No. 871,417. PATENTED NOV. 19, 1907.

O. A. KENYON.

CUT ESTIMATOR.

APPLICATION FILED NOV. 20, 1906.

FIG. 1.

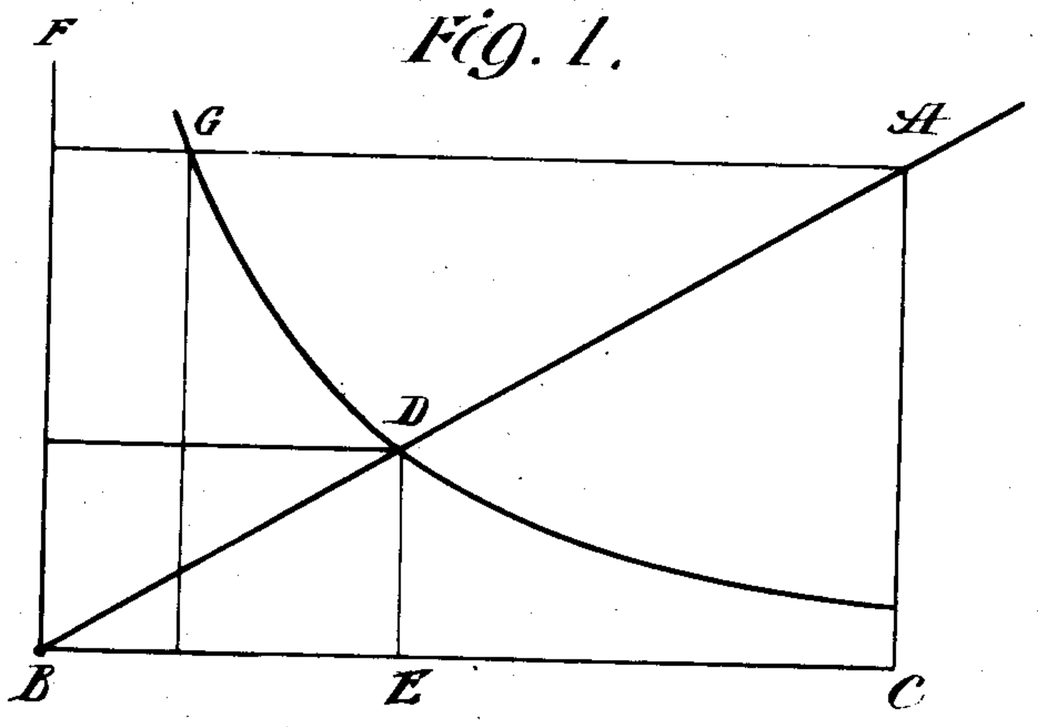
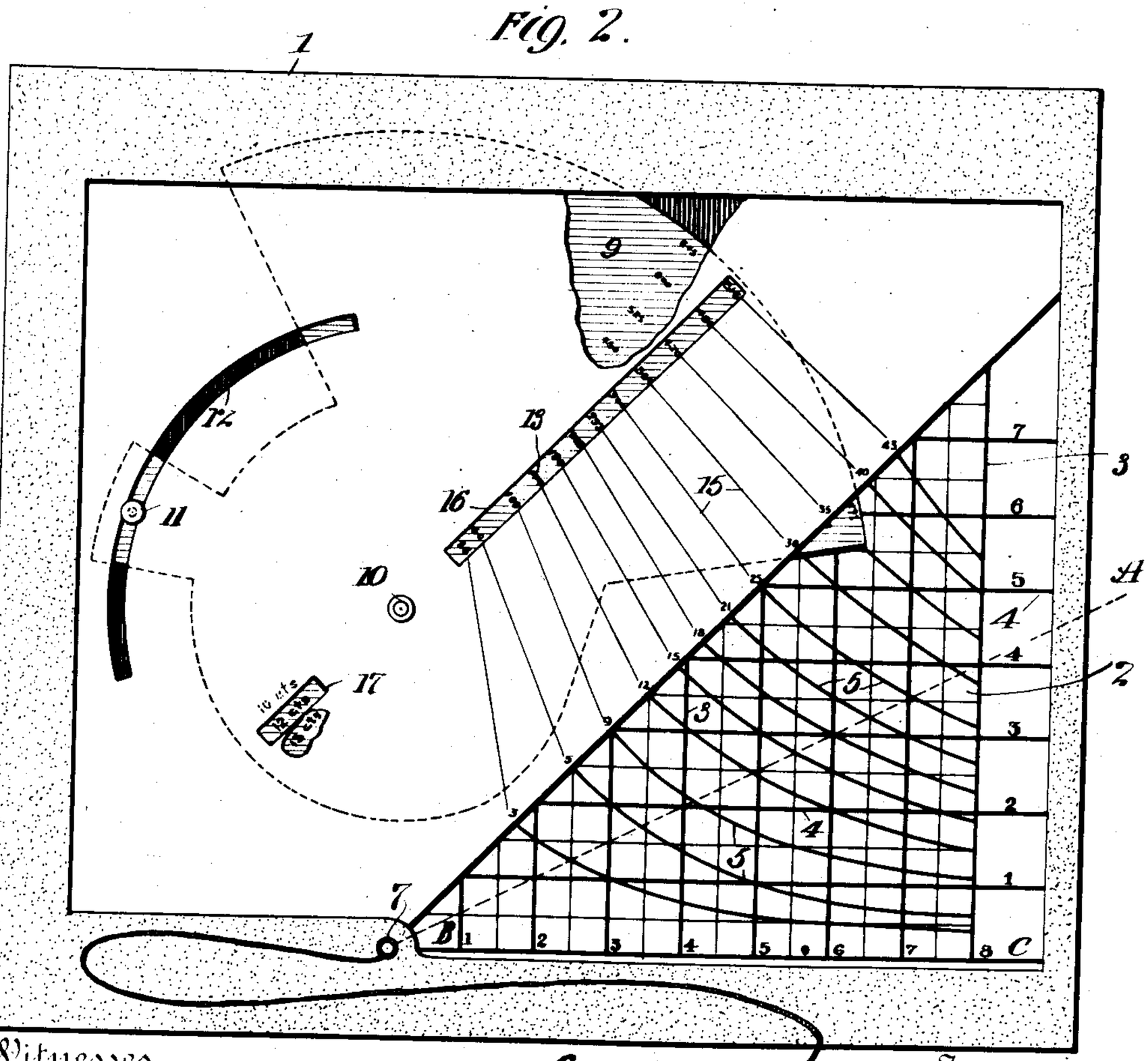


FIG. 2.



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CUT-ESTIMATOR.

No. 871,417. Specification of Letters Patent. Patented Nov. 19, 1907.

Application filed November 20, 1906. Serial No. 344,206.

To all whom it may concern:

Be it known that I, OTIS ALLEN KENYON, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Cut-Estimators, of which the following is a full, clear, and exact description.

My invention relates to an apparatus for indicating all of the various data required in connection with photo-mechanical reproductions, including the dimensions of the plate, its area, and the cost at any particular price rate.

The principal object of the invention is to provide a very cheap and simple device which indicates directly by a very simple manipulation, all of the required computations.

With this object in view the invention consists in the features of construction hereinafter set forth and claimed.

In the drawing: Figure 1 is a diagrammatic view illustrating the principles of the invention; Fig. 2 is a view of a practical device embodying said principles.

In carrying out my invention I make use of two geometrical principles as a basis for the calculations. The first principle employed is the property of similar triangles, the corresponding sides of which are in the same ratio to one another. The second principle utilized is the property of the equilateral hyperbola, the product of the ordinates and abscissa of which at all points is constant.

Referring to Fig. 1 of the drawings, A B C is a triangle having sides A C and B C. D B E is another triangle, having sides D E and B E. Since these triangles are both right triangles and have a common angle, they are similar, and since they are similar, it follows that the relation of the sides of the large triangle to one another is the same as the relation of the sides of the small triangle. This is the first principle utilized.

In order to illustrate the second principle I will consider an equilateral hyperbola described through the point D with the lines B C and B F as coördinates axes. Then the product of the coördinates of any point, as, for example, the point D, is the same as the product of the coördinates of any other point, as, for example, G. But the product of the coördinates of any point represents the area of a rectangle having such coördinates as sides. Thus if the parameter of the hyperbola is known, the area of every rectangle constructed on the coördinate axes and which has its corner falling on the hyperbola is also at once ascertained. By having a number of hyperbola with different parameters, all known, it is possible to ascertain the area of any rectangle whatsoever within the limits of the diagram used.

Referring now to Fig. 2, 1 indicates a sheet of cardboard, or any suitable material, and 2 a transparent portion, which may be of celluloid. I have made the transparent portion 2 in the form of a 45° right triangle, and this triangle has ordinates and abscissa 3 and 4 thereon at unit distance apart.

5 indicate a series of equilateral hyperbolas, the equations of which vary in an orderly sequence as follows: $x\ y=3$, $x\ y=4$, $x\ y=5$, etc., supposing that x and y are the coördinates of any point.

The marking of the triangle 2 corresponds generally with the diagram (Fig. 1). The diagonal line A B is formed in the practical device by any convenient indicating means, such as a straight edge or a string 6 attached or pivoted at the point 7. The various hyperbolas are conveniently marked as shown, 9, 12, 15, 18, etc., corresponding to their parameters or equations and the ordinate and abscissa lines 3 and 4 are also denoted by numerals to indicate their value.

The operation is as follows: Supposing that it is desired to ascertain the exact dimensions and area of a photo-mechanically reduced plate to be made from any drawing. The computer is placed so that the point 7 falls at one corner of the drawing, and the base line B C lies along one edge. The straight line indicator or string 6 is then swung so as to fall across the opposite corner of the drawing, for example as shown in dotted lines in Fig. 2. It is then merely necessary to discover where any particular ordinate intersects the straight edge to know all the required computations. For example, if a cut 5 inches long is desired, it will be seen that the ordinate 5 intersects the straight line indicator or string 6 at the point 2.5, so that the cut will be 2½ inches high. This point of intersection lies almost on the hyperbola No. 12, so that the area is substantially 12 square inches. The indication is always near enough for the purposes of fixing prices, by considering the most adjacent hyperbola, or estimating fractional values between two hyperbolas.

I provide means for carrying the process one step further so as to indicate the expense of the cut. 9 indicates a plate pivoted at 10 upon the under side of the sheet 1. This plate has a handle 11 projecting through an arcuate slot 12 in the sheet 1, so as to swing the plate about its pivotal point. 13 indicate radial rows of figures each of which represents the cost of a cut of certain area at a certain price rate. The different rows represent different price rates and the different figures in each row stand for different areas. Each of the hyperbola is connected by an indicating line 15 to register with particular figures of any radial row. The particular row which is moved into operative position is indicated through a slot 16 in the sheet 1 by suitable inscriptions on the plate 9, appearing through a slot 17.

What I claim, is:—

1. A computing appliance comprising a sheet having a portion ruled with a series of ordinates and abscissa, the location of which is marked or denominated, and a series of hyperbolas, the parameters of which are also marked or denominated, and means pivoted at the intersection of the axes of said hyperbolas for intersecting said ordinates and hyperbolas with a line corresponding to a diagonal of the drawing to be reproduced, whereby the vertical dimension of the reproduction desired is indicated by the intersection of the said diagonal with an abscissa, and the area is indicated by the intersection of the diagonal with a hyperbola.

2. A computing appliance comprising a sheet having a portion with ordinates and hyperbolas thereon, means for intersecting said ordinates and hyperbolas with a line corresponding to a diagonal of the drawing to be reproduced, and means movable with respect to the sheet to denominate each of said hyperbolas with different price values whereby the cost of the reproduction is indicated for different rate charges.

3. A computing appliance comprising a sheet having a triangular transparent portion ruled with a series of ordinates and abscissa, and a series of equilateral hyperbolas, said hyperbolas having the bases of said ordinates and abscissa as coördinate axes, said coördinate axes passing through an apex of said triangular transparent portion of the sheet and means pivoted at said apex of the triangular portion for intersecting said ordinates and hyperbolas with a line corresponding to a diagonal of the drawings to be re-produced.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

OTIS ALLEN KENYON.

Witnesses:
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WALTER CALLAHAN.