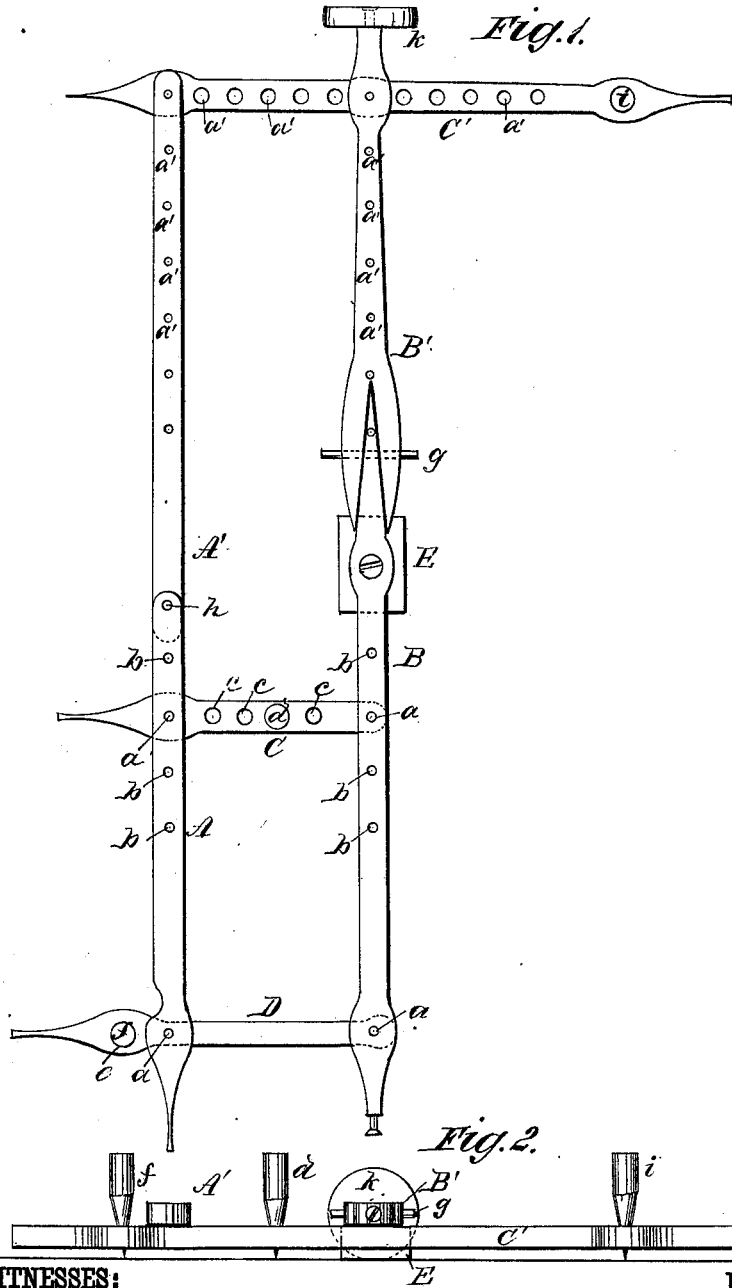


E. WARE.  
PANTOGRAPH.

No. 195,315.

Patented Sept. 18, 1877.



WITNESSES:  
Francis McArdle,  
J. H. Scarborough.

INVENTOR:  
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BY Munnell  
ATTORNEYS.

# UNITED STATES PATENT OFFICE.

ELIJAH WARE, OF OMAHA, NEBRASKA.

## IMPROVEMENT IN PANTOGRAPHS.

Specification forming part of Letters Patent No. **195,315**, dated September 18, 1877; application filed July 13, 1877.

*To all whom it may concern:*

Be it known that I, ELIJAH WARE, of Omaha, in the county of Douglas and State of Nebraska, have invented a new and Improved Pantograph, of which the following is a specification:

Figure 1 is a plan view of my improved pantograph. Fig. 2 is an end elevation.

Similar letters of reference indicate corresponding parts.

The object of my invention is to provide a simple and inexpensive pantograph which may be adapted to large or small work, as may be required.

In the drawing, A and B are bars, which are connected to transverse bars C D by pins *a*, which pass through both sets of bars and form joints that permit of moving the bars upon each other.

The bars A B are provided with holes *b*, through which the pins *a* may be placed when it is desired to shift the bar C toward or away from the pivot of the instrument.

The transverse bar C is provided with a number of holes, *c*, between the bars A B, for receiving a tracing-point or pencil, *d*, and in the bar D, outside of the bar A, there is a hole, *e*, for receiving a tracing-point or pencil, *f*.

The bar B is pivoted to a block, E, that is provided with spurs for retaining it in place, and the end of the said bar is elongated, and to it is fitted an extension-bar, B', which is retained by a pin, *g*.

An extension-bar, A', is secured to the bar

A by a screw, *h*. The bars A' B' are provided with holes *a'*, for receiving pins, by which the transverse bar C' is jointed to them. This bar is also provided with holes *a'*, to admit of moving it lengthwise. Near the end of the bar C' there is a hole for receiving the pencil or tracing-point *i*.

At the end of the bar B' there is a castor-wheel, *k*, which may be shifted to the bar B when the bars A' B' C' are not used. These last-mentioned bars are used in copying or enlarging or reducing large work. The size of the copy is varied by shifting the bar C' toward or away from the pivot of the instrument, and by moving the said bar so as to change the position of the pencil or tracing-point *i*.

When the instrument is used for smaller work the bars A' B' are disconnected, and the pencils or tracing-points *d f* are used.

The pivot or block, with spurs E, may, when desired, be changed to the extreme end of the bar B'.

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

The combination of the bars A' B' C' with the bars A B C D, substantially as shown and described.

ELIJAH WARE.

Witnesses:

HARRIET D. McCLOUD,  
ELLEN J. WARE.