F. O'RYAN.

Apparatus for Illustrating the Rules of Perspective Drawing.

No. 224,945. Patented Feb. 24, 1880.

Fig. 1.

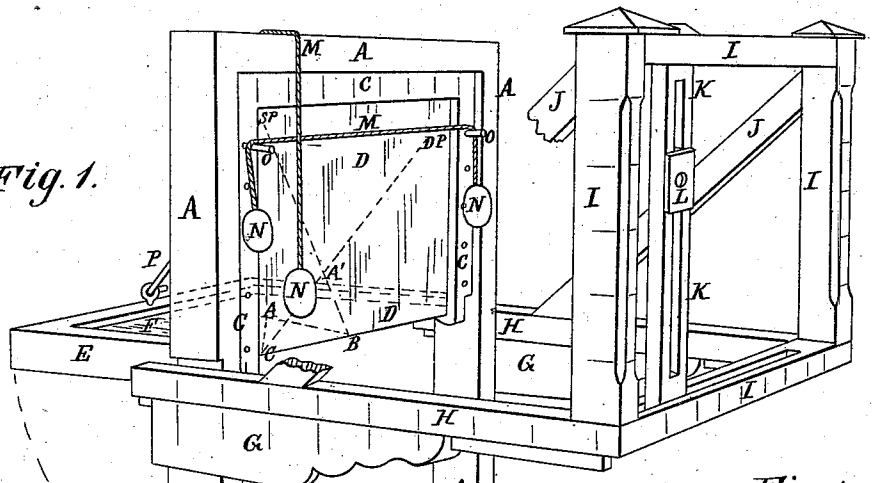


Fig. 4.

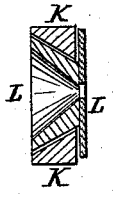


Fig. 3.

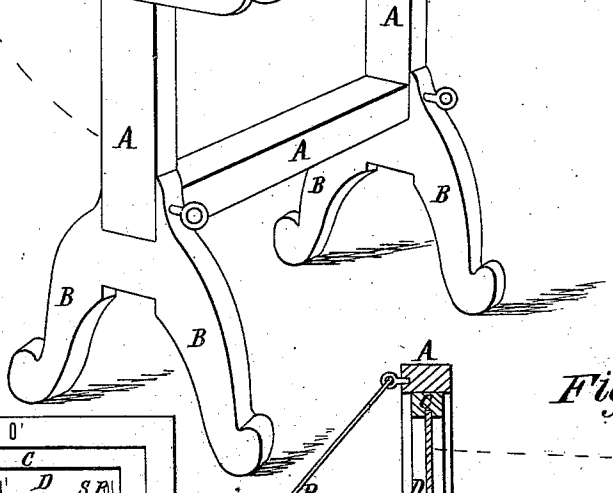
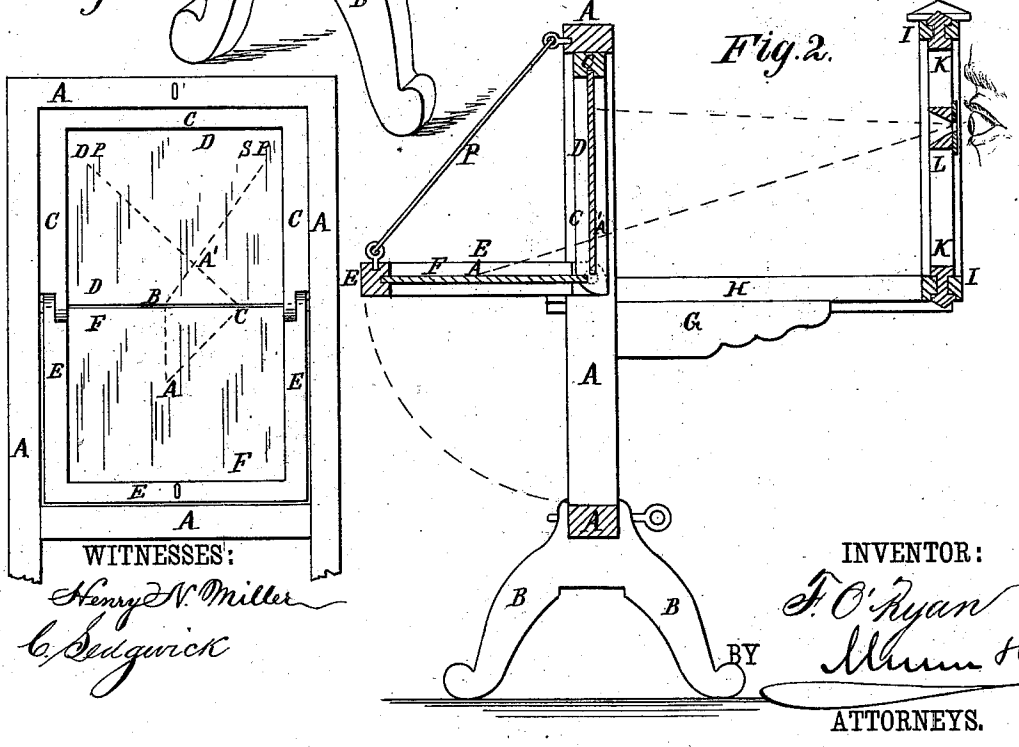


Fig. 2.



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APPARATUS FOR ILLUSTRATING THE RULES OF PERSPECTIVE DRAWING.

SPECIFICATION forming part of Letters Patent No. 224,945, dated February 24, 1880.

Application filed October 6, 1879.

To all whom it may concern:

Be it known that I, FRANK O'RYAN, of the city, county, and State of New York, have invented a new and useful Improvement in Apparatus for Illustrating the Rules of Perspective Drawing, of which the following is a specification.

Figure 1 is a perspective view of the apparatus, part being broken away. Fig. 2 is a sectional side elevation. Fig. 3 is a rear elevation of the picture-plane and the ground-plane. Fig. 4 is a sectional plan view of the eye-piece.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an apparatus for illustrating the rules of perspective drawing, so that a teacher by its use can prove to his pupils the correctness of the diagrams made in accordance with the rules.

The invention consists in combining a stationary transparent picture-plane and a movable transparent ground-plane in such a way that the ground-plane may be adjusted in vertical and horizontal positions while keeping the adjacent edges of the two planes in contact with each other, and also in the combination, with the frame that supports the picture-plane and the ground-plane, of a mechanism for supporting the eye-piece in such a way that it may be adjusted horizontally and vertically, as set forth.

A is a vertical frame of convenient size, and which is mounted upon feet B, or other suitable support, to raise it to a convenient height. In the upper half of the frame A is secured a half-frame, C, provided with a glass plate, D, called the "picture-plane." To the half-frame C is hinged a second half-frame, E, provided with a glass plate, F, called the "ground-plane."

The half-frames C E are so arranged and hinged that the adjacent edges of the glass plates D F may always be exactly parallel and in contact with or close to each other when they are in the same vertical plane and when the plate F has been swung up into a horizontal position.

To the middle part of the side bars of the frame A are attached horizontal arms G, which project forward and have their upper sides grooved longitudinally to receive tongues formed upon the lower sides of the sliding bars H.

To the forward ends of the sliding bars H are attached the lower corners of the vertical frame I, which is strengthened in position by inclined braces J. The upper ends of the braces J are attached to the upper parts of the side bars of the frame I, and their lower ends are attached to the sliding bars H.

The top and bottom bars of the vertical frame I are slotted longitudinally to receive the ends of the bar K, which ends are grooved transversely to receive the bars of the frame I, to prevent the bar K from moving longitudinally, while allowing it to have a free lateral movement.

The bar K is slotted longitudinally to receive the sight-piece L, so that the said sight-piece L may be moved up and down, as required.

M are two cords, to the ends of each of which are attached two weights, N. One of the weighted cords M N is designed to be hung upon two pins, O, attached to the side bars of the half-frame C, to represent the horizontal line. Several holes are formed in the side bars of the half-frame C to receive the pins O, so that the weighted cord M N may be adjusted at any desired height. The other weighted cord M N is designed to be hung over the top bar of the frame A, to fix the sight-point by their intersection. Upon the front sides of the top and side bars of the half-frame C, the front sides of the side and bottom bars of the vertical frame I, and upon the outer sides of the sliding bars H are formed scales divided into inches, so that the operator can properly adjust the apparatus.

To illustrate the use of the apparatus I will give the rule for finding the perspective of a point, and then illustrate the rule by reference to the apparatus.

The perspective of a point is found where a line passing from the point to the eye intersects a vertical plane situated between the point and the eye. The perspective A′ of a point, A, is found upon an opaque surface, as a black-board or sheet of paper, at the intersection of the vanishing line of perpendiculars with the vanishing line of diagonals.

In the diagram made in dotted lines in Figs. 1 and 3, S P represent the sight-point, and the distance-point D P is supposed to be placed as far from the sight-point S P as the eye is supposed to be in front of the said sight-point S P.

The ground-line, which in Figs. 1 and 3 is represented by the lower edge of the plate D, separates the picture-plane D above it from the ground-plane F below it. The proper position of the ground-plane is horizontal; but as it cannot be so represented upon an opaque surface it is supposed to be swung down into a vertical position, so as to be a continuation of the picture-plane, bringing with it the point A, which must be supposed to become visible, though placed upon the opposite side of the said ground-plane. The line A B, drawn from the point A, makes an angle of ninety degrees with the ground-line, and vanishes at the sight-point S P, and the line A C, drawn from the point A to a point, C, upon the ground-line at the same distance from the point B as the point A, forms an angle of forty-five degrees with the ground-line, and vanishes at the distance-point D P. The intersection of the lines B S P and the lines C D P gives the perspective A′ of the point A. Thus far the rule.

To show by the apparatus that the rule is correct the ground-plane F is swung up into and secured in a horizontal position by a hook, P, or other suitable means, and two points, S P and D P, are marked upon the picture-plane D, to represent the sight-point and the distance-point, and the movable frame-work is adjusted to bring the sight-piece L to the same distance from picture-plane D that the point D P is from the point S P, and directly opposite the point S P. Then, by looking through the eye-piece L at the given point A, it will be seen through the point A′, showing that the perspective point has been located correctly; and by connecting the perspective point A′ with the points S P and D P, extending the lines thus formed to the ground-line, and drawing lines from these points of intersection to the point A, it will be found, when the ground-plane F has been swung down into a vertical position, that a diagram has been formed similar to the one drawn by the rule. In the same way the rules for drawing the perspectives of a vertical line and of a solid can be shown to be correct, and at the same time the reason for the rule will be made clear.

The apparatus may be applied to other uses, such as making drawings of objects placed behind the picture-plane D, and if the lines are made with the crayon known as "Clarke's glass crayon," or other similar crayon, an impression can be taken from the glass by rubbing a piece of white paper over the drawing.

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

In an apparatus for illustrating the rules of perspective drawing, the combination, with a stationary transparent picture-plane, D, of a hinged transparent ground-plane, F, substantially as herein shown and described, so that the ground-plane may be adjusted in vertical and horizontal positions while keeping the adjacent edges of the two planes parallel with and close to each other, as set forth.

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Witnesses:

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