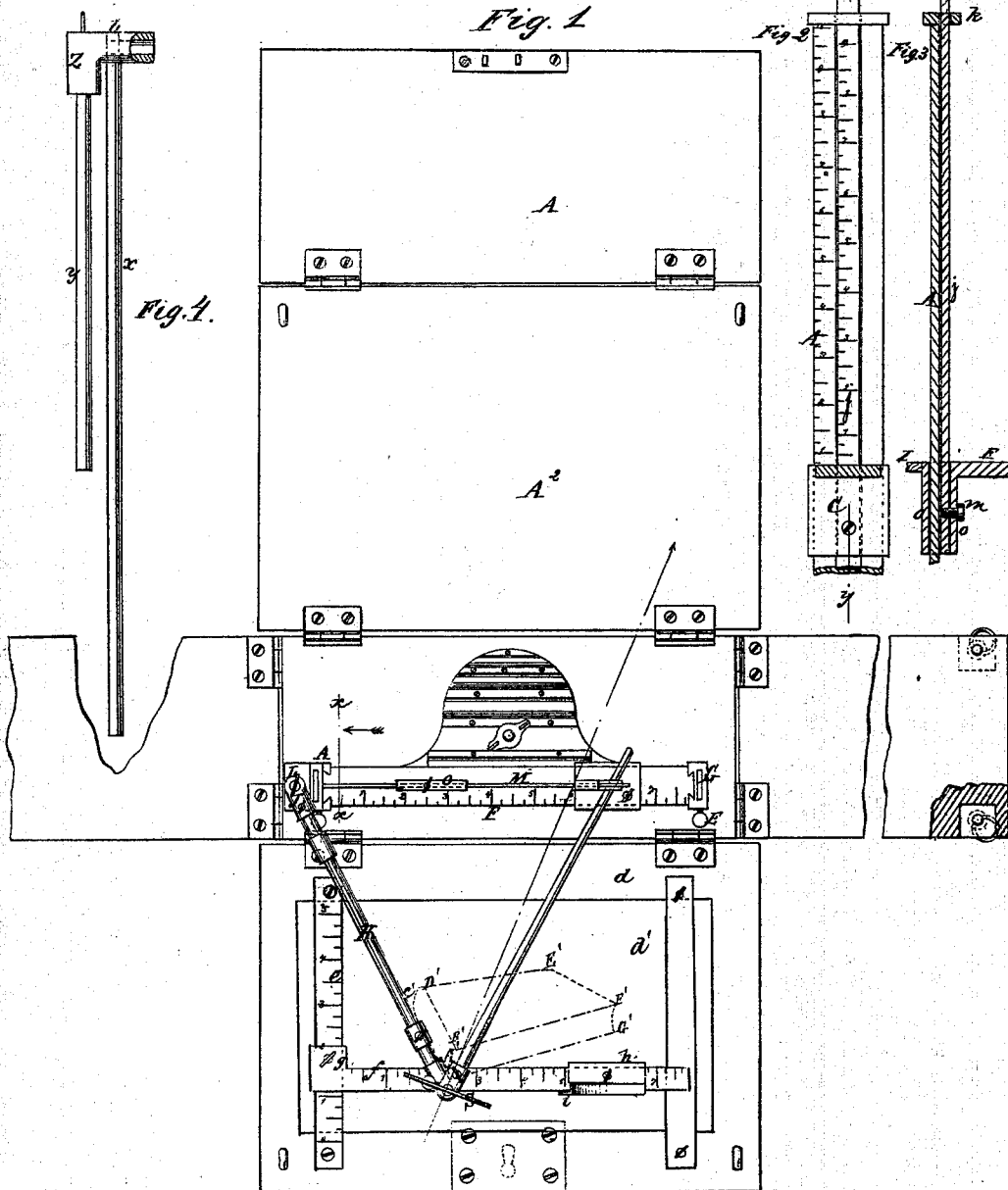


A. R. EAST.
Perspectographs.

No. 146,811.

Patented Jan. 27, 1874.



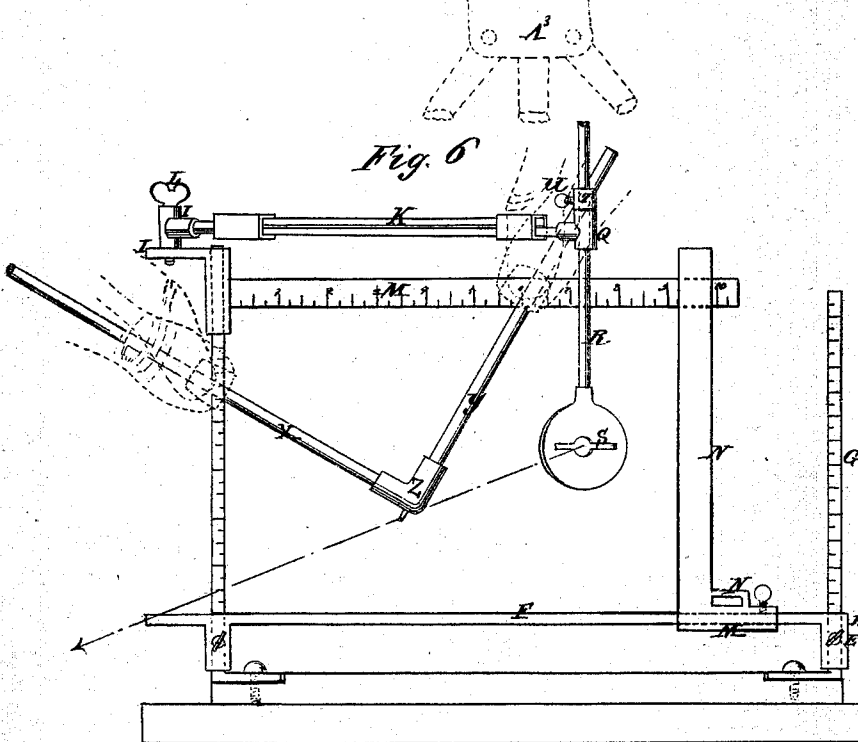
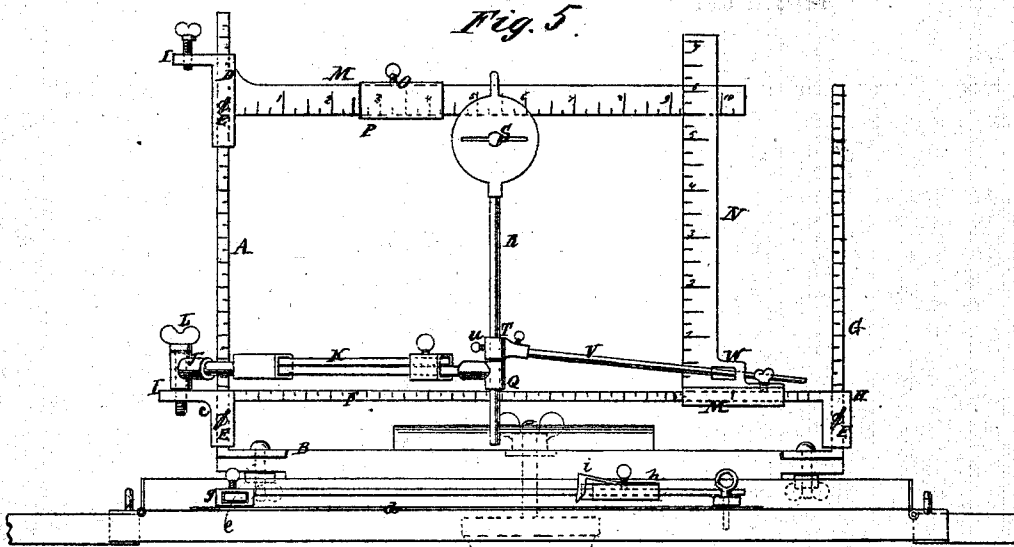
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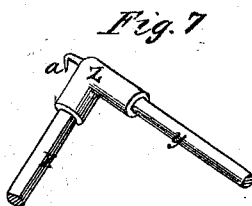
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN PERSPECTOGRAPHS.

Specification forming part of Letters Patent No. **146,811**, dated January 27, 1874; application filed September 27, 1873.

To all whom it may concern:

Be it known that I, ANDERSON R. EAST, of Selma, in the county of Delaware and State of Indiana, have invented a new and Improved Perspectograph, of which the following is a specification:

The object of the invention is to provide a simple and efficient mechanical apparatus by which to take the points or boundary lines of all visible stationary objects accurately and transfer them to paper on a sketch-board.

The invention will first be fully described, and then pointed out in the claims.

Figure 1 is a plan view of the apparatus. Fig. 2 is a section of Fig. 1 on the line *xx*, looking in the direction of arrow 1. Fig. 3 is a section of Fig. 2 on the line *yy*. Fig. 4 is a side elevation of the sketch-square as it appears when adjusted for packing. Fig. 5 is a front elevation of the apparatus. Fig. 6 is a front elevation of the apparatus, showing the application of the sketch-square; and Fig. 7 is a perspective view of a portion of the sketch-square.

Similar letters of reference indicate corresponding parts.

A represents a perpendicular bar fixed on one end of a bed-piece, B, and having two sliding blocks, C and D, fitted on it, so as to slide up and down freely, and fasten at any point by a set-screw, E. F is a base attached to the lower block C, and extending to the perpendicular bar G at the other end of the bed-piece B, and attached to a slide, H, working up and down on said bar, and fastening by a set-screw, E. Both the perpendicular and base have graduated scales. The blocks C and D each have a bracket, I, for the support of the T-head J of the extension-arm K, the said head being attached to the bracket by a thumb-screw, L, which holds it, so that the head can be turned freely as the arm is required to swing, and so that said head can be readily taken off to be shifted from one bracket to the other. M is a horizontal scale attached to the block D, so as to slide up and down, and be fastened with the block. This horizontal scale and the base may be detachably connected to the blocks, if preferred. The base F has a sliding block, M', from which rise side by side two bars, N, which are connected at the top,

so as to afford a guide for the horizontal scale M, which works between said bars. This scale M I call the "scale of longitude," and one of the bars N, which is also provided with a graduated scale, I call the "scale of latitude." The horizontal scale M has a sliding attachment, O, which has a pointer, P. Said slide, which is not always to be used, is capable of sliding off the scale at the end when not pointed by the bars N. The extension-arm K supports a T-head, Q, at its free end, from which a staff, R, rises, and supports an eye-plate, S, at the top. Above the head Q, the staff passes through another head, T, which is fastened to said staff by a set-screw, U, and has a guide-rod, V, fastened in it, and extending through the slot W on the sliding block M'. The set-screw U and head T hold the staff of the eye-plate at any required height, and allow the staff to be turned by the guide-rod V as the scale of latitude is shifted along the base to keep the hole in the eye-plate in line with the eye of the operator and the object. The sketch-square is a common square, consisting of the arms X Y, inserted in the angle-block Z, and the pointer on the apex of the angle of the head. One of said arms is connected detachably to the head, and the head has a hole, *b*, so that the square can be arranged as represented in Fig. 4, for convenience in packing it. *d* represents the sketch or flat board to hold the paper *d'*, on which the notes taken by the above-described apparatus are to be placed, over which said board a graduated scale, *e*, is fixed, and on this scale there is a horizontal scale, *f*, for longitude or departure, fixed by a sliding head, *g*, so as to slide along scale *e*. The scale *f* has a slide, *h*, on it, carrying a spring-point, *i*, for marking points in the paper on the sketch-board. *j* represents a sliding scale, which is to be arranged in a groove in the perpendicular A, and attached to the block C of the base, as shown at *m*, or in any equivalent way, so as to slide up and down with said block. The upper end passes through an opening in the cup-block *k*. It is graded from the top of the base, and serves to mark the latitude when I operate by the sliding pointer T on the horizontal scale by the second mode, as hereinafter described.

In the construction of these scales, the stand-

and inch has been used, and for all practical purposes will answer; but for a well-constructed instrument the geometrical proportion or ratio of the perpendicular to the base, or the base to the perpendicular, of 3:4 or 4:3, should be observed. To find the proper grade or division for the scales, make the base radius, and divide it into nine equal parts, and each of these into two equal parts, and apply these equal parts to the scales.

The instrument may be variously constructed, either of wood, metal, or other substance, in whole or in part, of round, square, or flat form, or some of one form and some of another; but in any mode or form of construction, the operation and result are the same.

There are three modes of operating or using the instrument—two by the use of the scales, and one by the use of the sketch-square without the use of the scales. To operate by the use of the perpendicular scale A and the horizontal scale M, or, in other words, to take field notes by latitude and departure, using the sliding scales, slide the horizontal scale M to the top of the meridian, and move the scale of latitude N on the base to the extreme right; select an object in the foreground to the extreme left and nearest to you; put one eye to the hole in the eye-piece, and look toward the object, say a book on the case-table A² behind the instrument; select a point on the extreme left and nearest to you; move the scale of latitude on the base till it comes in direct line with the eye and the said point; fasten the scale (if needful) by the set-screw at its base. Then, with the left hand, loosen the horizontal scale at the top of the meridian, and move it down till it also comes in the direct line from the eye to the object, and you have the angle of incidence or the latitude and departure of the said point of the object at the intersection of the two scales. Now move the horizontal scale *f* on the plat-board along the scale *e*, until it cuts the degree of latitude of said point in the object and screw it fast; then, with the right hand, move the little dotter to the angle of longitude or departure, and by a gentle pressure on the dotter fix the point on the paper at A. Proceed in this way from object to object, and from point to point, until the entire field is gone over and fixed on the paper at B', C', D', E', F', and G', being careful always to connect the notes or points as they are transferred to the paper.

The second mode of operating the machine by the scales is to move the scale of latitude to the extreme right, and put the sliding index O or pointer on the horizontal scale, or scale of longitude. Then, looking through the hole in the eye-piece, select the object, and move the horizontal scale up or down till it cuts the point in the object; then move up the index or pointer till it comes in direct line with the eye, and the point in the object, and again the angle of incidence or latitude and departure is obtained. The note or point thus formed

is then transferred to the paper on the sketch-board, as in the first mode; then proceed in the same way to obtain the other points, till the whole field is gone over.

In the third mode of operation by the sketch-square, the eye-piece is inverted, and the extension-support attached to the upper block D, as the eye-piece cannot be conveniently used below, and the guide-rod is dispensed with, there being no arrangement at the top by which it can be applied. Now move the scale of latitude to the extreme right on the base, and the scale of longitude to the top of the meridian, and fasten. Fix the eye-piece to its proper place and focus—*i. e.*, about the middle of the picture or field of view, and at such a distance from the base that all the objects may be seen distinctly. Take the long arm of the sketch-square in the left hand, between the thumb and finger, and the short arm between the thumb and finger of the right hand; select an object, as before, and, looking through the hole in the eye-piece toward the object or point, apply the square to the perpendicular A and base F, or the horizontal scale M, as in Fig. 6; move it up or down, and to the right or left, till the index or pointer *a* comes in a direct line with the eye and the point in the object, and the degrees on the perpendicular and base or horizontal scale M', at the points where the arms of the sketch-square cross, give the latitude and departure, which is transferred to the sketch-board by removing the square from the scales A, F, or M, and placing it in the same way, and noting the point by pressing the dotter into the paper, proceeding in the same way for all the points. This mode I call "off-hand sketching," and the other "sketching by the scales." It frequently happens in sketching, particularly in small groups or compositions, the fixed medium is too far to the extreme left. In such cases, when sketching with the sketch-square, I use the scale of latitude on the base, and set it to any degree of longitude on the base for a meridian or starting point to suit the extent of the group or field of vision, applying the long leg of the sketch-square to the face of this, as in other cases it is applied to the face of the fixed meridian.

The off-hand mode is most expeditious, and better adapted to landscape sketching than either of the other methods. They are all, however, adapted and applicable to any kind of sketching, and either may be used at the option of the operator. This example is given with a perpendicular on the left and half perpendicular on the right. I will, in practice, have two equal perpendiculars, with a cap on the top, thus completing the parallelogram. This cap should be reduced or cut away in front, so as to let the scale of latitude press up as the base is elevated. It will also need an aperture or opening in the slide or left-hand attachment for the sliding scale in the meridian to pass through as the base is elevated. This right-hand perpendicular should be made of two thin flat bars, with an aperture or opening

between them, and of sufficient size for the base and scale of longitude to move up and down between them, and the front bar should have an opening in the center about half the height, of sufficient size to admit a thumb-screw attached to the base to move up and down, so as to fasten this end of the base at any given elevation, and keep it horizontal and steady. The inside edge of this slit or opening should be graded to correspond with the sliding scale in the left-hand perpendicular or meridian. The base being graded, the instrument, when set up, will have three scales of latitude, and two of longitude or departure. As previously stated, the proper ratio of the perpendicular to the base, or the base to the perpendicular, is as 3:4, or as 4:3. This ratio is the smallest perfect rectangle, and is denominated "prime." From this various-sized instruments may be constructed, from prime, or No. 1, to duodecimo, or No. 12. But, as large instruments are weighty and inconvenient for practical sketching, I propose to use one or two sizes, as a trio, No. 3, or a quarto, No. 4. A trio, or No. 3, is nine by twelve, and a quarto, or No. 4, twelve by sixteen. No. 3 will probably be the best and most convenient size for practical use.

To supply the place of all the other sizes, I propose to construct the scales from prime, or No. 1, to duodecimo, or No. 12, so that the notes as taken by the instrument can be platted by

any-sized scales. Thus, if I take notes by a trio, or No. 3 instrument, and plat by sextant-scales, my sketch will be eighteen by twenty-four, or twice as large as the instrument; or, if I plat the same notes by prime scales, or No. 1, the sketch will be three by four, or one-third the size of the instrument. The instrument is, in practice, attached to a three-legged stand, similar to a surveyor's "Jacob's staff" as indicated in dotted lines at A³, Fig. 5, with an elevator passing through the center of the head of the block of the stand, and through a screw-nut, by which the elevator is fixed at any desired height.

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

1. The combination of the slide O and pointer P with the scale M, perpendicular A, and the eye-piece S, substantially as specified.
2. The combination of the guide V with extension-support K and eye-piece S, substantially as specified.
3. The extension-support K, mounted on the base-block C, or upper block D, by the head J, bracket I, and screw L, substantially as specified.

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Witnesses:

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