No. 659,817. Patented Oct. 16, 1900.

J. M. JONES.

PLANETARIUM.

(Application filed Dec. 12, 1899.)

(No Model.) 3 Sheets—Sheet 1.

FIG. 1

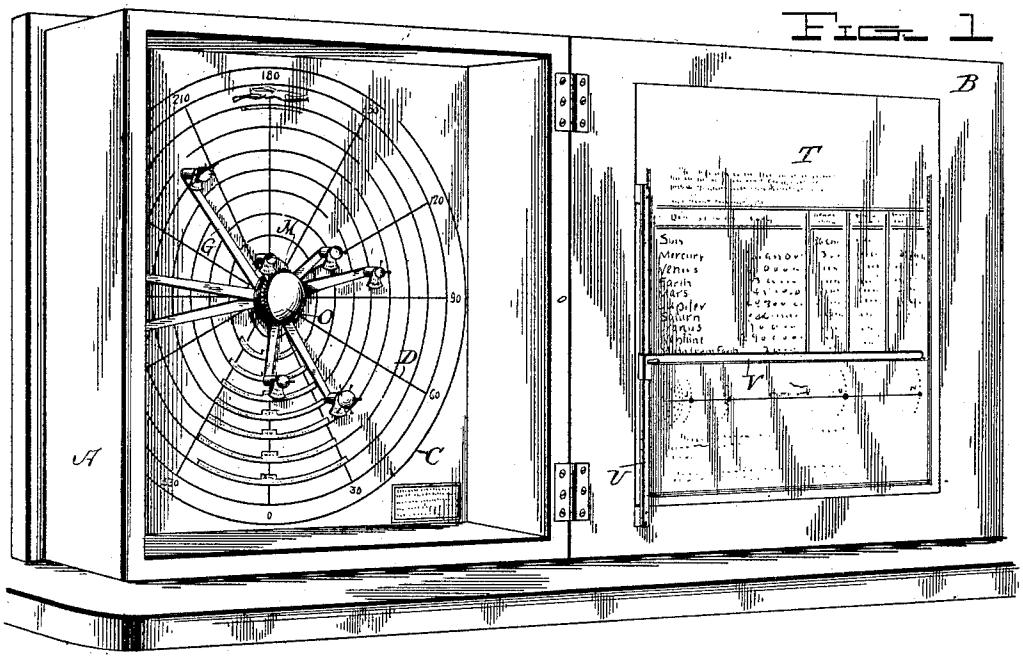
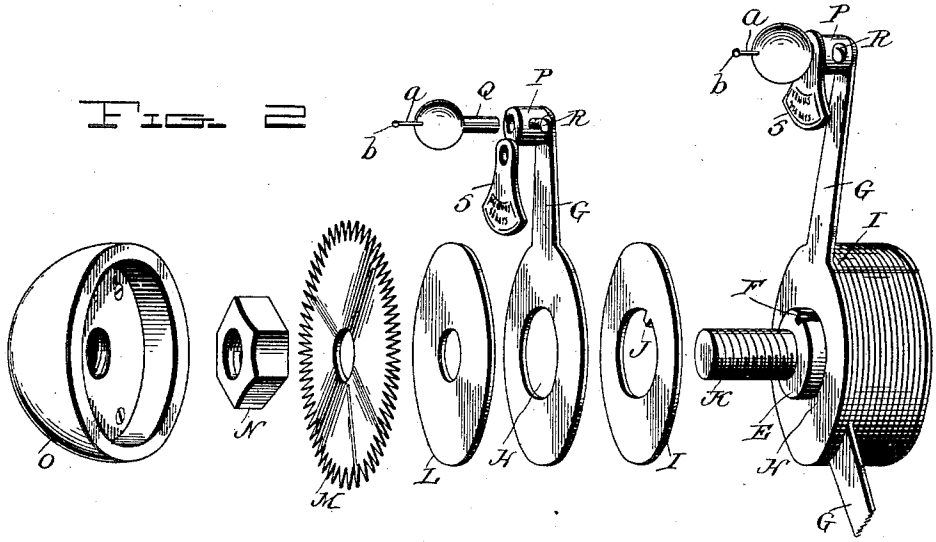


FIG. 2



Witnesses:
D. E. Burdine

Inventor:
John M. Jones,
by Dodge and Sons,
Attorneys.

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

No. 659,817. Patented Oct. 16, 1900.

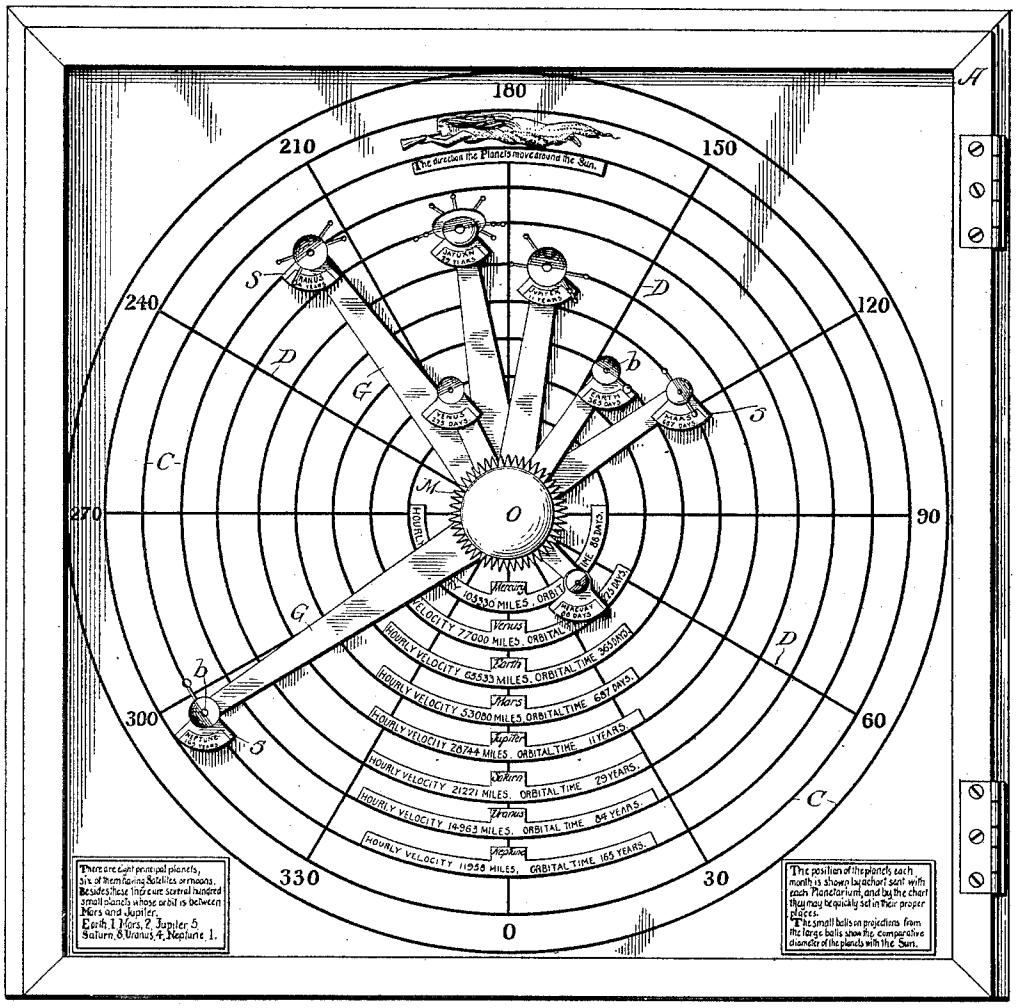
J. M. JONES.

PLANETARIUM.

(Application filed Dec. 12, 1899.)

(No Model.) 3 Sheets—Sheet 2.

FIG. 2



Witnesses:
D. L. Jonkins
D. E. Burdine

Inventor:
John M. Jones,
Dodge and Sons,
by Attorneys.

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

No. 659,817. Patented Oct. 16, 1900.

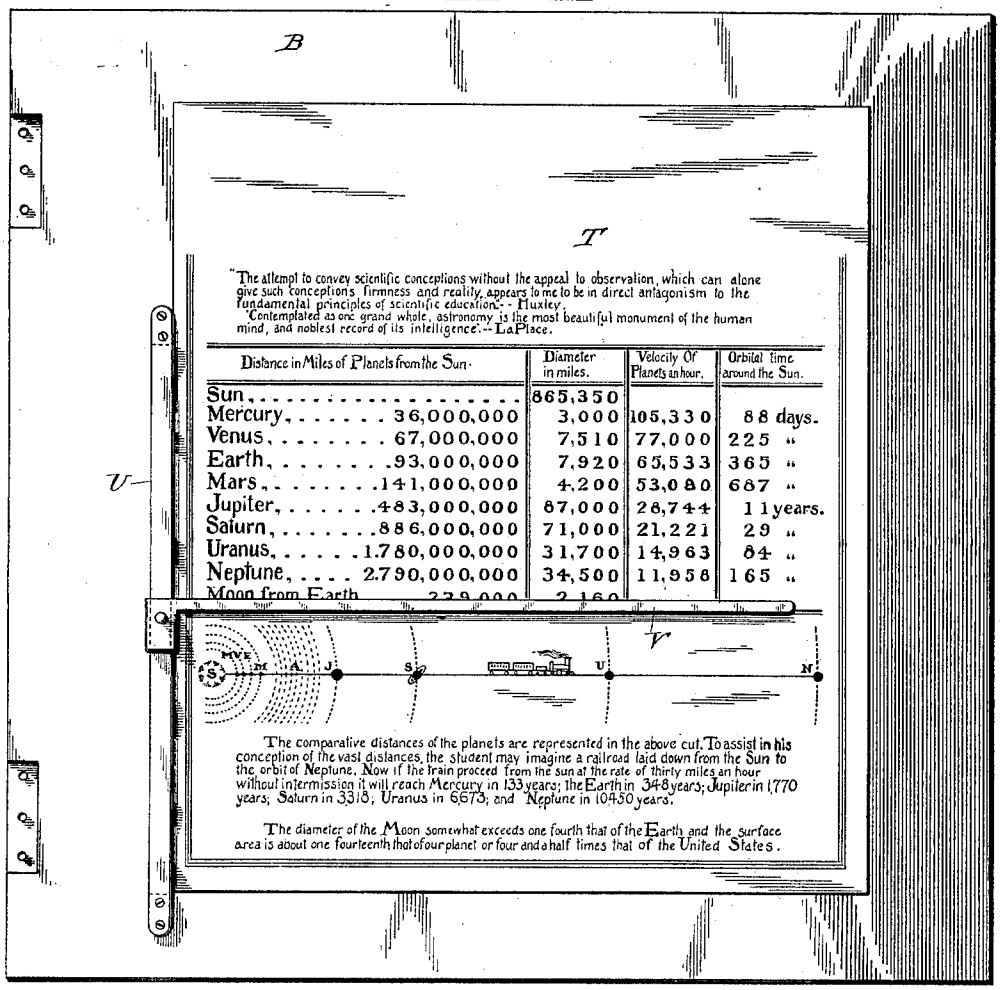
J. M. JONES.

PLANETARIUM.

(Application filed Dec. 12, 1899.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 4



"The attempt to convey scientific conceptions without the appeal to observation, which can alone give such conceptions firmness and reality, appears to me to be in direct antagonism to the fundamental principles of scientific education."—Huxley.

"Contemplated as one grand whole, astronomy is the most beautiful monument of the human mind, and noblest record of its intelligence."—LaPlace.

Distance in Miles of Planets from the Sun.	Diameter in miles.	Velocity Of Planets an hour.	Orbital time around the Sun.
Sun	865,350		
Mercury	36,000,000	3,000	105,330	88 days.
Venus	67,000,000	7,510	77,000	225 "
Earth	93,000,000	7,920	65,533	365 "
Mars	141,000,000	4,200	53,080	687 "
Jupiter	483,000,000	87,000	28,744	11 years.
Saturn	886,000,000	71,000	21,221	29 "
Uranus	1,780,000,000	31,700	14,963	84 "
Neptune	2,790,000,000	34,500	11,958	165 "
Moon from Earth	239,000	2,160		

The comparative distances of the planets are represented in the above cut. To assist in his conception of the vast distances, the student may imagine a railroad laid down from the Sun to the orbit of Neptune. Now if the train proceed from the sun at the rate of thirty miles an hour without intermission it will reach Mercury in 133 years; the Earth in 348 years; Jupiter in 1,770 years; Saturn in 3318; Uranus in 6673; and Neptune in 10450 years.

The diameter of the Moon somewhat exceeds one fourth that of the Earth and the surface area is about one fourteenth that of our planet or four and a half times that of the United States.

Witnesses:
D. L. Bradbury
D. E. Purdue

Inventor,
John M. Jones,
by Dodge and Sons,
Attorneys.

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

UNITED STATES PATENT OFFICE.

JOHN M. JONES, OF PALMYRA, NEW YORK.

PLANETARIUM.

SPECIFICATION forming part of Letters Patent No. 659,817, dated October 16, 1900.

Application filed December 12, 1899. Serial No. 740,094. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. JONES, a citizen of the United States, residing at Palmyra, in the county of Wayne and State of New York, have invented certain new and useful Improvements in Planetariums, of which the following is a specification.

My present invention pertains to improvements in planetariums, the construction and advantages of which will be hereinafter set forth, reference being had to the accompanying drawings, wherein—

Figure 1 is a perspective view of the entire apparatus; Fig. 2, a perspective view of certain portions thereof, showing the parts in a separated condition; Fig. 3, a face view of the planetarium proper, and Fig. 4 a similar view of the explanatory diagram going with and forming a part of the completed planetarium.

One object of my invention is to provide a simple and compact planetarium, in which the arms carrying the representations of the various planets may be moved around a common center representing the sun without affecting one another in their movements.

A still further object of my invention is to provide a case in which the planetarium may be mounted, so that when opened an explanatory diagram containing matter relative to the various planets shown will be brought into such position that it may be readily and easily referred to.

In the accompanying drawings, A denotes the main casing or box, and B a cover hinged thereto, preferably at one side, as shown in Fig. 1. It is designed when the apparatus is in use that the box shall be upon a suitable support or suspended from the wall in a vertical position, so that when the cover or lid is open it may be swung around into the position indicated in Fig. 1, wherein it will be noted that the explanatory diagram stands to one side of the planetarium and may be readily referred to by the person using the device. The inner face of the bottom of the box is provided with a chart, upon which appears a series of circles C, each representing the orbit of a particular planet, and said circles are intersected by a series of radiating lines D, which divide the circles into degrees, starting with zero at the bottom. The name of each planet, as will be seen upon reference to Fig. 3, appears just above the circle defining its orbit, and for convenience its hourly velocity in miles and its orbital time are also denoted. Thus for Jupiter it will be noted that the velocity is twenty-eight thousand seven hundred and forty-four miles and the orbital time eleven years.

Secured to the center of the bottom of the box or casing is a shaft or spindle E, in one side of which is formed a groove or channel F, for purpose which will presently appear.

Each of the planets is carried at the outer end of an arm G, which, as will be seen upon reference to Fig. 2, is enlarged at its inner end and provided with a central opening H of a size adapted to pass over and make a neat fit with the spindle or shaft E.

In assembling the several arms upon the central shaft or spindle there is placed between each a washer or disk I, provided with an inwardly-projecting finger or lug J, which extends into the groove or channel F, and thus prevents the washers from rotating about the spindle or shaft. Thus it will be seen that when one of the arms G is moved the washers adjacent thereto on each side cannot rotate therewith, and consequently no movement is imparted to the other arms mounted on the shaft or spindle.

To secure the various arms and washers in place, I provide the outer end of the shaft or spindle E with a reduced threaded portion K, over which are passed a washer L and a disk M, preferably provided with a series of points or projections upon its periphery. When these are in place, a nut N secures them all in their proper positions and prevents any endwise movement of the same relative to the shaft, while leaving the arms free to move thereabout. Over the nut N and upon the end of the reduced portion K there is secured a rounded nut O, which, as will be seen upon reference to Fig. 3, is of a diameter slightly less than that of the disk M, so that the projections or points upon said disk extend out beyond the edge or periphery of said nut O. The nut O, with the points or projections upon the disk M, is designed to represent the sun and in practice will be gilded to accentuate that fact.

The outer end of each arm G is provided

with a socket-piece P, adapted and designed to receive the shaft or stud Q, carrying one of the representations of the planets. This stud Q is secured in place in the socket-piece P by means of a set-screw R. It will therefore be seen that the planets may be removed from the arms should occasion so require.

Each planet is provided with a plate S, loosely mounted upon its attaching-shaft Q, and which in effect forms a pendant carrying the name of the planet and any other suitable inscription—such, for instance, as its orbital time. Being thus loosely mounted upon the shaft it matters not what the position of the arm may be, for the pendant or sign will always hang vertically and the printing thereon appear in proper position to be read. Each of the several planets will be provided with its own moons, as is usual in this class of devices.

In order to indicate the direction of movement of the arms, and consequently the direction of travel of the planets, a figure or other suitable indicating device is placed, preferably, at the upper portion of the chart. Any suitable description or explanatory matter may, as shown in Fig. 3, be placed upon the chart outside of the orbital lines.

The cover B, as before stated, is provided with an explanatory diagram T, to one side of which is secured a bar U, having slidably mounted thereon an indicator or arm V, the indicator or arm being so arranged as to carry out a line of notations for any one of the various planets. The diagram shown is merely for the purpose of illustration, and any other printed matter may be substituted therefor. For instance, a chart showing the various positions of the planets from time to time or month to month might be substituted and the indicating arm or pointer used in the same manner, as illustrated.

As will be noted upon reference to Figs. 2 and 3, each of the planet representations has projecting out from it an arm *a*, carrying a sphere *b*, which sphere is designed to show the comparative diameter of the planet to the sun—that is to say, the diameter of *b* is to the diameter of the planet representation as the diameter of the planet representation is to that of the sun or the nut O.

Having thus described my invention, what I claim is—

1. In a planetarium, the combination of a suitable vertically-disposed base; a series of arms pivotally mounted thereon carrying planet representations; and pendent plates pivotally attached to the planet representations, substantially as and for the purpose described.

2. A planetarium provided with an arm movable in a substantially-vertical plane, said arm carrying a planet representation; and a pendent plate pivotally secured thereto, said plate having notations thereon, substantially as and for the purpose described.

3. In a planetarium, the combination of a suitable base; a central shaft or spindle secured thereto and provided with a groove or channel in its face; a series of arms journaled upon said spindle; washers interposed intermediate said arms, said washers being provided with lugs or fingers adapted to enter the groove in the face of the shaft or spindle; and means for securing said arms and washers in place upon the shaft.

4. In a planetarium, the combination of a suitable base; a shaft or spindle secured thereto and provided with a channel or groove F in its face; a series of arms G journaled upon said shaft, each arm carrying a planet representation at its outer end; a series of washers I mounted upon said shaft or spindle intermediate said arms, each washer being provided with a finger or projection *j* adapted to enter the groove; and a suitable locking-nut adapted to be secured upon the outer end of the shaft holding the parts in position, substantially as described.

5. In a planetarium, the combination of a suitable base; a shaft or spindle secured thereto and provided with a groove or channel F in its face; a series of arms G journaled upon said shaft, each of said arms carrying at its outer end a planet representation; a pendent plate also carried at the outer end of each of said arms; washers I placed upon the shaft intermediate the arms G, each of said washers being provided with a finger or projection adapted to enter the groove F; and means for securing the arms and washers in place upon the shaft.

6. In a planetarium, the combination of a suitable base; a shaft or spindle secured thereto and provided with a groove or channel F on one face thereof; a series of arms G journaled upon said shaft or spindle; a planet representation removably secured to the outer end of each arm; a pendent plate likewise carried by the outer end of each of said arms; washers I placed upon the shaft intermediate said arms G and provided with a finger or projection adapted to enter the groove F; a disk M secured upon the outer end of the shaft by a nut N; and a rounded nut O secured upon the end of the shaft or spindle over the nut N, substantially as and for the purpose described.

7. In a planetarium, the combination of a suitable casing; a series of planet representations pivotally mounted thereon; a chart or diagram independent of the planet representations, and also carried by the casing; and an arm movably secured upon the casing over said chart or diagram and adapted to be brought into proper position thereover to indicate the movement of a particular planet representation, substantially as and for the purpose described.

8. In a planetarium, the combination of a suitable shaft or spindle; a series of arms G journaled thereon; a socket-piece P carried at the outer end of each of said arms; a planet representation provided with a shaft Q adapt-

ed to enter said socket P; means for securing said shaft in place; and a plate S pivotally mounted upon said shaft Q.

9. In a planetarium, the combination of a planet representation, and a sphere or rounded body carried by said representation, said sphere or rounded body being made of a size designed to show the comparative diameters of the planet and the sun.

10. In a planetarium, the combination of a suitable shaft or spindle; a series of arms journaled thereon; a sun representation carried by said spindle; a planet representation carried by each of said arms; and a sphere or body attached to and carried by said planet representations, said sphere or body being so proportioned as to indicate the comparative diameter of the planet to the sun.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN M. JONES.

Witnesses:
GEO. R. STETSON,
HARRY G. CHAPMAN.