

(No Model.)

J. O. MADISON.  
SPACING INSTRUMENT.

No. 287,145.

Patented Oct. 23, 1883.

Fig. 1.

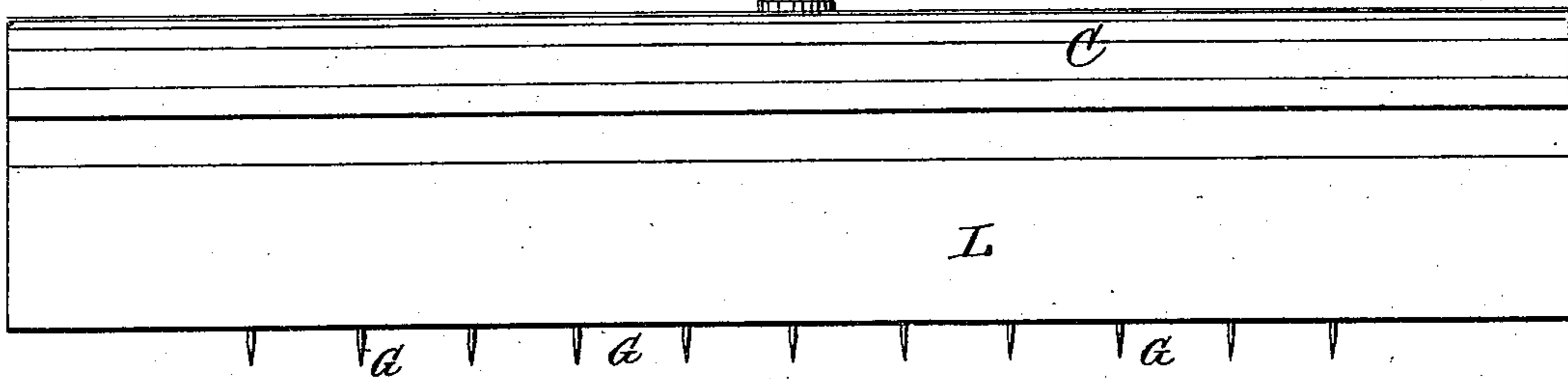


Fig. 2.

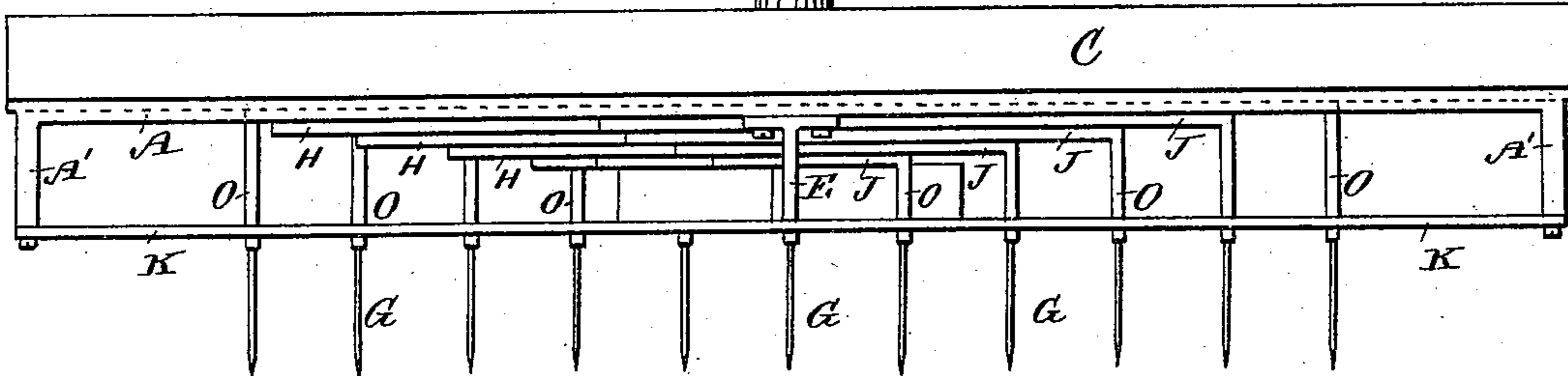


Fig. 3.

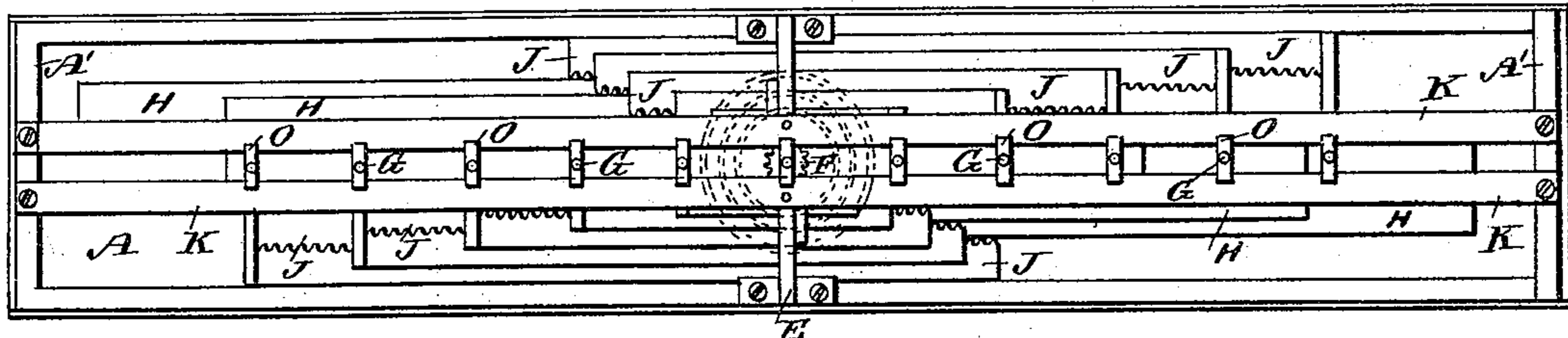
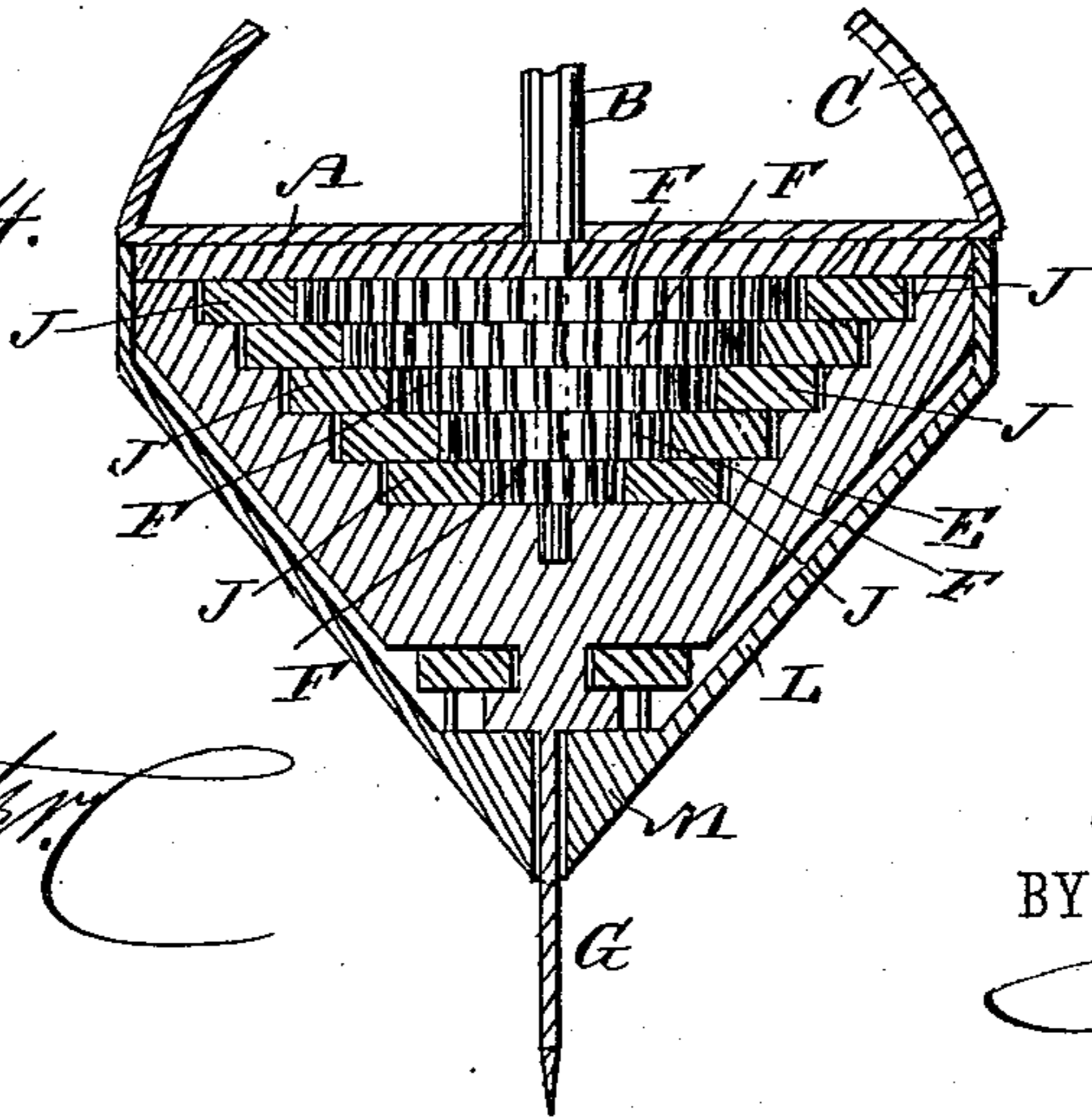


Fig. 4.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JAMES O. MADISON, OF NEW YORK, N. Y.

## SPACING-INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 287,145, dated October 23, 1883.

Application filed February 23, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES O. MADISON, of the city, county, and State of New York, have invented a new and Improved Spacing-Instrument, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved instrument for dividing lines into any desired number of equal parts.

10 The invention consists in a series of pins attached to devices for moving them in such a manner that they will always be equidistant.

The invention further consists in a series of cog-wheels having different diameters and 15 mounted on the same shaft, combined with a series of racks engaging with the cog-wheels at diametrically-opposite points, so that they will move in opposite directions when the cog-wheels are rotated, to the ends of which racks 20 pins are attached.

The invention also consists in certain combinations of parts, as will be fully set forth and described hereinafter.

Reference is to be had to the accompanying 25 drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal elevation of my improved spacing-instrument. Fig. 2 is a longitudinal elevation of the same, showing the 30 casing removed. Fig. 3 is a plan view of the under side of the same, the casing being removed. Fig. 4 is an enlarged detail cross-sectional elevation of the same.

35 In the middle of a plate, A, a spindle, B, is journaled, which projects both from the upper and lower surface of the said plate, and is secured above a casing, C, secured on the top of the plate, with a handle-knob, D, for turning 40 the said spindle on its longitudinal axis. The lower end of the spindle is journaled in a V-shaped recessed transverse partition, E, secured to the under side of the plate. On the spindle A five cog-wheels, F, are rigidly 45 mounted, which cog-wheels increase regularly in diameter from the lower surface of the plate A to the end of the spindle, so that the largest wheel F will be at the under surface of the plate A and the smallest will be at the end of the 50 spindle. A pin, G, projects from the bottom or smallest end of the partition E, parallel with the plane of the partition. A series of guide-

plates, H, are arranged like stairs on the under surface of the plate A—that is, the width of the guide-plates decreases from the under 55 surface of the plate A downward. The guide-plates are so arranged that racks J, placed against the guide-plates in such a manner that they rest against the outer edge of the next higher guide-plate, can engage with the teeth 60 of the ratchet-wheels F. Two racks J engage with each cog-wheel, each pair engaging at diametrically-opposite points of the cog-wheels, so that when the cog-wheels are turned the racks will be moved in opposite directions. 65 The racks and guides are placed parallel with the longitudinal axis of the plate A. The racks are of different lengths, the longest racks engaging with the largest cog-wheels, and so on. At the ends farthest from each other—that is, 70 at the outer ends—the racks are each provided with a downwardly-extending foot-piece, O, which rests on two guide-strips, K, attached to downwardly-projecting end pieces, A', of the plate A, the said strips K passing through 75 notches or recesses in the foot-pieces, so that the foot-pieces will be guided in their movements by the guide-strips K. A pin G projects from the lower end of each foot-piece, the points of all the pins G being on a right line. 80 A V-shaped casing, L, provided at its apex with a longitudinal slot, in which the pins G can move, is secured to the bottom of the plate A. At its middle the slot is crossed by a transverse partition, M, provided with an aperture, 85 through which the middle pin G passes, which is fixed, all the other pins being movable. In place of using five pinions and ten racks, more or less may be used, and the instrument can be made large or small, as may be desired. 90

The operation is as follows: The knob D is turned in one direction or the other, and thereby the pins G will be moved toward or from each other. The racks engaging with the larger cog-wheels move so much more rapidly than 95 those engaging with the smallest cog-wheels that the pins G will always be the same distance apart, and thus the space between any number of pins greater than two will be divided into equal parts. As the pins are always a like 100 distance apart, long or short lines can be spaced or subdivided. The above-described instrument can be used for dividing a line into ten or less equal parts. If a line is to be divided

into a smaller number of parts than ten—for instance, six—one end pin G is placed on one end of the line and the seventh pin is placed on the other end of the line.

5 The instrument is to be used by draftsmen, engineers, cutters, pattern-makers, engravers, &c.

In place of the devices described for moving the pins in such a manner that they will always be equal distances apart, other suitable devices  
10 may be used.

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

1. In a spacing-instrument, the combination,  
15 with a series of cog-wheels having different diameters and mounted on the same shaft, of racks engaging with the cog-wheels, and of pins attached to the ends of the racks, substantially as herein shown and described, and for the purpose set forth.  
20

2. In a spacing-instrument, the combination, with a series of cog-wheels having different diameters and mounted on the same shaft, of racks engaging with the said cog-wheels, and  
25 pins attached to the ends of the racks, and of guide-plates for the racks, substantially as herein shown and described, and for the purpose set forth.

3. In a spacing-instrument, the combination,  
30 with a series of cog-wheels having different diameters and mounted on the same shaft, of two

racks engaging with each cog-wheel at diametrically-opposite points, and of pins secured to the opposite ends of the racks, substantially as herein shown and described, and for the purpose set forth. 35

4. In a spacing-instrument, the combination, with the plate A, the spindle B, and the cog-wheels F, mounted thereon, of the racks J, engaging with the cog-wheels, the foot-pieces O  
40 at the opposite ends of the racks, the guide-strips K, and the pins G, projecting from the foot-pieces, substantially as herein shown and described, and for the purpose set forth.

5. In a spacing-instrument, the combination,  
45 with the plate A, the spindle B, and the cog-wheels F, of the racks J, the foot-pieces O, the pins G, the guide-strips K, and the casings C L, substantially as herein shown and described, and for the purpose set forth. 50

6. In a spacing-instrument, the combination, with the plate A, the spindle B, and the cog-wheels F, of the racks J, the foot-pieces O, the pins G, the central partition, E, the guide-strips K, the casings C L, and the button D,  
55 substantially as herein shown and described, and for the purpose set forth.

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Witnesses:

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