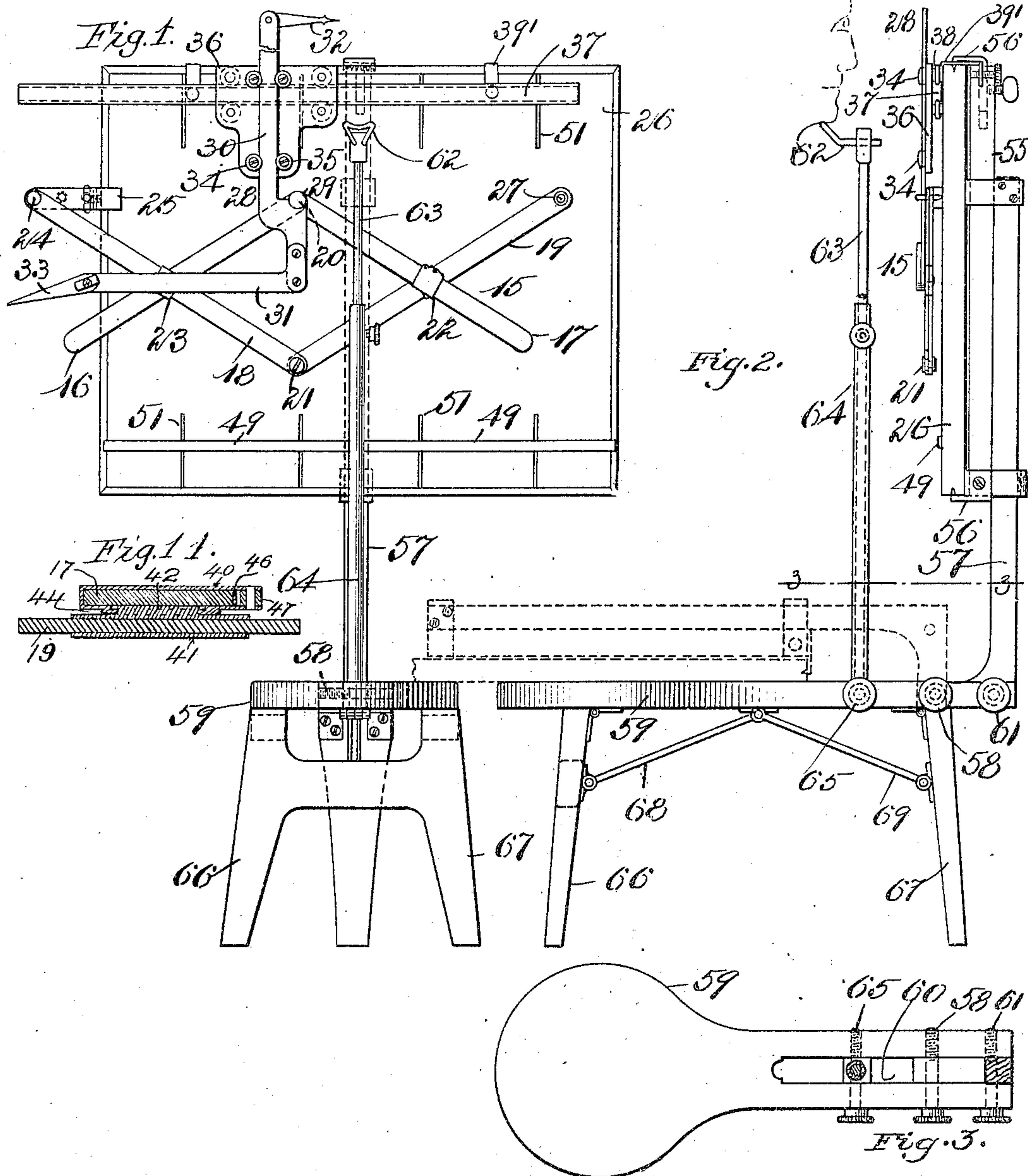


No. 789,901.

PATENTED MAY 16, 1905.

A. W. DAVIS.
PANTOGRAPH.
APPLICATION FILED JULY 29, 1903.

2 SHEETS—SHEET 1.



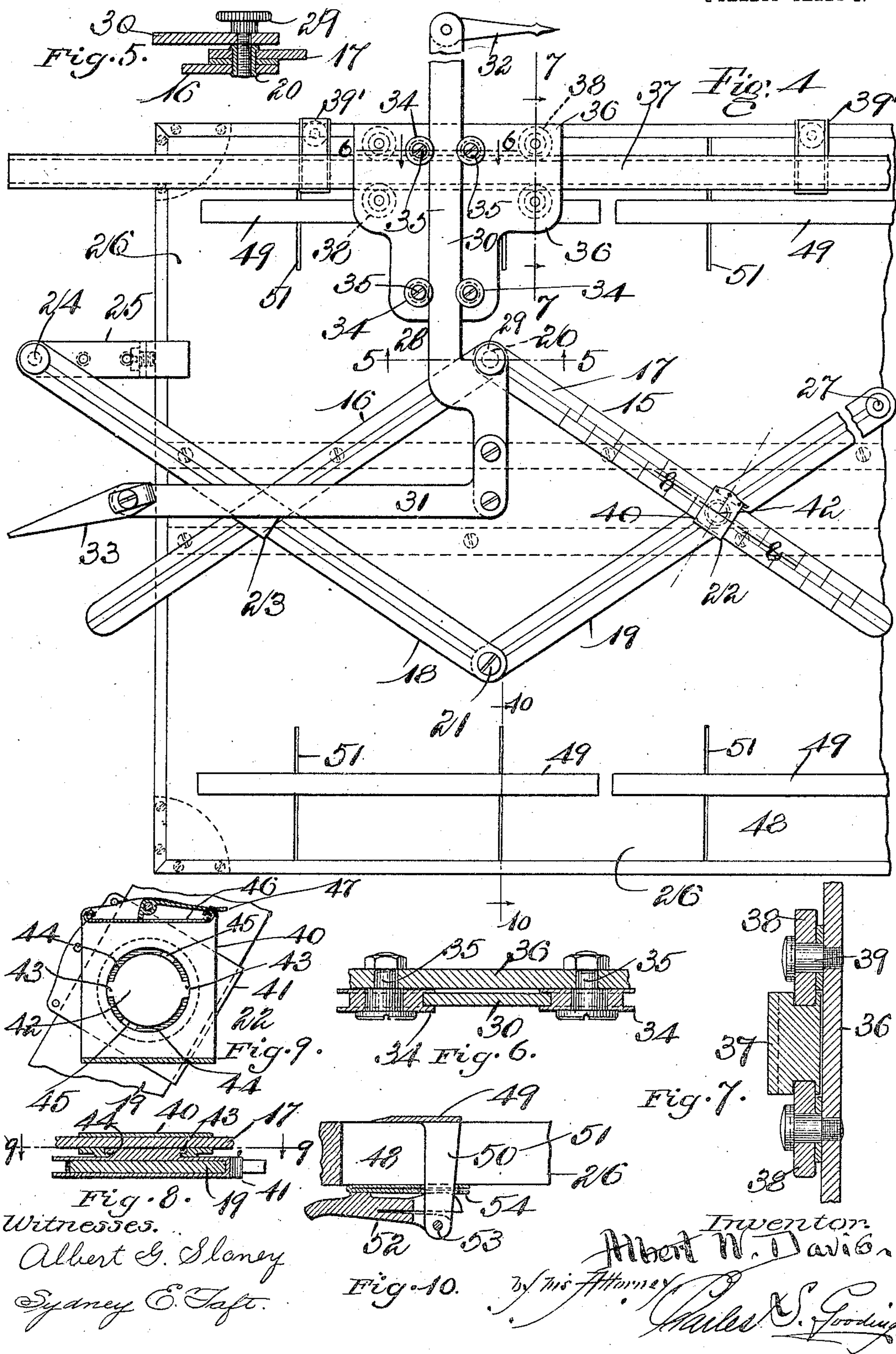
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PANTOGRAPH.

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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

ALBERT W. DAVIS, OF BOSTON, MASSACHUSETTS.

PANTOGRAPH.

SPECIFICATION forming part of Letters Patent No. 789,901, dated May 16, 1905.

Application filed July 29, 1903. Serial No. 167,374.

To all whom it may concern:

Be it known that I, ALBERT W. DAVIS, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Pantographs, of which the following is a specification.

The object of this invention is to provide a pantograph which may be used in the manner of an ordinary pantograph for producing a copy of a drawing or picture upon a larger or smaller scale than the original; and, further, the object of the invention is to provide a pantograph which may be used to produce upon a flat surface a perspective view or reproduction of objects as seen by the eye, either at a distance or near to the observer.

The invention consists of a device attached to a pantograph, said device provided with an indicator-slide and preferably with an indicator-finger pivoted to said indicator-slide, all so constructed and arranged that when said indicator-finger is caused to pass over the outline of an object, between said object and the eye of the observer, a picture of said object will be reproduced by the pantograph upon a flat surface, as a piece of drawing-paper attached to a drawing-board.

The invention again consists in certain improved details of construction of said pantograph.

The invention further consists of the combination of a pantograph, to which is attached an indicator-slide, as hereinbefore set forth, with a drawing-board and means for supporting said drawing-board, together with a seat for the observer and a rest for the observer's chin, so that the eye of said observer shall always maintain a fixed position with relation to the object being reproduced.

The invention finally consists in the combination and arrangement of parts set forth in the following specification, and particularly pointed out in the claims thereof.

Referring to the drawings, Figure 1 is a front elevation of my improved pantograph attached to a drawing-board and provided with a seat and chin-rest. Fig. 2 is a side elevation of the same as viewed from the right of Fig.

1, the drawing-board and its support being indicated in dotted lines in the position assumed when the device is folded up for shipment. Fig. 3 is a section taken on line 3 3 of Fig. 2, showing the seat in detail. Fig. 4 is a front elevation of a drawing-board broken away to save space in the drawings and having my improved pantograph and indicating device attached thereto. Fig. 5 is an enlarged section, partly in elevation, taken on line 5 5 of Fig. 4 looking upwardly in said figure. Fig. 6 is a section, partly in elevation, taken on line 6 6 of Fig. 4 looking downwardly in said figure. Fig. 7 is a section, partly in elevation, taken on line 7 7 of Fig. 4 looking toward the right in said figure. Fig. 8 is a section taken on line 8 8 of Fig. 4. Fig. 9 is a plan section taken on line 9 9 of Fig. 8, said Figs. 8 and 9 illustrating in enlarged detail the construction of the sliding pivotal joint by which the bars of the pantograph are adjustably fastened to each other. Fig. 10 is a sectional elevation taken on line 10 10, Fig. 1. Fig. 11 is a section taken on line 14 14 of Fig. 4.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 15 is a pantograph consisting of four bars 16, 17, 18, and 19, the bars 16 and 17 being pivoted one to the other at 20 and the bars 18 and 19 pivoted to each other at 21. The bars 17 and 19 are connected together by a swiveled sliding joint 22, and the bars 18 and 16 are connected together by a swiveled sliding joint 23. The bar 18 is pivoted at one end thereof, as at 24, to a bracket 25, which is clamped or fastened to a drawing-board 26. The outer end of the bar 19 is provided with a hole 27 to receive the pencil for tracing the outline of the picture upon the paper attached to the drawing-board 26. An indicator-slide 28 is fastened by a screw 29 to the tubular pivot 20, said tubular pivot constituting a pivotal point upon which the bars 16 and 17 are rotated and being internally screw-threaded to receive said attaching-screw 29. The indicator-slide consists of a vertical arm 30 and a horizontal arm 31, the arm 31 being preferably attached to the vertical arm 30 by screws. Indicator-

fingers 32 and 33 are pivotally attached to the arms 30 and 31, respectively, of the indicator-slide 28. The vertical arm 30 of the indicator-slide 28 is constructed to slide transversely of the drawing-board 26, being guided by rolls 34 34, journaled upon studs 35 35, fast to a supporting-slide 36. The supporting-slide 36 is constructed to slide upon a track 37, extending longitudinally of the drawing-board 26, and is attached to said track to slide thereon by rolls 38 38, journaled to rotate upon studs 39, fast to said supporting-slide 36. The track 37 is fastened to the drawing-board 26 by clamp-brackets 39'.

The sliding joint 22 consists of two rectangular plates 40 and 41, the bar 17 being arranged to slide longitudinally through the hollow rectangular plate 40 and the bar 19 being arranged to slide longitudinally through the hollow rectangular plate 41. The plate 40 is swiveled to rotate upon the plate 41 about a pivot 42, integral with said plate 41 and provided with two lugs 43 43, which project laterally above a flange 44, provided upon the under side of the plate 40. Said flange is provided with two openings 45 45, which allow the lugs 43 to pass therethrough, and thus to form a means by which the plate 40 can be disconnected from the plate 41. A clamp-plate 46, consisting of a flat spring, (see Fig. 9,) is provided in the plate 40, which is forced against the side of the bar 17 by a clamp-lever 47, thus binding the bar in a stationary position with relation to the plate 40. A similar means is provided in the hollow rectangular plate 41 for the purpose of locking the bar 19 in a stationary position with relation to said plate. One side of each of the plates 40 and 41 forms a means for setting the bar in any desired position by bringing said side to register with one of the side index-marks upon said bar.

The sliding joint 23 is constructed and operates in the same manner as the sliding joint 22, hereinbefore described.

The paper or canvas upon which the picture is to be portrayed is fastened to the drawing-board 26 by clamps 48 48, said clamps each consisting of a sheet of thin metal 49 upon the face of the drawing-board, to which is rigidly attached arms 50 50, which project through slots 51 51, made in the drawing-board and extending therethrough. The arms 50 are each provided with a clamp-lever 52, pivoted thereto at 53 and constructed to press against a spring 54, interposed between the clamp-lever 52 and the back side of the drawing-board 26. The spring 54 yields to accommodate varying thicknesses of paper.

The drawing-board 26 is fastened to a supporting-frame 55 by clamp-arms 56 56, and the supporting-frame 55 is arranged to slide up and down upon a standard 57, pivoted at 58 to a seat 59. The standard 57 projects into

a slot 60, extending longitudinally of the seat 59, and is clamped in position by a clamp-screw 61. By removing the clamp-screw 61 the standard 57, supporting-frame 55, and drawing-board 26 attached thereto may be folded downwardly into the position shown in dotted lines, Fig. 2.

A chin-rest 62 is provided, the same being attached to the upper end of a tube 63, arranged to slide longitudinally in another tube, 64, the tube 64 being pivotally attached by a clamp-screw 65 to the seat. By tightening the clamp-screw 65 the tube 64 may be held in a stationary position, and by loosening the same the tube 64, together with the chin-rest and tube 63, may be folded downwardly, or the clamp-screw may be removed, and thus allow the chin-rest, with its supporting-tubes, to be detached entirely from the device.

The seat 59 is supported upon legs 66 and 67, hinged thereto and provided with braces 68 and 69, respectively.

The general operation of the device hereinbefore specifically described is as follows: Assuming the device to be in the position indicated in Figs. 1, 2, and 3 and it is desired to reproduce a picture in outline upon a flat surface—viz., upon the paper or canvas attached to the drawing-board 26—the chin of the artist is placed upon the chin-rest 62 with the eye on a level with the end of the indicator-finger 32 when said indicator-finger is placed in a vertical position. The end of the indicator-finger is then moved to cover the different points of the picture which it is desired to reproduce—that is, it is moved to a position in which it is in line from the artist's eye to the different points in the picture desired. In thus moving the indicator-finger to cover different points in the picture to be reproduced it will be evident that the slide-arm 30 will move transversely of the drawing-board and that the slide 36 will move longitudinally thereof, the combination of this transverse and longitudinal movement making it possible for the artist to move the indicator-finger to any desired position and in so doing to move the different arms of the pantograph and with the pencil attached to the arm 19 trace upon the paper a reproduction in miniature of the picture at a distance, such as a landscape or building or any object desired.

The indicator-finger 33, pivotally attached to the arm 31, is used where it is desired to reproduce upon the surface of the paper a picture in outline of an object near at hand—as, for instance, in making a perspective view of a machine or other object.

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

1. A device of the character described comprising in its construction, a track fast to said drawing-board at one side thereof and extend-

ing longitudinally thereof, a supporting-slide constructed to slide on said track, an indicator-slide constructed to slide upon said supporting-slide, transversely of said track, a pantograph 5 pivoted at one of the pivotal joints thereof to said indicator-slide, and a bracket fast to and projecting outside said drawing-board, the outer end of one of the bars of said pantograph pivoted to said bracket.

10 2. A device of the character described comprising in its construction a drawing-board, an indicator-slide thereon, and a pantograph fast at one of the joints thereof to said slide, 15 said indicator-slide having a vertical and a horizontal arm thereon.

3. A device of the character described comprising in its construction a drawing-board, an indicator-slide thereon, a pantograph fast at one of the joints thereof to said slide, said in-

indicator-slide having a vertical and a horizontal arm thereon, and an indicator-finger pivoted at the outer end of each of said arms. 20

4. A pantograph comprising in its construction two bars, a sliding plate upon each of said bars, a pivot integral with one of said plates, 25 the second of said plates swiveled thereon, a flange concentric with said pivot fast to said second plate and provided with a slot, and a lug fast to the first of said plates constructed to project above said flange, substantially as 30 described for the purpose specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ALBERT W. DAVIS.

Witnesses:

CHARLES S. GOODING,
GEORGE K. ARNOLD.