R. J. WALLACE.

LONGITUDE AND TIME CHART.

APPLICATION FILED JUNE 17, 1916.

1,223,128.

Patented Apr. 17, 1917.

2 SHEETS—SHEET 1.

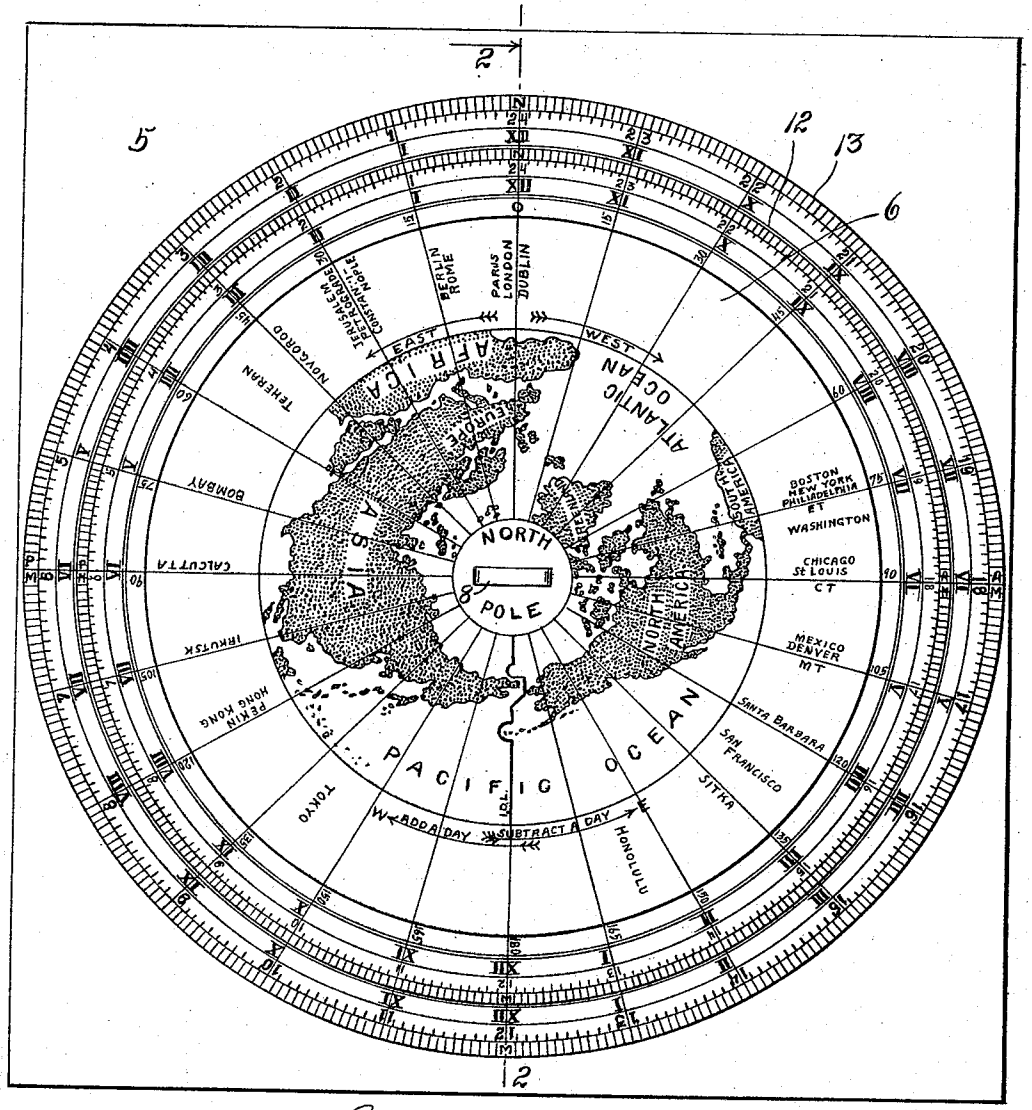


Fig. 1.

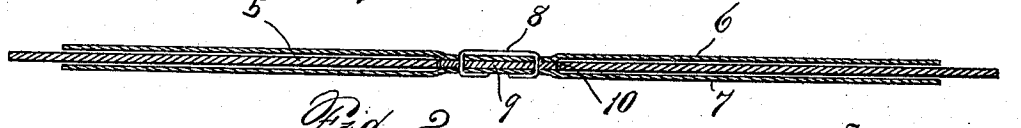


Fig. 2.

Inventor
R. J. Wallace.

By A. J. Boyd
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

R. J. WALLACE.

LONGITUDE AND TIME CHART.

APPLICATION FILED JUNE 17, 1916.

1,223,128.

Patented Apr. 17, 1917.

2 SHEETS—SHEET 2.

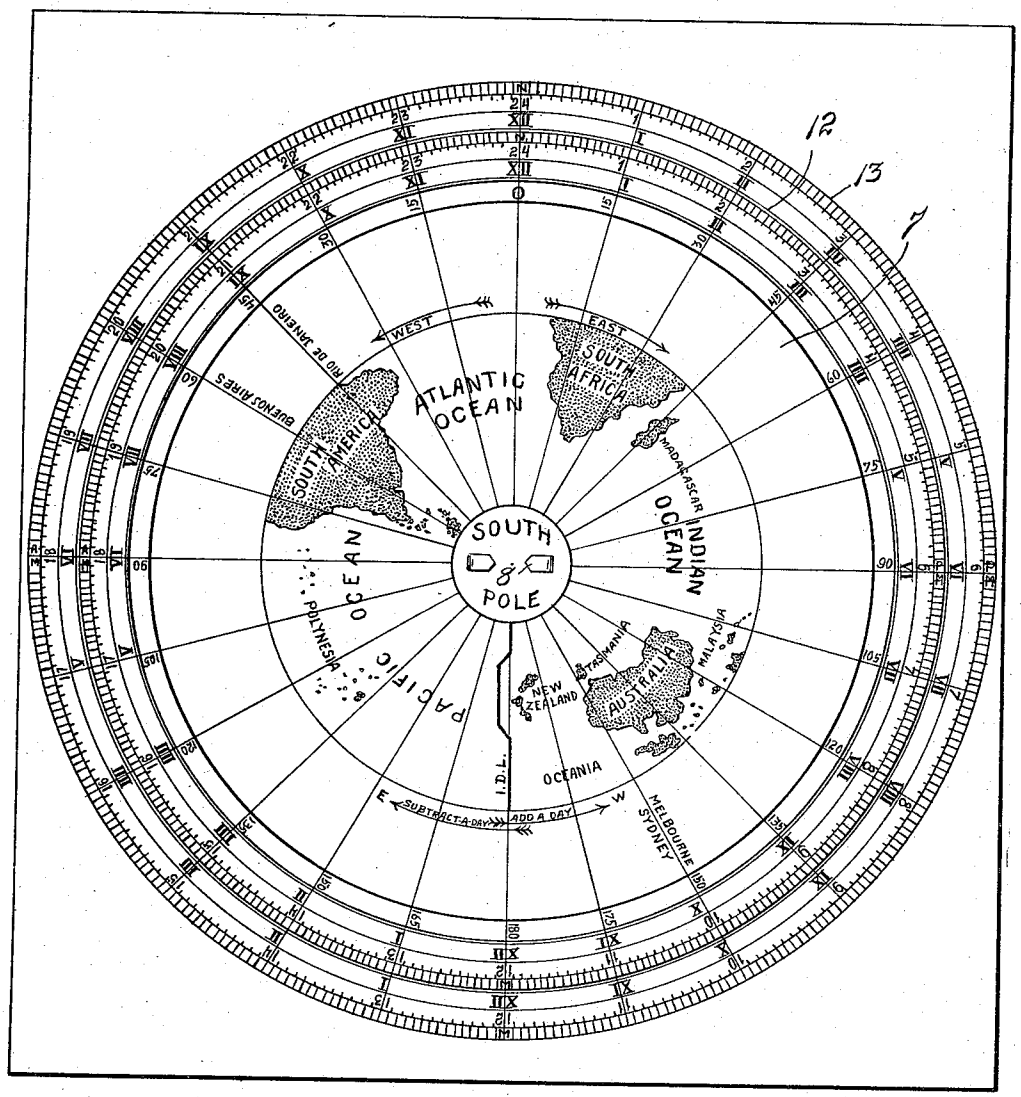


Fig. 3.

Inventor

R. J. Wallace.

By R. J. Wallace

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ROBERT J. WALLACE, OF DENVER, COLORADO.

LONGITUDE AND TIME CHART.

1,223,128. Specification of Letters Patent. Patented Apr. 17, 1917.

Application filed June 17, 1916. Serial No. 104,336.

To all whom it may concern:

Be it known that I, ROBERT J. WALLACE, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Longitude and Time Charts; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to what I term a longitude and time chart, my object being to provide an article which will be adapted by suitable manipulation requiring no special skill, to demonstrate the movement of the earth on its axis, the relative positions of places on the earth's surface to the sun, the comparative time of places, the relative position of any two places on the earth's surface with regard to longitude, how days are determined where the person remains in the same time belt, how days are determined when moving either east or west out of or over a time belt, the relation of time to longitude and vice versa, the principles in computing arithmetical problems in longitude and time, the difference between sun dial, or sun time and clock time together with other similar matters of importance which it is desired to know. My further object is to provide a device of this class which shall be simple in construction, very economical in cost, and which shall also be reliable and efficient in use and which shall require no special skill in its manipulation.

My improved construction consists of three plates or planes, two of which plates are arranged on opposite sides of a middle plate, the two outer plates having movement with relation to or independently of the middle plate. It is assumed that the middle plate remains stationary and it is of such size or area that it extends beyond the outer plates which are arranged on opposite sides thereof, so that the middle plate may be held stationary with one hand while the outer plates are rotated or adjusted by the other hand. As the two outer plates are centrally connected to rotate in unison, the movement of one also actuates the other. The two outer plates are preferably disk-shaped, while the middle or intermediate plate is preferably square or rectangular in shape, though it will be understood that the outline of these plates is immaterial so far as the invention is concerned, though the particular shapes stated are believed preferable both from the standpoint of appearance as well as for the reason that they facilitate to some extent the manipulation of the structure without the employment of any superfluous material.

The two outer plates which will hereafter be referred to as disks, represent in the device the Northern and Southern Hemispheres, while the middle plate represents the face of a 24-hour clock with corresponding hour indications of an equivalent 12-hour clock.

Words, letters, figures and maps are inscribed on the three plates, such as will be appropriate to demonstrate the revolutions of the earth on its axis; the relative positions of places on the earth's surface to the sun; the comparative time of places; the international date line and its purpose; the midnight meridian and its effect on the change of day; the time belts; the manner of ascertaining the relative positions of two places on the earth's surface with regard to longitude; that from each of the poles there is but one direction; how days are determined where the person remains in the same time belt; how days are determined when moving either east or west out of or over a time belt; the relation of time to longitude and vice versa; the principles in computing arithmetical problems in longitude and time; the difference between sun dial, or sun time and clock time; how that time and days are controlled by longitude irrespective of latitude; why some ancients believed that time was governed by sun movement instead of earth movement; why time pieces in different time belts differ; and other matters of importance which it is desired should be known and understood by students and others.

Having briefly outlined my improved chart, I will proceed to describe the same in detail, reference being made to the accompanying drawing, in which is illustrated an embodiment thereof. In this drawing,—

Figure 1 is a view of the device from one side, namely, the side having the disk upon which the Northern Hemisphere is repre-

sented. Fig. 2 is a section taken centrally along a line at right angles to the line 2—2. Fig. 3 is a view of the device from the side opposite that shown in Fig. 1. In this view the disk is shown upon which the Southern Hemisphere is represented.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the middle plate; and 6 and 7 the outer plates or disks. As illustrated in the drawing, the disks 6 and 7 are secured to rotate in unison by means of a centrally located fastening device 8 of the staple form whose members pass through the central portions of the two disks and through an interposed spacing washer 9, the fastening device being tightly clenched, whereby the parts 6, 7 and 9 are made to constitute substantially an integral device. The middle plate 5 has a disk-shaped opening 10 of sufficient size or diameter to allow the washer 9 to enter and move freely therein in a rotary direction, since in the manipulation of the device the connected disks 6 and 7 are rotated, while the middle plate 5 remains stationary, as heretofore explained.

It is evident that the two plates 6 and 7 may be otherwise connected in operative relation to enable them to perform their characteristic function, as heretofore outlined. It must, therefore, be understood that the specific manner of connecting the three plates in coöperative relation, is immaterial, at least so far as the scope of the claims is concerned.

Practically the entire areas of the exposed surfaces of the two disks 6 and 7 are taken up by the data formed thereon and heretofore outlined, and it is believed in view of the explanation heretofore given, that the data formed on these disks will be understood without further detailed explanation except so far as the description hereinafter given is concerned, in which the use of the device is explained somewhat more in detail.

As shown in the drawing, the data formed on the middle plate which coöperates with the data formed on the two disks, is confined or arranged between inner and outer circles 12 and 13. The portions of the middle plate beyond these circles, are shown plain in the drawing, though they may and undoubtedly will contain when the device is manufactured in a commercial way, a brief explanation of the manner of manipulating the device in order to make use of it for the purpose heretofore outlined.

The portion of the middle plates between the circles 12 and 13, may be considered the rim of a clock dial which has a similar face on each side.

The meridians radiating from the poles toward the equator may be followed from one pole to the other by tipping the chart on its edge so that both poles may be seen at one glance, and will show that those indicating the same longitude are one and the same line.

On the chart there are 24 meridians dividing the earth into 15 degree belts representing 1 hour each, making a total of 360 degrees and representing 24 hours' time. Each of these belts is divided into 15 other meridians each showing 1 degree representing 4 minutes of time. Each of these belts is also divided into 12 meridians each showing one degree and 15 minutes of longitude representing 5 minutes of time. The middle plate 5 records hours, 5 minutes and 4 minutes.

The arrows on the disks 6 and 7 show the directions east and west on the earth's surface. In explanation of the line marked I. D. L. which stands for international date line, it should be stated that this line indicates where the days are changed, as well as at the midnight meridian.

In further explanation of the manner of using the chart, the following instructions are given: Revolve the outer disk until one of the cities marked thereon as Denver, is opposite a predetermined time of day as indicated on the plate 5. Then the longitude of any other city will be opposite the time of day of that city as indicated by the corresponding meridian and the figures adjacent the same. The earth revolves from west to east (earth motion); the sun appears to move from east to west (clock motion). The zero (0) meridian is the Greenwich meridian which passes through London; east thereof for 180 degrees is east longitude; west thereof for 180 degrees is west longitude. The meridian facing the sun or opposite the letter N on the plate 5, and directly underneath thereof, is for that instant called the noon meridian. The meridian that is 180 degrees from the noon meridian is for that instant called the midnight meridian. The day of any place ends when its meridian becomes a midnight meridian and a new day begins the instant following. The international date line (I. D. L.) is a date line agreed upon by civilized nations. Beginning at the North Pole, it follows fairly closely the 180 degree meridian to the South Pole, but zig-zags in places to avoid passing over land that is or may be inhabited. Going east when you cross the midnight meridian on the middle plate add a day; but when you cross the international date line subtract a day. When going west reverse the foregoing. By comparing the Northern and Southern Hemispheres it will be noted that the clock face and the east and west directions are reversed with reference to your right and left. But when you compare them looking upon the equator so as to see both disks, you will notice that both are revolving in the same direction.

Many other interesting demonstrations

may be made by the use of my improved chart and which will readily occur to those inclined to follow out matters of this kind. But the foregoing information and description is believed sufficient for the purposes of this application.

Having thus described my invention, what I claim is,—

1. A chart including three connected plates, two of which are arranged on opposite sides of the third, the two outer plates being connected to rotate together and independently of the intermediate plate, the two outer plates representing respectively the Northern and Southern Hemispheres and containing appropriate data, while the inner plate represents on each side thereof the face of a clock.

2. A chart including three plates connected in coöperative relation, two of which are arranged on opposite sides of the third, the two outside plates being connected to rotate in unison independently of the third plate, the two outer plates representing respectively the Northern and Southern Hemispheres and containing appropriate data, while the inner plate contains data on each side representing the face of a 24-hour clock, each of the outer disks also containing the same data arranged adjacent the data of the intermediate plate.

In testimony whereof I affix my signature, in presence of two witnesses.

ROBERT J. WALLACE.

Witnesses:
GRACE HUSTON,
A. EBERT O'BRIEN.

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