(No Model.)

C. S. GOODING.

PARALLEL AND RADIAL RULER AND LINEAR SPACER.

No. 328,668. Patented Oct. 20, 1885.

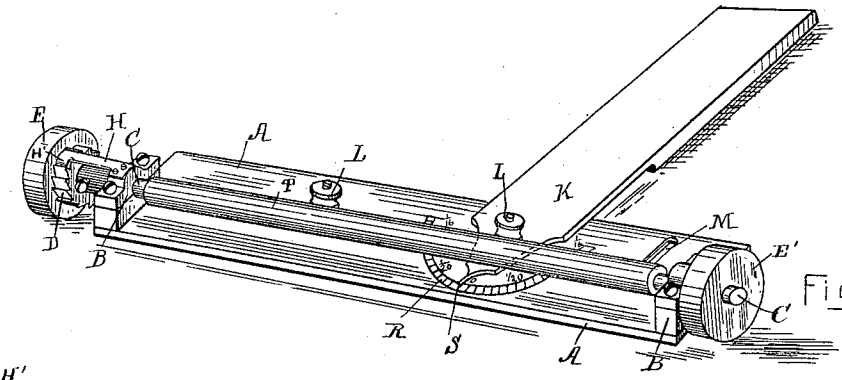


Fig. 1.

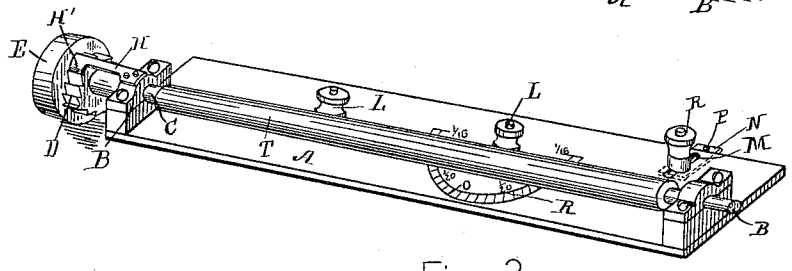


Fig. 2.



Fig. 3.

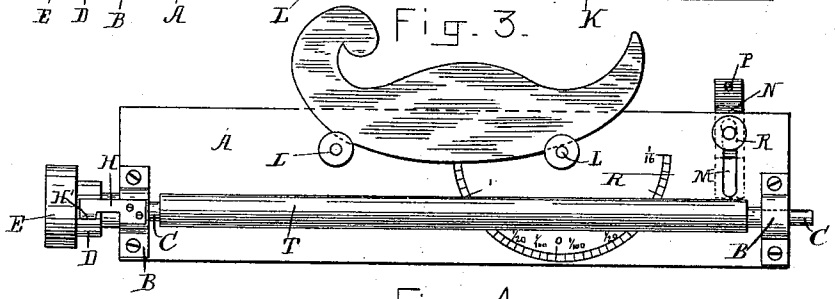


Fig. 4.

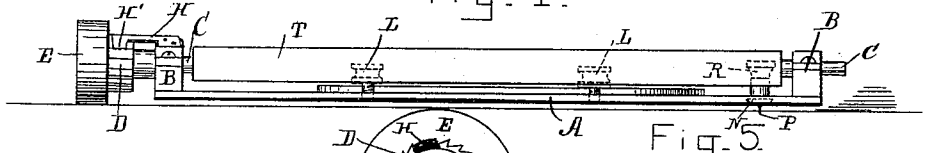


Fig. 5.

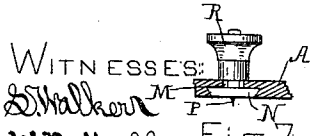


Fig. 7.

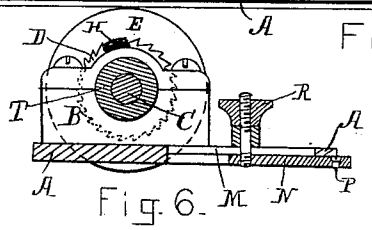


Fig. 6.

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UNITED STATES PATENT OFFICE.

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PARALLEL AND RADIAL RULER AND LINEAR SPACER.

SPECIFICATION forming part of Letters Patent No. 328,668, dated October 20, 1885.

Application filed January 28, 1885. Serial No. 154,256. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. GOODING, of Boston, (Brookline,) in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in a Parallel and Radial Ruler and Linear Spacer, of which the following is a specification.

My invention relates to parallel rulers, and more particularly to that class wherein the linear spaces may be predetermined by means of an indicator or regulator connected therewith; and it consists in the construction, combination, and arrangement of the several parts of the device, as hereinafter more fully described, and specifically set forth in the claims.

Figure 1 represents a perspective view of my invention, showing it as a parallel ruler. Fig. 2 represents a similar view, showing the same as a radial ruler. Fig. 3 represents a vertical longitudinal section through the device adapted to use as a parallel ruler. Fig. 4 represents a plan view of the same as a radial ruler with a curve or irregular guide attached. Fig. 5 represents an elevation of the rear edge of the device adapted as a radial ruler. Fig. 6 represents a cross-section of the same, showing the adjustable point of the radial ruler, and drawn on an enlarged scale. Fig. 7 represents a detail of construction on the same scale.

A represents the main plate or body of the ruler, having secured to the upward face at each end thereof suitable supports or journal-bearings, B, within which is journaled the shaft C, and on the ends of this shaft C and outside of the said bearings B are provided elastic or flexible rubber friction-wheels E, the peripheries of which rest upon the surface on which the front or ruling edge of the said ruler-plate A rests and project a little below the rear or opposite edge of the said plate, whereby the same rests at a slight incline. To the said shaft C is secured a ratchet-wheel, D, near one end of the same, and to one of the said bearings B is secured one end of the flat steel spring H, the opposite free end of which is provided with a short right-angle projection, which is bent downward or curved, so as to serve as a pawl, H′, adapted to engage with the teeth of the ratchet-wheel D when rotated in one direction, passing over the incline faces of the teeth and springing into position against the opposing faces thereof, so as to prevent the rotation of the said friction-wheels E in the opposite direction, and consequently the movement of the said body-plate or ruler A in one direction over the surface upon which it has a bearing, but permit its free movement in the opposite direction. Thus it will be understood that the distance between the said ratchet-teeth D may serve to predetermine the spaces between lines being drawn by a "right-line pen" or pencil bearing against the front edge of the said ruler-plate A forming the guide. The "click" of the said steel ratchet-spring as it passes over one tooth at a time indicates the exact point of movement of the said ruler-plate A, or the exact distance it has thus been moved from the previous line drawn, whereby a series of parallel lines may be drawn with great rapidity and precision, and at an exact distance between or from each other, leaving the lines and spaces uniform throughout.

It will thus be seen and understood that the said ruler-plate A may be moved such distance as to permit one line to be drawn at each click of the spring-pawl H′, as above described, or varied by causing it to be moved over two, three, four, or any number desired, after the previous line has been drawn, before the next line is drawn at the point desired, as indicated by the number of clicks heard or counted after moving the ruler A from the last line drawn before drawing the next line.

Now, in order that parallel lines may be made or drawn very much nearer each other than the teeth can be practically made on the periphery of the ratchet-wheel D, I provide an adjustable ruler plate or arm, K, one end of which is pivoted to or upon the upward surface of the said ruler-plate A by means of a screw-threaded bolt and thumb-nut L, whereby the said ruler plate or arm K may be adjusted and held or secured in the desired position temporarily for use, at any angle varying it in the slightest degree from a right angle to the forward or working edge of the said ruler-plate A, when, if a line be drawn

using the edge of the said ruler plate or arm K as a guide, and then moving the ruler A one tooth, or the distance required to actuate the said spring-pawl H over the movement of the tooth, so as to produce the click, as above described, the said arm or ruler K will have traversed obliquely over the bearing-surface, upon which the main ruler device is actuated by movement thereon, an infinitesimal space or distance, when the next line may be drawn in like manner, using the traversing edge of the said ruler-arm K as the ruling-guide, by which means fine lines may be drawn with a right-line pen and india-ink upon card-board or bristol-board with great ease and rapidity, and without fatiguing the eyes of the operator when so drawn, leaving the spaces between the lines as fine as two hundred to an inch, and showing uniformity or exact regularity throughout.

Now, in order that this indicating and spacing ruler may be adapted for drawing radial lines, I provide the main ruler A with a slot, M, which extends nearly across the said plate near the end thereof opposite the said ratchet-wheel D, and fit within a corresponding groove formed in the bottom surface of the said plate A, and somewhat wider than the said slot M, and dovetailed, an adjustable slide, N, provided near one end with a fine projecting point, P, and near the opposite end with a screw-threaded pin or bolt passing upward through the said slot M, and provided with a milled thumb-nut, R, which may be turned or screwed downward, so as to bear upon the top of the main ruler-plate adjacent to the said slot M, so as to retain the said adjustable slide N at the point desired, either with its pivotal point P in line with the working-edge of the said ruler A or at any desired point outward or inward therefrom, as hereinafter described.

Supposing it is desired to draw radial lines with this ruler instead of parallel lines, it can be changed ready for operation by simply removing the right-hand end friction-wheel, E', from the end of the rotating shaft C, as shown in Figs. 2, 4, and 5, and then by bringing the said pivotal point P to the point from which the lines to be drawn are to diverge, and forcing it into the body of the material upon which the lines are to be drawn, and then making the first line, when the free end of the ruler, upon which the said wheel E and ratchet D are secured upon the said shaft C, may be moved in a circular direction, the said friction-wheel E rotating upon the surface of the material or other foundation so as to actuate the ratchet D and spring-pawl H, the click being thus produced, as before described. The spaces between the radial lines may be left as uniform and exact or varied as predetermined by the movement of one or more teeth under the said spring-pawl H, as above described. The distance or spaces between the radial lines being drawn are indicated in the same manner as before. Now, if it is desired to draw the series of lines tangent to a circle of any desired radius, I adjust the said pivotal point P in the said cross-slot M so as to be secured in position at a predetermined point outwardly or inwardly from the line of the working-edge of the said ruler-plate A, as shown in Fig. 4, whereby the faces of spur-gears may be accurately located, spaced regularly, and very rapidly drawn to any desired scale.

In order to facilitate the adjustment of the said ruling-arm K to the line of the main ruler A at such angle as desired, I provide upon the said main ruler-plate A a segmental scale, R, having gradation marks and figures or decimals, which indicate the distance the said ruling-arm K will travel obliquely from a given point. While the said ruler A is moved the distance of one ratchet-tooth, producing the click, (say, one-twentieth of an inch,) the said arm K will have moved obliquely one-hundredth part of an inch. The end of the arm K extends a short distance beyond its pivot to the said plate or ruler A, and is brought to a fine point, S, which traverses over the said segmental scale R as the said ruling-arm K is moved in either direction, whereby any desired angle may be given the said arm by moving it in the proper direction until the said point S rests at the point on the scale indicating the spaces that the lines will show when drawn, using the arm K as the ruling-guide for the pen when moving the main parallel ruler A over the surface as described for drawing parallel lines.

The said ruling-arm K may be removed, and a curve or irregular drawing guide or pattern of any desired outline may be secured upon the main ruling-plate A, as shown in Fig. 4, by means of the screw-bolts or thumb-nuts L, which may be brought to bear upon the same, so as to secure it temporarily in position. These irregular curves, ovals, or other shaped devices provided to guide the direction of the pen may be used in drawing irregular or curved radial lines or for forming a uniform series of lines of the same curve or irregularity, as occasion may require. I do not limit my invention to the construction herein set forth in detail, as many features of the invention may be modified without departing from the principle of the invention.

In operating my improved ruler it will be found convenient to apply the thumb and fingers to the said shaft C to rotate the same with the said friction driving-wheels E, so as to move the plate or ruler A over the surface upon which said wheels have a bearing, and in order that the fingers may rotate the same with precision and with slight pressure thereon, I provide the said shaft C with an elastic rubber sleeve or flexible tube T, or otherwise provide the same with a suitable coating or roughened surface; and in order that the said friction-wheels E may adhere slightly to the surface over which they are rolled or rotated, so as to insure their movement in a direct line when

employed as a parallel ruler, I construct the same of elastic india-rubber with their central hole or opening somewhat smaller than the said shaft C, so that when forced thereon their elasticity will cause them to adhere to the same sufficiently to hold them in position without further means of attachment. It will be obvious that these results can be accomplished by providing the peripheries of the said friction-wheels E with an elastic rubber band or tire, the main portion of said wheels being constructed of metal and secured upon the said shaft C in any suitable manner.

If desired, the parallel ruler may be moved over the surface by applying the fingers to the journal-box B. A slight pressure downward and forward will be found sufficient to cause the wheels to rotate with the shaft, and thus actuate the pawl and ratchet as above described.

It will be seen and understood that the said rubber sleeve T may be enlarged in size, so as to bear upon the surface its entire length, thereby dispensing with the said friction-wheels E.

Having thus described my invention, what I claim is—

1. The ruler-plate A, provided with journal-bearings B, rotating shaft C, provided with a removable friction-wheel, E′, ratchet D, and spring-pawl H, as and for the purposes set forth.

2. The ruler-plate A, provided with a pivoted arm, K, journal-bearings B, rotating shaft C, having friction-wheels E, ratchet D, and spring-pawl H, as described.

3. The ruler-plate A, provided with journal-bearings B, rotating shaft C, having friction-wheels E, and ratchet D, spring-pawl H, and adjustable slide N, provided with the point P, as and for the purposes set forth.

4. The ruler A, provided with journal-bearings B, rotating shaft C, provided with an elastic rubber sleeve, T, elastic rubber wheels E, ratchet D, and spring-pawl H, for the purposes set forth.

5. The ruler-plate A, provided with a pivoted arm, K, journal-bearings B, rotating shaft C, having elastic rubber wheels E, and provided with an elastic rubber sleeve, T, ratchet D, and spring-pawl H, substantially as described.

6. The parallel ruler A, provided with a pivoted ruling-arm, K, having the point S, segmental scale R, friction-wheels E, ratchet D, spring-pawl H, and shaft C, as and for the purposes set forth.

7. The ruler-plate A, provided with the holding devices L, whereby irregular curves or irregular guides may be secured thereon, ratchet D, spring-pawl H, and rotating friction device adapted to move the ruler, substantially as described.

8. The ruler-plate A, provided with journal-bearings B, rotating shaft C, having an elastic rubber sleeve, T, and one end provided with an elastic rubber wheel, E′, and the opposite end with a ratchet, D, spring-pawl H, and elastic rubber wheel E, constructed and arranged to operate substantially as described.

CHAS. S. GOODING.

Witnesses:
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L. H. COLE.