Oct. 2, 1923. 1,469,664

G. S. KYLE

PLANISPHERE

Filed Nov. 1, 1922 5 Sheets-Sheet 1

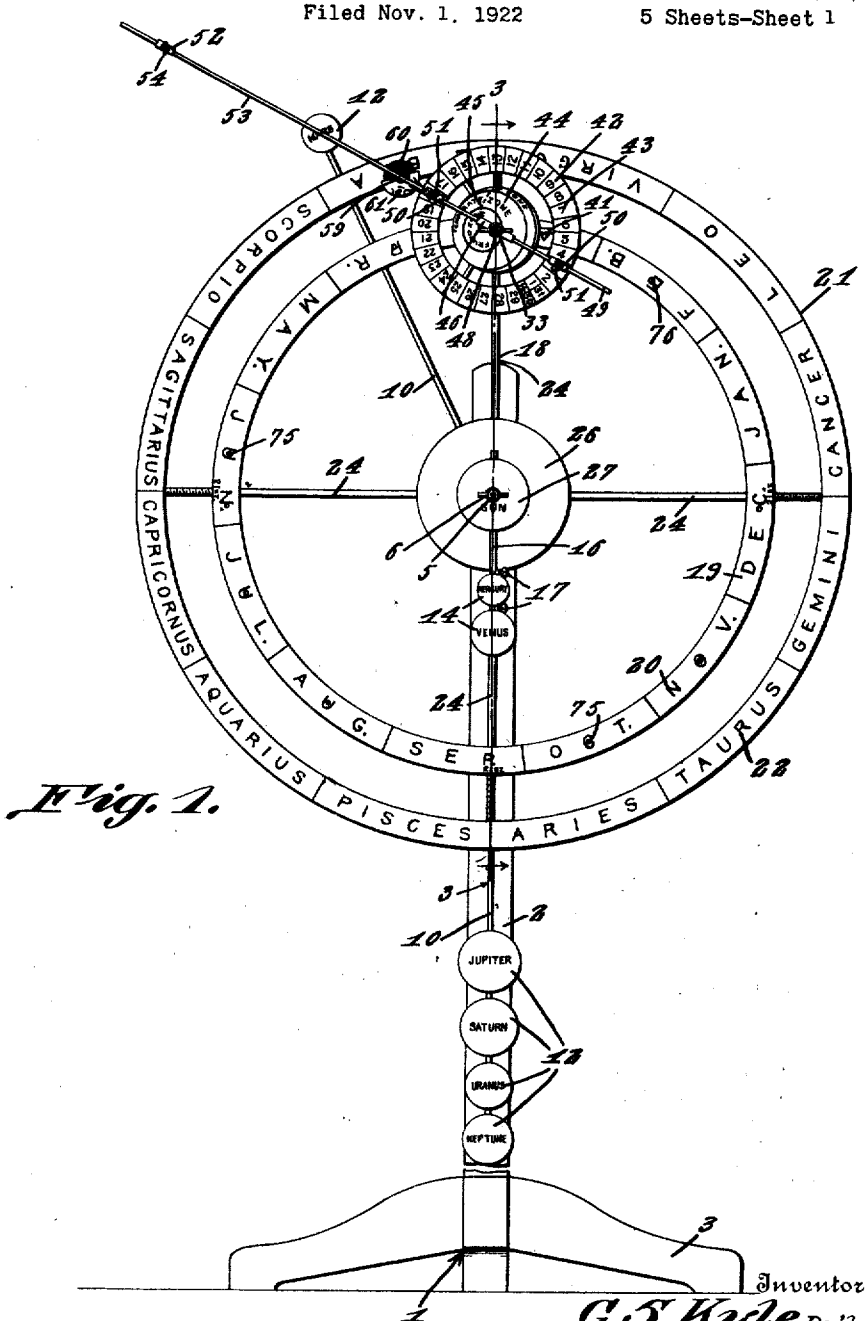


Fig. 1.

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Oct. 2, 1923. 1,469,664

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PLANISPHERE

Filed Nov. 1, 1922 5 Sheets-Sheet 2

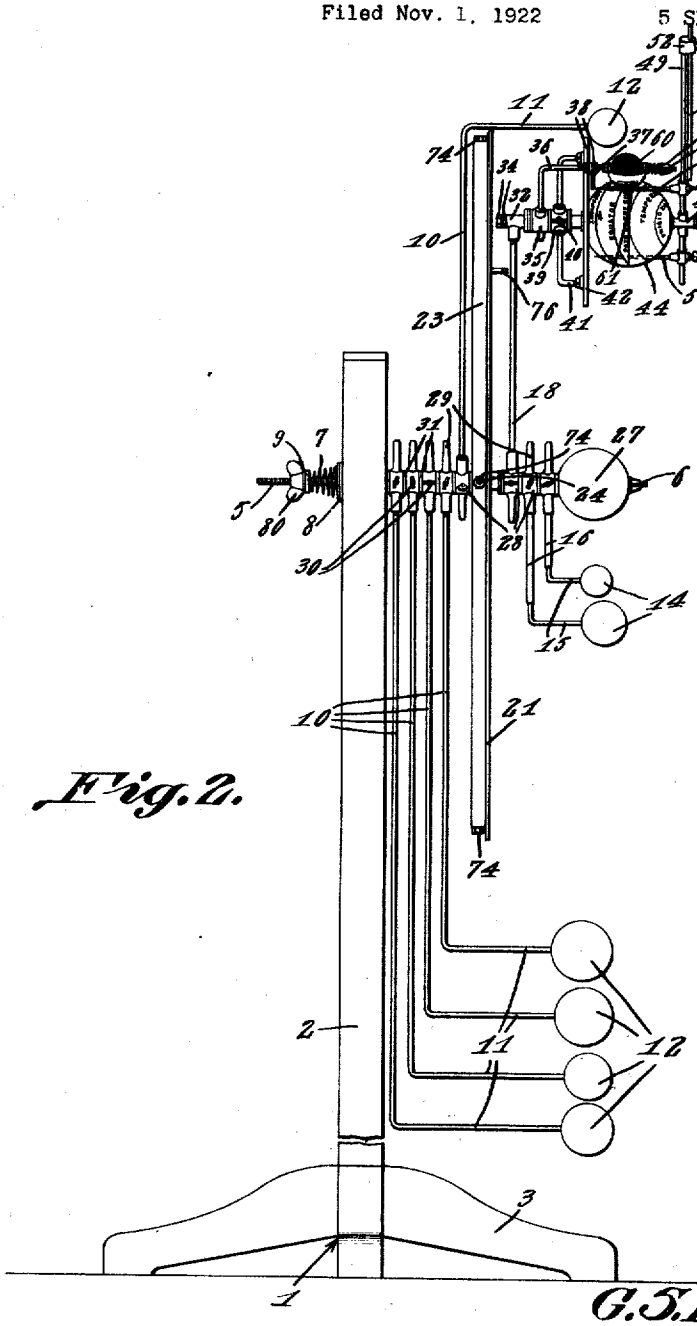


Fig. 2.

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1,469,664

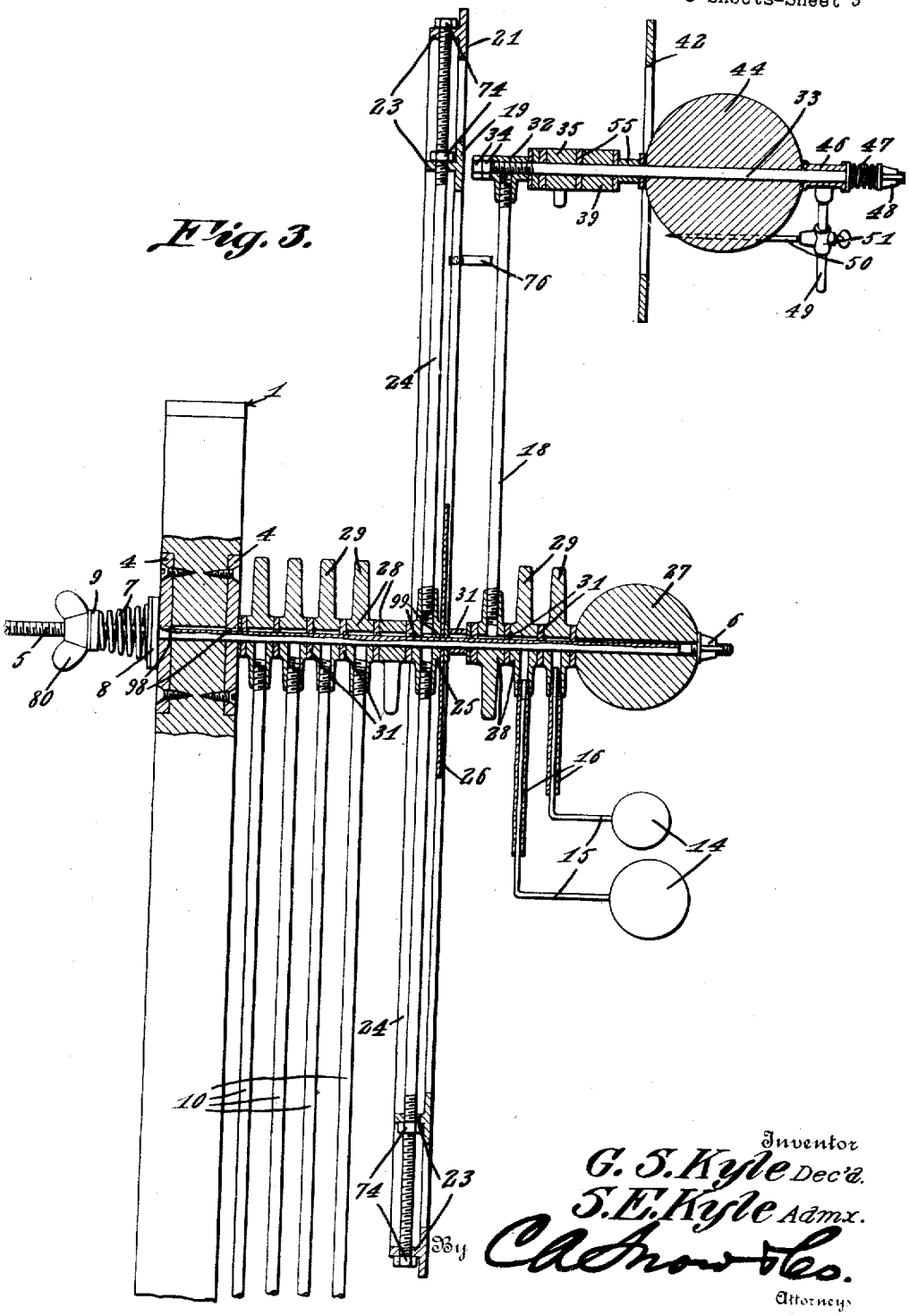
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Filed Nov. 1, 1922

5 Sheets-Sheet 3

Fig. 3.



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1,469,664

PLANISPHERE

Filed Nov. 1, 1922

5 Sheets-Sheet 4

Fig. 4.

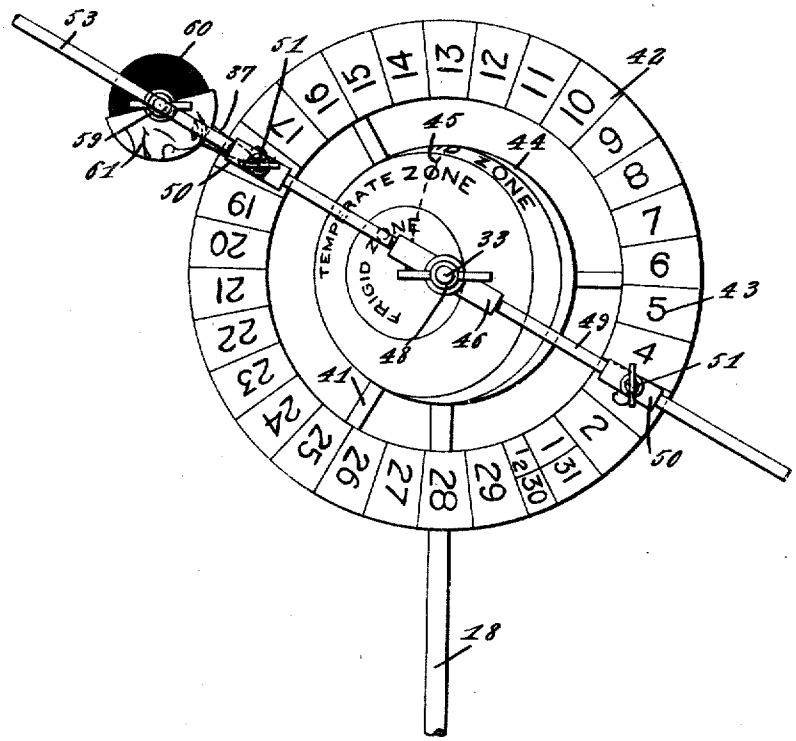
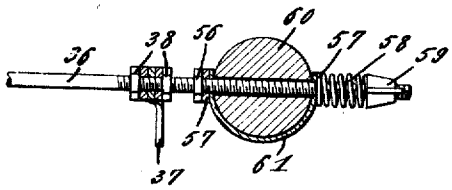


Fig. 5.



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Oct. 2, 1923.

1,469,664

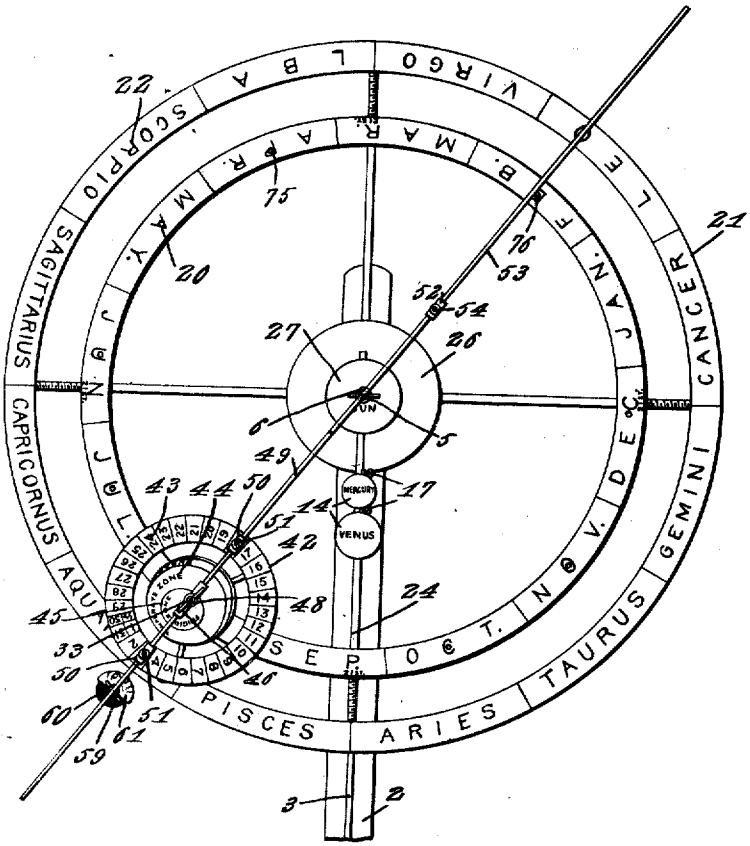
G. S. KYLE

PLANISPHERE

Filed Nov. 1, 1922

5 Sheets-Sheet 5

Fig. 6.



Inventor

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S. E. Kyle Admx.

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Patented Oct. 2, 1923. 1,469,664

UNITED STATES PATENT OFFICE.

GEORGE S. KYLE, DECEASED, LATE OF CHAMBERSBURG, PENNSYLVANIA; BY SARAH E. KYLE, ADMINISTRATRIX, OF CHAMBERSBURG, PENNSYLVANIA.

PLANISPHERE.

Application filed November 1, 1922. Serial No. 598,362.

To all whom it may concern:

Be it known that I, SARAH E. KYLE, a citizen of the United States, residing at Chambersburg, in the county of Franklin and State of Pennsylvania, am administratrix of the estate of George S. Kyle, late of the same place, deceased, who, in his lifetime invented sundry new and useful Improvements in a Planisphere, whereof the following is a specification.

This invention aims to provide a simple device which, being devoid of complicated parts, may be operated readily to permit members representing various heavenly bodies to be disposed in various relationships, for example, in conjunction.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the invention appertains.

Although but one form of the invention has been shown, it will be understood that a maker of scientific instruments exercising such skill as he might be expected to possess may, within the scope of what is claimed, make changes and alterations, without departing from the spirit of the invention or placing the utility thereof in jeopardy.

For a clear understanding of the invention, let the specification be read in connection with the accompanying drawings, wherein Figure 1 shows in elevation, a planisphere constructed in accordance with the invention; Figure 2 is an elevation wherein the device is viewed at right angles to the showing of Figure 1; Figure 3 is a vertical section, wherein parts appear in elevation, portions being broken away; Figure 4 is an elevation showing the earth globe and parts associated therewith; Figure 5 is a section showing the moon globe and its mounting, parts appearing in elevation; and Figure 6 is an elevation showing the parts as they will appear when the moon is at its full period.

In carrying out the invention, there is provided a supporting frame 1, including a standard 2 carried by a base 3. Wear plates 4 (Figure 3) are mounted on the standard 2 adjacent to the upper end thereof, and through the standard and the wear plates passes a longitudinally adjustable shaft 5, supplied at its outer end with a head 6, which may be a wing nut. A compression spring 7 surrounds the rear portion of the shaft 5, a wing nut 80 being threaded on the rear end of the shaft 5, washers 8 being interposed between the spring and one of the plates 4, washers 9 being interposed between the spring and the wing nut 80. A plurality of parts, hereinafter described, are carried for swinging or rotary movement on the shaft 5, and a glance at Figure 3 will demonstrate that by rotating the wing nut 80 and compressing the spring 7, a slight endwise movement will be given to the shaft 5, all of the aforesaid parts being bound so that they will not swing or rotate too freely.

A plurality of arms 10 of a fixed length are disposed at right angles to the shaft 5 and have outstanding fingers 11 whereon are mounted globes 12 representing certain of the planets which move in an orbit about the sun, to wit, Neptune, Uranus, Saturn and Jupiter. The globes 14 which represent Venus and Mercury are mounted on the outstanding fingers 15, of longitudinally extensible arms 16, the telescoped parts of which are held at adjusted lengths by set screws 17 appearing in Figure 1. The arm which carries the earth globe 44 is marked by the numeral 18.

A dial in the form of a ring 19 is disposed in a plane at right angles to the shaft 5 and is marked, as at 20, to indicate the months of the year, the dial 19 having openings 75, individual to most of the month markings 20, and adapted to receive a removable stop pin 76, which appears in Figures 2 and 3. Located outwardly of the dial 19 is a dial 21, in the form of a ring, marked at 22, in any appropriate way, to indicate the signs of the zodiac. Figure 3 shows that the ring dials 19 and 21 have rearwardly extended flanges 23, wherein spokes 24 are held by nuts 74, the spokes proceeding from a hub 25 on the shaft 5. The shaft 5 carries a disk 26 abutting against the hub 25. A globe 27, representing the sun, is mounted on the outer end of the shaft 5, in engagement with the head or wing nut 6. The arms 10, 16 and 18, hereinbefore alluded to, are carried by hubs 28 rotatable on the shaft 5 and provided with handles 29 whereby they may be rotated on the shaft, the hubs being provided with set screws 30 (Figure 2) which, coacting with the shaft 5, hold the arms 10, 16 and 18, in any position to which they have been swung. Friction members, such as washers and spacers 31, are distributed

along the shaft 5 and aid in holding the arms 10, 16 and 18 against swinging too freely, the function of the spring 7 and the wing nut 80 of Figure 3 being recalled at this point.

Passing to a specific description of the means for mounting the earth globe 44 on the arm 18, it is to be observed, referring to Figure 3, that a coupling 32 is carried by the outer end of the arm, an outstanding shaft 33 being mounted in the coupling, nuts 34 being threaded upon the shaft and being engaged with the coupling. A hub 35 is rotatably adjustable on the shaft 33, and carries an angular arm 36, the outstanding portion of which is supplied with an index 37, shown in Figure 4, the index being secured at 38 to the outstanding portion of the arm 36, as depicted in Figure 5. The outstanding portion of the arm 36 carries an abutment nut 56 and washers 57, a hemi-spherical shell 61 being mounted for adjustment on the outstanding portion of the arm 36, between the washers 57. A globe 60, representing the moon, is mounted on the part 36, within the shell 61. The globe 60 preferably is colored black, whereas the outer surface of the shell 61 is silvered or gilded, to represent the illuminated portion of the surface of the moon. On the outer end of the member 36, a nut 59 is threaded, the same coacting with a compression spring 58 to hold the shell 61 in any position to which it may have been adjusted, circumferentially of the outstanding portion of the angular arm 36.

On the shaft 33 is mounted a hub 39, held in adjusted positions by a set screw 40 (Figure 2) the hub carrying a spider supporting a ring dial 42, which is marked, as shown most clearly in Figure 4, with the numerals of the lunar and calendar months, as indicated at 43. It is with these markings at 43 that the index 37 of the arm 36 coacts, in a way and for a purpose which will be made manifest hereinafter. The earth globe 44 is carried by the shaft 33 and the shaft is located in the globe at an angle represented by the inclination of the axis of the earth with respect to the ecliptic. The earth globe 44 has a mark 45 which will be alluded to hereinafter.

Outwardly of the earth globe 44, a sleeve 46 is mounted for rotary adjustment on the shaft 33. A compression spring 47 surrounds a portion of the shaft 33 and abuts against the sleeve 46 under the impulse of a wing nut 48 threaded on the shaft, the sleeve thus being held frictionally against the earth globe 44, for rotary adjustment, and to provide for the adjustment of a planet locator which is carried by the sleeve. The planet locator embodies a cross piece 49 mounted in the sleeve and shown best in Figure 4. Pointers 50 are adjustable along the cross piece 49 and are adapted to cooperate with the markings 43 on the ring dial 42, the pointers being held in adjusted positions by set screws 51. At its outer end (Figure 2) the cross piece 49 has a head 52, wherein an extension rod 53, constituting part of the planet locator, is mounted for sliding adjustment longitudinally of the cross piece, the extension rod being held in adjusted positions by a set screw 54 threaded into the head 52. Washers and spacers 55 are distributed along the shaft 33, to hold the members 35 and 39 against too free rotation, the function of the spring 47 and the nut 48 in this connection being obvious when Figure 3 is noted.

In practical operation, the stop pin 76 is inserted into the opening 75 individual to the month marking 20 on the dial 19, for which the instrument is to be set—or, if the month selected happens to be adjacent to the bottom of the dial 19 or adjacent to the top thereof, it may not be necessary to use the stop pin, since the arm 18, being disposed in an approximately vertical position, will not swing after being once set. Assuming, however, that the stop pin 76 is used, the arm 18 is swung until the nuts 34 or the coupling 32 (Figure 3) abut against the stop pin. The earth globe 44 thus is positioned properly for the selected month. The planet locator 49—53 is swung until it is in alinement with the earth globe 44 and the sun globe 27. The arm 36 is swung on the shaft 33 until the moon globe 60 coincides with the planet locator 49—53; the earth globe 44, the sun globe 27 and the moon globe 60 being alined, (Figure 6), and the moon globe being located opposite or behind the earth globe from the sun globe, this being the relative positions of the elements specified, when the moon is full. Now, from an almanac the operator ascertains the date in the particular month in which he is operating, on which the full moon occurs. The ring dial 42 then is rotated, until the full moon date, derived from the almanac, coincides with the appropriate one of the pointers 50 on the planet locator, the ring dial 42 thus being set for the month.

Noting Figure 1, suppose that it is desired to set the instrument for a conjunction involving the earth, the moon and Mars. Then the conjunction date is obtained from an almanac and the planet locator 49—53 is swung until the appropriate one of the pointers 50 registers with the conjunction date on the dial 42. The planet locator is shown positioned thus in Figure 1. The arm 36 is swung to bring the moon globe 60 into alinement with the planet locator 49—53, and the proper arm 10 is swung to bring the globe 12, which represents the planet Mars, into alinement with the planet

locator. By a similar operation, readily understood by those skilled in the art, other planetary conjunctions, whether inferior or superior, may be demonstrated, the rod 53 of the planet locator being slid outwardly on the cross piece 49 when necessary, in order to provide for a proper setting of these planets which are most remote from the sun.

As the moon globe 60 is adjusted in an orbit about the earth, the shell 61 should be turned so that it always faces the sun. By doing this all of the moon's peculiar changes and phases from new to full and back to new again will be clearly demonstrated. The earth globe 44 should always be positioned so that the mark 45 on the earth globe is uppermost, regardless of the position of the earth in its orbit. By observing this direction, the arrival of the solstitial and equinoctial points will always come into proper alinement with the sun, at the time of these quarter-annual occurrences.

The shaft 5 preferably is keyed at 98 into the plates 4 on the standard 2, and the hub 25 which carries the dials 19 and 21 is keyed at 99 to the shaft 5 to prevent rotation of the dials with respect to the shaft, and to prevent a rotation of the shaft in the plates 4, the shaft having a longitudinal movement in the plates, when the spring 7 is compressed by the action of the nut 80. The disk 26 may be made of brass, or may be polished, and, being located behind the sun globe or member 27, emphasizes the luminosity of that body.

Having thus described the invention, what is claimed is:—

1. In a device of the class described a support; a sun member mounted thereon; a first arm mounted to swing on the support; an earth member carried by the first arm and movable therewith about the sun member; a second member mounted to swing on the first arm; a moon member carried by the second arm and movable therewith about the earth member; a locator mounted to swing on the first arm with the axis of rotation of the earth member as a center, the moon member being movable into direct alinement with the locator; and a dial journaled for rotation with the axis of the earth member as a center and having markings adapted to be brought into coincidence with the locator when the dial is rotated.

2. In a device of the class described, a support; a sun member mounted on the support; a first arm mounted to swing on the support; a second arm mounted to swing on the first arm; a third arm mounted to swing on the support; an earth member carried by the first arm and movable therewith about the sun member; a moon member carried by the second arm and movable therewith about the earth member; a planet member carried by the third arm and movable therewith about the sun member; a locator mounted to swing on the first arm with the axis of the earth member as a center, the moon member and the planet member being movable into alinement with the locator; and a dial journaled for rotation with the axis of the earth member as a center, and having markings adapted to be brought into coincidence with the locator when the dial is rotated.

3. In a device of the class described, a support; a dial fixedly carried by the support and provided with markings indicating the months of the year; a sun member supported within the periphery of the dial; a first arm mounted to swing on the support and to cooperate with the markings of the dial; an earth member carried by the first arm and movable therewith about the sun member; a second arm mounted to swing on the first arm; a moon member carried by the second arm and movable therewith about the earth member; a locator mounted to swing on the first arm with the axis of the earth member as a center, the moon member being movable into alinement with the locator; and a second dial journaled for rotation with the axis of the earth member as a center and having markings adapted to be brought into coincidence with the locator when the dial as rotated.

4. In a device of the class described, a support; a sun member mounted thereon; a first arm mounted to swing on the support; an earth member carried by the first arm and movable therewith about the sun member; a second arm mounted to swing on the first arm; a moon member carried by the second arm and movable therewith about the earth member; a dial journaled for rotation with the axis of the earth member as a center; a third arm mounted to swing on the support; a planet member carried by the third arm; and means for securing an alinement of the planet member, the moon member, the earth member, and any selected one of the markings of the dial.

5. In a device of the class described, a support; a fixed dial on the support and having markings; a sun member within the periphery of the dial; a first arm mounted to swing on the support and adapted to be brought into registration with any of the markings of the dial; an earth member carried by the first arm and movable therewith about the sun member; a second arm mounted to swing on the first arm; a moon member carried by the second arm and movable therewith about the earth member; a second dial journaled for rotation with the axis of the earth member as a center, and having markings; an index on the second arm and adapted to cooperate with the markings of the second dial; a locator mounted to swing

on the first arm with the axis of the earth member as a center, and adapted to cooperate with the markings of the second dial, the moon member being movable into alinement with the locator; a third arm mounted to swing on the support; and a planet member carried by the third arm and movable therewith into alinement with the locator.

6. In a device of the class described, a support; a dial thereon and having markings indicating the months of the year; a sun member within the periphery of the dial; an arm mounted to swing on the support; an earth member carried by the arm and movable therewith about the sun member; a second arm mounted to swing on the first arm; a moon member carried by the second arm and movable therewith about the earth member; and a dial mounted to rotate for adjustment with the axis of rotation of the earth member as a center, and having markings indicating the days of the month, the second arm being movable into registration with any of the last-specified markings.

7. In a device of the class described, a support; a first arm mounted to swing on the support; an earth member carried by the first arm and movable therewith about the sun member; a second arm mounted to swing on the first arm; a moon member carried by the second arm and movable therewith about the earth member; and an illuminated shell mounted to swing about the moon member to occupy a position facing the sun member when the moon member moves in its orbit about the earth member.

In testimony that I claim the foregoing as the invention of the said GEORGE S. KYLE, deceased, I hereunto set my hand.

SARAH E. KYLE,
Administratrix.