A. T. DAWSON AND G. T. BUCKHAM.

ORDNANCE.

APPLICATION FILED MAR. 19, 1920.

1,386,459. Patented Aug. 2, 1921.

Fig. 1.

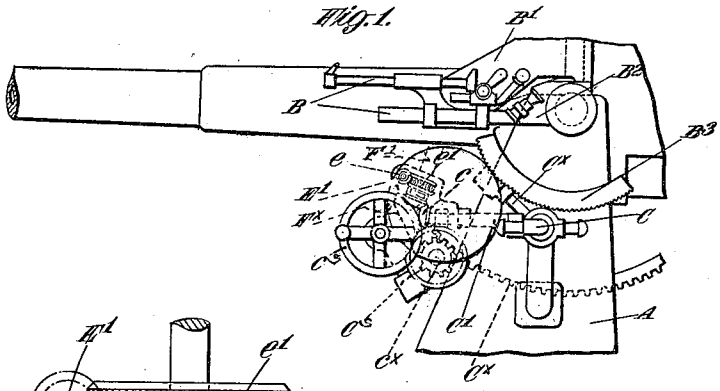
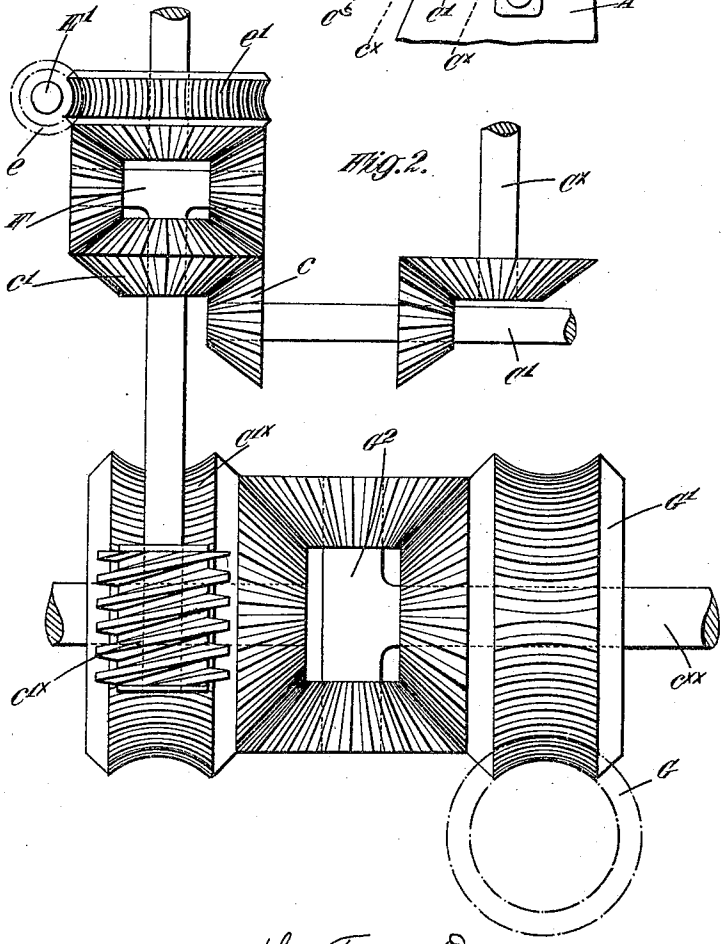


Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## ORDNANCE.

1,386,459. Specification of Letters Patent. Patented Aug. 2, 1921.

Original application filed November 11, 1918, Serial No. 262,086. Divided and this application filed March 19, 1920. Serial No. 367,296.

*To all whom it may concern:*

Be it known that we, Sir ARTHUR TREVOR DAWSON, Bart., and Sir GEORGE THOMAS BUCKHAM, Knight, both subjects of the King of Great Britain, residing at Vickers House, Broadway, Westminster, in the county of London, England, have invented certain new and useful Improvements in or Relating to Ordnance, (for which I have filed application in Great Britain, No. 16680, dated November 13, 1917,) of which the following is a specification.

This invention relates to ordnance, particularly anti-aircraft ordnance, having an independent line of sight and provided with vertical deflection gear for correcting the angle of tangent elevation for a target advancing toward or receding from the gun position.

According to the invention the vertical deflection gear is mounted on the gun carriage and operates through differential gearing to effect relative movement between the gun and the sight so as to correct for an advancing or a receding target, this differential gearing being also operated by the pointing gear to move the gun and the sight together in keeping the sight on the target. In this manner the vertical deflection gear remains in the same position whatever the angle of elevation of the gun may be.

In order that the 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 elevation showing a constructional form of the invention as viewed from the left hand side of the gun, and

Fig. 2 is a diagram of the various gears of Fig. 1.

A is the gun carriage, B, B are the sights, B′ is the sight carrier, $B^2$ the sight bracket, and $B^3$ the toothed elevating arc attached to the sight bracket. C is the double crank hand lever of the pointing gear, this gear comprising a pinion $c^x$ (carried by a shaft $c^{xx}$—Fig. 2) meshing with a toothed arc $C^x$ attached to the gun cradle as is well understood. The hand wheel of the vertical deflection gear and the vertical deflection dial, are situated in the right hand side of the gun and are mounted on a bracket attached to the gun carriage. F is the aforesaid differential gearing mounted in a casing $F^x$ attached to the gun carriage. The pointing hand lever C drives a shaft C′ operating through the bevel wheels $c$, $c'$ (or through a worm and worm wheel) upon the differential gearing F which is also operated upon through a worm $e$ and a worm wheel $e'$ by a shaft E′ driven from the vertical deflection hand wheel.

The vertical deflection gear operates through the said differential gearing upon the pointing arc $C^x$ and the pointing hand lever C, as well as operating upon the differential gearing, operates upon the elevating arc $B^3$ of the sight bracket by a worm carried by a shaft $C^s$, the ratio of the gearing being such that when the hand lever C is moved, assuming that the vertical deflection hand wheel is not being moved, the sight is moved through the same angle as the gun.

G (Fig. 2) is the worm of the ranging gear, this worm meshing with a worm wheel G′ with which and with the aforesaid shaft $c^{xx}$ and a worm wheel $C'^x$ driven by a worm $c'^x$ operated by the bevel wheel $c'$, is associated a differential gear $G^2$. $G^3$ and $G^4$ (Fig. 1) are respectively the handwheel and the dial of the ranging gear. It will be understood from the foregoing that the vertical deflection gear thus moves the gun without the sight, the ranging gear also moves the gun without the sight and the pointing gear moves the gun together with the sight.

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

1. In ordnance, the combination with the gun, the gun cradle, the gun carriage, the sight mounted on the cradle, the pointing gear for elevating the gun and the sight together and the ranging gear for elevating the gun without the sight, of a vertical deflection operating device additional to said ranging and pointing gears and mounted in a fixed position on the carriage, and means whereby said device operates upon part of the pointing gear to move the gun in elevation with respect to the sight so as to correct for an advancing or a receding target.

2. In ordnance, the combination with the gun, the gun cradle, the gun carriage, the sight, the pointing gear comprising an operating device and a pinion meshing with a toothed arc on the cradle, and the ranging

gear for elevating the gun without the sight, of differential gearing interposed between said operating device and said pinion, means driven by said device for moving the sight in unison with the gun, a vertical deflection operating device additional to said ranging and pointing gears and mounted in a fixed position on the carriage and means whereby the last mentioned device operates upon said differential gearing to move the gun in elevation with respect to the sight so as to correct for an advancing or a receding target.

In testimony whereof we affix our signatures.

ARTHUR TREVOR DAWSON.
GEORGE THOMAS BUCKHAM.