

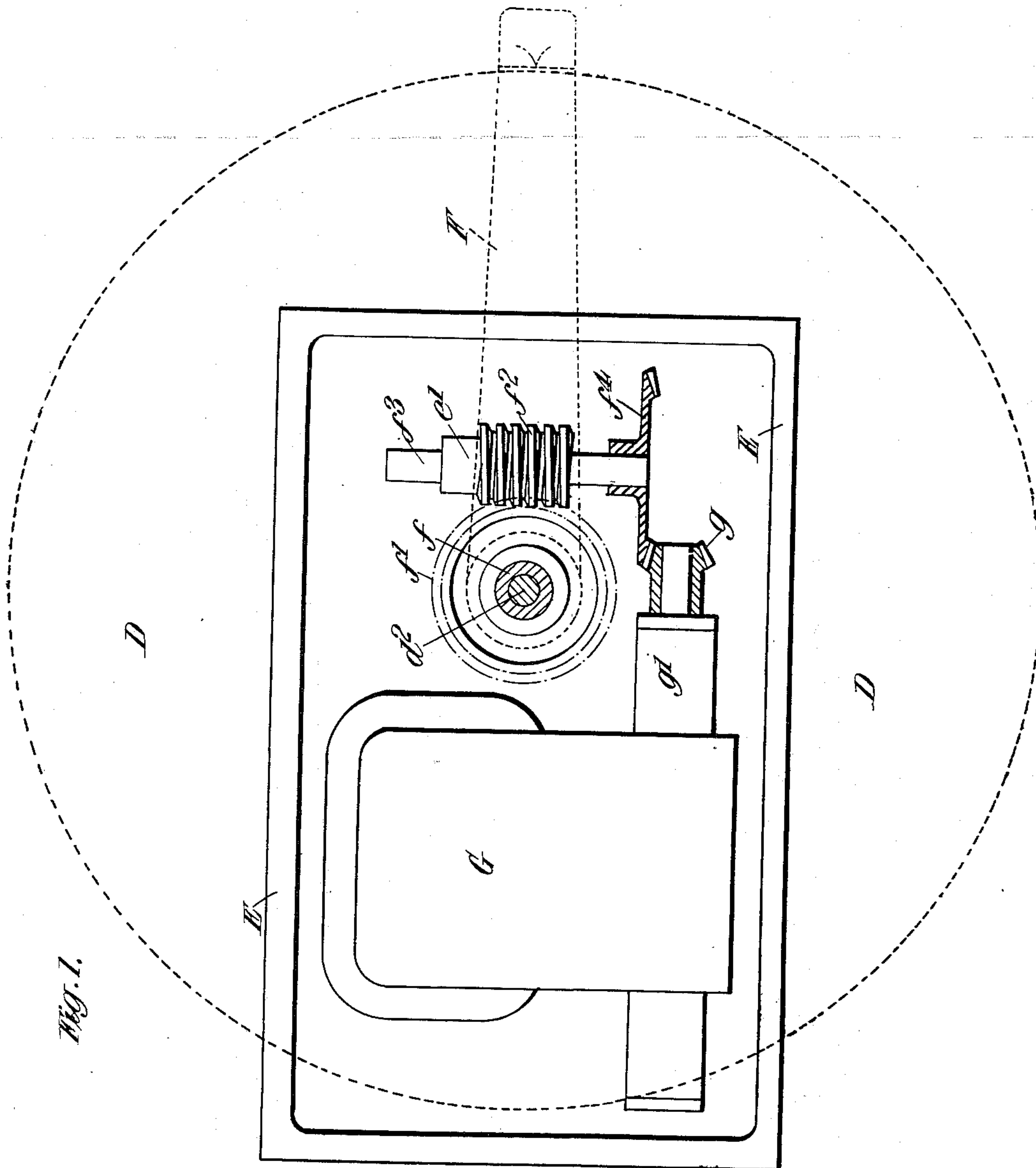
No. 863,593.

PATENTED AUG. 20, 1907.

A. T. DAWSON & G. T. BUCKHAM.
SIGHTING APPARATUS FOR ORDNANCE.

APPLICATION FILED FEB. 1, 1907.

3 SHEETS—SHEET 1.



Witnesses:
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J. E. Nares.

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George Thomas Buckham
By Edward S. Beach
Attorney.

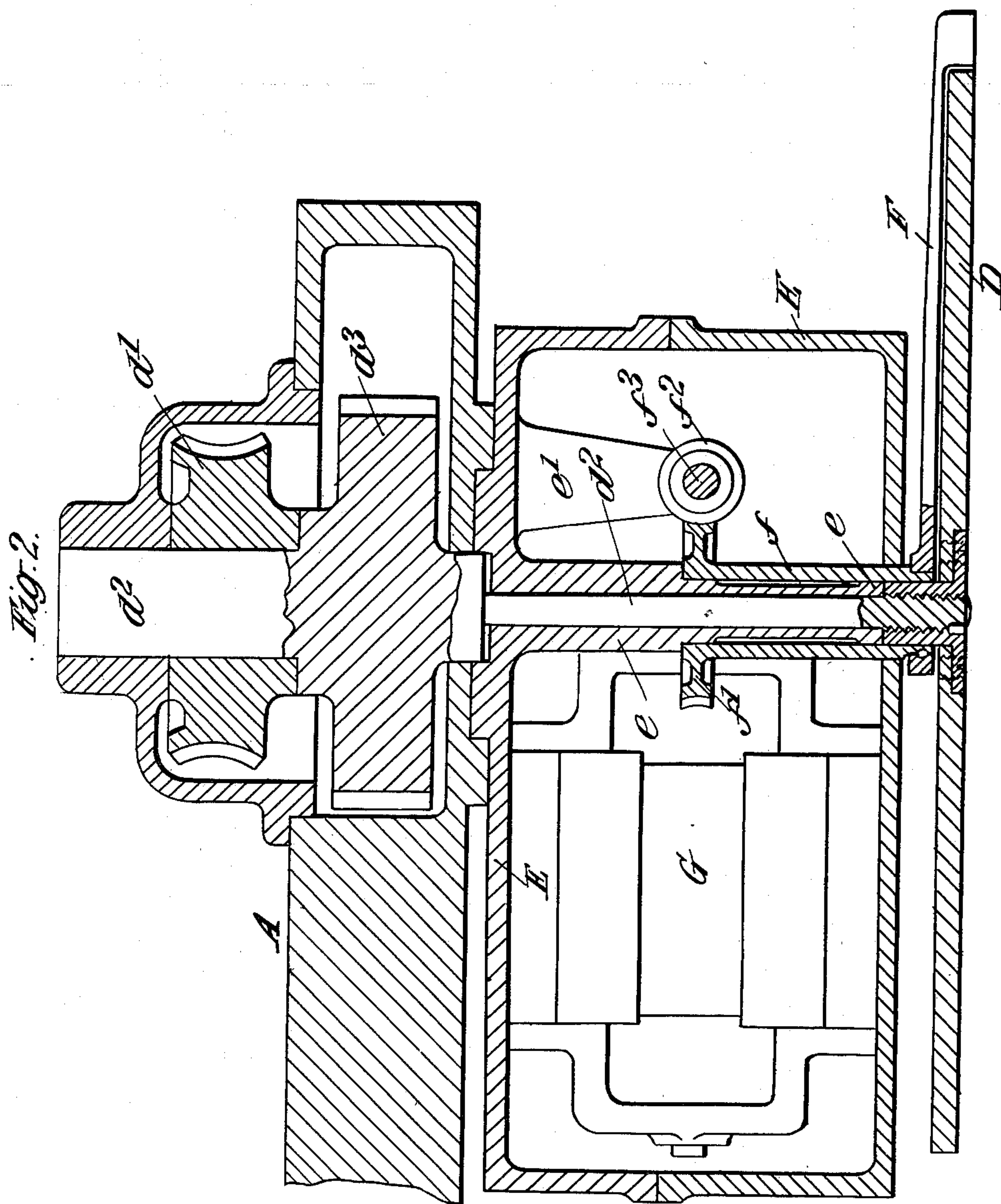
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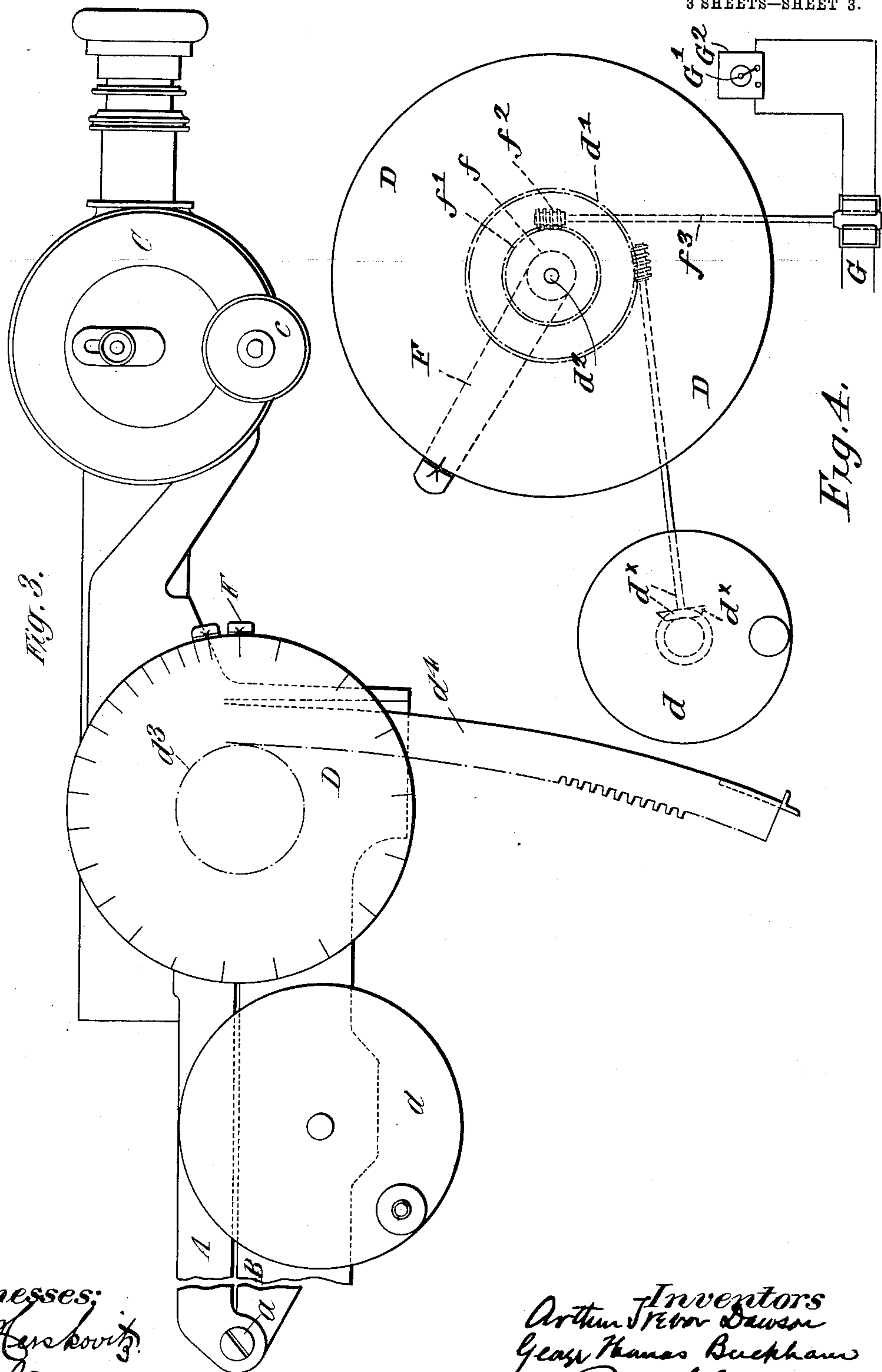
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3 SHEETS—SHEET 3.



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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.

SIGHTING APPARATUS FOR ORDNANCE.

No. 863,593.

Specification of Letters Patent.

Patented Aug. 20, 1907.

Application filed February 1, 1907. Serial No. 355,205.

To all whom it may concern:

Be it known that ARTHUR TREVOR DAWSON, lieutenant of the Royal Navy, director and superintendent of Ordnance Works, and GEORGE THOMAS BUCKHAM, engineer, 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 and Relating to Sighting Apparatus for Ordnance, of which the following is a specification.

This invention relates to sighting apparatus for ordnance.

In the ordinary working of the sights of ordnance, the necessary orders are given from a distant station to the sight setter verbally by telephone, or by mechanical communicating devices, and then the sighting apparatus is adjusted by hand to correspond with such orders. According to our invention we propose to improve this method of working in such a manner as to render the operation quicker, simpler and more accurate than has heretofore been practicable. For this purpose we provide apparatus comprising a traveling pointer which is movable in the plane of a dial, drum, pointer, or other indicating device adapted to be moved by the sighting apparatus during its elevation or adjustment. The said traveling pointer is capable of being actuated or "set" from a distance by mechanical or electrical means, for which purpose we may use a clock movement or any suitable motor capable of being controlled from the place whence the instructions relating to the sighting are transmitted.

In order that our 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 sectional elevation, and Fig. 2 a sectional plan of the apparatus which is adapted to be actuated by an electric motor, and is shown applied to sighting apparatus of the kind in which the traveling pointer coöperates with an indicating device in the form of an ordinary graduated range dial. Fig. 3 is a general elevation of the sighting apparatus. Fig. 4 is a diagrammatic view showing the general arrangement of the system for actuating the apparatus.

A is the usual radial bar carrying the sight proper, said bar being hinged at *a* to the bracket B by which the apparatus is connected with the gun cradle in the ordinary manner.

C is the deflection dial which is actuated by the rotary finger piece *c*.

D is the range dial which is actuated by the hand wheel *d* through the ordinary gearing *d*^x that imparts motion to the worm wheel *d*¹ fixed to the spindle *d*². This spindle *d*² also carries the elevating pinion *d*³ that

gears with the toothed arc *d*⁴ depending from the radial bar A, as is well understood, for changing the angle of elevation of the sight.

In the example of the apparatus illustrated, the aforesaid spindle *d*² extends through a bush *e* forming part of a box or casing E attached to the sight bracket. Around this bush is arranged a sleeve *f* at the outer end of which is the traveling pointer F whose free end is capable of moving about the periphery of the range dial D to any required angular position. The inner end of said sleeve carries a worm wheel *f*¹ which gears with a worm *f*² mounted on a vertical spindle *f*³ carried by a bracket *e*¹ of the said box or casing E. This spindle *f*³ has a bevel wheel *f*⁴ (Fig. 1) that gears with a bevel pinion *g* mounted on the shaft of the armature *g*¹ of the electric motor G inclosed in the said box or casing E. This motor is preferably of the step by step type or class and has the armature arranged to move in quarter turns, as set forth in the specification of our prior application for patent filed on the 27th November 1905 Serial No. 289242 and the said motor is controlled by transmitting apparatus comprising a rotary hand switch G¹ and electric transmitter G² of the kind also set forth in that specification, the said transmitting apparatus being situated at the controlling position or distant station whence the instructions concerning the range are transmitted. When the motor G is thus actuated it will cause the traveling pointer F to assume the required angular position relatively to the dial, to accord with the range transmitted from the sending station. The dial is then moved by the actuation of the hand wheel *d* until an index line on said dial comes opposite a mark on the traveling pointer F, and as the dial and the sight-elevating pinion *d*³ are attached to the same spindle *d*², the sight will be brought to the angle of elevation corresponding to the particular range.

The arrangement of the armature-shaft gearing is preferably such that for every quarter turn of the aforesaid armature, the traveling pointer F will move through angular distances representing ranges of about twenty five (25) yards at low ranges of about say five hundred (500) yards, but at higher ranges, as the angles of elevation increase for a given number of yards range, the angular movements of the pointer will represent ranges of less than twenty-five (25) yards and may, at about eight thousand (8000) yards' range represent five (5) yards.

The above described apparatus can be arranged in connection with the various sighting apparatus of a group of guns so that the sight setting of the entire group can be controlled by one transmitting switch.

Obviously the deflection dial C may also be furnished with a traveling pointer geared with an electric motor operating as described with reference to the range dial

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

1. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of an indicating device adapted to move simultaneously with the change in elevation of the sight, a traveling pointer movable in a path adjacent to the path of movement of the indicating device, and means for actuating said traveling pointer from a distance.
2. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of an indicating device adapted to move simultaneously with the change in elevation of the sight, a traveling pointer movable in a path adjacent to the path of movement of the indicating device, a motor operatively connected with said traveling pointer for driving it, and means for controlling said motor from a distance.
3. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of an indicating device adapted to move simultaneously with the change in elevation of the sight, a traveling pointer movable in a path adjacent to the path of movement of the indicating device, an electric motor operatively connected with said traveling pointer for driving it, and means for controlling said motor from a distance.
4. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of an indicating device adapted to move simultaneously with the change in elevation of the sight, a traveling pointer movable in a path adjacent to the path of movement of the indicating device, an electric motor operatively connected with said traveling pointer for driving it, and electric transmitting apparatus situated at the distant station for controlling said motor.
5. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of an indicating device adapted to move simultaneously with the change in elevation of the sight, a traveling pointer movable in a path adjacent to the path of movement of the indicating device, an electric motor operatively connected with said traveling pointer for intermittently driving it, transmitting apparatus situated at the distant station for controlling said motor, electric circuits connecting the said motor and transmitting apparatus, and a rotary hand switch also situated at the said distant station and controlling the aforesaid electric circuits.
6. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of a range dial adapted to move simultaneously with the change in elevation of the sight, a traveling pointer movable in a circular path adjacent to the periphery of the range dial, and means for actuating said traveling pointer from a distance.
7. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of a range dial adapted to move simultaneously with the change in elevation of the sight, a traveling pointer movable in a circular path adjacent to the periphery of the range dial, a motor operatively connected with said traveling pointer for driving it, and means for controlling said motor from a distance.
8. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of a range dial adapted to move simultaneously with the change in elevation of the sight, a traveling pointer movable in a circular path adjacent to the periphery of the range dial, a motor geared with said traveling pointer for driving it, and means for controlling said motor from a distance.
9. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of a range dial adapted to move simultaneously with the change in elevation of the sight, a traveling pointer movable in a

circular path adjacent to the periphery of the range dial, a motor situated adjacent to the range dial and geared with said traveling pointer for driving it, and means for controlling said motor from a distance.

10. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of a range dial geared with said means for changing the elevation of the sight, a traveling pointer movable about the axis of revolution of the range dial and in a circular path adjacent to the periphery thereof, a motor situated adjacent to the range dial, toothed gearing coupling said motor to the traveling pointer, and means for controlling said motor from a distance.

11. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of a range dial geared with said means for changing the elevation of the sight, a traveling pointer movable about the axis of revolution of the range dial and in a circular path adjacent to the periphery thereof, an electric motor situated adjacent to the range dial, toothed gearing coupling said motor to the traveling pointer, and electric transmitting apparatus situated at a distant station for controlling said motor.

12. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of a range dial adapted to move simultaneously with the change in elevation of the sight and bearing a spot or mark near its periphery, a traveling pointer movable in a circular path adjacent to the path of movement of the said spot or mark on the periphery of the range dial, a motor operatively connected with said traveling pointer for driving it, and means for controlling said motor from a distance.

13. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of a graduated range dial adapted to move simultaneously with the change in elevation of the sight and bearing a spot or mark near its periphery, a traveling pointer movable in a circular path adjacent to the path of movement of the said spot or mark on the periphery of the range dial, a motor operatively connected with said traveling pointer for driving it, and means for controlling said motor from a distance.

14. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of a graduated range dial adapted to move simultaneously with the change in elevation of the sight and bearing a spot or mark near its periphery, a traveling pointer movable in a circular path adjacent to the path of movement of the said spot or mark on the periphery of the range dial, an electric motor operatively connected with said traveling pointer for driving it, and electric transmitting apparatus situated at a distant station for controlling said motor.

15. In gun sighting apparatus, the combination with the means for changing the elevation of the sight, of a graduated range dial adapted to move simultaneously with the change in elevation of the sight and bearing a spot or mark near its periphery, a traveling pointer movable in a circular path adjacent to the path of movement of the said spot or mark on the periphery of the range dial, an electric motor situated adjacent to the range dial, toothed gearing coupling said motor to the traveling pointer, and electric transmitting apparatus situated at the distant station for controlling said motor.

In testimony whereof we affix our signatures in presence of two witnesses this seventeenth day of January 1907.

ARTHUR TREVOR DAWSON.
GEORGE THOMAS BUCKHAM.

Witnesses:

HENRY KING,
H. PETER VENN.