

No. 815,170.

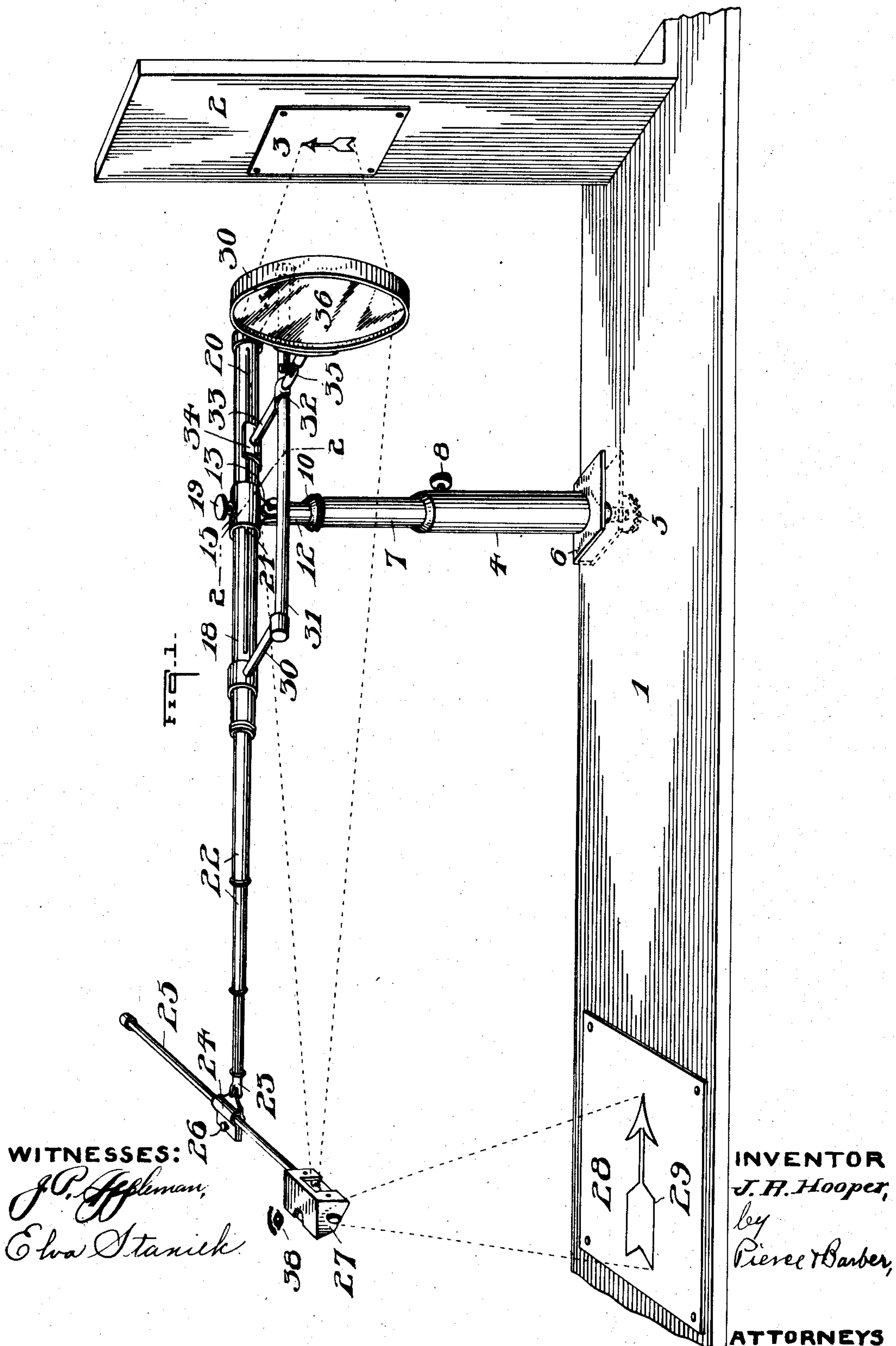
PATENTED MAR. 13, 1906.

J. R. HOOPER.

APPARATUS FOR PRODUCING IMAGES OF OBJECTS.

APPLICATION FILED DEC. 17, 1904.

2 SHEETS—SHEET 1.



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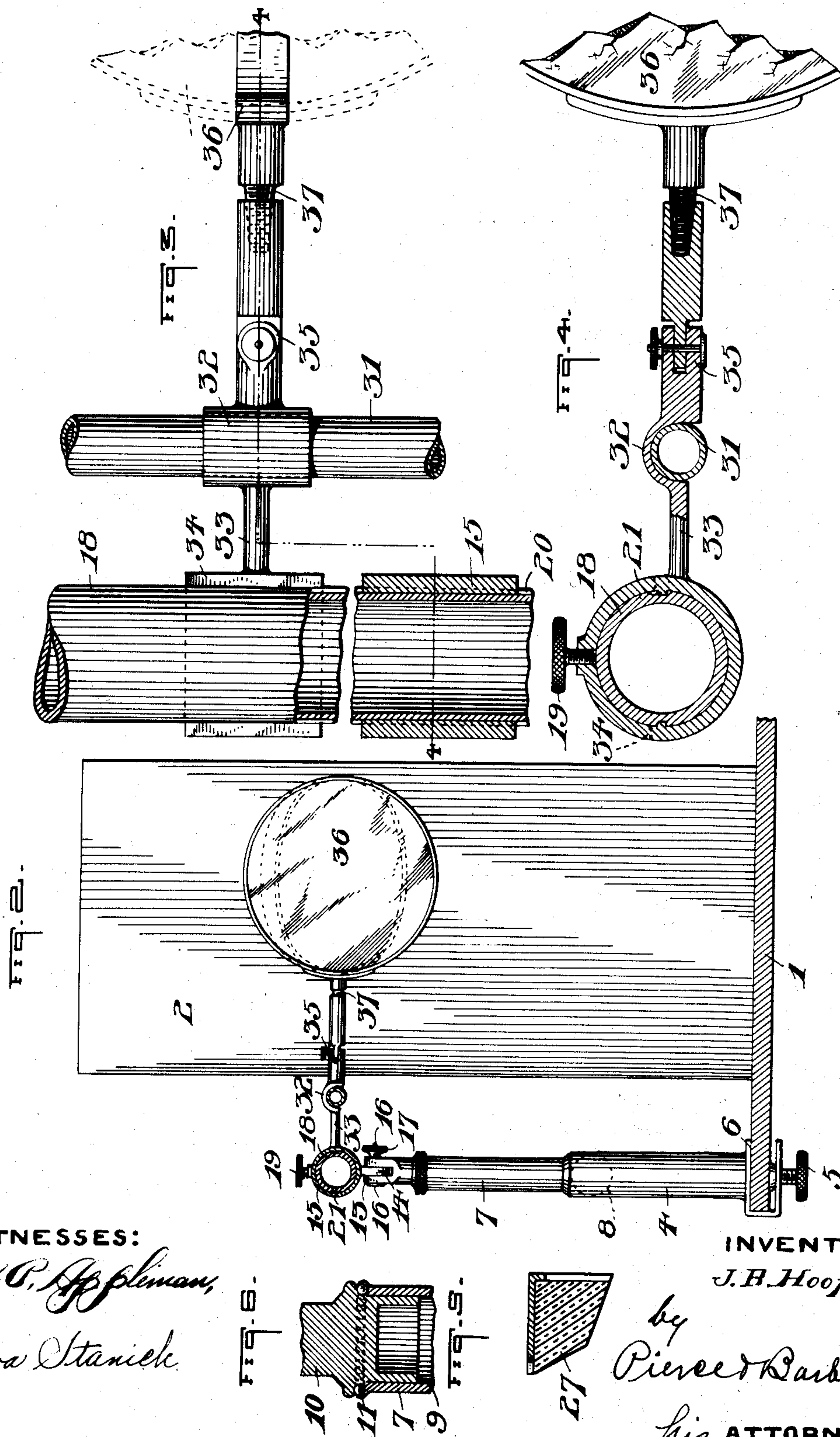
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2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES R. HOOPER, OF PITTSBURG, PENNSYLVANIA.

APPARATUS FOR PRODUCING IMAGES OF OBJECTS.

No. 815,170.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed December 17, 1904. Serial No. 237,258.

To all whom it may concern:

Be it known that I, JAMES R. HOOPER, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Apparatus for Producing Images of Objects, of which the following is a specification.

My invention relates to apparatus for producing images of objects and is in the nature of a camera lucida.

The object thereof is to produce such an apparatus that the images to be copied may be reduced or enlarged as compared with the size of the originals to any desired extent.

Referring to the drawings, Figure 1 is a perspective of my invention; Fig. 2, a cross-section on the line 2 2 of Fig. 1; Fig. 3, a fragmentary view showing the microscope and its adjustments, the view being partly in plan and partly in horizontal section; Fig. 4, a vertical section on the line 4 4 of Fig. 3, the microscope being in side elevation; Fig. 5; a cross-section of the prism and its holder, and Fig. 6 a section showing the joint for the rotation of the prism in a horizontal plane.

In the drawings, 1 designates a table having the upright object-support 2, which is shown as a flat surface, to which the object 3 is tacked; but it may be otherwise constructed. The post or support 4 is clamped to one edge of the table by means of the set-screw 5, which passes through the member 6 and engages with the under side of the table. The member 6 is secured to the post 4 and is spaced from the bottom of the latter by a little more than the thickness of the table. When the screw is turned up tight against the table, the post or support 4 is rigidly secured to the table and may be readily adjusted to occupy any position along the edge thereof.

Slidable vertically within the support 4 is the extension 7, which may be secured at any adjustment in the support by the set-screw 8. On the top of the extension 7 is a socket 9, which receives the head 10, rotatable horizontally on the antifriction-rollers 11. The head 10 carries the vertical stem 12, having at its top the ears 13, between which is seated the ear 14 of the horizontal collar 15, the pin 16 passing through all three ears and constituting a horizontal pivot on which the collar 15 swings. The pin 16 is threaded and carries the nut 17, which turns against one of ears 13 and clamps all the ears together to

hold the collar 15 in the required adjustment.

Slidable in the collar 15 is the horizontal rod 18, which is held in any adjustment in the collar by the set-screw 19 and is prevented from rotation by the horizontal slots 20 in the rod 18, into which slot the ribs 21 in the collar extend. The rod 18 carries a number of telescopic sections 22, the outer one carrying the fork 23, in which is pivoted the clamp-holder 24, consisting of two overlapping members, having therebetween an opening to receive the prism-holding rod 25, which is adjustable horizontally in the holder and is held in any adjustment by the screw 26. The end of the rod 25 carries the prism-holder 27, carrying the usual camera-lucida prism. The paper or surface 28, on which the image 29 of the object 3 is traced, is secured on the table beneath the prism.

The rod 18 carries the horizontal arms 30, which support the rod or bar 31, on which slides the saddle 32, carried by the rod 33, having an end concave part 34 sliding on the under side of the rod 18. The saddle carries the fork 35, in which horizontally swings the lens 36. The lens is rotatable by the threaded connection 37.

The operation is as follows: The object, as 3, to be enlarged is tacked or otherwise secured to the support 2 or is otherwise held above the table. The extension 7 is adjusted to the height of the object, and the sections 22 and the rod 18 are adjusted, as becomes necessary, to produce on the paper or surface 28 an image of the desired size. The size can be varied by moving the lens toward or from the object, by moving the prism-holder 27 toward or from the object, or by raising or lowering the extension 7, which varies the distance of the prism from the paper or surface 28. By the various adjustments described the image may be enlarged to any degree. The lens and prism may be swung to accommodate themselves to any angle from which the view is desired. The rays of light from the ends of the object 3 will pass through the convex lens by which the light entering the lens appears to come from an object larger than the object 3, as is shown by the dotted line on Fig. 1. The rays of light will be made further divergent by the prism in the holder 27, and the eye 38 looking down through the upper acute angle of the prism will see the enlarged image 29.

To reduce the image, a concave lens would be used and placed sufficiently close to the object to get the reduction required, the rod 18, the sections 22, and the other adjustments being also set to get the proper result.

I do not limit myself to the precise details and combinations shown and described, but reserve the right to include within my invention all modifications which embody the spirit thereof.

Having described my invention, I claim—

1. In an apparatus for producing images of objects, a vertically-adjustable support, a horizontal rod carried by the support and adjustable thereon, a lens carried by said rod and adjustable thereon, a prism also carried by said rod and adjustable toward and from the lens, and a support to receive the image.

2. In an apparatus for producing images of objects, a support, a horizontal rotatable rod carried thereby, a prism adjustable longitudinally of the rod, and a support for the image.

3. In an apparatus for producing images of objects, a support, a horizontal rod carried thereby, an arm supported by said rod and adjustable therealong, a lens supported on said arm, a prism arranged to transmit the real image of the object to the eye and a support for the virtual image.

4. In an apparatus for producing images of objects, a horizontal rod, a support se-

cured thereto, an arm supported and guided by said rod and support and adjustable therealong, a lens carried on said arm, a prism, and an image-support.

5. In an apparatus for producing images of objects, an object-support, a lens and a prism, pivotally adjustable in the same plane, and an image-support.

6. In an apparatus for producing images of objects, a horizontal rod, an arm projecting therefrom, a lens carried by the arm, a second arm carried by the rod, a prism carried by the second arm, and a support on which the virtual image of the object may be seen.

7. In an apparatus for producing images of objects, a horizontal rod, an arm projecting therefrom, a lens carried by the arm, a second arm carried by the rod, a prism carried by the second arm, and adjustable transversely thereof.

8. In an apparatus for producing images of objects, a vertical telescopic support, a telescopic rod carried thereby, a prism carried by the rod, a lens, and an image-support.

Signed at Pittsburg, Pennsylvania, this 13th day of December, 1904.

JAMES R. HOOPER.

Witnesses:

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A. M. STEEN.