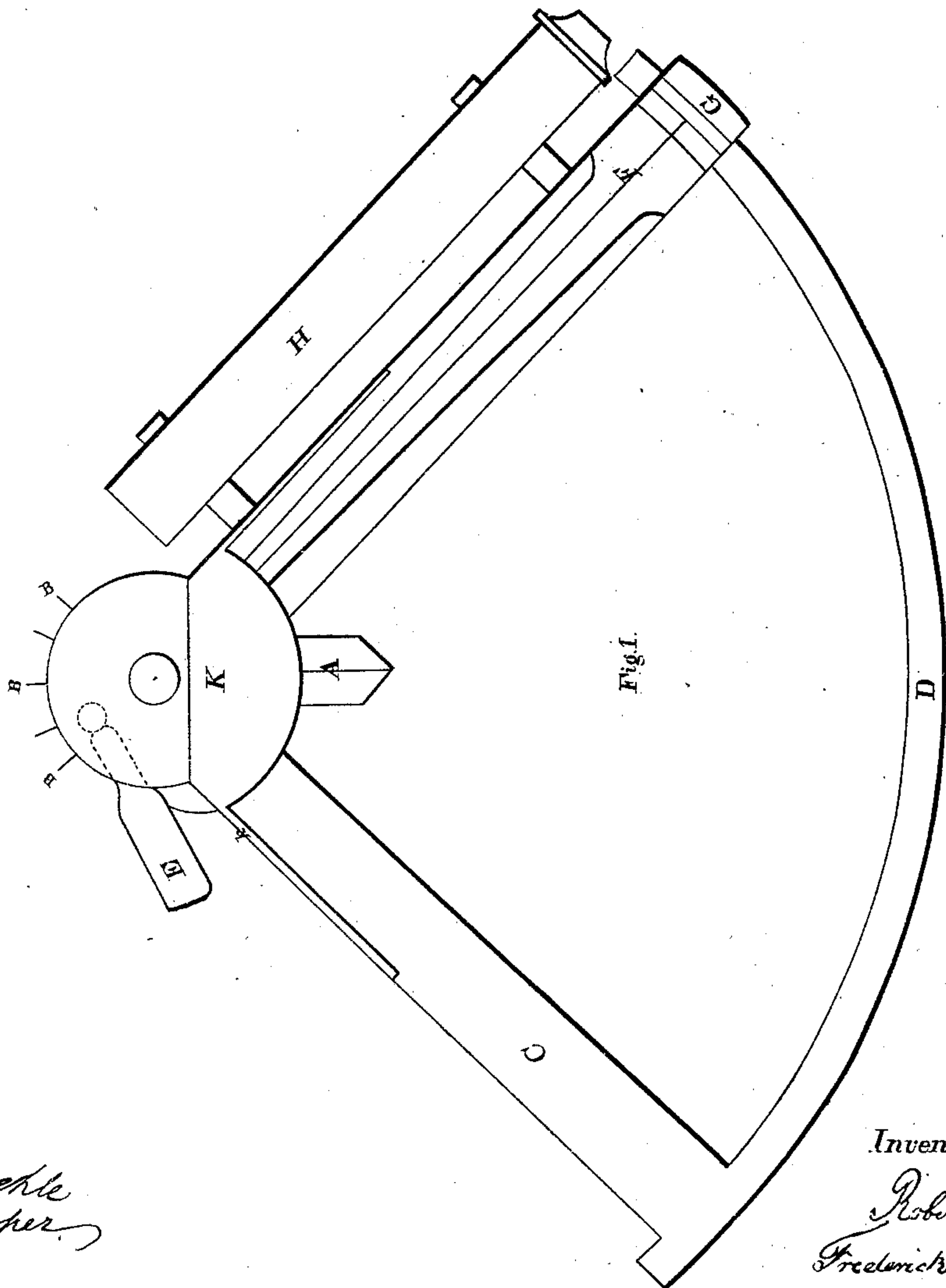
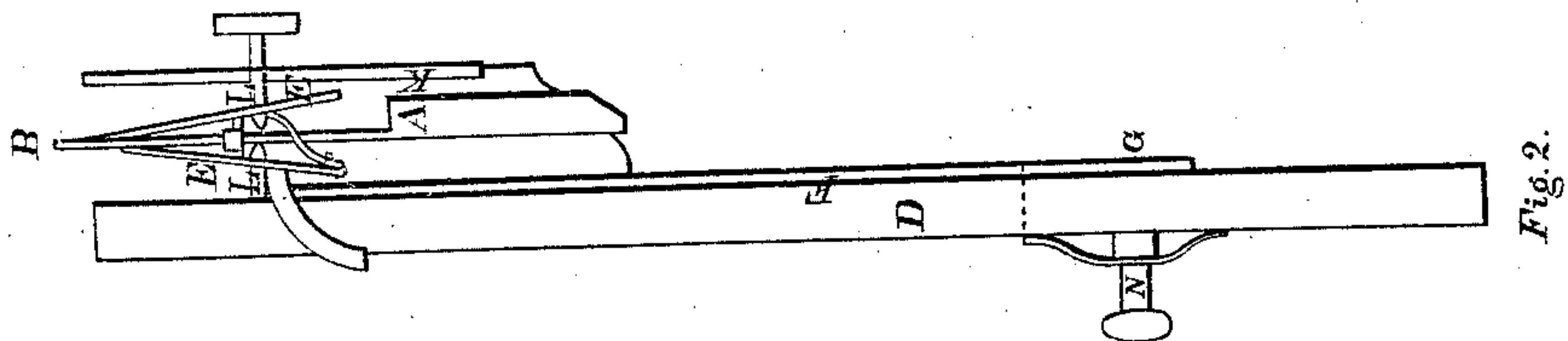


*Norris & Peters.*

*Sextant.*

*N<sup>o</sup> 18,701.*

*Patented Nov. 24, 1857.*



*Witnesses:*

*Charles W. Winkle*  
*Geo. W. Sleeper*

*Inventor.*

*Robert Norris*  
*Frederick Peters*

# UNITED STATES PATENT OFFICE.

ROBERT NORRIS AND FREDERICK PETERS, OF NEW YORK, N. Y.

## PENDULUM-QUADRANT.

Specification of Letters Patent No. 18,701, dated November 24, 1857.

### *To all whom it may concern:*

Be it known that we, ROBERT NORRIS and FREDERICK PETERS, of the city, county, and State of New York, have invented a new and useful Improvement on Quadrants for Taking Latitudes at Sea; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a front view, and Fig. 2 is a side view (without the sight-tube) of my invention.

Similar letters of reference indicate corresponding parts in these figures.

This instrument consists of a quadrant frame C, an arch or limb D, a pendulum A, with a telltale B, a stopper E with a wind-protector K, a sight tube H, and an index F with a nonius G. The quadrant frame and the arch, which comprise a quarter of a circle graduated in the usual manner, and the index with its nonius, are constructed like the same parts in all similar instruments.

The pendulum A consists of a short round disk made heavy and pointed at the bottom, and with a telltale at the top. The pivot of this pendulum forms the central point of the arch, and the center line of the pendulum is marked thereon; the telltale of the pendulum consists of a number of light bars B radial on the pivot, and in sight of the center of the sight tube. The pivot L of the pendulum is formed by two pointed screws situated in a line forming a right angle, with the plane of the arch, and the pendulum is suspended between these two points. The index F, whose center line is marked thereon throughout its length, is turned to the back of the arch, where it is provided with a screw and spring N; so that it may be moved and fastened on any point of the arch. The wind protector K will shield the pendulum from the actions of any currents in the air.

The stopper consists of spring tongues so constructed that by a pressure of the hand it releases the hold of the pendulum, and immediately after the pressure ceases, it regains its hold on the pendulum.

The sight tube H is fixed parallel with the side of the right angle, forming the radius pointing at 90 degrees, and is permanently fixed to that radius. A fine wire

or hair is fixed in the usual diametrical position in the sight tube.

When an altitude of any celestial object is to be taken this instrument is used in the following manner. The observer places his eye to the lower end of the sight tube, releases the stopper from its pressure and moves the instrument slowly until the diametrical wire or hair on the other end of the tube appears to touch the lower limb of the object, whose altitude is to be taken. At this moment the pressure of the spring is to be restored, and the pendulum is thereby fixed. The index is then moved until its center line forms the exact continuation of the center line of the pendulum, and the nonius will then show a certain number of degrees and minutes on the graduated arch, expressive of the angle between the celestial object and the horizon formed on the point of observation. During the time, when the pressure of the tongue is released the points B of the telltale will be seen moving, when the pendulum works freely. But should the free movement of the pendulum be prevented by any accident, the points B will cease to move and thereby indicate a defect.

The advantage which our instrument has over all others at present in use for the purpose of taking altitudes at sea are as follows: In taking an altitude with the instruments now used, it is necessary to move the index forward, until the image of the celestial object whose latitude is to be taken touches the horizon; but at night or in foggy weather at day time the horizon cannot be perceived at all, although the sun, moon, or star may be seen with sufficient clearness. But the observations taken with our instrument are independent of the clearness of the horizon and the result will be sufficiently accurate for practical purposes.

We are perfectly aware that quadrants have been described, by which rude observations may be taken without the aid of a visible horizon; but these quadrants could not be used, to measure altitudes at sea with the accuracy required; because the index and the pendulum being pointed and moving on the arch, the vertical position of the same is liable to be disturbed by the movements of the vessel, and by the action of the winds; but our instrument is free from these defects, as the moving pendulum is not in contact with the arch and is protected during the time of the observation, and the index



may be brought to its proper place, at any  
moment when the vessel is quiet. We there-  
fore do not claim a quadrant for taking alti-  
tudes without the aid of a natural horizon  
5 but

What we claim as new and desire to secure  
by Letters Patent of the United States, is—  
The pendulum with its telltale in combi-

nation with the index, the sight tube and the  
other parts of the quadrant substantially as 10  
described.

ROBERT NORRIS.  
FREDERICK PETERS.

Witnesses:

CHARLES WEHLE,  
GEO. W. SLEEPER.