

W. E. DAVIS.  
Galvanometers.

No. 154,588.

Patented Sept. 1, 1874.

Fig. 1

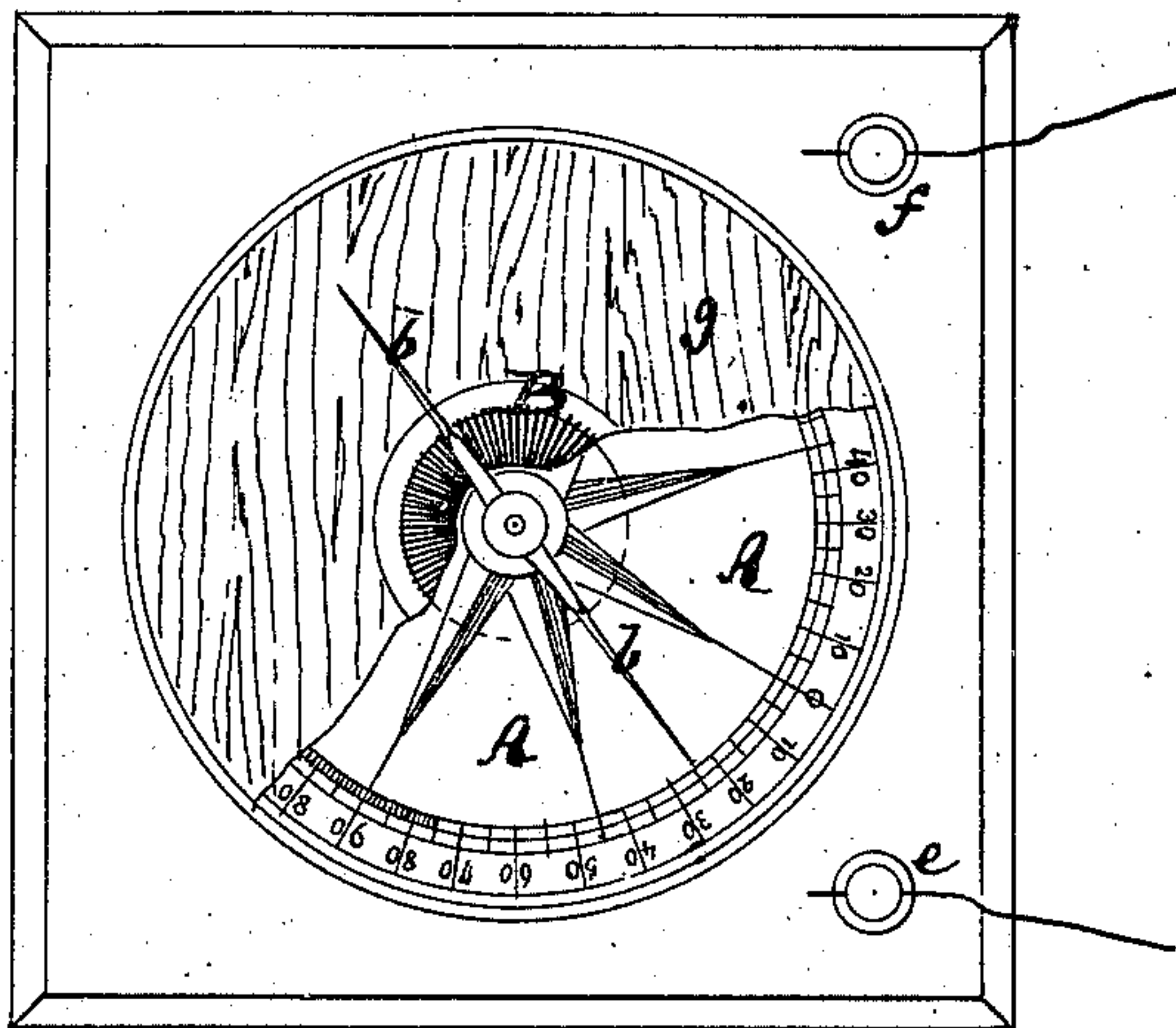


Fig. 2

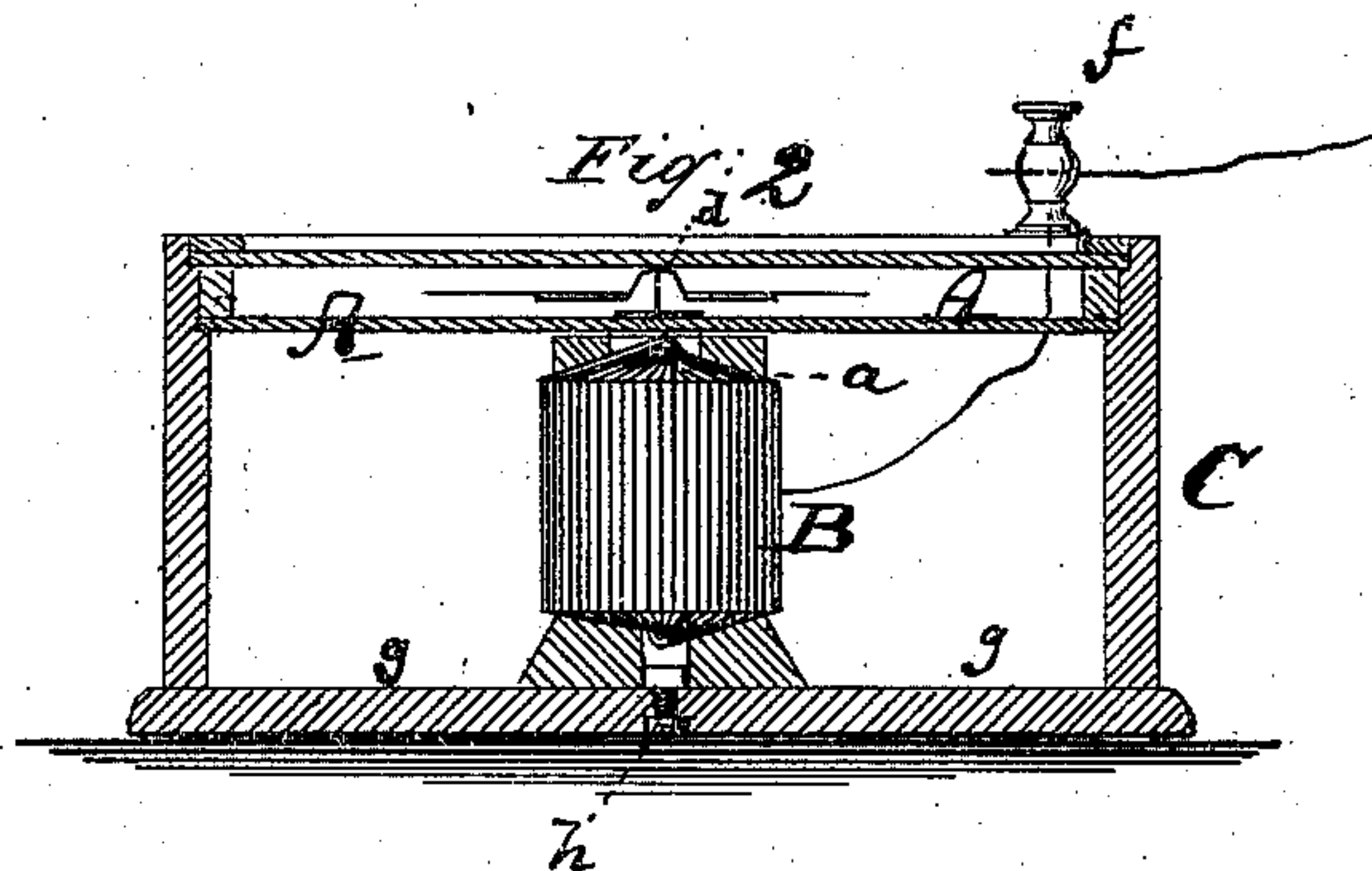
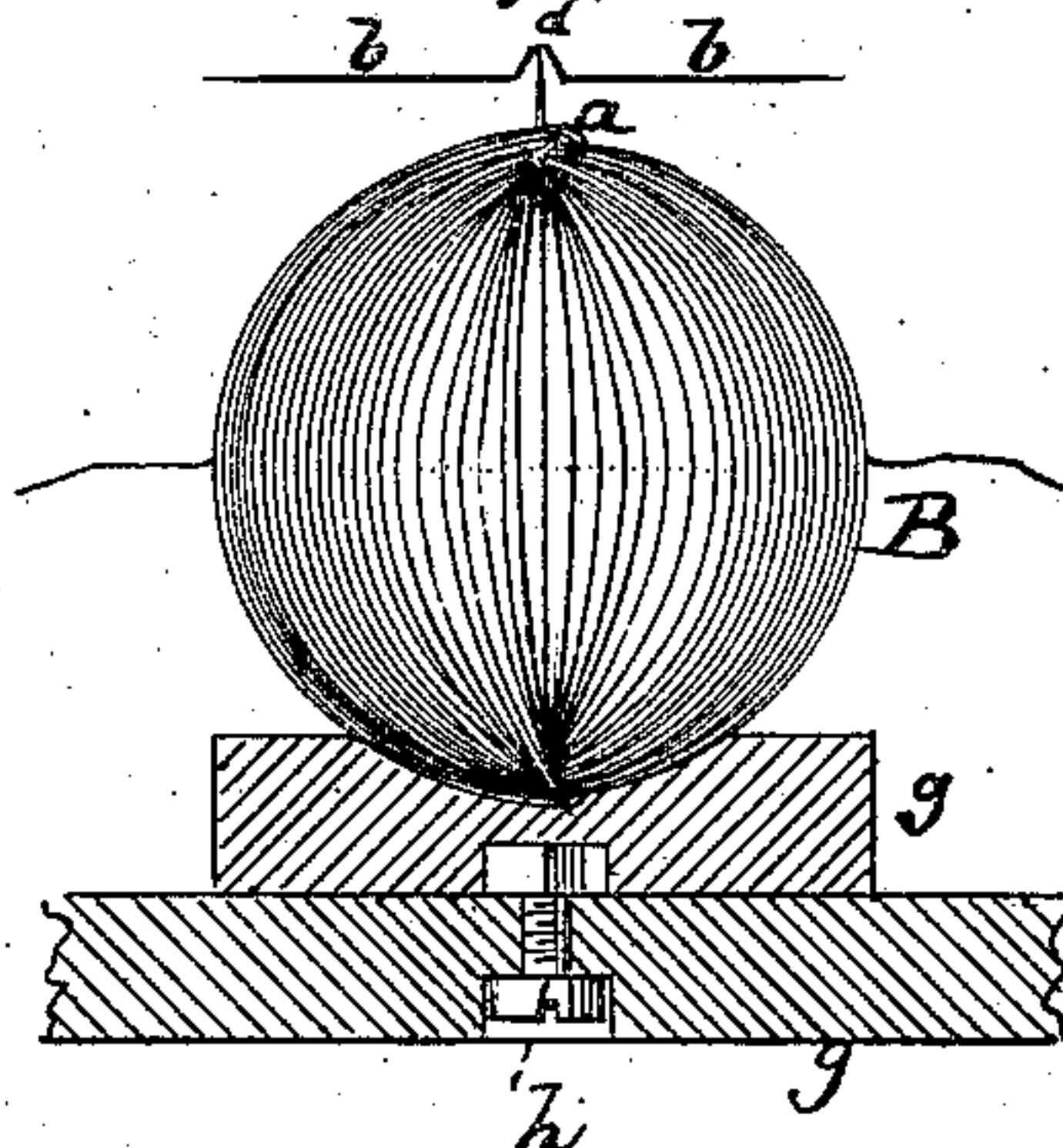


Fig. 3



Witnesses:

Chas. Rattig.  
F. V. Briesen

Inventor:

W. E. Davis  
by his attorney  
A. V. Briesen



# UNITED STATES PATENT OFFICE.

WILLIAM E. DAVIS, OF JERSEY CITY, NEW JERSEY.

## IMPROVEMENT IN GALVANOMETERS.

Specification forming part of Letters Patent No. 154,588, dated September 1, 1874; application filed March 5, 1874.

*To all whom it may concern:*

Be it known that I, WILLIAM E. DAVIS, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and Improved Galvanometer-Coil, of which the following is a specification:

Figure 1 is a top view, partly in section, of my galvanometer-coil. Fig. 2 is a vertical central section of the instrument, showing the coil in side elevation; and Fig. 3, a side view of a modified form of the coil.

Similar letters of reference indicate corresponding parts in all the figures.

The object of this invention is to produce a sensitive galvanometer, in which a single coil will answer every purpose of operating the needle, and in which every one of the convolutions will, under the influence of a current, directly affect the position of the needle.

As heretofore made, the coils of galvanometers are wound around the peripheries of cylindrical cores or blocks, and so placed, necessarily, that one convolution of each coil must be laterally nearer the needle than the remaining convolutions. A defect in the operation of the instrument thus constructed is necessary, as the convolution nearest the magnet will affect it more than that which is farther away from it.

Now, my invention consists in so arranging the convolutions of the wire around the block or supporting-core of the coil that all the convolutions cross each other at one point, which is directly underneath the needle, so that a current flowing through the coil will, during its passage through each convolution, affect the needle, thus producing a harmonious and very pronounced effect on the needle.

In fact I have ascertained, by practical experiment, that an instrument with but two or three hundred convolutions will be so sensitive as to cause a deflection of the needle when a drop of water is placed on one of the binding-posts, and a piece of zinc from the other binding-post dipped in such water.

In the drawing, I first refer to Fig. 3, which best shows my system of arrangement, the same being the representation of a sphere, around which the convolutions of wire are

wound, so that each convolution extends from pole to pole of the sphere, one of the poles, *a*, being directly beneath the pivot of the needle *b*. There is, therefore, not, as in former instruments, one convolution, or a series of convolutions, laterally nearer to the needle than the remaining convolutions, and the object heretofore mentioned is thus fully attained by my invention.

But the spherical form of the coil is not an absolute necessity, as the same principle of invention may be used on a cylindrical block, as indicated in Fig. 2, or on a block of other suitable form, the convolutions extending on a cylindrical block along the sides of the cylinder, parallel to the axis thereof, and crossing over the heads or ends of the cylinder, so that they will all meet at the poles, as shown.

In order to avoid the slight elevation at the poles by the thickness of the wires crossing each other there, the core or block on which the wires are wrapped may be slightly depressed at the ends, so that finally the entire coil will be flush at the ends. But this is a matter of mere mechanical choice.

The needle *b* will be supported on a pivot, *d*, that rests on a graduated disk, *A*, under which the coil *B* is placed, and the ends of the convolutions of the coil are connected to binding-posts *e f*, and thence to the ground and to the battery, or to the material to be tested, as may be desired.

By an instrument of this construction, the least variation of conductive capacity can be observed, and it will, therefore, be of great advantage in testing the conducting power of plants and animal and vegetable matter of various kinds much better than such tests could be made heretofore.

In order to balance the instrument—that is to say, to bring it in such exact position that the same power of current coming from one direction will deflect the needle exactly as much as the same power of the current will deflect it when coming from the opposite direction—I place the coil *B* on the supporting-plate *g* of the inclosing-case *C*, so that it can be turned, a suitable screw or pin, *h*, extending from the coil through the bottom *g*, so

that by means of a screw-driver or other instrument the coil may be slightly turned until the requisite balance is obtained, and then it will be always in the right position for any current.

I claim as my invention—

A galvanometer-coil, B, whose convolu-

tions cross each other at the pole *a*, beneath the center of the needle, substantially as described.

WILLIAM EDWARD DAVIS.

Witnesses:

F. V. BRIESEN,

A. V. BRIESEN.