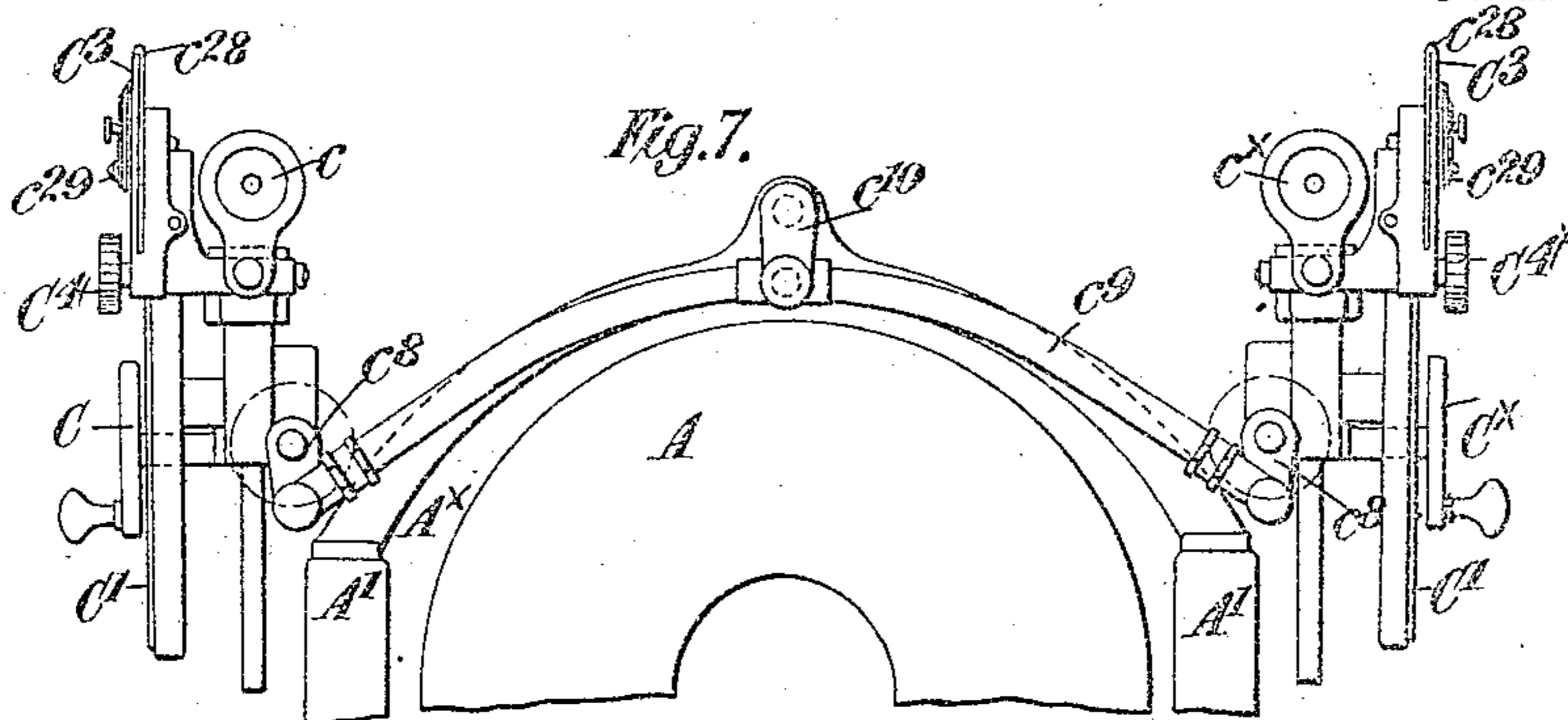
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4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

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

DEVICE FOR SIGHTING AND TRAINING QUICK-FIRING ORDNANCE.

No. 891,601.

Specification of Letters Patent.

Patented June 23, 1908.

Application filed March 14, 1904. Serial No. 198,168.

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, 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 Devices for Sighting and Training Quick-Firing Ordnance, of which the following is a specification.

Our invention relates to the sighting and working of quick firing ordnance, and is for the purpose of effecting the same in a more efficient, reliable and convenient manner than heretofore. We so combine the sighting, elevating and training gear of the mounting, that the different operations may be independently performed by three men situated upon platforms carried from either or both sides of the mounting.

According to our present invention we arrange a complete set of sighting elevating and training gear on each side of the gun, with means for enabling the elevating gear on one side to be thrown out of action when the elevating gear on the other side is to be worked.

Our present invention also has reference to the graduated drums or disks for indicating range and deflection, as will be hereinafter described.

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 a left hand side elevation. Fig. 2 a right hand side elevation, and Fig. 3 a plan of a pedestal mounting for a quick firing gun with our improvements applied thereto. Fig. 4 is a sectional plan showing so much of the parts as is necessary to explain the gearing used for training the gun. Fig. 5 is a front elevation and Fig. 6 a vertical section of the means employed for enabling the elevating gear on one side of the mounting to be thrown out of action when the elevating gear on the other side is to be worked. Figs. 7 and 8 are detail transverse sections taken approximately on the lines

1. 1. and 2. 2. of Fig. 3. Fig. 9 is a detail sectional view on an enlarged scale of part of the arrangement illustrated in Fig. 7 and Fig. 10 is a vertical section on the line 3—3 of Fig. 9. Fig. 11 is a front elevation of the range dial and Fig. 12 is a front elevation of the deflection dial. Fig. 13 is a vertical section showing how the deflection disks or dials are actuated.

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

A is the gun adapted to recoil in the cradle A' which is trunnioned in the mounting B.

C C^x are the hand wheels of the sighting gear, D D^x the hand wheels of the gun elevating gear, and E E^x the hand wheels of the training gear, the gear being in each case duplicated i. e. arranged in two sets on opposite sides of the mounting, each set being worked by three men or numbers standing on the platforms B' B².

D² D^{2x} are shoulder pieces against one of which the man No. 2 controlling the gun elevating gear can lean and steady himself while looking through the sight c or c^x. D³ D^{3x} are pistol grips or firing levers for enabling said man No. 2 to fire the gun.

The two sights c c^x are coupled together by means of transverse connecting rods c⁹ c¹⁰ so that the said sights can be simultaneously actuated from either side of the mounting, for range setting and deflection.

The rod c⁹ is bent and provided near its middle with a crank c¹⁰ carried by a bracket A^x. The ends of said rod are adjustably coupled to cranks or crank disks c⁸ by means of which the elevating gear of one sight is worked from the other. The axle of each of the said cranks c⁸ is provided with a worm c¹¹ that gears with a worm-wheel c¹² mounted on the shaft c¹³ that carries the pinion c¹⁴ for actuating the elevating rack bar c¹⁵ of the sight. On the axle c¹⁶ that carries the crank c⁸ is a bevel pinion c¹⁷ which gears with a bevel pinion c¹⁸ mounted on the axle that carries the hand wheel C or C^x. By revolving one or other of said hand wheels therefore, the two sights can be simultaneously moved for changing their elevation. The said sights are also connected by means of the said cross bar c¹⁹ by means of which they can be actuated

ing the milled heads C^4 C^{4x} be caused to turn laterally about pivots C^5 for simultaneously varying the angle of deflection of each sight, said bar having an adjusting screw c^{20} and
 5 being provided with thumb pieces or spring catches c^{21} for enabling it to be readily connected or disconnected to and from the sights.

The two parts of the aforesaid duplex gun-elevating gear are of the ordinary well known
 10 kind, each gear comprising a worm actuated by the hand wheel D or D^x for operating a worm-wheel mounted on an axle d^x that carries a pinion d gearing with a toothed arc d' on the gun. With our duplex arrangement
 15 of gun elevating gear it is of course necessary that only one of the worm wheels of the said gear should be in operation at a time. For this purpose we arrange a friction clutch on each of the axles d^x , said friction clutches
 20 being made on a quick releasing principle. Metal friction disks d^2 surround the axle d^x and are alternately keyed to the said axle and the worm wheel as is well understood.

d^3 is a screw threaded nut adapted to work
 25 on a correspondingly screw threaded portion of the axle d^x and to apply pressure to the said friction disks d^2 , through the intervention of a Belleville spring washer d^4 , when said nut is turned in the proper direction by a
 30 lever d^5 . The nut has circumferential notches d^6 and is free to move inside the boss of the said lever, except when engaged therewith by a spring plunger catch d^7 carried by the lever and operated by a handle-grip d^8 at the end
 35 of said lever. When the handle-grip d^8 is actuated, the catch d^7 is forced into engagement with one or other of the notches d^6 , so that the nut can then be turned by the movement of the lever d^5 . When the handle-grip
 40 d^8 is free, the catch is disengaged from the notches d^6 by its spring, so that the lever may hang down in a vertical or approximately vertical position and be out of the way of the men. The nut d^3 can then re-
 45 volve without moving the said lever. In order to facilitate the operation of applying the pressure to the friction plates by the said nut, we may introduce a ball bearing d^9 between the surfaces where friction is occasioned
 50 on turning the nut against the resistance of the spring washer d^4 .

For enabling the training of the gun to be performed from either side of the mounting, the shaft e (see Fig. 4) carrying the worm e'
 55 that engages with the usual toothed ring e^2 is furnished with a bevel wheel e^3 near each end. Gearing with these bevel wheels e^3 are bevel pinions e^4 one being carried by a shaft e^5 that is operated by the hand-wheel E^x and the
 60 other being carried by a shaft e^6 that is operated by the hand wheel E . It will thus be seen that either of these hand wheels can be actuated independently of the other without impediment.

The drums or disks C' C^2 for recording the
 65 range and deflection are of comparatively large diameter and the deflection drum C^3 (Fig. 10) is graduated in such manner that there are several (preferably four) series or
 70 sets of graduations, the outermost set c^{24} being for speed and the others c^{25} c^{26} c^{27} being in series for yards range. Each division on the yards series may represent small increments in deflection, say 5 yards. When we graduate
 75 the deflection drum in this manner we sometimes arrange the pointer in two parts c^{28} c^{29} , one part viz. c^{28} working around the periphery of the drum for the speed setting, and the other part viz. c^{29} working on the face of the
 80 disk for setting the deflection in yards. The part c^{29} of the pointer may be adjustable lengthwise so that it can be set to the required radius and the desired deflection to the right or to the left in yards, suitable for
 85 the firing ranges of the gun, the object being that when once the deflection has been given on the speed scale, correction may be made in small increments, when the gun is fired at any range, as may be found necessary from
 90 actual observation of the shooting.

For imparting the motion of the hand wheel or milled head C^4 or C^{4x} to the deflection disk the axle carrying the said milled head is provided with a pinion c^{30} which gears
 95 with a pinion c^{31} carried by the axle c^{32} . This pinion c^{31} gears with a toothed wheel c^{33} which moves with the deflection disk C^3 . We preferably arrange that the direction of the hand wheel or milled head C^4 or C^{4x} , for
 100 actuating the deflection disk or drum, and the direction of the pointer for setting the sight for deflection correspond with the deflection to be given to the projectile; that is to say, turning the drum or pointer towards
 105 the left means that the projectile will strike more to the left, and vice-versa. We also, preferably arrange that the hand wheel C or C^x for actuating the range dial for setting the elevation, shall similarly correspond, that is to say when the hand wheel and the dial
 110 move upwards towards the pointer C^2 recording the graduation, then the muzzle of the gun will require to be raised, thereby increasing range, and conversely, when the hand wheel is moved in the downward direction,
 115 the muzzle of the gun will require to be depressed, thereby diminishing the range.

We do not herein claim either a sight for ordnance comprising two sighting members
 120 disposed one on each side of the gun, means for simultaneously elevating and depressing said members, and means for simultaneously adjusting said members laterally; or, a sight for ordnance comprising two sighting members, one disposed at each side of the gun, and
 125 means for simultaneously adjusting said members,—because the same forms subject-matter of and is claimed by us in our pending reissue

application Serial No. 379,674, filed June 18, 1907, for reissue of our United States Patent No. 792,972 granted June 20, 1905, on an application of the same date as our present application.

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

1. In a gun mounting, means whereby the operations of sighting elevating and training the gun can be independently performed by separate numbers from both sides of the mounting substantially as described.

2. In a gun mounting, the combination with means whereby the operations of sighting elevating and training the gun can be independently performed by separate numbers from both sides of the mounting, of means whereby the gun elevating gear on one side can be rendered inoperative while the gun elevating gear on the other side is in use, substantially as described.

3. In a gun mounting, the combination with means whereby the operations of sighting elevating and training the gun can be independently performed by separate numbers from both sides of the mounting, of toothed wheels forming part of the gun elevating gear on opposite sides of the mounting, friction devices for rendering said toothed wheels operative or inoperative with respect to their axles, spring washers adjacent to said friction devices, and means for exerting or removing pressure on said spring washers substantially as described.

4. In a gun mounting, the combination with means whereby the operations of sighting elevating and training the gun can be independently performed by separate numbers from both sides of the mounting, of toothed wheels forming part of the gun ele-

vating gear on opposite sides of the mounting, friction disks alternately secured to the said toothed wheels and their axles, spring washers situated outside said friction disks, screw threaded nuts mounted on correspondingly screw threaded portions of said axles, hand levers whose bosses surround said nuts, spring handle-grips on said levers, and catches actuated by said handle-grips for engaging with peripheral recesses in said nuts substantially as and for the purpose specified.

5. In a gun mounting, the combination with a sighting device on each side of the gun, of means for enabling the sights to be simultaneously operated from either side of the mounting.

6. In a gun mounting, the combination with a sighting device on each side of the gun, of a deflection disk provided for each sight and having several sets of graduations, the outermost of which is for indicating speed and the other for indicating range, a pointer or index having two parts, one of which is adjustable, and means for actuating said disks simultaneously from each side of the gun.

7. A sight for ordnance comprising two sighting members arranged one at each side of the gun, and means operable from either side of the gun for simultaneously adjusting both of said sighting members.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses this twenty ninth day of February 1904.

ARTHUR TREVOR DAWSON.
GEORGE THOMAS BUCKHAM.

Witnesses:

C. A. SEARLE,
JOHN J. SHIELDS.