July 2, 1935. B. P. JOYCE 2,006,896

ADJUSTING MEANS FOR ORDNANCE SIGHTS AND OTHER INSTRUMENTS

Original Filed Dec. 4, 1934

FIG. 1

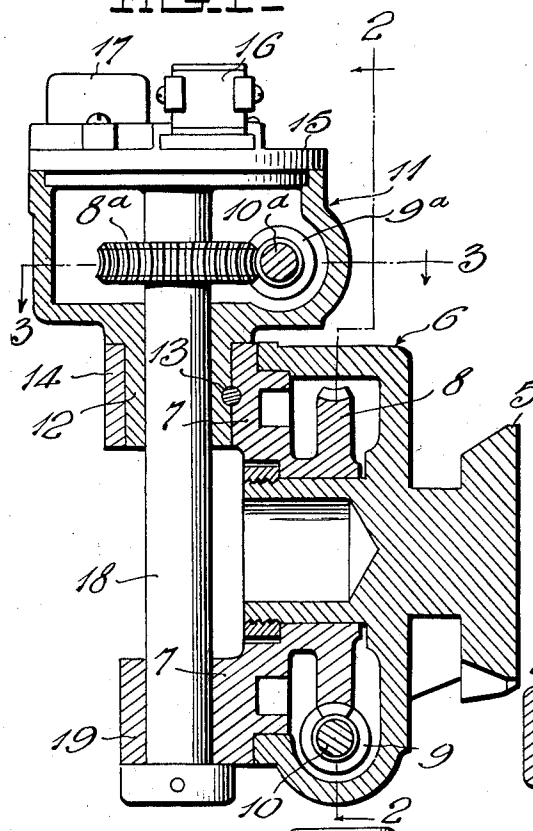


FIG. 2

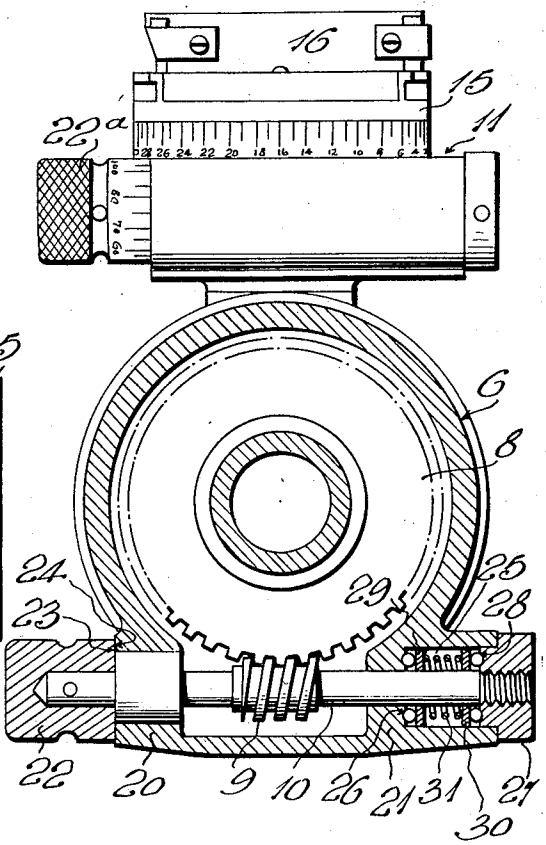


FIG. 3

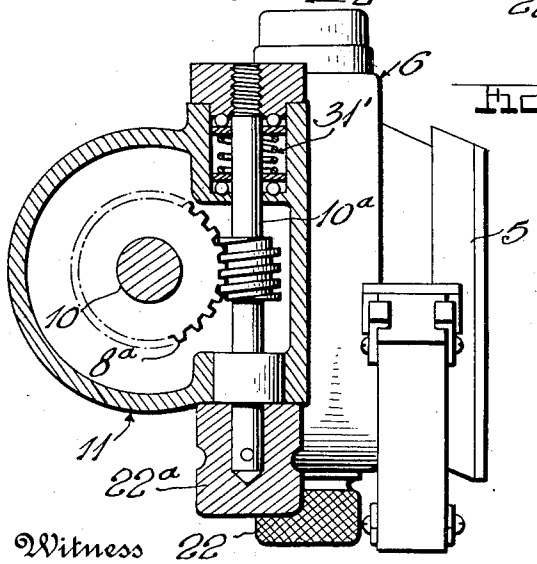
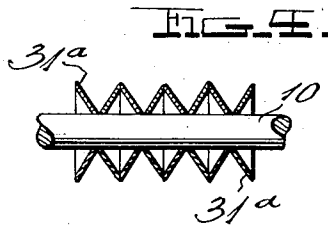


FIG. 4



Witness
H. Woodard

Inventor
BRYAN P. JOYCE

By H. B. Williamson & Co
Attorneys.

Patented July 2, 1935 2,006,896

UNITED STATES PATENT OFFICE

2,006,896

ADJUSTING MEANS FOR ORDNANCE SIGHTS AND OTHER INSTRUMENTS

Bryan Pope Joyce, East Orange, N. J., assignor to American Armament Corporation, New York, N. Y., a corporation of New York

Original application December 4, 1934, Serial No. 755,984. Divided and this application March 13, 1935, Serial No. 10,936

7 Claims. (Cl. 74—425)

This application is a division of my parent U. S. application, Serial No. 755,984, filed December 4, 1934 on an ordnance sight.

Various forms of ordnance sights include adjusting means for use in sight setting, and the present invention aims to provide new and improved instrument adjusting means which when applied to such sights, will not jar out of adjustment when firing the gun, mortar or the like, on which the sight is used. When employed on instruments other than ordnance sights, the adjusting means will also be proof against accidentally moving out of adjustment due to jars, vibration, etc.

With the foregoing in view, the invention resides in the novel subject matter hereinafter described and claimed, description being accomplished by reference to the accompanying drawing.

Fig. 1 is a vertical transverse sectional view through an ordnance sight of the construction shown in the parent application above mentioned, said sight embodying the improved adjusting means.

Fig. 2 is a vertical sectional view on line 2—2 of Fig. 1.

Fig. 3 is a horizontal sectional view on line 3—3 of Fig. 1.

Fig. 4 is a detail vertical sectional view showing a modification.

A sight is shown provided with a dove-tail 5 for use in mounting it, said dove-tail being joined to one end wall of a short cylindrical casing 6 whose other end wall 7 is rotatably mounted for turning about the casing axis, said wall 7 being provided with a worm-wheel 8 within the casing 6 meshing with a worm 9 on an adjusting shaft 10 used to adjust the sight for elevation. The casing end wall 7 supports a second short cylindrical casing 11 connected therewith in the present disclosure by a downwardly projecting hub 12 secured by a pin 13 in a boss 14 on said end wall 7. A top wall 15 of the casing 11 is rotatable and carries a sighting device 16 and a leveling device 17. A shaft 18 is secured to the top wall 15 and passes rotatably through the hub 12 and through a bearing lug 19 on the end wall 7, said shaft 18 having a worm wheel 8^a in the casing 11 meshing with a worm 9^a on an adjusting shaft 10^a used to set the sight for traverse.

The construction so far briefly explained is claimed in the parent application above mentioned, and the gist of the present invention will now be described.

The adjusting shaft 10 associated with the casing 6, extends outwardly through bearing bosses 20 and 21 carried by said casing, said shaft being provided with an operating knob 22 at the exterior of the boss 20. The inner end 23 of this knob abuts the outer end 24 of the boss 20 and said abutting ends constitute frictional braking surfaces for holding the shaft 10 in adjusted position. The boss 21 is internally enlarged at its outer end, providing a recess 25 around the shaft 10, and the inner end 26 of this recess constitutes a thrust shoulder facing in the same direction as the surface 23. A collar or the like 27 is secured on the shaft 10 and closes the outer end of the recess 25, the inner end 28 of said collar or the like constituting a thrust shoulder which is spaced longitudinally of said shaft from the shoulder 26 and faces toward the latter. A non-torsional spring device which may be of the type shown in Fig. 2 or of the form shown in Fig. 4, surrounds the shaft 10 within the recess 25, thrusts in one direction on the shoulder 26 and in the other direction on the shoulder 28. This non-torsional spring device exerts an endwise pressure on the shaft 10 holding the frictional braking surfaces 23 and 24 in contact with each other, to hold said shaft 10 after it has been rotated for elevational adjustment. The non-torsional characteristic of the spring device insures that it shall not be torsionally tensioned by rotation of the shaft 10, for it has been found that any spring device which is so tensioned by rotation of the shaft, springs back to its original position when the gun or mortar is fired, causing slight rotation of the adjusting shaft and moving the sight out of adjustment.

In Fig. 2, the non-torsional spring device consists of two annular anti-friction bearings 29 and 30 surrounding the shaft 19 and abutting the shoulders 26 and 28 respectively, and a coiled compression spring 31 interposed between and abutting said bearings. In Fig. 4, however, the non-torsional spring device is formed from a plurality of cupped resilient washers 31^a.

The adjusting shaft 10^a is mounted in the same manner as the shaft 10, said shaft 10^a being provided with an operating knob 22^a at the exterior of the casing 11 and being provided with means 31′ whereby it is held in adjusted position. This means 31′ may be identical with the corresponding means shown in Fig. 2 or may be of the form shown in Fig. 4.

It will be seen from the above, that a very simple, compact and durable construction has been provided which will well withstand the shocks of

firing, without either being injured or being jarred out of adjustment. It will also be clear that while the invention is disclosed in connection with a sight, it is not restricted to this particular instrument. Then too, while certain details of construction have been illustrated, it will be understood that variations may be made within the scope of the invention as claimed.

I claim:

1. In an instrument having a rotatable adjusting shaft; end facing frictional braking surfaces for said shaft carried one by the shaft and the other by a non-rotatable part of the instrument, and a non-torsional spring device exerting an end thrust on said shaft to hold said frictional braking surfaces in contact.

2. In an adjusting means for an instrument having a casing; a rotatable member having a worm wheel within said casing, a worm in said casing meshing with said worm wheel, a shaft carrying said worm, said casing being provided with bearing bosses through which the ends of the shaft extend, a knob on one end of said shaft abutting the outer end of one of said bosses, the other of said bosses being internally enlarged at its outer end to provide a recess around said shaft, a collar secured on said shaft and closing the outer end of said recess, and a non-torsional spring device confined in said recess and thrusting in opposite directions against said collar and the inner end wall of said recess to frictionally hold said knob against the outer end of said one boss and prevent accidental rotation of the knob, shaft and worm.

3. In an adjusting means for an instrument having a body; an adjusting shaft rotatable in said body, said body and shaft having frictional shaft-holding surfaces abutting in a plane transverse to the shaft, said body having a thrust shoulder facing in the same direction as the friction surface of said shaft, said shaft being provided with a thrust shoulder spaced longitudinally of the shaft from the aforesaid thrust shoulder and facing the latter, and a non-torsional spring device surrounding said shaft and forcing in opposite directions on said thrust shoulders, whereby said spring devices will hold said frictional shaft-holding surfaces in contact and will not be torsionally tensioned when said shaft is rotated.

4. In an adjusting means for an instrument having a body; an adjusting shaft rotatable in said body, said body and shaft having frictional shaft-holding surfaces abutting in a plane transverse to the shaft, said body having a thrust shoulder facing in the same direction as the friction surface of said shaft, said shaft being provided with a thrust shoulder spaced longitudinally of the shaft from the aforesaid thrust shoulder and facing the latter, anti-friction bearings surrounding said shaft and abutting said thrust shoulders respectively, and a compression spring surrounding said shaft, said spring being interposed between and abutting said anti-friction bearings, whereby said spring will hold said frictional shaft-holding surfaces in contact and will not be torsionally tensioned when said shaft is rotated.

5. A structure as specified in claim 1; said non-torsional spring device consisting of a series of cupped resilient washers.

6. A structure as specified in claim 3; said non-torsional spring device consisting of a series of cupped resilient washers.

7. A structure as specified in claim 1; said non-torsional spring device comprising a coiled compression spring and at least one annular anti-friction bearing abutting an end of said spring.

BRYAN POPE JOYCE.