

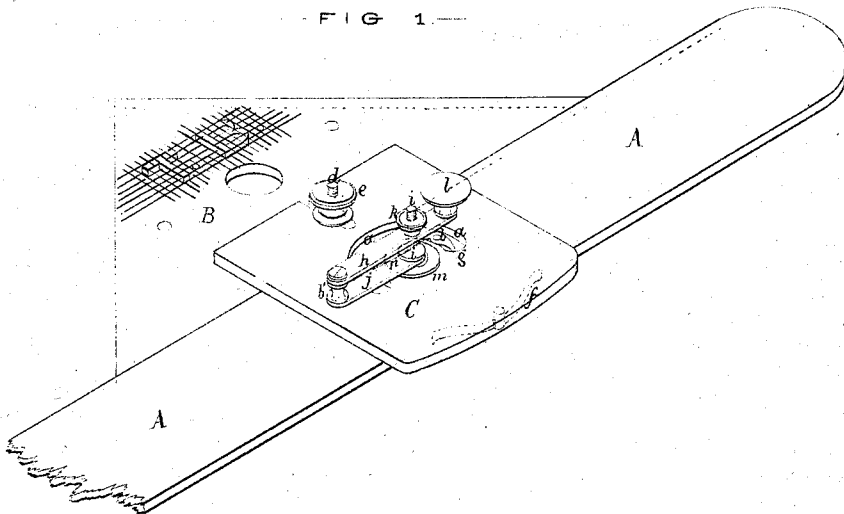
T. BERGNER.

Improvement in Parallel Rulers.

No. 125,115.

Patented April 2, 1872.

FIG. 1. — (continued)



— FIG. 3. —

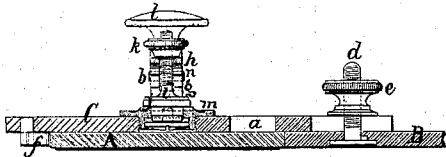
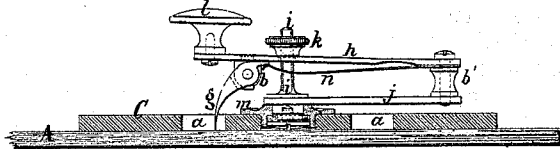
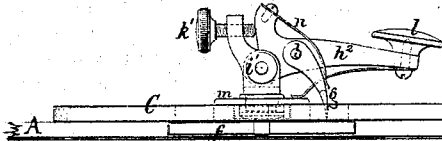


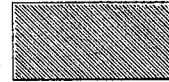
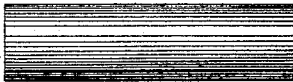
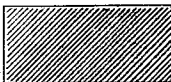
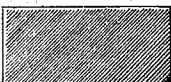
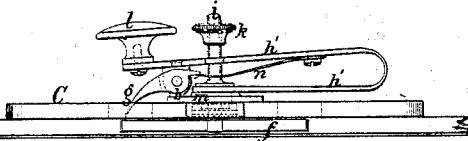
FIG. 2.—



— FIG. 5. —



— FIG. 4. —



Witnesses :

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IMPROVEMENT IN PARALLEL RULERS.

Specification forming part of Letters Patent No. 125,115, dated April 2, 1872.

Specification describing certain Improvements in Parallel Rulers, invented by THEODORE BERGNER, of the city of Philadelphia, State of Pennsylvania.

To indicate sections of objects in mechanical drawing by closely-spaced lines is one of the most tedious manipulations of the practical draughtsman, requiring a steady eye and skilled hands to produce that evenness of surface and unblemished appearance which characterizes the handiwork of an accomplished draughtsman.

Several devices have been constructed and brought forward to facilitate this tedious parallel ruling; but those which I know of require alternate application of the fingers to two distinct parts, intermittently sliding one against or within the other, and, for the reason that both the ruler and stop-piece are required to slide, (the one being held down upon the surface while the other is moved forward,) their manipulation becomes tedious and the action of the instrument slow and uncertain in its guidance.

Now, the leading object of my present invention is to provide a more convenient and efficacious means of mechanically defining the spaces between section-lines, with a view to expedite this kind of work, to relieve the eyes of the draughtsman, and to enable a person of moderate ability or practice to produce an effect of uniformity and neatness almost or quite equal to engine dividing, which gives to sectional engravings of machinery or architectural work a characteristic appearance very difficult to attain in line-drawings executed by hand.

The nature of my invention, and the construction in detail of the improved devices, will be fully and readily understood on reference to the accompanying drawing, which forms a part of this specification, and also practically exhibits the efficiency of the instrument by specimens of section-lining executed therewith, and by a few of the many other applications of the instrument suggested during its practical use. Its facilities for drawing screw-threads, or for laying out the spaces for brick-work, for large lettering on drawings, &c., are indicated in the drawing, and those specimens will suggest many similar and useful applications of the instrument.

Figure 1 is a perspective view of the improved parallel-ruling instrument. Fig. 2 is a sectional side view, and Fig. 3 a transverse section of the instrument. Modifications in the construction of details of the instrument are illustrated in Figs. 4 and 5.

The whole consists of three essential parts: a stationary ruler-blade, A, movable ruler B, and a pawl, *g*, actuated, as hereinafter fully described, for imparting an intermittent movement of the ruler B with variable gradations of space between the lines. The fixed blade A acts as a guide for the movable ruler B. This latter may, for all ordinary work, consist of a common triangle or set-square, with one of its sides bearing against and sliding along one of the edges of the said ruler A. A plate, C, rests upon the top surface of the ruler A, and is movably secured to the triangle B by means of a clamping-screw, *d*, and nut *e*. The screw *d* passes through a slot in plate C, (see Figs. 1 and 3,) which provides an adjustment of C in the required direction for regulating the tension of a light spring, *f*, so affixed to plate C as to bear against the ruler A on the edge opposite to the triangle B, the latter being thus steadily held against its guiding-edge on A while intermittently advancing. The pawl *g*, by the action of which the required advance movement is obtained, bears with its knife-edge upon the top surface of ruler A, for which purpose the plate C is perforated at *a*.

In the construction of the instrument represented in Figs. 1, 2, and 3, which, for its simplicity, I have adopted in practice, the pawl *g* is jointed at *b* to a horizontally-placed flat bar, *h*, of elastic metal, which bar is at *b'* attached to the outer end of an arm, *j*, projecting horizontally from a vertical central stud, *i*. The upward-extending screwed end of this stud passes through an opening in the strip *h*, and above is fitted with a nut, *k*. The pawl *g* is actuated, in the direction for sliding the plate C and triangle B along the guiding-ruler A, by a light pressure with the finger upon a button, *l*, on bar *h*, directly over the pawl. This depression of *h*, and consequent vibration of pawl *g* on its fulcrum, is limited by the fulcrum-piece *b* bringing up against a metal plate, *m*, (as seen in Fig. 4,) and thus the forward motion of the triangle B, due to the tog-

gling action of the pawl, is each time positively arrested by the contact of two metallic surfaces. With the release of the pressure upon button *l* the elastic bar *h*, acting as a spring, rises to resume its normal position until arrested in this direction by the nut *k*. At each rise of the bar *h* the pawl *g* is released, and, following the tension of its take-up spring, *n*, takes a new hold upon the blade *A*. Now, the amount of this take-up motion of the knife-edge horizontally is proportionate to the movement of its fulcrum vertically, and this vibration of the fulcrum *b* with bar *h*, being limited by the distance between the plate *m* and nut *k*, acting as opposite stops, any adjustment of the nut *k* to increase or decrease this amount of vertical vibration will proportionately affect the horizontal feed of the knife-edge, which may thus be regulated for any desired gradation of space between the lines, varying from extreme fineness to the full feeding capacity of the instrument.

Upon reference to the drawing it will be seen that the whole of the described feed-mechanism is carried by the central stud *i*, and that the lower end of this stud is so arranged within the plate *m* as to permit its rotation about a vertical axis.

Now, this simple arrangement provides, therefore, the means of reversing the direction of motion of the triangle *B* along the stationary blade *A* by a half-turn of the stud *i* upon its axis, the position of the pawl *g* and its mechanism being thereby instantly changed for feeding from right to left, or vice versa. The semi-annular opening *a* through plate *C* is provided to admit this swinging of the pawl *g* about the axis of *i*.

It will be evident that, to insure accurate working of the instrument, the ruler *A* must be prevented from moving while the instrument is in use.

Now, instead of various other feasible modes of securing the blade *A*, such as clamps, or weights, or sharp points projecting from the under side of *A*, and entering the paper or other material upon which the blade is to be secured, I use, by preference, a more simple and practically efficient means—viz., a surface of India rubber on the under side of the blade. The strong adhesive property of this substance prevents any motion of the blade upon a surface of paper, wood, or stone, and the downward pressure exerted on the button *l* in actuating the pawl *g* only tends to increase this hold of the blade *A* upon the material on which it rests. On the other hand the avoidance of more complicated means of securing the blade adds to its portability, and convenience in handling or adjusting for every new starting point.

It will be observed that the pen or other instrument used for drawing the lines must be steadily maintained in a certain position laterally against the ruling edge to prevent the slight but perceptible inaccuracy of the spaces, which would occur if the drawing-in-

strument be allowed to incline to one or the other side from the angle in which it was held in starting.

The construction of the instrument shown in Fig. 4 differs from that hereinbefore described in the substitution of a single bent spring, *h*¹, for the parts *h* and *j*, Figs. 1 and 2.

The modification represented in Fig. 5 is more complicated and differs essentially from either of the above, the pawl *g* being in this case hinged to a non-elastic lever, *h*², having its fulcrum in a swivel-stand, *i*¹. This swivel only partly takes the place of the stud *i* in Figs. 1, 2, 3, and 4, while a separate adjusting-screw, *k*¹, is provided on this stand *i*¹ for limiting the vibrations of lever *h*² and regulating the feed, which is likewise obtained from a pawl, *g*, acting in all essential respects alike in the various-described constructions of the instrument.

It will be observed that further modifications of detail are admissible without thereby impairing the usefulness of my invention. The plate *C*, for example, and its tension-spring *f*, might be dispensed with by guiding the triangle *B* along a groove in the fixed ruler *A*, and so attaching the pawl mechanism directly to the movable triangle that the knife-edge of the pawl shall still bear upon the top surface of *A* and act precisely as hereinbefore described. The plate *C* is, therefore, not necessarily a part in the combination of devices constituting my improvement, although I have, by preference, adopted this mode of construction of the instrument.

It is of obvious importance to make a fixed blade the guide for the movable ruler, and to let the pawl take its hold upon this guide-blade, instead of impressing the material upon which the drawing is made. By this provision I am enabled to use the instrument on any hard polished surface of metal or stone with a uniformly-reliable action, and without injury to the surface or the pawl from abrasion.

I do not claim a ruler moving between stops upon a sliding foot-piece; nor do I, broadly, claim the use of a pawl or sliding foot-piece to actuate a ruler; but

What I claim as my improvement in parallel rulers, and desire to secure by Letters Patent, is—

1. The combination, with a fixed guide-blade, *A*, and movable ruler *B*, of a pawl, *g*, having its fulcrum vibrating through a variable space between positive stops, and being actuated to impart motion to the movable ruler *B*, in the manner and for the purpose set forth.

2. Arranging the pawl *g* and the parts actuating the same to swing about a common axis for the purpose of reversing the motion of the movable ruler *B* along its guiding-edge on blade *A*, in the manner described.

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