E. K. Haynes'
Imp'd Instrument for Hatch-Lining Drawings.

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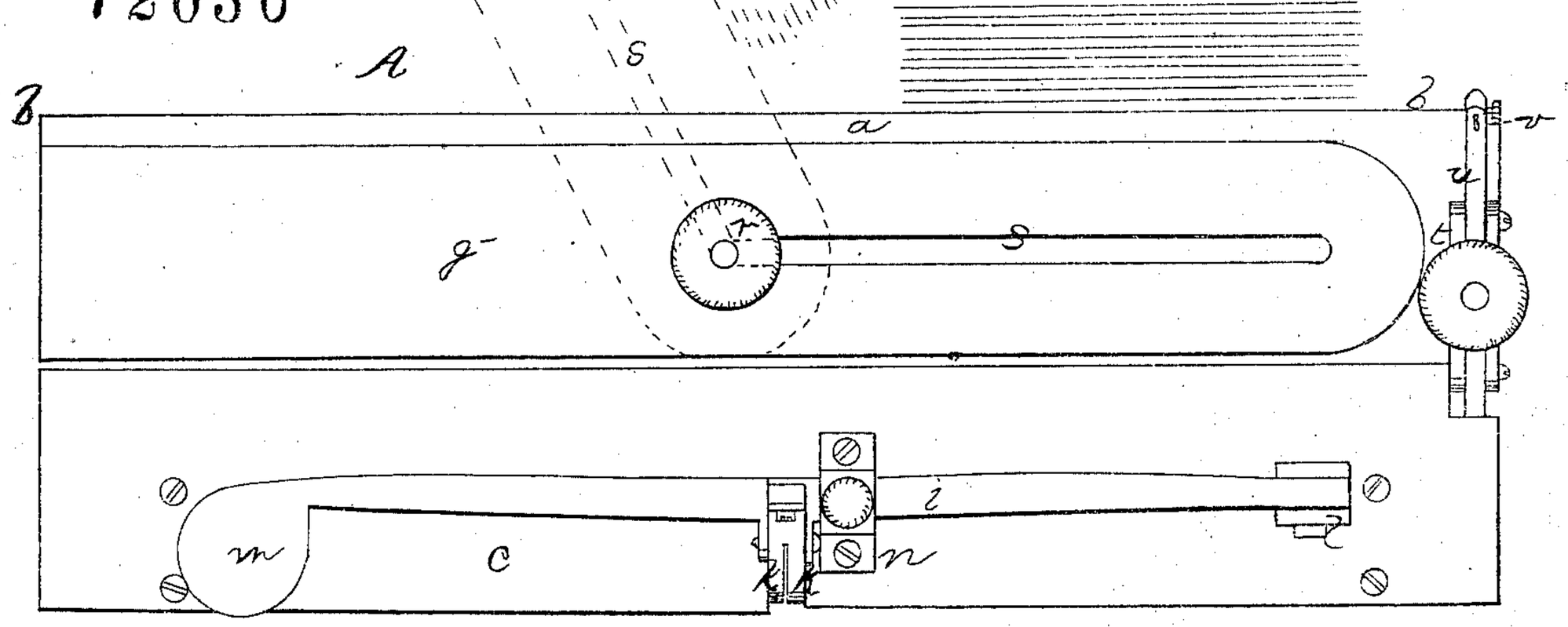

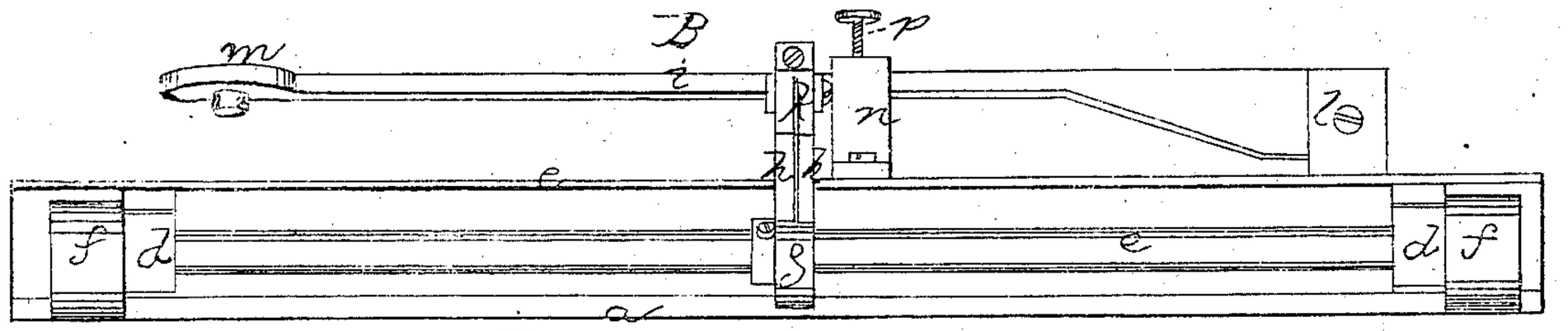

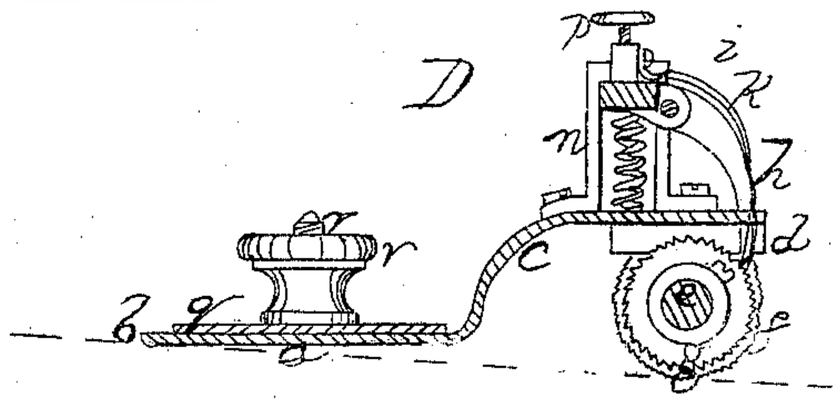

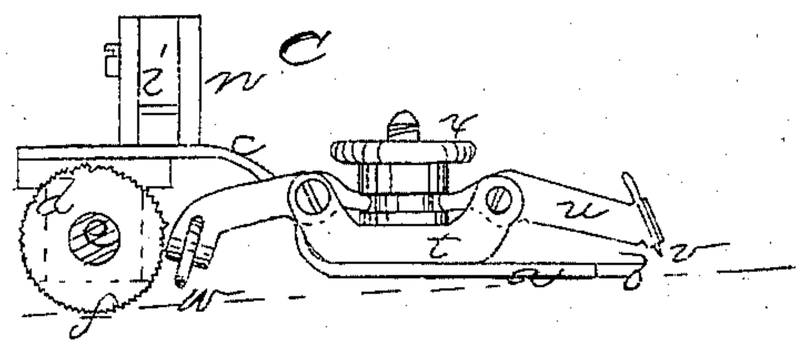

Witnesses
S. B. Kidder
Ab. W. Frothingham.

E. K. Haynes, by
Crosby Halsted & Goulee
Attys

United States Patent Office.

E. K. HAYNES, OF HANOVER, NEW HAMPSHIRE.

Letters Patent No. 72,036, *dated December* 10, 1867.

IMPROVEMENT IN HATCH-LINING DRAWINGS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, E. K. HAYNES, of Hanover, in the county of Grafton, and State of New Hampshire, have invented an Improved Instrument for Hatch-Lining Drawings; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practise it.

In shadowing mechanical drawings, draughtsmen resort to the employment of parallel lines to denote cut surfaces or sections, sometimes known as "hatching," and where large surfaces are to be thus "hatched," it is quite tedious and very trying to the eyes to give the lines an equidistance, or even to make them truly parallel, especially if a short scale or straight-edge be used without a T-square.

The object of my invention is to provide an instrument by which the manipulation of the hand, or of a finger of the hand, effects a rapid, uniform, and parallel movement of the straight-edge to space the lines, without any skill of the eye or of the hand, other than that the latter is simply required to depress a lever after each line is drawn, to bring the straight-edge into proper position for drawing the next line.

My invention may be set forth as consisting, primarily, in combining with a straight-edge or scale, a mechanism by which an intermittent uniform movement of the edge is effected.

The drawings represent a device embodying my invention; A showing a plan; B, a rear elevation; C, an end view, and D, a vertical section on the line *x x*.

a denotes the plate or scale, the front edge *b b* of which constitutes the straight-edge, along which the pen is drawn in making each line upon the surface of the paper under the scale. At the rear part of this piece *a*, is an extension, *c*, carried above the plate *a*, as seen at D, and on the under side of this extension, at its opposite ends, are bearings *d*, in which runs and is supported a long shaft, *e*, having fixed upon or near its ends, milled or toothed wheels or rolls *f* of equal diameter. This shaft also bears, preferably at or near its centre, a ratchet or feed-wheel, *g*, into or against which a suitable pawl or pawls, *h*, engage, such pawl or pawls being hung from a lever, *i*, (about midway thereof,) and being held up to the wheel *g* by a spring or springs, *k*. This lever is fulcrumed at one end, as seen at *l*, and its opposite or free end may have a thumb or finger-piece, *m*, projecting from it, as seen at A. The lever passes through a guide, *n*, and is pressed upwards by a spring, *o*. The rolls *f*, and the straight-edge, rest upon the surface of the paper to be lined, and depression of the lever *i* forces the pawls downward, this movement of the pawls effecting a rotative movement of the ratchet-wheel and the rolls, and a corresponding rear movement of the straight-edge over the paper, the extent of this latter movement being contingent upon the extent of movement of the lever. The downward movement of the lever is arrested by its free end, or a projection therefrom, striking the surface of the plate *c*, and in its upward movement, (effected by the spring *o*,) it brings up against an adjusting-screw, *p*. From this it will be seen that at each depression of the lever, the straight-edge falls back a fixed distance, (its opposite ends having the same movement,) thus making a parallel and equal distribution of the lines made by the drawing-pen. In using the instrument, the thumb or a finger of one hand is placed upon the end *m* of the lever, and a finger or thumb upon some part of the plate *a*, or the plate *c*, to steady the instrument upon the paper. One line being then drawn by guiding the pen along the edge *b b* by the other hand, the lever is depressed, moving the edge *b b*, as before stated, and the next line is similarly drawn. The lever having been raised by its spring, is again depressed, the straight-edge *b b* is again moved the same distance as before, another line parallel to the others is drawn, this operation being repeated until any desired extent of surface is shaded. To make the movement of the straight-edge greater or less, the adjusting-screw *p* is turned up or down to regulate the extent of play of the lever. To make parallel lines angular to the edge *b b*, a tongue, *q*, may be used, this tongue being confined to the plate *a* by a nut and screw, *r*, and having a slot, *s*, which permits the tongue to be slid back upon the scale *a*, as shown at A, or out therefrom at any angle, as shown by the red lines, the feed movement of the edge being effected as already described.

To draw radial lines, an attachment may be used as follows: At one end of the plate *a* is a block, *t*, in which is mounted a holder, *u*, carrying a centre-pin, *v*, this holder having a suitable mechanism for depressing the pin *v*, so that the point of the pin shall enter the paper, and for lifting it out of contact with the paper. In connection therewith, is a mechanism for carrying a roll, *w*, down to the surface of the paper, and for lifting

the adjacent roll from the paper, this roll *w* being arranged to travel in a circle from the centre, *v*. A nut and screw, *y*, may be used for effecting the elevation and depression of the centre-pin and the roll, or either of them, (this nut having a groove into which extensions from the holder *u*, and from the roll-holder, project,) or these movements may be effected by any other suitable mechanism. The centre-pin being depressed, and the feed-lever being worked, as before described, it will be obvious that the edge *b b* will assume positions radiating from the centre, *v*, the lines drawn being uniformly distant, and being made greater or less distant by movement of the adjusting-screw *p*.

I claim a staight-edge or scale, having a mechanism for effecting an intermittent movement of the same, substantially as described.

Also, in combination therewith, the tongue *q*, for angular lining, substantially as described.

Also, in combination with the feed-mechanism, a mechanism for presenting the straight-edge in positions radiating from a centre, substantially as set forth.

E. K. HAYNES.

Witnesses:

J. B. CROSBY,

FRANCIS GOULD.