No. 832,527. PATENTED OCT. 2, 1906.

L. BARRITT.

STAR AND PLANET FINDER.

APPLICATION FILED OCT. 5, 1905.

2 SHEETS—SHEET 1.

FIG. 1.

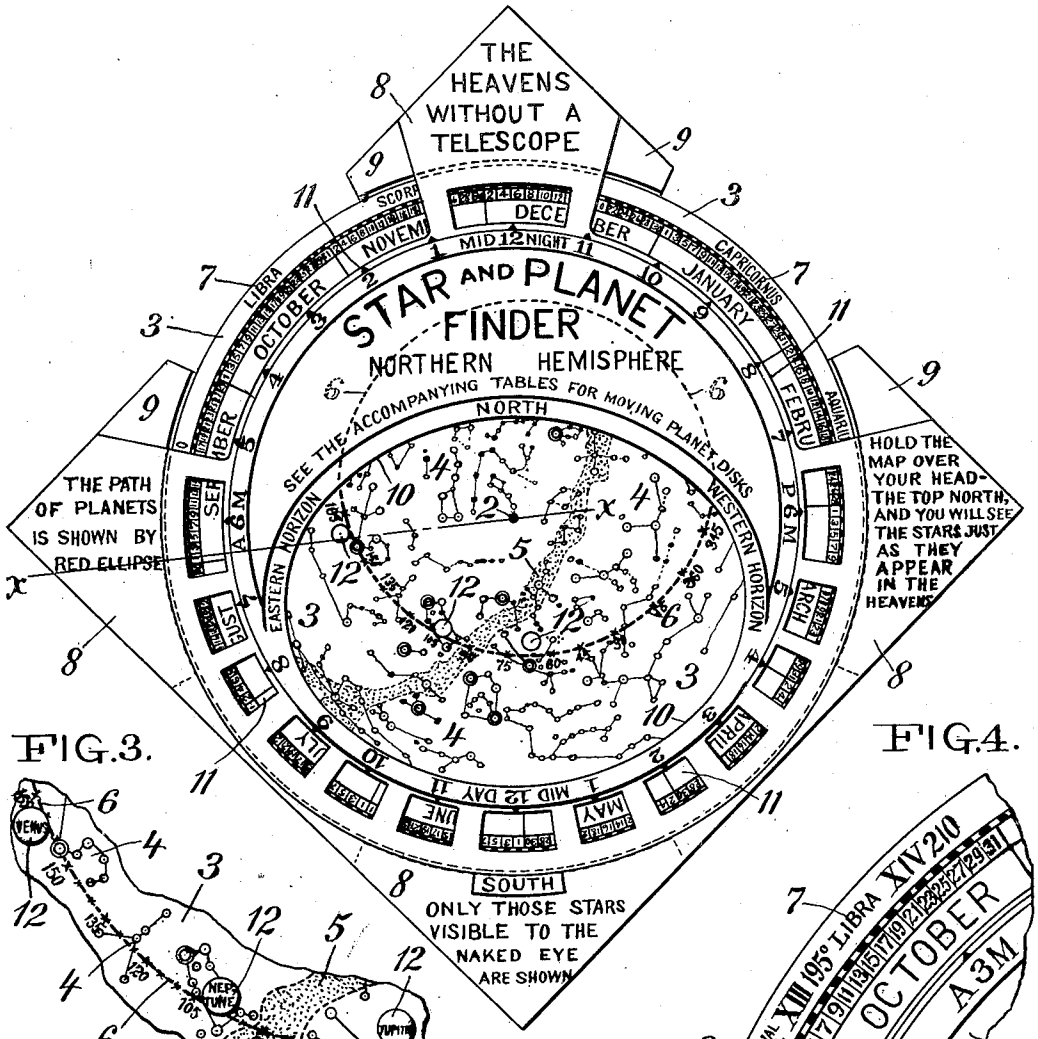
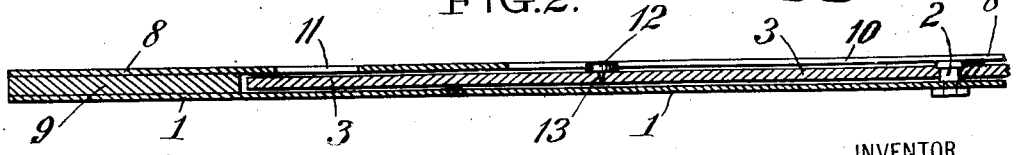


FIG. 3.

FIG. 4.

FIG. 2.



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FIG. 5.

PLANET DISK ENTRIES FOR 1905.

THE DEGREES ARE IN RED

ENTER THE PLANET DISK ON THE MAP ON THE DEGREE MARKS CORRESPONDING TO THE DATES IN THIS TABLE

VENUS	Jan. 1	Feb. 14	Mar. 21	Apr. 15	May 15	June 2	July 5	Aug. 4	Sept. 4	Oct. 4	Nov. 3	Dec. 4
	325	10	36	40	25	30	55	85	125	160	195	230
MARS	Jan. 1	Feb. 5	Mar. 1	Apr. 1	May 5	June 17	July 4	Aug. 3	Sept. 2	Oct. 2	Nov. 5	Dec. 5
	203	219	228	233	225	217	218	228	245	265	293	315
JUPITER	Jan. 1	Mar. 1	May 1	July 1	Sept. 1	Nov. 1						
	20	27	40	55	65	63						

Move disk only six times a year

SATURN	Jan. 1	Apr. 1	July 1	Oct. 1
	322	331	335	330

Move disk only four times a year

URANUS	Jan. 1
	270

Move disk only once a year — four degrees

NEPTUNE	Jan. 1
	100

Move disk only once a year — four degrees

MERCURY	Apr. 4	May 21	Aug. 2	Sept. 15	Nov. 27
	30	35	155	155	265

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STAR AND PLANET FINDER.

No. 832,527. Specification of Letters Patent. Patented Oct. 2, 1906.

Application filed October 5, 1905. Serial No. 281,472.

To all whom it may concern:

Be it known that I, LEON BARRITT, a citizen of the United States of America, residing at the borough of Brooklyn, in the city of New York, State of New York, have invented certain new and useful Improvements in a Star and Planet Finder, of which the following is a specification.

This invention has for its object to provide a simple, efficient, and inexpensive planisphere device adapted for use by expert or amateur astronomers or by teachers and students generally for enabling them to quickly and accurately locate and identify and distinguish the moving planets of the solar system relatively to the fixed stars or constellations of the heavens at any time and by the aid of annually-arranged reference-tables which specify the relative positions of the planets at proper times.

The invention will first be described and then will be particularly defined in the claims hereinafter set forth.

Reference is made to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a plan or face view of the improved star and planet finder with the plane of the ecliptic indicated by a heavy dotted line. Fig. 2 is an enlarged detail cross-sectional view taken on the line x x in Fig. 1. Fig. 3 is an enlarged detail plan view of an inner portion of the planisphere. Fig. 4 is an enlarged detail plan view of a marginal portion of the planisphere, and Fig. 5 is a face view of a planet reference tablet or table for the year 1905.

The numeral 1 indicates a suitable and preferably square base-plate or backing to which is pivoted at 2 in the "North Star" position a revoluble planisphere 3, on which the fixed stars or constellations 4, including the "Milky Way" 5, are produced in any ordinary or approved manner and preferably by printing or lithography, making them appear in white upon a black or dark ground, so as to be easily visible. On the planisphere 3 is produced distinctively and preferably in red ink a heavy elliptical line 6, which indicates the plane of the ecliptic or the apparent path of the sun. This ecliptic line 6 is preferably graduated into three hundred and sixty degrees, which are preferably indicated in successive "fives" and by the numerals "1, 5, 10, 15," &c., from one to three hundred and sixty, as shown in Figs. 1 and 3 of the drawings, to facilitate placement upon the planisphere of the planet-indicators hereinafter described. The planisphere-disk 3 preferably bears at its outer rim portion the names of the usual zodiacal sign-names 7, and within the circle of said signs are produced consecutively the names of the months from January to December. The spaces occupied by these month-names are also subdivided at the outer part into day-spaces, in which only the alternate days for each corresponding month may be numerically indicated.

Over the planisphere-disk 3 is applied a face-plate 8, which, like the backing 1, preferably has a generally square form. Interposed spacing-pieces 9, held at the four corners to and between the plates 1 8, permit rotation of the disk 3 on its axis 2 between these plates. The face-plate 8 has a large and preferably elliptical interior opening 10, through which most of the star-field of the planisphere 3 is visible. Said plate 8 also, preferably, has a series of segmental marginal openings 11, through which the month and day indices on the disk 3 may be seen. Within the margin of said openings 11 are produced on the plate 8 series of numerals "1" to "12," indicating the hourly time from midnight to midday and from midday to midnight. Above and below the elliptical horizon-opening 10 of the plate 8 are produced on said plate the direction-symbols "North" and "South," and to the left and right of the symbol "North" are produced the phrases "Eastern horizon" and "Western horizon." At the north corner of the face-plate 8 is preferably produced the title phrase "The heavens without a telescope," under which appears the phrase "See the accompanying tables for moving planet-disks." Toward the south appears the phrase "Only those stars visible to the naked eye are shown," while to the east appears the phrase "The path of planets is shown by red ellipse," and to the west appears the phrase "Hold the map over your head—the top north—and you will see the stars just as they appear in the heavens." The precise character and location of these information or direction imprints upon the face-plate 8 are immaterial, as they may widely vary as occasion may suggest or require.

The planet locating and distinguishing means comprises by preference a series of adjustable indicators 12 in the form of disks

having some suitable means of attachment to the face of the planisphere 3, such means, for instance, as short tacks 13, permitting the planet-indicators to be readily affixed like thumb-tacks to the planisphere at or near its ecliptic line 6. On these disks are produced by printing or otherwise the names of all the planets of the solar system (excepting the earth) from Mercury to Neptune, one planet-name being on each planet disk or indicator.

The tables enabling any one of ordinary intelligence to quickly, easily, and properly locate the indicators 12 or any equivalent planet-indicators upon the planisphere 3 are preferably made in separate tablet or card form, one for each year, the tablet for 1905 being shown in Fig. 5 of the drawings. The numerals ranging after the planet-names in squares or subdivisions of this table and preferably printed in red ink indicate the degrees of the ecliptic plane at or near which the indicators 12 are to be located upon the planisphere 3 at the dates appearing, preferably, above the respective degree-marks on the table. One or more of these annually-arranged tablets or tables may be supplied with each planisphere device. It now is proposed to supply a series of twenty tables for locating the planets relatively to the fixed stars for a period of twenty years ahead of the date of publication of the planisphere.

A prior planisphere not accompanied by adjustable planet-indicators and reference tablets or tables for locating them at the ecliptic and requiring consulting an almanac to determine the time at which any given planet rises, souths, or sets before being able to locate the planets relatively to the fixed stars had its graduated ecliptic degrees arranged in twelve groups of thirty degrees, and one group for each adjacent imprinted name of the month from January to December, and each monthly group having its degrees indicated by numerals 10 20 30, and which is an arrangement of the degree subdivisions quite unlike the herein-described plan of numerically indicating only the degrees from one to three hundred and sixty, inclusive, at the ecliptic plane and without adjacent confusing month-names.

The herein-described annually-arranged tablets or tables would be serviceable if the degree-graduations at the ecliptic plane were indicated in manner other than hereinbefore mentioned—as, for instance, by lines radiating from the planisphere-axis to its periphery—whereat said lines may be numerically marked at the graduated degree-points; but the numerical marking of the degrees in "fives" from one to three hundred and sixty directly on or near the imprint of the ecliptic plane, as herein shown and described, is preferred, because it avoids all preliminary calculations, such as by eye measurements along radial lines, and also avoids search for month names next degree indications of the ecliptic, in order to ascertain the precise degree positions at the imprinted ecliptic plane to which the planet-indicators are to be adjusted, and thus assures very quick, easy, and accurate adjustment of the indicators upon any part of the planisphere in accordance with the accompanying table by any intelligent adult or child pursuing the study of the heavens.

Illustrative of the use of this invention the planisphere 3 in Fig. 1 of the drawings is shown turned upon its axis 2 until the date of October 5 registers with the hour of "4 a. m." By referring to the illustrated table arranged for the year 1905 it will be seen that the planet Venus stands at about the one hundred and sixtieth degree, and the indicator 12, marked "Venus," is therefore applied or affixed to the planisphere 3 at or near the numerically-marked one hundred and sixtieth degree of its ecliptic plane 6. Said table shows that Jupiter and Neptune occupy respective positions at the sixty-fifth and one hundreth degrees, and their indicating-disks will also be applied to the planisphere 3 at these respective degree positions at or near the ecliptic plane 6, all as shown in Figs. 1 and 2 of the drawings. If now the directions at the right-hand corner of the face-plate 8—"Hold the map over your head—the top to the north"—be followed, the imprints of the fixed stars and their constellations on the planisphere 3 and the disks 12 applied thereto will together clearly indicate on the planisphere the precise relative positions the visible stars and planets occupy in the Leavens at four a. m. on October 5, 1905. By simply turning the planisphere 3 on its pivot 2 to any position indicating the month, day, and hour, with reference to the prepared table for any given year, the relative positions of the fixed stars and moving planets may be quickly, easily, and certainly indicated at any time of day or night during that year by adjusting the planet-indicating disks 12 on the planisphere 3 at or near the ecliptic plane 6 at proper positions in accordance with the tables.

It is obvious that with this planisphere device and accompanying tables any person of ordinary intelligence will be able to find the fixed stars and their constellations and also locate and identify and most clearly distinguish the planets appearing as morning or evening stars or otherwise at any time and for any number of years for which the tables may be prepared. The very large number of persons, both professionals and amateurs, interested in the study of the heavens may in this simple device have always conveniently at hand a readily-adjustable celestial chart enabling them by the aid of the easily-read reference-tables to unfailingly locate all the fixed stars and their constellations and

clearly distinguish them from the planetary system at any year, day, month, and hour.

Adjustable planet-indicators applicable directly to a planisphere-disk having imprint of the fixed stars have before been used; but with this prior planisphere device no accompanying tables were provided by which to locate the positions of the planets at an imprinted plane of the ecliptic, and it was specially directed that with this prior device an ephemeris or nautical almanac be used to determine where to locate the planet-indicators upon the planisphere at various times of any given year for which the ephemeris was issued.

The tablets or tables accompanying the planisphere in accordance with this invention cost but a trifle by comparison with the cost of an ephemeris for a period of twenty years. It also requires special training or skill to accurately use ephemeris or almanac tables to distinguish the planets from the fixed stars by a process of selection of proper tables from the great mass of tabulated information for astronomers and navigators usually compiled in these volumes. This trouble of selecting and using the proper ephemeris or almanac tables to determine the planet positions would alone discourage popular or wide use of a star and planet finder by novices in astronomy and navigation, aside altogether from the almost prohibitive cost, bulk, and weight of many volumes of the ephemeris or almanac, if used only for distinguishing the planets from the fixed stars, as is proposed to be done by the aid of this improved planisphere device of which the accompanying tablets or tables thus obviously form an important part.

The special object of this invention is to provide a planisphere having imprints of the fixed stars and of a graduated ecliptic plane with adjustable planet-indicators and accompanying tablets or tables, by the aid of which any young or older student may quickly and easily and accurately apply the planet-inditors at or near the imprinted ecliptic plane of the planisphere-disk and without requiring the inconvenient use of expensive and bulky ephemeris or almanac volumes. This invention by including in itself all necessary means or appliances for quickly and accurately locating and visibly positioning the planets relatively to the fixed stars is for this purpose the full equivalent of and an obvious improvement upon any prior planisphere device necessarily accompanied by an ephemeris or almanac, the proper use of which is not understood by the very large majority of intelligent persons who are unable to make calculations from such volumes, but desire a fairly accurate knowledge of the celestial sphere. In other words, the object of this invention is to provide at low cost the most complete and effective combination of simple appliances for easily and accurately locating the planets relatively to the fixed stars without laborious or inconvenient or expensive calculations that has as yet been devised and with a view to stimulating and widely popularizing the asthetic and helpful study of the heavens.

Various modifications may be made in the form of the planet-indicators and in the method of applying or affixing them to the planisphere 3—as, for instance, the planet-indicator attachment may be effected magnetically or in manner other than by the teeth or pins 13, herein specially shown and described. The terms "imprints" and "imprinted" also are to be construed as including any method of producing on the planisphere the desired representations of the fixed stars and their constellations and the graduated ecliptic plane.

This improved planisphere device may also be used to indicate the phases of the moon for any month of any year by employing a series of disks 12, indicating in proper manner the moon phases—"new moon," "first quarter," "full moon," "last quarter." By reference to specially-prepared tables relatively indicating the days of the month and the degrees of the ecliptic said moon-disks may be applied to the planisphere at the ecliptic plane line 6. For instance, for the month of December, 1905, the table shows that the moon enters as "new moon" on December 1, at two degrees; enters the "first quarter" on December 7, at ninety-six degrees; becomes "full moon" on December 14, at one hundred and ninety-two degrees, and enters the "last quarter" on December 21, at eighteen degrees. By placing the corresponding moon-phase disks at the degree marks 2 96 192 18 on the ecliptic plane line 6 these disks will indicate "new moon," "first quarter," "full moon," and "last quarter" phases, respectively, for said month of December, 1905. If desired, but one "full-moon" disk may be used and placed at the corresponding degree indicating such phase in the table.

This improved planisphere device may also be used to determined the apparent or relative position of the sun upon the ecliptic at any day or date by simply laying a ruler or straight-edge directly from the "North Star" 2 to the desired date at the margin of the disk 3, and the point of intersection or the degree imprinted where the ruler crosses the plane of the ecliptic 6 will indicate at said ecliptic the apparent position of the sun at that date.

I claim as my invention—

1. A star and planet finder comprising a planisphere having imprints of the fixed stars and a graduated imprint of the ecliptic plane, adjustable planet-indicators adapted to said planisphere at or near its graduated ecliptic plane, and one or more accompanying tablets or tables having imprints identifying the

planets and their respective positions at certain times relatively to the degrees of the planisphere ecliptic plane, substantially as described.

2. A star and planet finder comprising a planisphere having imprints of the fixed stars and a graduated imprint of the ecliptic plane, adjustable planet-indicators adapted to said planisphere at or near its graduated ecliptic plane, and one or more accompanying annually-arranged tablets or tables having imprints identifying the planets and their respective positions at certain times relatively to the degrees of the planisphere ecliptic plane, substantially as described.

3. A star and planet finder comprising a planisphere having imprints of the fixed stars, and a graduated imprint of the ecliptic plane with applied or adjacent numerical degree indications, adjustable planet-indicators adapted to said planisphere at or near its graduated ecliptic plane, and one or more accompanying tablets or tables having imprints identifying the planets and their respective positions at certain times relatively to the degrees of the planisphere ecliptic plane, substantially as described.

4. A star and planet finder comprising a planisphere having imprints of the fixed stars, and a graduated imprint of the ecliptic plane with applied or adjacent numerical degree indications arranged from one to three hundred and sixty, inclusive; adjustable planet-indicators adapted to said planisphere at or near its graduated ecliptic plane, and one or more accompanying tablets or tables having imprints identifying the planets and their respective positions at certain times relatively to the degrees of the planisphere ecliptic plane, substantially as described.

5. A star and planet finder comprising a planisphere having imprints of the fixed stars and a graduated imprint of the ecliptic plane, adjustable planet-indicators having attaching points or teeth adapted to detachably fasten them to the planisphere at or near its imprinted ecliptic plane, and one or more accompanying tablets or tables having imprints identifying the planets and their respective positions at certain times relatively to the degrees of the planisphere ecliptic plane, substantially as described.

6. A star and planet finder comprising a face-plate having an interior horizon-opening and outer hour-marks; a planisphere revoluble relatively to the face-plate and having imprints of the fixed stars and a graduated imprint of the ecliptic plane visible at said horizon-opening and also having month and day indices visible relatively to the hour-marks of the face-plate, combined with adjustable planet-indicators adapted to said planisphere at or near its graduated imprinted ecliptic plane, and one or more accompanying tablets or tables having imprints identifying the planets and their respective positions at certain times relatively to the degrees of the planisphere ecliptic plane, substantially as described.

7. A star and planet finder comprising a face-plate having an interior horizon-opening and outer hour-marks; a planisphere revoluble relatively to the face-plate and having imprints of the fixed stars, and a graduated imprint of the ecliptic plane with applied or adjacent numerical degree indications and visible at said horizon-opening and also having month and day indices visible relatively to the hour-marks of the face-plate, combined with adjustable planet-indicators adapted to said planisphere at or near its graduated imprinted ecliptic plane, and one or more accompanying tablets or tables having imprints identifying the planets and their respective positions at certain times relatively to the degrees of the planisphere ecliptic plane, substantially as described.

8. A star and planet finder comprising a face-plate having an interior horizon-opening and outer hour-marks; a planisphere revoluble relatively to the face-plate and having imprints of the fixed stars and a graduated imprint of the ecliptic plane visible at said horizon-opening and also having month and day indices visible relatively to the hour-marks of the face-plate, combined with adjustable planet-indicators having attaching points or teeth adapted to detachably fasten them to said planisphere at or near its graduated imprinted ecliptic plane, and one or more accompanying tablets or tables having imprints identifying the planets and their respective positions at certain times relatively to the degrees of the planisphere ecliptic plane, substantially as described.

9. A star and planet finder comprising a face-plate having an interior horizon-opening and marginal openings and adjacent hour-marks; a planisphere revoluble beneath the face-plate and having imprints of the fixed stars and of the ecliptic plane visible through said horizon-opening of the face-plate and also having month and day indices visible through the marginal openings of the face-plate, combined with adjustable planet-indicators adapted to said planisphere at or near its imprinted ecliptic plane, substantially as described.

10. A star and planet finder comprising a face-plate having an interior horizon-opening and marginal openings and adjacent hour-marks; a planisphere revoluble beneath the face-plate and having imprints of the fixed stars and a graduated imprint of the ecliptic plane visible through said horizon-opening of the face-plate; said planisphere also having month and day indices visible through the marginal openings of the face-plate, combined with adjustable planet-indicators adapted to said planisphere at or near its

graduated ecliptic plane, substantially as described.

11. A star and planet finder comprising a face-plate having an interior horizon-opening and marginal openings and adjacent hour-marks; a planisphere revoluble beneath the face-plate and having imprints of the fixed stars and of the ecliptic plane visible through said horizon-opening of the face-plate and also having month and day indices visible through the marginal openings of the face-plate, combined with adjustable planet-indicators having attaching points or teeth adapted to detachably fasten them to the planisphere at or near its imprinted ecliptic plane, substantially as described.

LEON BARRITT.

Witnesses:
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ALVIN K. GOODWIN.