

J. E. FAHS.  
 INCLINOMETER.  
 APPLICATION FILED JULY 29, 1918.

1,298,484.

Patented Mar. 25, 1919.

Fig. 1.

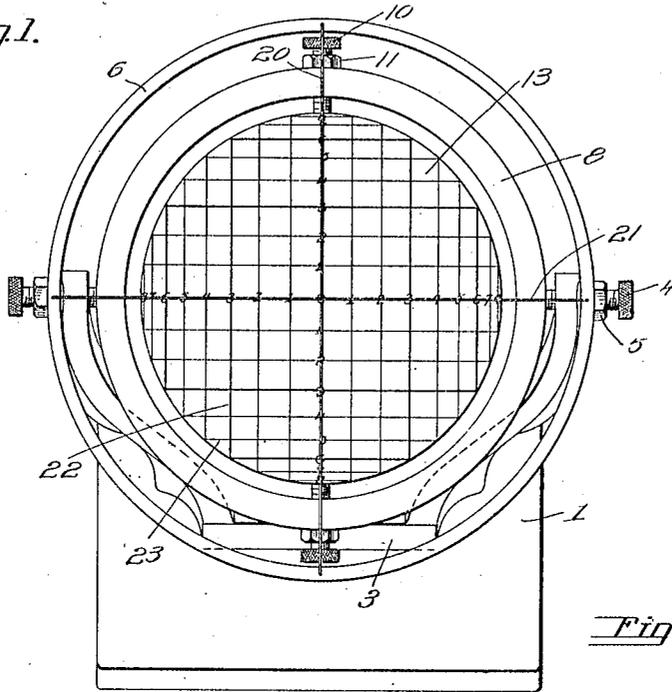


Fig. 3.

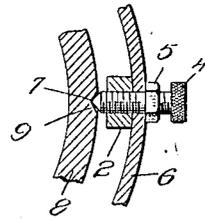


Fig. 4.

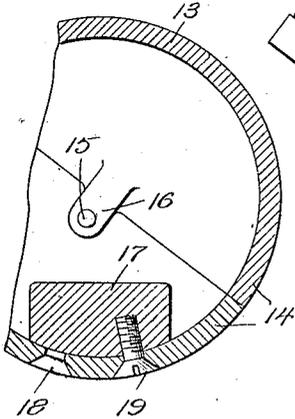
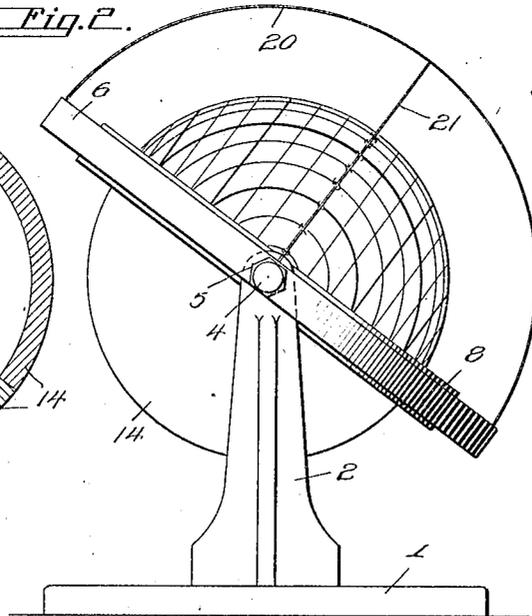


Fig. 2.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## INCLINOMETER.

1,298,484.

Specification of Letters Patent.

Patented Mar. 25, 1919.

Application filed July 29, 1918. Serial No. 247,195.

*To all whom it may concern:*

Be it known that I, JOHN E. FAHS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Inclinerometers, of which the following is a specification.

My present invention pertains to indicating devices of the kind that are adapted to accommodate themselves to different conditions.

The object of the invention is the provision of what I denominate an inclinometer, because the device is constructed and arranged primarily with a view to enabling an aviator, more especially a student aviator, to ascertain by reference to the device the angle of inclination at which he is ascending or descending, as well as the angle at one side or the other of a vertical plane.

To the attainment of the foregoing the invention consists in the inclinometer comprising certain essential elements, as well as in the peculiar construction, novel combinations, and adaptation of parts, all as hereinafter explicitly described and pointed out in my appended claims.

In the accompanying drawings, which are hereby made a part hereof:

Figure 1, is a view showing the inclinometer constituting the best practical embodiment of my invention of which I am cognizant as the same appears when a person looks downwardly upon the face of the device.

Fig. 2 is a side elevation of the same.

Fig. 3 is a detail section illustrative of the manner in which the annulus is mounted in the standards.

Fig. 4 is a detail section showing the adjustable capacity of the weight in the globular member of the device.

Similar numerals of reference designate corresponding parts in all of the views of the drawings.

In addition to a base 1 which may be a support of any description, my novel device comprises standards 2, preferably formed integral with a transverse intermediate portion 3, superimposed upon and suitably fixed to the base.

Bearing in the upper portions of the standards 2 are screws 4, equipped with nuts 5, and pivotally mounted at diametrically opposite points on the said screws 4 is an annulus 6; the said annulus being interposed between the nuts 5 and the standards 2, Fig. 2, in order that the nuts 5 may be used to clamp the annulus against the standards and thereby adjustably fix the annulus in the position desired. The inner ends of the screws 4 are conical, as indicated by 7, and on the said conical ends is pivotally mounted the inner annulus 8 of the device, said annulus 8 having seats 9 to receive the inner ends of the screws as shown, in such manner as to leave the annulus 8 free to swing in a vertical plane. Manifestly in addition to the function ascribed to the nuts 5 said nuts are adapted to serve the additional purpose of jam nuts for preventing casual movement of the screws 4.

Bearing in the inner annulus 8 at points midway between the bearing points of said annulus are screws 10, equipped with jam nuts 11, and having their inner ends cone shaped, and mounted between and upon the inner ends of the said screws 10 is the globular member 13 of the device. The said globular member is adapted to turn on an axis extending through the screws 10, and is preferably, though not necessarily, of the specific construction illustrated—*i. e.*, is made up of two semi-globular sections 14, detachably connected together by diametrically opposite screws 15, counter-sunk in one section and threaded into lugs 16 carried at the inner side of the other section, and a weight 17 arranged in the globular member and possessed of adjustable capacity for the purpose hereinafter set forth. The weight may be adjustably fixed in the member 13 in any approved manner, the mode illustrated comprising a plurality of apertures 18 in the plain section of the member, and a screw 19 adapted to be seated in any one of the apertures 18 and threaded into the weight as illustrated.

Suitably connected together at points midway between their ends are fine wires 20 and 21 which are reduced to arcuate form

and have their ends socketed in or otherwise connected to the outer annulus 6 at equi-distant points.

As will be observed by comparison of Figs. 1 and 2 the exposed half of the globular member 13 is divided by lines 22 and 23, analogous to lines of longitude and latitude, respectively, and the vertical central and horizontal central lines are preferably though not necessarily, numbered from zero at the center outwardly from the center as illustrated.

The outer annulus 6 and the weight 17 in the globular member are preferably made adjustable as described in order that irrespective of the position of the device in an aeroplane the vertical central and horizontal central lines on the globular member 13 will be in registration with the pointers, preferably wires, 20 and 21, when the aeroplane is in a level position.

The scheme of my invention is to provide means to enable an aviator more especially a student aviator to determine by reference to the device the angle of inclination at which he is ascending or descending in a line perpendicular to the earth as well as to determine to what extent he is diverging from said perpendicular line in one direction or the other, with a view to conducing to the factor of safety incident to the handling of the aeroplane, and to enable the aviator to initiate a flight and make a landing to better advantage. It will be apparent in this connection that by observing the changes in position of the globular member, relative to the pointers or pointer wires, or vice-versa, the aviator will be able to ascertain the angles at which he is progressing, and this even when the numerals referred to are omitted from the globular member.

It will be apparent from the foregoing that the globular member 13 is universally connected with the support by which it is carried, this mode of mounting being essential in order to enable the aviator to determine the angle at which he is moving vertically as well as the angle at one side or the other of the vertical plane.

Having described my invention what I claim and desire to secure by Letters-Patent is:

1. An inclinometer comprising supporting means, pointer means carried by the supporting means, and an eccentrically weighted and graduated globular member pivoted to turn about an axis passing through its center and mounted in the supporting means to move relatively to the pointer means.

2. An inclinometer comprising supporting means, pointer means carried by the supporting means, swinging means mounted in the supporting means, and an eccentrically

weighted and globular member pivoted to turn about an axis passing through its center and mounted to turn on its axis in said swinging means.

3. An inclinometer comprising supporting means, a swinging annulus, a graduated weighted globular member movable about its axis in the annulus at right angles to the axis of rotation of the annulus, and pointer means carried by the supporting means and adapted to cooperate with the globular member.

4. An inclinometer comprising supporting means, an annulus mounted to swing therein, a weighted globular member mounted in the annulus to swing at right angles to the axis of rotation of the annulus and having graduations extending at right angles to each other, and arcuate pointer wires carried by the supporting means and disposed at right angles to each other and approximately concentric to the surface of the globular member.

5. An inclinometer comprising supporting means, an annulus mounted to swing in said means, a graduated and weighted globular member mounted in the annulus to swing at right angles to the axis of rotation of the annulus, a second annulus mounted to swing on the supporting means, and an arcuate pointer wire carried by the second named annulus.

6. An inclinometer comprising standards, screws bearing in the standards and equipped with nuts, an annulus adjustably mounted on the screws and interposed between the nuts and standards, arcuate pointer wires carried by the annulus and disposed at right angles to each other, an annulus mounted to swing on the inner portions of said screws, and a graduated and weighted globular member mounted in the second named annulus to swing at right angles to the axis of rotation of the annulus.

7. An inclinometer comprising a support, an annulus mounted to swing therein, a weighted globular member mounted to swing in the annulus at right angles to the axis of rotation of said annulus; said globular member having an adjustable weight; a second annulus adjustable on the support, and arcuate pointer wires carried by the last named annulus and disposed at right angles to each other.

8. An inclinometer comprising standards, an annulus adjustable vertically on the standards, arcuate pointer wires disposed at right angles to each other and carried by the annulus, a second annulus mounted to swing vertically in the support, and a globular member mounted in the last named annulus to swing at right angles to the axis of rotation of said annulus and having an inte-

rior adjustable weight and also having means for adjustably fixing said weight.

5 9. A globular member for use in an inclinometer, comprising two semi-globular hollow sections one of which is provided with lugs to rest within the other, and the other of which is provided with apertures having counter-sinks at their outer ends,

screws connecting the said sections, a weight adjustable in the globular member, and a screw connected to said weight and disposed in one of the apertures of the globular member. 10

In testimony whereof I affix my signature.

JOHN E. FAHS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."