(No Model.)

J. TROLL.

APPARATUS FOR DELINEATING THE MOON'S ORBIT.

No. 487,800. Patented Dec. 13, 1892.

FIG. 1.

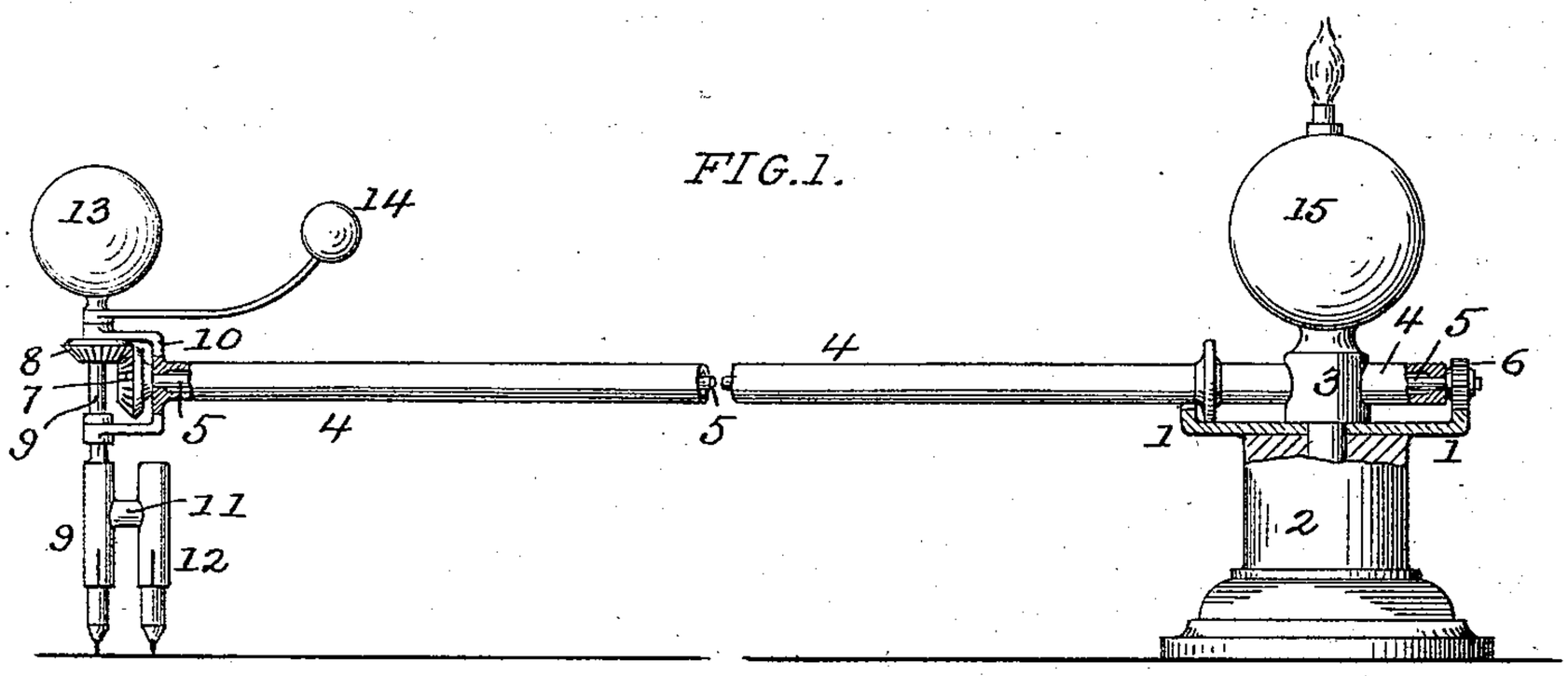
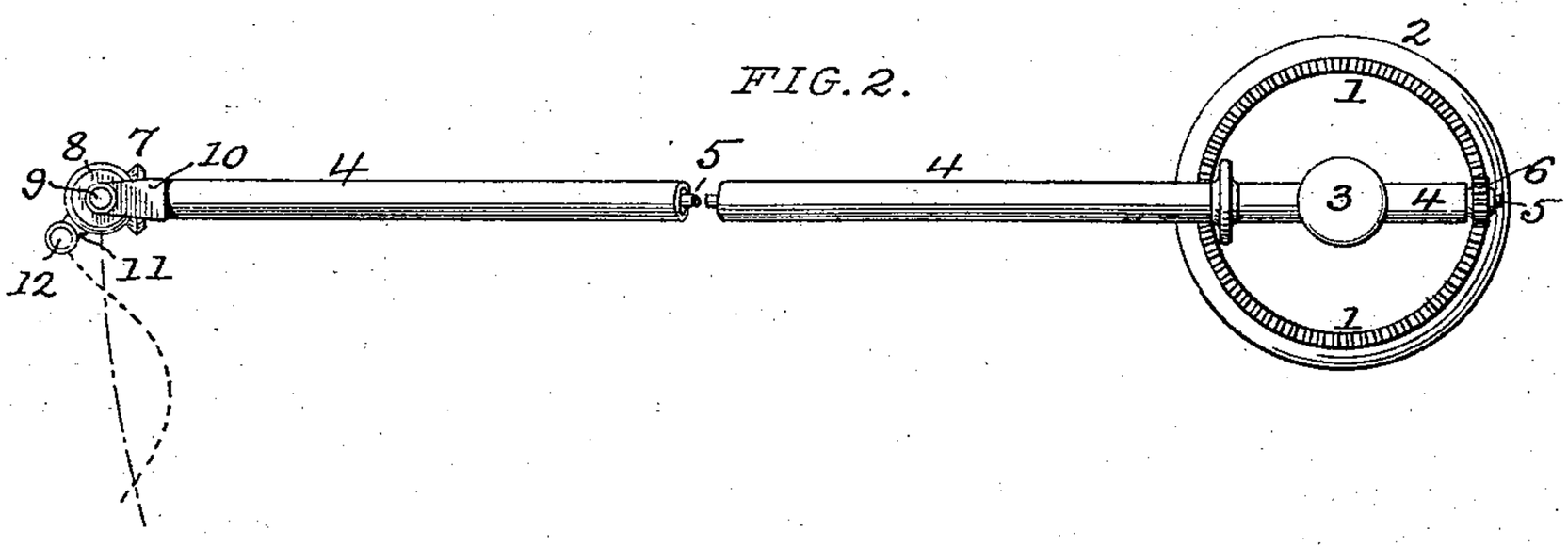


FIG. 2.



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APPARATUS FOR DELINEATING THE MOON'S ORBIT.

SPECIFICATION forming part of Letters Patent No. 487,800, dated December 13, 1892.

Application filed April 18, 1892. Serial No. 429,691. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH TROLL, a citizen of the United States, residing at Belleville, in the county of St. Clair and State of Illinois, have invented a certain new and useful Apparatus for Delineating the Moon's Orbit; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

The present invention relates to an apparatus for graphically delineating the path or orbit of the moon upon a blackboard or other like surface.

The object of the present invention is to provide a simple and effective mechanism whereby a true wave-line to indicate the path of the moon is drawn upon a circular line that indicates the path of the earth around the sun, the purpose being to clearly demonstrate the fact that the lunar path is a regular wave-line. I attain such object by a construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of one form or type of my lunar-orbit delineator, and Fig. 2 a plan view of the same.

Similar numerals of reference indicate like parts in the both views.

Referring to the drawings, 1 represents a cogged rim or disk fixedly attached to the central stationary base or standard 2, at the center or axis of which is arranged a vertical arbor 3, having a suitable knob or handle, by which motion around its axis can be imparted to such arbor 3 by hand.

4 represents a tubular arm of convenient length and thickness, one end of which is attached to the vertical arbor 3 in any suitable manner, preferably passing through a transverse orifice in said arbor, as shown.

5 is a slender shaft or spindle turning in suitable bearings on the arm 4 and preferably arranged in the interior of the same, as shown, with pinions 6 and 7 on its respective ends, the pinion 6 gearing with the stationary cogged rim 1, so as to receive motion therefrom when a circular motion is imparted by hand to the arm 4, while the pinion 7 gears with a pinion 8 on the vertical shaft or sleeve 9, that has suitable bearings in a bracket formation 10 on the outer end of the main tubular arm 4. The vertical shaft or sleeve 9 carries a fixed lateral arm 11, at the outer end of which is a vertical shaft or sleeve 12, parallel to the shaft or sleeve 9, the arrangement being such that as the sleeve 9 turns on its axis the sleeve 12 will move in a circular path around the same. The preferable proportions of the cog-rim 1 and pinions 6, 7, and 8 will be such that the sleeve 12 will revolve about twelve and one-third times around the sleeve 9 while such sleeve 9 and the main tubular arm 4 is making one revolution around the axis or arbor 3.

With an apparatus constructed and operated as above the pencil or drawing-point indicating the earth's orbit will draw a circular line around the main axis that represents the sun, while the pencil or drawing-point indicating the moon's orbit will draw a regular wave-line, intersecting the circular line that represents the earth's path, as illustrated in Figs. 2 and 3. The shafts 9 and 12 are parallel to each other and have their lower ends in the form of receiving-sleeves for sections of pencils or other suitable drawing material, which are secured in position by any usual and well-known holding or clamping mechanism.

In the practical construction of the apparatus it is preferable to arrange upon the upper end of the shaft 9 a globular enlargement 13 to represent the earth, and adjacent thereto, but at a greater proportionate distance than that between the sleeve 9 and 12, a smaller globe 14 to represent the moon, while at the main axis or arbor 3 a lamp 15 is arranged to indicate the sun.

The scope of my present invention is not limited to any special mechanism, whereby the sleeves 9 and 12, carrying suitable marking means, are operated to graphically delineate the moon's orbit or path, as such movement of the sleeves may be attained by a variety of intermediate mechanisms that are the mechanical equivalents to the mechanism just described.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus for delineating the moon's orbit, the combination of the main ra-

dial arm 4, pivoted at its inner end, a shaft or sleeve 9, journaled at the outer end of the arm 4 and carrying a marking-point, a shaft or sleeve 12, connected to the shaft 9 and carrying a marking-point, and means for imparting motion to the shaft 12 around the shaft 9, substantially as set forth.

2. In an apparatus for delineating the moon's orbit, the combination of the main radial arm 4, a shaft or sleeve 9, journaled at the outer end of the arm 4 and carrying a marking-point, a shaft or sleeve 12, connected to the shaft 9 and carrying a marking-point, the arbor 3, and fixed gear 1, concentric therewith, the spindle 5, having at one end a gear 6, meshing with the gear 1, and at the other end a bevel-gear 7, and a bevel-gear 8 on the vertical shaft or sleeve 9, meshing with the gear 7, substantially as set forth.

3. In an apparatus for delineating the moon's orbit, the combination of the main radial arm 4, a shaft or sleeve 9, journaled at the outer end of the arm 4 and carrying a marking-point, a shaft or sleeve 12, connected to the shaft 9 and carrying a marking-point, the arbor 3, and fixed gear 1, concentric therewith, the spindle 5, having at one end a gear 6, meshing with the gear 1 and at the other end a bevel-gear 7, the bevel-gear 8 on the vertical shaft or sleeve 9, the globes 13 and 14, carried by the shaft or sleeve 9, and lamp 15, mounted above the arbor 3, substantially as set forth.

JOSEPH TROLL.

Witnesses:
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