(No Model.)

# L. VON KÖPPEN.

## DIVIDING APPARATUS.

No. 546,336. Patented Sept. 17, 1895.

Fig. 1.

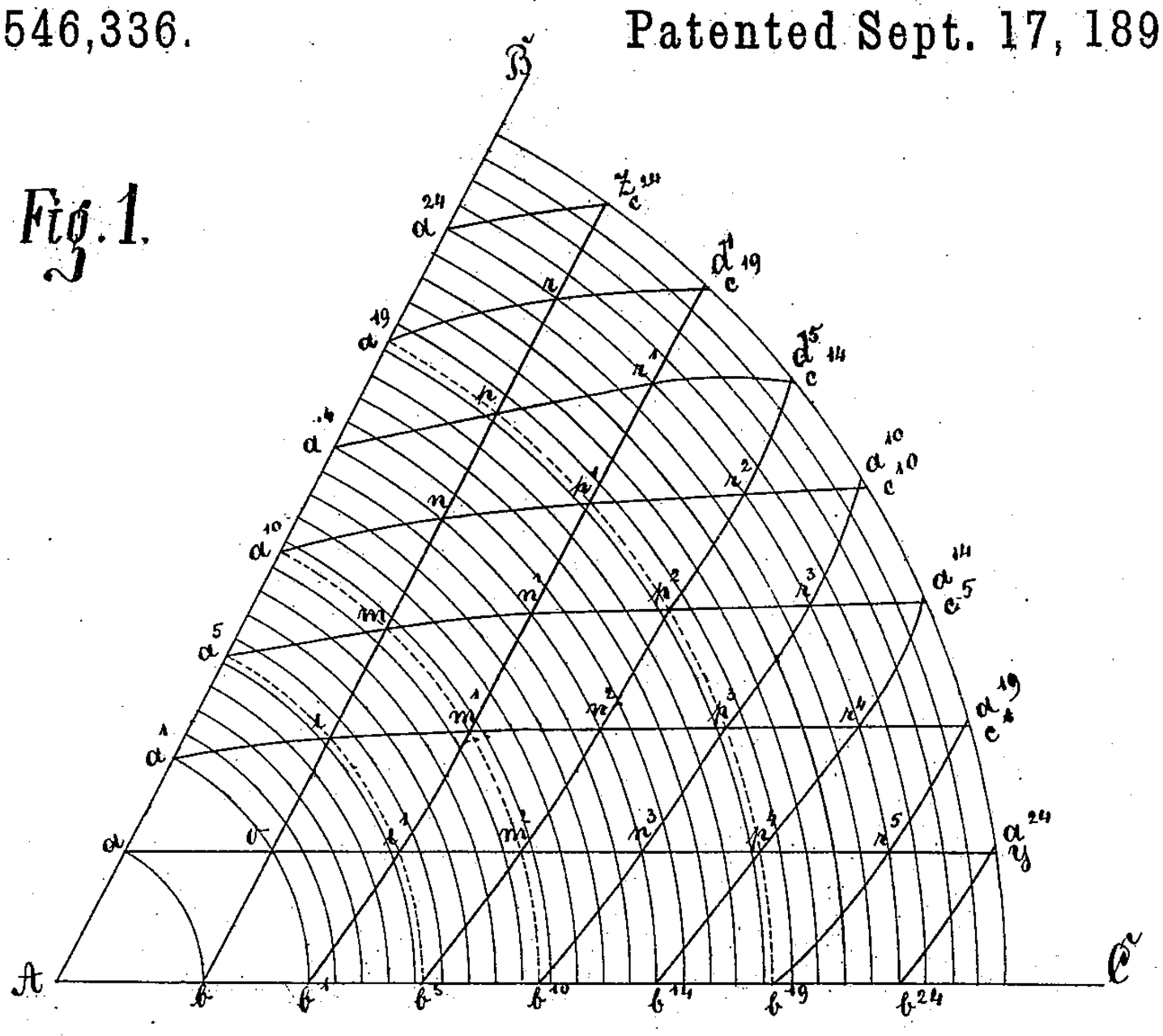
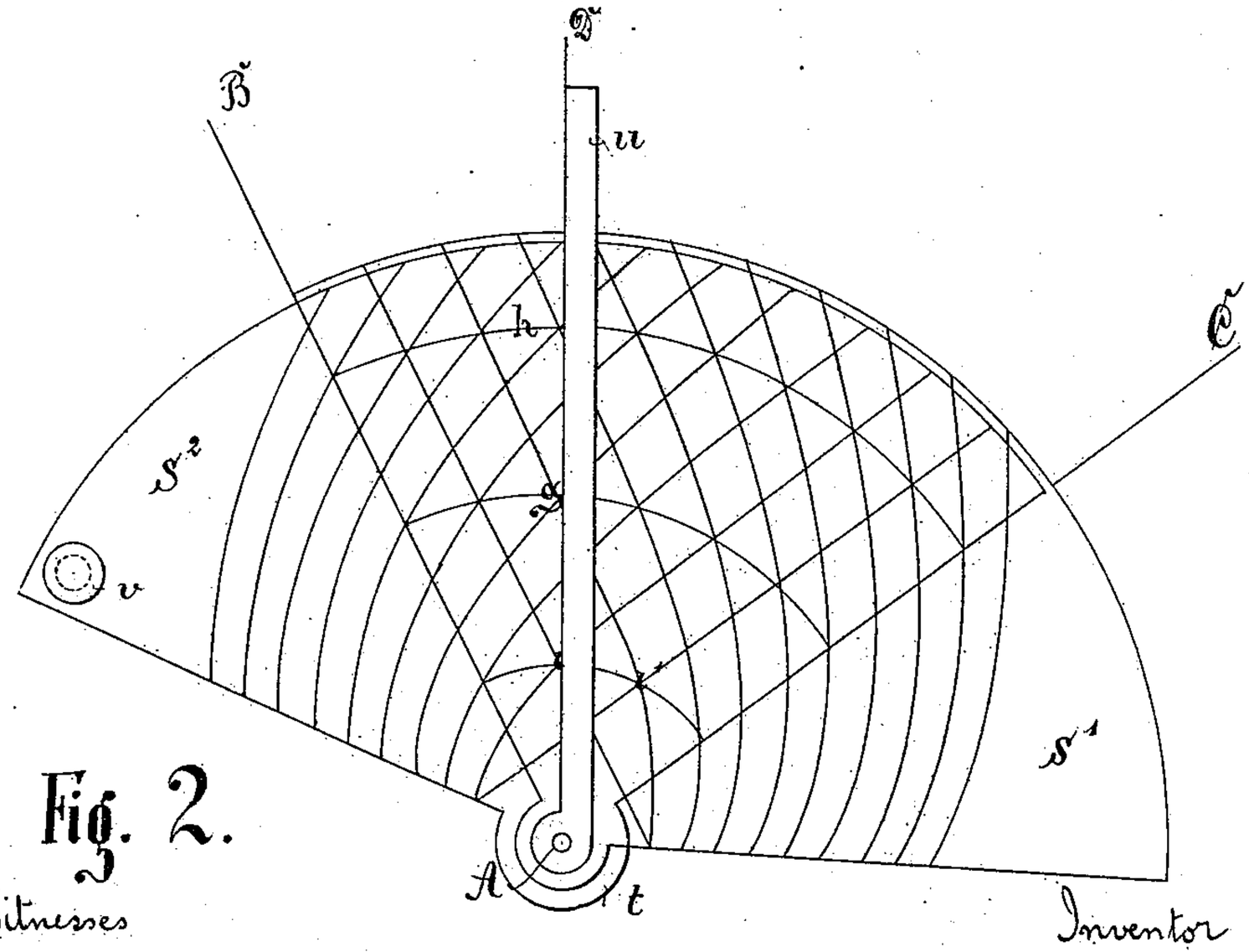



Fig. 2.

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# UNITED STATES PATENT OFFICE.

LOTHAR VON KÖPPEN, OF MUNICH, GERMANY.

## DIVIDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 546,336, dated September 17, 1895.

Application filed January 10, 1895. Serial No. 534,464. (No model.)

*To all whom it may concern:*

Be it known that I, LOTHAR VON KÖPPEN, a citizen of the Kingdom of Prussia, and a resident of Munich, Bavaria, Germany, have invented certain new and useful Improvements in Dividing Apparatus, of which the following is a specification.

The subject-matter of the present application relates to an instrument whereby, after the same has been set, any angle can be divided in an optional number of even parts.

In the drawings, Figure 1 is a plan of a divided angle. Fig. 2 is a plan of the instrument.

The method of dividing upon which my invention is based is as follows: Let A B C represent the divided angle. Spaces bounded by A B and A C are given any desired radius between these lines, as at $a\ b\ a'\ b'$, &c., and from the points $a\ b$ straight lines, as $a\ y$ and $b\ z$, are made parallel with the lines A B and A C. If we now draw segments, to commence at $a\ b$ with continuously-increasing diameter, as at $a'\ b'$ to $a^{24}\ b^{24}$, the two divisions of each segment will have exactly the same size. If the parts of the segment cut off by the straight lines $a\ y$ and $b\ z$ on both sides of the straight lines are laid out, curves $a'\ c'\ a^5\ c^5\ b'\ d'\ b^5\ d^5$ will be formed, the points of section of which will constitute angle-dividing points, and $i\ i'$, for instance, will be the points for the division of the angle in three parts, $m\ m'\ m^2$ the points for dividing the same in four parts, and $n\ n'\ n^2\ n^3$ the points for dividing the same in five parts.

The instrument shown in Fig. 2 is constructed as follows: Two sector-shaped plates S′ S², equal in size, the upper made of a transparent material, are pivotally arranged around a common center point $t$, so that the transparent plate S² can glide over the lower plate S′. A rod or ruler $u$ also pivots around $t$, one of the edges of which in its prolongation passes exactly through the center $t$. The geometrical design shown in Fig. 1 is represented in such a manner by the sector-plates S′ S² that the plate S′ carries one and plate S² the second system of curves, and when the plates are turned so as to fit exactly the one upon the other the transparency of the upper plate will permit the design of Fig. 1 to be seen with all the points of sections of the curves. A change of position of the plates, which can be effected by means of the knob $v$ of the upper plate and at any angle, changes the position of the curves as to their points of section in regard to the angle, but not as far as the reciprocal proportions are concerned. The curve system will thus continue to exist no matter what the angle may be, and, so doing, every angle can be divided.

In order to practically divide an angle, I proceed as follows: Let A B C, Fig. 2, for instance, be the angle it is desired to divide. One of the sides of the lower plate S′ is in line with the lines A B, so that the points A and $t$ fall together. The upper plate S² is then pushed over by means of the knob $v$ until its side falls in line with the line C, so that the angle A B C is limited by the sides of the plates S′ S². The system of curves formed by this position of the two plates shows at the points of intersection of the curves the corresponding dividing-points. If the ruler $u$ is then put upon the desired dividing-point, the aliquot-angle part can be designed immediately. In Fig. 2, in the division of the angle A B C, the ruler has been placed upon the tripartition point B A D, equals one-third B A C. As will be obvious, and as is geometrically necessary, the ruler will pass also through the other dividing-points, as at $g$ and $h$.

I claim—

1. An instrument for dividing angles consisting of two sector shaped plates S′ S² provided with a system of curves and pivoting around a common center, the top plate of which is transparent, the various points of intersection of the curves constituting the desired dividing points of the angles combined with a ruler $u$ pivoted at the common center of the sector plates, the said dividing points along the curves being visible through the top plate, substantially as described.

2. An instrument for dividing angles consisting of two sector shaped plates S′ S² provided with a system of curves and pivoting around a common center, the top plate of

which is transparent, the various points of intersection of the curves constituting the desired dividing points of the angles combined with a suitable ruler, the said dividing points along the curves being visible through the top plate, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

LOTHAR VON KÖPPEN.

Witnesses:

ALBERT WEICKMANN,

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