(No Model.)

C. S. RICHÉ.

PANTOGRAPH.

No. 364,043. Patented May 31, 1887.

Fig. 1.

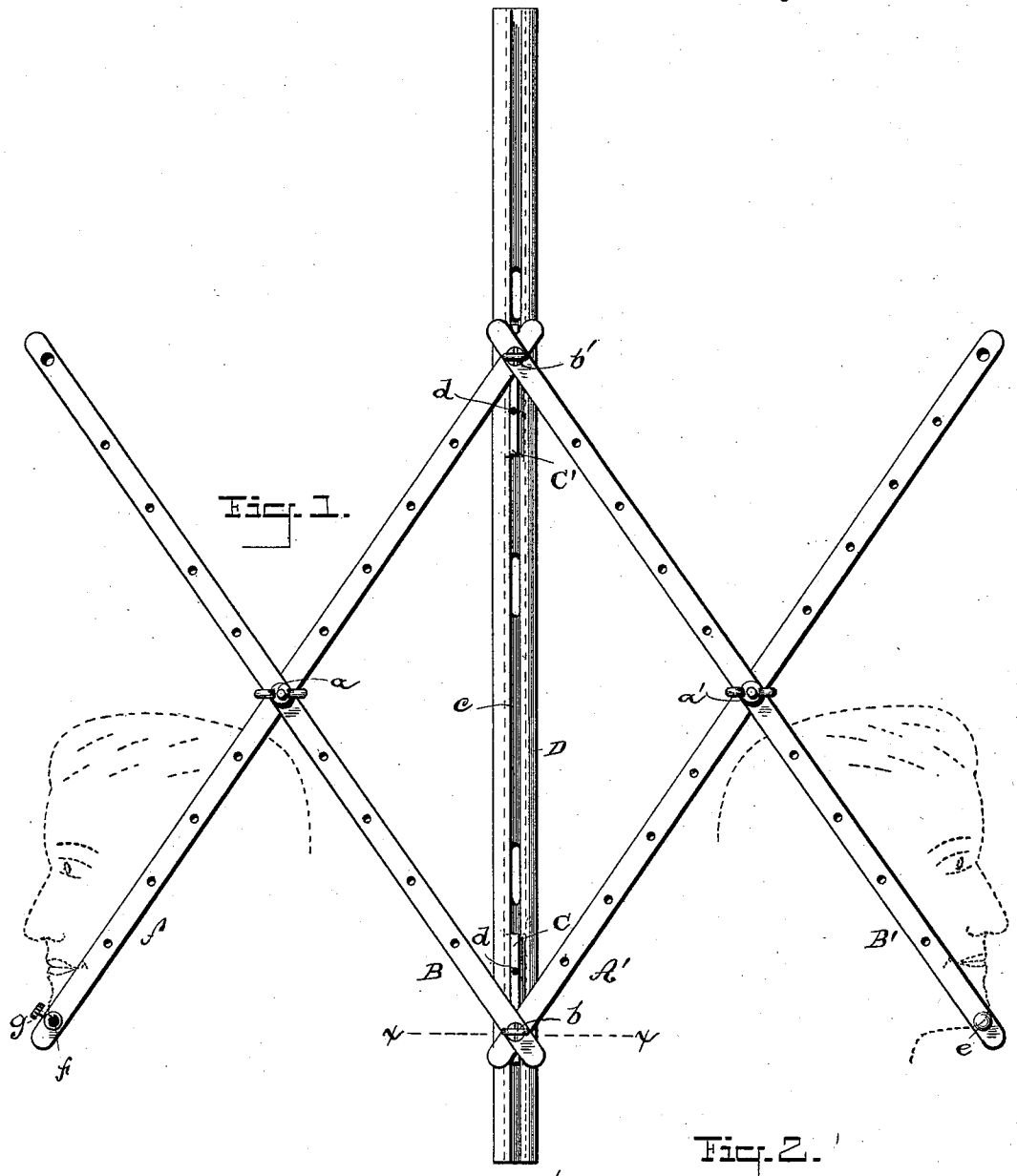
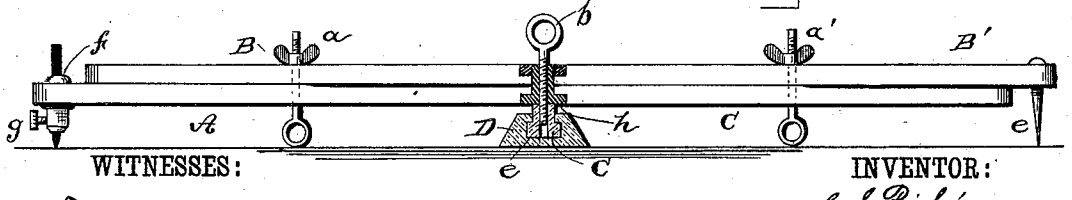


Fig. 2.



WITNESSES:

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CHARLES S. RICHÉ, OF WILLET'S POINT, NEW YORK.

PANTOGRAPH.

SPECIFICATION forming part of Letters Patent No. 364,043, dated May 31, 1887.

Application filed December 6, 1886. Serial No. 220,841. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. RICHÉ, of Willet's Point, in the county of Queens and State of New York, have invented a new and Improved Pantograph, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a plan view of my improved pantograph, and Fig. 2 is an end sectional elevation taken on line *x x* in Fig. 1.

Similar letters of reference indicate corresponding parts in both views.

The object of my invention is to provide a pantograph for copying, reducing, and enlarging drawings, for reversing drawings, and for caricaturing.

My invention consists in the combination, with the four bars of a pantograph, of slides attached to the end pivots of opposite pairs of bars and a guide adapted to receive the slides, all as hereinafter more fully described.

The pantograph is formed of two pairs of bars, A B, A′ B′, the bars being pivoted together in pairs on bolts *a a′*, and provided between their centers and their ends with series of holes, the series of holes in each bar upon one side of the center being like the series of holes in each bar on the opposite side of the center, but oppositely arranged. The pairs of bars are pivoted to each other and to slides C C′ by the pivotal screws *b b′*. The slides C C′ are fitted to a T-shaped longitudinal groove, *c*, in the bar D, and each slide C C′ is provided with a screw-threaded hole, *d*, for receiving one of the screws *b b′*.

The free extremities of all the bars are apertured to receive either a tracing-point or a pencil-holder. In the present case a tracing-point, *e*, is inserted in the end of the bar B′, and a pencil-holding tube, *f*, is inserted in a hole in the end of the bar A and provided with a binding-screw, *g*, by which the pencil is clamped in the tube.

When it is desired to copy or reduce an enlarged drawing, the pivotal screw *b′* is removed from the slide C′ and inserted in the hole *d* of the slide C, and made to bear upon the bottom of the T-shaped slot *c* of the bar D, thus clamping the slide C in a fixed position in the slot of the bar D. The entire instrument is then free to move on the pivotal screw *b*, and the drawing is done in the usual way.

When it is desired to enlarge a picture, the bolt *a′* is placed in one of the holes near the free end of the bar B′, and also in the corresponding hole near the pivoted end of the bar A′. In like manner the bolt *a* is moved to a hole near the free end of the bar B, corresponding in position to that in which the bolt *a′* is placed in the bar B′, and the bolt *a* is also placed in a corresponding hole of the bar A, near the pivotal screw *b′*. By means of this arrangement the leverage is increased, so that the drawing produced by the pencil carried by the tube *f* is enlarged in proportion to the difference in leverage of the two sides of the pantograph.

When it is desired to reduce a drawing, the connections may be changed so as to give the tracing point *e* a greater leverage over the pencil-point; or, the connections of the bars remaining the same, the tracing-point and the pencil-holder may be transposed.

When it is desired to use the pantograph in caricaturing, the connection between the bars may be made unsymmetrical, so as to either elongate or otherwise distort the picture being copied; or the leverage of the arms may be adjusted as for enlarging or reducing, and the pivotal screws *b b′* may be inserted in the slides C C′ as for enlarging or reducing, as hereinafter described.

The joint between the ends of the bars A′ B′ and B A is formed by means of tubular bolts *h*, adapted to receive the pivotal screws *b b′*, so that when either end of the pantograph is removed from its slide the bars of which it is formed are still pivotally connected with each other.

When it is desired to employ the pantograph for reversing, the pivotal screw *b* is inserted in the slide C, and the pivotal screw *b′* is inserted in the slide C′, and the slides C C′ are left free to move in the slot *c* of the bar D. Lines drawn parallel with the bar D and by the sliding of the pantograph in the said bar are produced by the bodily movement of the entire pantograph in the direction parallel with the slot of the bar D; but lines drawn in a direction at right angles to the bar D are formed by the movement of the bars A B′ in opposite direc-

tions. All of the lines drawn by the instrument adjusted in this manner will be reversed. For example, a face looking toward the right traced by the point *e* will by the movement of the bar A produce a drawing of a face looking toward the left, as indicated in dotted lines in the drawings. It will thus be seen that one-half of a design which is to be duplicated and at the same time reversed may be traced by means of the pantograph when arranged in this manner.

The pantograph is also serviceable in producing reversed tracings for drawings on wood for wood-engravings.

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

1. The combination, with the bars A B A′ B′ of a pantograph, of the longitudinally-grooved bar D and the slides C C′, pivotally connected with the pantograph, substantially as described.

2. The combination, with the bars A B A′ B′ and tubular bolts *h*, connecting them together, of the slides C C′, the pivotal screws *b b′*, and the bar D, provided with the longitudinal groove *c*, adapted to receive the slides C C′, substantially as described.

CHARLES S. RICHÉ.

Witnesses:
HENRY C. NEWCOMER,
MASON M. PATRICK.