(No Model.) 2 Sheets—Sheet 1.

B. F. HARDAWAY.

PARALLEL RULER.

No. 385,512. Patented July 3, 1888.

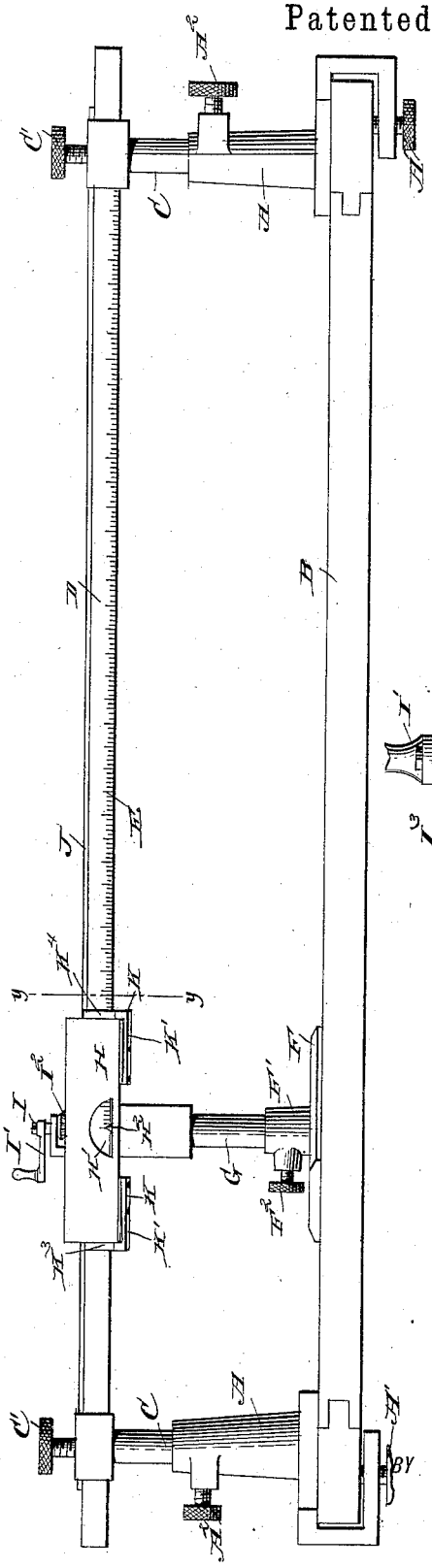


Fig. 1.

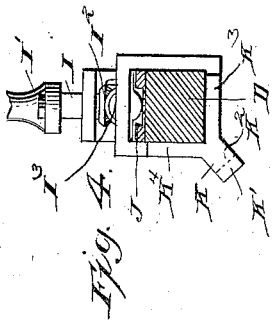


Fig. 4.

WITNESSES:

W. R. Davis.

C. Sedgwick.

INVENTOR,

B. F. Hardaway,

BY Munn & Co

ATTORNEY,

(No Model.)

2 Sheets—Sheet 2.

B. F. HARDAWAY.

PARALLEL RULER.

No. 385,512. Patented July 3, 1888.

Fig. 2.

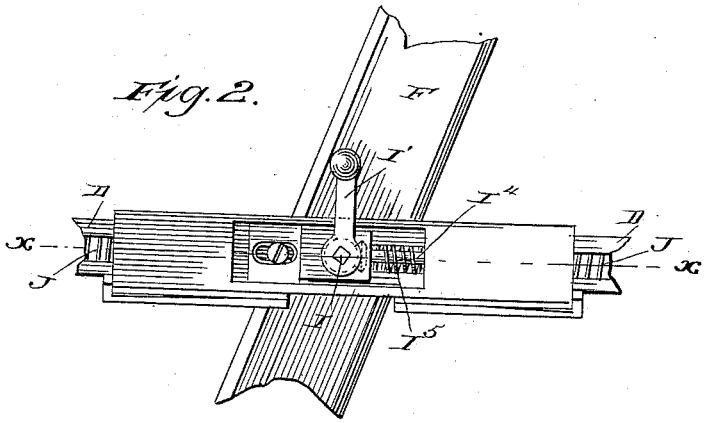


Fig. 3.

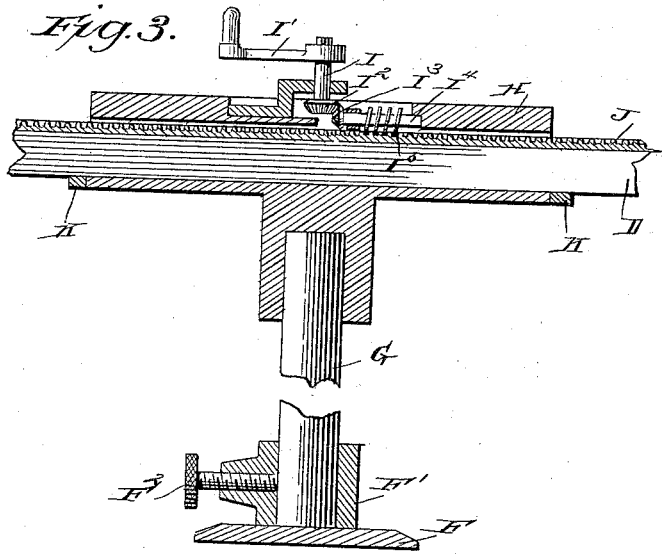
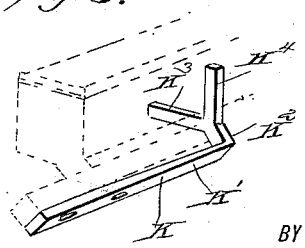


Fig. 5.



WITNESSES:

H. R. Davis.

C. Sedgwick.

INVENTOR.

B. F. Hardaway

BY Munn & Co

ATTORNEY.

UNITED STATES PATENT OFFICE.

BENJAMIN F. HARDAWAY, OF FORT D. A. RUSSELL, WYOMING TERRITORY.

PARALLEL-RULER.

SPECIFICATION forming part of Letters Patent No. 385,512, dated July 3, 1888.

Application filed February 9, 1888. Serial No. 263,435. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN FRANKLIN HARDAWAY, of Fort D. A. Russell, in the county of Laramie and Territory of Wyoming, have invented a new and Improved Drawing-Instrument, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved instrument especially adapted for drawing section-lines.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is an enlarged plan view of part of the same. Fig. 3 is a sectional side elevation of the same on the line *x x* of Fig. 2. Fig. 4 is a sectional end elevation of part of the improvement on the line *y y* of Fig. 1; and Fig. 5 is a perspective view of one of the springs, hereinafter more fully described.

The improved drawing-instrument is provided with the clamping-posts A A, adapted to be secured by a set-screw, A′, or other suitable device, to the drawing-board B, on which the section-lines are to be drawn by the instrument. In each post A is held to slide vertically a rod, C, adapted to be secured at any desired height in the post A by the set-screw A^2, screwing in the latter and against the said rod C. The rods C support a bar, D, secured in the said rods by set-screws C′, and the said bar is provided with a graduation, E, on one of its faces.

The section-lining device is provided with a rule, F, having on its top a lug, F′, adapted to be secured to the lower end of a rod, G, by means of a set-screw, F^2. The rod G is formed on a sleeve, H, held to slide on the bar D and provided on its front side with an opening, H′, through which the graduation E on the bar D can be seen. A pointer, H^2, is secured on the sleeve H in the said opening H′, so as to conveniently read the graduation E on the said bar D. On top of the sleeve H is mounted to rotate a vertical shaft, I, provided on its outer end with a crank-arm, I′, and on its inner end with a bevel gear-wheel, I^2, meshing into a bevel gear-wheel, I^3, fastened on a shaft, I^4, placed horizontally and mounted to rotate in suitable bearings in the top of the said sleeve H. On the shaft I^4 is formed a worm, I^5, meshing into a rack, J, secured to the top of the bar D.

In order to take up lost motion of the sliding sleeve H, I provide the latter at each end with an L-shaped spring, K, consisting of the arm K′, secured to the sleeve H, and of the arm K^2, branching into the forked arms K^3 and K^4, fitting tightly over one corner of the graduated bar D. (See Fig. 5.) The spring-arm K′ presses the forked arms K^3 and K^4 firmly in contact with the graduated bar D, so that the sleeve H is held in position at any desired point on the said graduated bar D.

The operation is as follows: The ruler F is held directly on the paper secured to the drawing-board B, and is placed at the desired angle in which the section-lines are to be drawn by adjusting the lug F′ on the rod G by the set-screw F^2. The operator now draws a section-line along the edge of the ruler F with one hand, and with his other hand turns the crank-arm I′, so as to impart a rotary motion to the shaft I, which, by the bevel gear-wheels I^2 and I^3, imparts a rotary motion to the shaft I^4, and the latter, by its worm I^5 engaging the fixed rack J, moves the sleeve H forward on the bar D. The distance which the sleeve H is moved forward depends on the distance which the crank-arm I′ is turned, and the said distance can be read on the graduation E, seen through the opening H′ in the sleeve H. The operator then draws a second section-line along the edge of the ruler F, and the two section-lines will be the same distance apart as the sleeve H is moved forward on the bar D, as indicated by the graduation E. After the second section-line is drawn, the operator again turns the crank-arm I′ the same distance as before, so that the next section-line is the same distance from the second section-line as the second section-line is from the first. Thus the section-lines can be placed equal distances apart; or, if desired, the distance can be varied by turning the crank-arm I′ more or less.

Having thus fully described my invention,

I claim as new and desire to secure by Letters Patent—

1. In a drawing-instrument, clamping-posts adapted to be secured to a drawing-board and a horizontal graduated bar held adjustably on the said clamping-posts, in combination with a sleeve mounted to slide on the said bar and a ruler held to turn on the said sleeve, substantially as shown and described.

2. In a drawing-instrument, clamping-posts adapted to be secured to a drawing-board and a horizontal graduated bar held adjustably on the said clamping-posts, in combination with a sleeve adapted to slide on the said graduated bar, a rod extending from the said sleeve, and a ruler held adjustably on the said rod, substantially as shown and described.

3. In a drawing-instrument, clamping-posts adapted to be secured to a drawing-board and a horizontal graduated bar held adjustably on the said clamping-posts, in combination with a sleeve adapted to slide on the said graduated bar, a rod extending from the said sleeve, a ruler held adjustably on the said rod, and means, substantially as described, for moving the said sleeve forward and backward on the said arm, as set forth.

4. In a drawing-instrument, the combination, with a horizontal graduated bar provided with a rack, of a sleeve held to slide on the said graduated bar, a ruler carried by the said sleeve, and a worm meshing into the said rack and mounted to turn on the said sleeve, substantially as shown and described.

5. In a drawing-instrument, the combination, with a horizontal graduated bar provided with a rack, of a sleeve held to slide on the said graduated bar, a ruler carried by the said sleeve, a vertical shaft mounted to rotate on the said sleeve and provided with a crank-arm, a bevel gear-wheel secured on the said shaft, a second bevel gear-wheel meshing into the first-named bevel gear-wheel, a horizontal shaft carrying the said bevel gear-wheel and mounted to rotate on the said sleeve, and a worm formed on the said horizontal shaft and meshing into the said rack secured to the said graduated bar, substantially as shown and described.

BENJAMIN F. HARDAWAY.

Witnesses:
WM. W. ELLIOTT,
JOHN C. F. ARNOLD.