J. H. HARDEN.

Parallel Rulers.

No. 230,008. Patented July 13, 1880.

Fig. 2. Fig. 1. Fig. 3. Fig. 4.

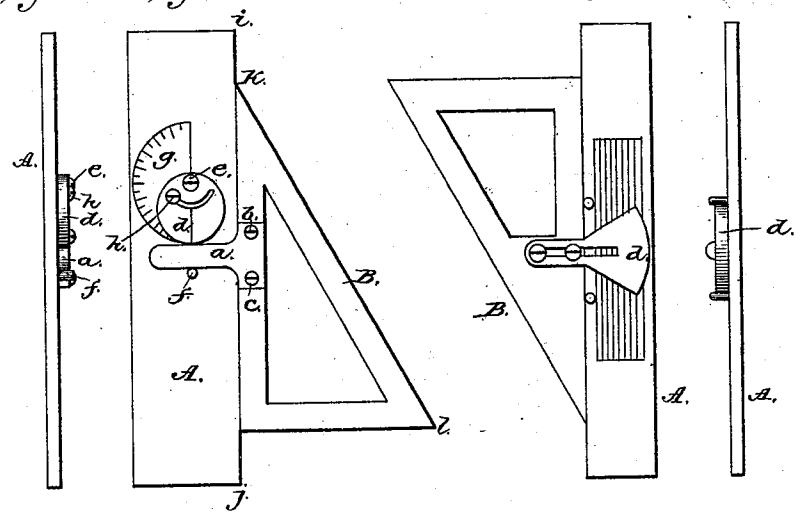
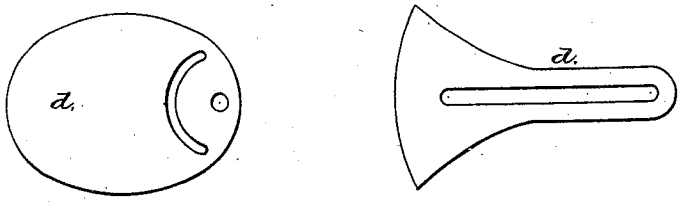


Fig. 5. Fig. 6.



WITNESSES

John A. Ellis.

E. C. Dunton

INVENTOR

John Henry Harden

by E. W. Anderson

his ATTORNEY

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN H. HARDEN, OF PHILADELPHIA, PENNSYLVANIA.

PARALLEL RULER.

SPECIFICATION forming part of Letters Patent No. 230,008, dated July 13, 1880.

Application filed February 25, 1879.

To all whom it may concern:

Be it known that I, JOHN HENRY HARDEN, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Drawing-Instruments, of which the following is a specification.

The invention relates to "ruling edges" for the purpose of civil, mining, architectural, and mechanical engineering drawing.

The object of my invention is to provide an instrument for ruling parallel lines with accuracy at equal distances, or at irregular distances apart for "section-lining," technically so-called, or cylindrical shading.

The invention consists of a straight-edge having a projecting arm on one side and a triangle having a stud, an eccentric, and a circular scale attached; and it finally consists in the particular construction and arrangement of these parts.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a plan of a device embodying my invention. Fig. 2 is a side view of the same; and Figs. 3, 4, 5, and 6, modified forms of the eccentric.

The straight-edge A and triangle B are of equal thickness. *a* is a projecting arm, of metal, secured to the triangle B by means of screws *b c*, and *d* represents an eccentric pivoted to the straight-edge A by screw *e*. *f* designates a stud riveted to the straight-edge. *g* is a circular scale graduated upon the same, and *h* represents a stud riveted to the eccentric.

The projecting arm *a* and the eccentric *d* are of equal thickness, and the former fits between the latter and the stud *f* in the position shown.

The operation of the device is as follows: To rule parallel lines equidistant, first revolve the eccentric *d* about its center of motion, (the screw *e*,) when the distance between it and the stud *f* is increased, and will allow the projecting arm *a* to be moved between the eccentric and the stud a distance regulated by the eccentric and the scale. The instrument being in adjustment, the straight-edge A and triangle B are moved alternately in the line *i j*, each guided by the other and limited to the distance to which the instrument has been previously adjusted by the arm *a*, eccentric *d*, and stud *f*. The line *k l* is the ruling-edge, and the lines ruled will be equidistant and parallel.

Ruling lines at increasing or decreasing distances apart, that no two spaces shall be equal, or shading a cylinder or irregular surface to give it the appearance of being circular or rounding, is performed in the same manner so far as relates to the alternate movement of the parts A and B, with the additional movement of the eccentric *d*, in accord with the scale *g* for each line drawn, by which a gradually-increasing or decreasing distance may be obtained between parallel lines. Having in this way shaded one half a cylinder, reverse the operation to shade the other half.

Cylinders of different diameters may be shaded by revolving the eccentric a greater or less number of degrees accordingly.

It will readily be seen by persons versed in the art that the instrument may be made in various modified forms by differently graduating the scale, also by a different form or outline of the eccentric. However, I consider such modifications, changes of form, and arrangement of parts are embraced within the scope of my improvement, as hereinbefore described, and therefore I do not consider it necessary to give drawings and descriptions of the various modifications which may be employed.

What I claim is—

1. The combination of a straight-edge and triangle provided with a projecting arm, *a*, eccentric *d*, stud *f*, and circular scale *g*, operated for the purpose of ruling parallel lines, section-lining, or cylindrical shading, substantially as specified.

2. The combination, with the straight-edge A, of the circular scale *g*, stud *f*, and the revolving eccentric *d*, pivoted to said straight-edge by the screw *e*, substantially as specified.

JOHN HENRY HARDEN.

Witnesses:

BENJN. DANIELS,

CHAS. C. EARECKSON, Jr.