

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

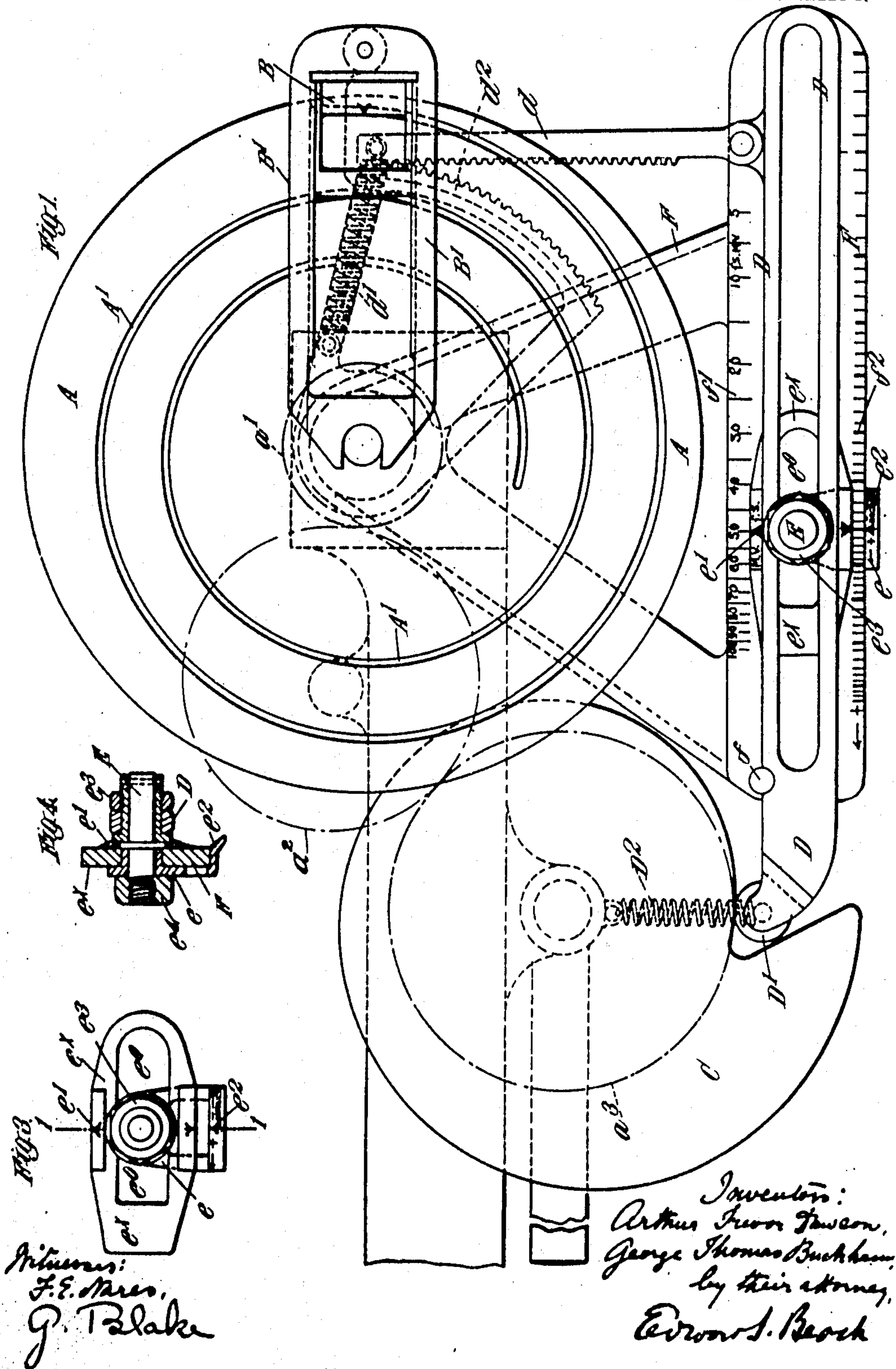
SIGHTING APPARATUS FOR GUNS.

APPLICATION FILED JUNE 1, 1907.

899,207.

Patented Sept. 22, 1908.

2 SHEETS—SHEET 1.



Witness:
F. E. Mares,
J. T. Blake

Inventors:
Arthur Trevor Dawson,
George Thomas Buckham,
by their attorney,
Edmond S. Beach

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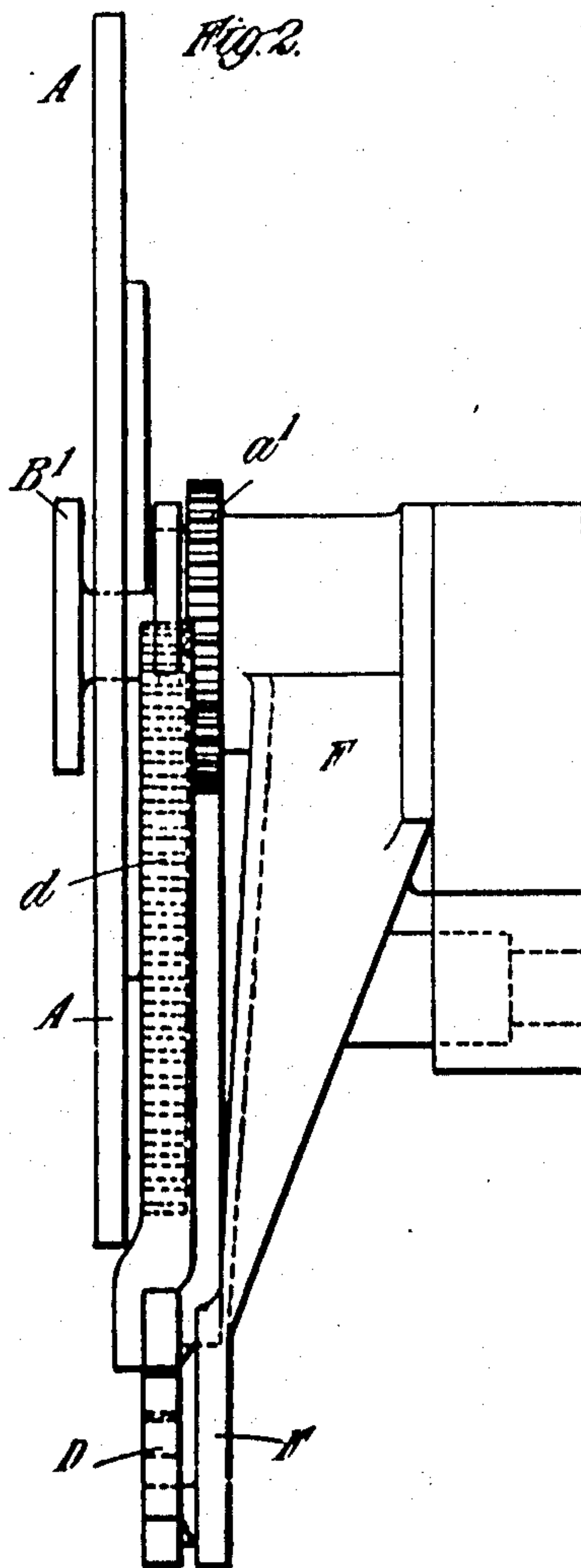
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UNITED STATES PATENT OFFICE.

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

SIGHTING APPARATUS FOR GUNS.

No. 899,207.

Specification of Letters Patent.

Patented Sept. 22, 1908.

Application filed June 1, 1907. Serial No. 376,813.

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 Improvements in
10 Sighting Apparatus for Guns, of which the following is a specification.

This invention relates to sighting apparatus for guns, and has for its chief object to enable corrections to be made in the sighting
15 in order to compensate for the variations that arise from the fall in muzzle velocity due to repeated firing of the gun and also those that arise from differences in the temperature of the charges resulting from the climatic con-
20 ditions, as regards heat and cold, which prevail at different parts of the globe.

The principle upon which our apparatus is constructed is that the alteration in the range for given elevation of the gun is pro-
25 portional to the alteration in muzzle velocity and also to the variation of the normal temperature of the charges. For instance at a given elevation of the gun the decrease in range, due to a diminution of a given number
30 of foot-seconds, is approximately twice that which is due to a diminution of half that number of foot-seconds.

For the purpose of our invention we employ in conjunction with the range dial a
35 cam which by means of suitable gearing receives motion from the range dial and is adapted to transmit angular movement to the range pointer through the intervention of suitable mechanism which is capable of
40 being set to compensate for the aforesaid variations in the muzzle velocity and the temperature of the charges.

According to our invention, when applied to sighting apparatus of the kind in which a
45 spirally grooved range dial and a radially movable pointer are employed, the cam is adapted to make one complete revolution for the maximum elevation of the sight and is adapted to act, through the intervention of
50 a roller, upon a lever which is capable of rocking about a suitable pivot. The said guide in which the aforesaid pointer moves by the action of the spiral groove in the dial is adapted to receive angular displacement about the
55 axis of revolution of the said dial, by the

movement of the cam-actuated lever about its pivot, this movement being transmitted through suitable gearing.

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

Figure 1 is a front elevation of our improved apparatus applied to sighting appa-
65 ratus of the kind above stated. Fig. 2 is a side elevation of the same as seen from the right of Fig. 1. Fig. 3 is a front elevation of the adjustable pivot about which the afore-
70 said cam-actuated lever rocks. Fig. 4 is a vertical section of said pivot taken on the line 1—1 of Fig. 3.

A is the range dial, and A' its graduated spiral groove. B is the radially movable pointer that engages with the said spiral
75 groove in the well known manner and B' is the guide in which said pointer moves during the revolution of the dial.

C is the cam, D the lever actuated thereby, and E the pivot about which said lever rocks
80 when thus actuated. The said cam C is arranged with its axis of revolution parallel to the axis of revolution of the range dial A. By means of gear wheels a' , a^2 , a^3 the said cam is adapted to revolve once for two and
85 one-sixth revolutions which the range dial is (in the example shown) intended to perform during the maximum elevation of the sight. The throw of this cam for any elevation of
90 the sight is proportional to the angle subtended on the range dial by the decrease in range due to a fall of x foot seconds in the muzzle velocity. Carried by a frame or
95 bracket F is the slotted lever D which is adapted to be rocked about the adjustable pivot E by the action of the said cam C upon a roller D' situated at the contiguous end of the lever and constantly kept pressed against the cam by a spring D². The said lever has
100 hinged thereto a rack d which, under the influence of a spring d' , is kept in engagement with a toothed sector d^2 . This sector together with the pointer-guide B', is free to swing about the axis of revolution of the range dial. The said bracket F to which the
105 lever D is pivoted is furnished with a stop-pin f against which said lever bears when in the position indicated in the drawings. The bracket F is provided with two sets of graduations or scales f' , f^2 , the former being ar- 110

ranged contiguous to the upper edge and the
 latter contiguous to the lower edge of the le-
 ver D. The upper scale f' indicates the alter-
 ations in muzzle velocity and is so construct-
 ed that if the adjustable pivot E of the said
 5 slotted lever D is shifted along this scale, the
 movement imparted by the cam C to the said
 toothed sector d^2 and consequently to the
 pointer-guide B' is equal to the angle sub-
 10 tended by the alteration in range for the
 given decrease in muzzle velocity. The
 lower scale f^2 indicates the alterations re-
 quired for changes in the temperature of the
 charges and is so arranged that successive
 15 graduations or markings denote equal differ-
 ences of temperature. The aforesaid ad-
 justable pivot E is mounted in a slide e hav-
 ing a pointer e^2 which is capable of movement
 along the temperature scale f^2 when the said
 20 pivot E is moved along the slotted lever D.
 Movable with the said pivot E is also another
 slide e^x having a pointer e' capable of move-
 ment on the muzzle velocity scale f' , and this
 last mentioned slide is also formed with a
 25 slot e^o to render it capable of small lateral
 movement relatively to the adjustable
 pivot E.

In order to set the apparatus for correc-
 tions due to a given decrease in muzzle ve-
 30 locity and a known variation in the tempera-
 ture of the charge, the muzzle velocity slide
 e^x and the adjustable pivot E are set into the
 proper position relatively to the muzzle
 velocity scale so as to indicate the alteration
 35 in the muzzle velocity. The said pivot E is
 then moved independently of the muzzle
 velocity slide to shift the temperature slide e
 along the temperature scale f^2 , it being un-
 derstood that the direction of movement of
 40 said temperature slide will be towards the
 cam C if the temperature is above the normal
 and in the opposite direction if the tempera-
 ture is below the normal. The aforesaid set-
 ting of the slides and pivot having been ef-
 45 fected the parts are clamped by nuts e^3 e^4 on
 the said pivot or by other appropriate means;
 it will of course be understood that the ampli-
 tude of movement of the lever D about its
 pivot E when actuated by the cam C is greater
 50 or less according as said pivot E is shifted to-
 wards or away from the cam C, whereby a
 correspondingly greater or less angular move-

ment is imparted to the pointer guide B' and
 its pointer B.

Although we have described our invention 55
 with particular reference to sighting appara-
 tus in which a spirally grooved range dial and
 radially movable pointer are employed we
 wish it to be understood that the said inven-
 tion is applicable to other forms of sighting 60
 apparatus in which a range dial and dis-
 placeable pointer are employed.

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

1. In gun sighting apparatus, the combi- 65
 nation with the range dial and its pointer, of
 a cam operating in conjunction with the
 range dial, mechanism for transmitting an-
 gular motion to the pointer from the cam,
 and means for enabling said mechanism to be 70
 set to compensate for variations in shooting
 due to atmospheric influence and to changes
 in the muzzle velocity.

2. In gun sighting apparatus, the combi-
 nation with the range dial and its pointer, of 75
 a cam operating in conjunction with the
 range dial, a lever for transmitting angular
 motion to the pointer from the cam, and
 means for varying the degree of movement
 transmitted by said lever from the cam to the 80
 pointer.

3. In a gun sighting apparatus, the com-
 bination with the range dial and its pointer,
 of a cam operating in conjunction with the
 range dial, a lever for transmitting angular 85
 motion to the pointer from the cam, and
 means for varying the amplitude of move-
 ment of said lever about its fulcrum.

4. In gun sighting apparatus, the com-
 bination with the range dial and its pointer, 90
 of a cam operating in conjunction with the
 range dial, a lever for transmitting angular
 motion to the pointer from the cam through
 suitable gearing, and means for enabling the
 fulcrum of the lever to be shifted toward or 95
 away from the said cam and set in relation to
 suitable scales.

In testimony whereof we affix our signa-
 tures in presence of two witnesses

ARTHUR TREVOR DAWSON.
 GEORGE THOMAS BUCKHAM.

Witnesses:

HENRY KING,
 E. E. LARKINS.