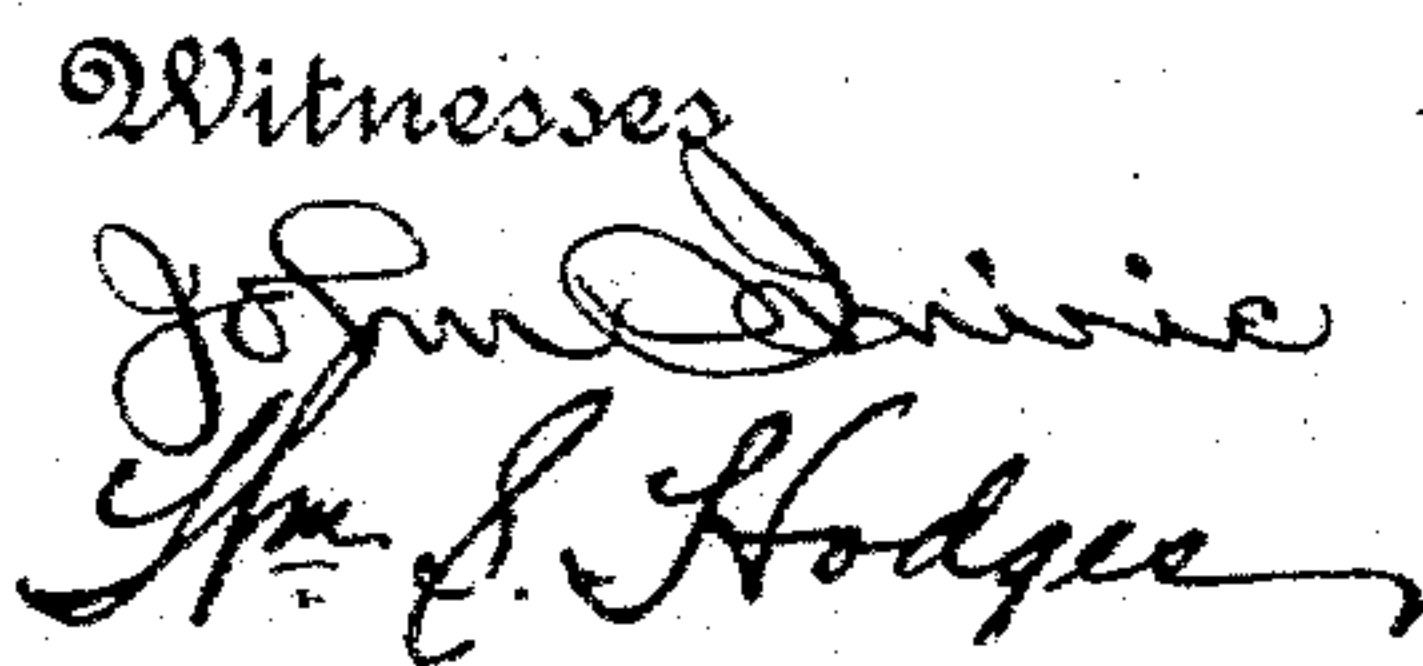


T. TOSTEVIN.  
DRAFTING INSTRUMENT.

Patented Apr. 4, 1893.



Inventor  
Thomas Fosterin,  
By the said  
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# UNITED STATES PATENT OFFICE.

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## DRAFTING-INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 494,944, dated April 4, 1893.

Application filed October 1, 1892. Serial No. 447,485. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS TOSTEVIN, of Council Bluffs, in the county of Pottawattamie and State of Iowa, have invented certain new and useful Improvements in Drafting-Instruments; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to drafting instruments and is especially designed as an improvement on the device shown and described in Letters-Patent No. 238,990, issued to me March 15, 1881.

The object of the invention, primarily, is to provide a square and protractor which can be readily and easily used on any drawing board or table, and by means of which a great nicety of adjustment is secured and the parts can be readily and easily operated, whereby the drafting is greatly facilitated.

The invention consists in providing a pivoted rule or straight-edge having the protractor scale or circle arranged thereon concentrically therewith.

The invention further consists in providing a drafting instrument with a pivoted rule or straight-edge composed of translucent material through which the operator can see the work covered by said straight edge.

The invention further consists in providing a drafting instrument with a pivoted rule or straight-edge of translucent material and having a protractor circle or scale arranged thereon concentrically therewith.

The invention further consists of a drafting instrument having a pivoted rule or straight edge and an adjustable vernier arranged concentric with the protractor scale or circle on said straight-edge.

The invention further consists of a drafting instrument having a straight-edge in engagement with a guide against one side of a groove in which said straight-edge is firmly held by spring-pressure.

The invention further comprises a drafting instrument having a separate grooved bar in which fit the webs or flanges of an adjustable guide with which latter a straight-edge engages.

The invention also comprises the detail

construction, combination and arrangement of parts, substantially as hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings:—Figure 1 is a plan view illustrating my improved drafting instrument, with parts broken away. Fig. 2 is a longitudinal sectional view on the line  $x-x$ , Fig. 1. Fig. 3 is a bottom plan view of the separate grooved bar. Fig. 4 is a plan view of a slightly modified form of my invention. Fig. 5 is a cross-sectional view thereof. Fig. 6 is a detail sectional view on the line  $y-y$ , Fig. 1.

Referring to the drawings, A designates a rule or straight-edge, and  $a$  an adjustable guide of approximately T-shape in plan view. This guide has a groove or recess  $a'$  therein in which rule or straight-edge A snugly fits, the same being held by overhanging plates  $a^2$  attached to said guide. This rule or straight-edge is held firm against one side-wall of said groove by spring-pressed rollers  $a^3$ . These rollers are located in cut-away portions of the guide and are pivoted to the free ends of spring-plates  $a^4$ . These spring-pressed rollers are concealed from view by two of the plates  $a^2$ . From the under side of guide  $a$  project webs or flanges  $b$ .

C is a bar provided with a longitudinal V-shaped groove  $b'$  in which snugly fit the webs or flanges  $b$ . This bar is made of heavy material, preferably steel, and to its under side, at periodical points, are secured pads or disks  $b^2$ , of cork or other suitable adhesive material. These pads or disks by reason of their frictional contact with the top of a drawing board or table prevent the bar from slipping. By means of this bar no specially constructed drawing board or table is required and wherever the bar is located the webs or flanges of guide  $a$  can be placed in its groove and the adjustment or sliding of said guide and of the rule is readily and easily accomplished. By making groove  $b'$  of V-shape the webs or flanges  $b$  will fit snug therein and all wobbling or shaking of the guide is prevented.

D designates a second rule or straight edge having the protractor scale or circle  $D'$  which incloses a disk-like portion  $D^2$ . The latter is pivotally mounted on the inner end of rule or straight-edge A. This straight edge D has a



central boss  $d$  the opening  $d'$  in which and in said straight-edge is beveled or inclined outwardly toward the under side of said straight edge. Through this opening is passed a stud or screw  $d^2$ , the head of which is beveled or tapered to correspond with the bevel of opening  $d'$  and adjacent this bevel or taper is a squared portion  $d^3$  which fits snug in the square opening of a barrel  $d^4$  fitted in an opening in the inner end of straight edge A. Upon the upper threaded end of stud or screw  $d^4$  is a milled nut  $d^5$ , which, when screwed down, will firmly bind the parts together, and permit the straight edge D to turn on its bearing. By beveling the head of the screw and the opening  $d'$  I am enabled to compensate for all wear and to preserve and maintain a true center. From the inner end of straight-edge A, projects a semi-circular plate  $e$ .

F is an adjustable vernier which at its inner end has a circular opening into which projects the lower narrowed cylindrical end  $f$  of barrel  $d^4$ , said vernier being held in place by the boss  $d$ . A milled nut  $f'$  working on a threaded stud  $f^2$  projecting from vernier F is designed to overlap and bind against the curved edge of plate  $e$  and thus hold the vernier at any point to which adjusted. The outer curved edge of this adjustable vernier conforms to the protractor scale or circle, and upon the upper surface of said vernier is a scale  $f^3$  graduated to degrees or any part or fraction thereof. It will be seen that the vernier is mounted concentrically to the graduated sector or protractor scale, and hence the desired degree or fraction is readily and easily obtained.

The straight-edge may be of any form or contour and is preferably made of sheet amber or other translucent material whereby the draftsman or operator can view the lines or work covered by said straight-edge. Another advantage of making the straight-edge of amber or translucent material is that it is exceedingly light in weight, and can be of any size. I prefer to make this amber straight edge of approximately triangular shape, with all, or two, of its sides of equal length.

If desired, instead of making the straight-edge of one or more long sides, or of triangular shape, it can be made in the form shown in Fig. 4, in which I employ a removable rule G which carries a dovetail plate  $g$  designed to fit and engage a correspondingly shaped block or strip  $g'$  attached to the under side of the circular disk D', said strip and plate being tapered throughout their lengths. This removable rule or straight edge can be of any desired length and hence a series of rules is generally kept close at hand ready for use. While this form may be employed in connection with a protractor made of amber or translucent material, yet it is more especially designed for use in connection with metallic protractor-disks.

The operation and advantages of my invention are apparent to those skilled in the art

to which it appertains. A drafting instrument thus constructed is extremely simple and inexpensive and the same is capable of being worked at any point or inclination and requires no specially constructed board or table. The grooved bar will always maintain its position. The straight-edge A is firmly held in proper relation to its adjustable guide and all deflection prevented. By employing a protractor scale or circle and an adjustable vernier arranged concentric to said protractor scale or circle I am enabled to secure great accuracy and nicety of adjustment to any desired angle or inclination. Then again by making the protractor rule or straight edge of translucent material the draftsman is enabled to keep his work in view.

I claim as my invention—

1. A drafting instrument comprising a rule or straight edge, as A, a second rule or straight edge having a protractor circle, a pivot-connection between said rules or straight edges, said protractor circle being concentric to said pivot-connection, and the adjustable vernier held by said pivot-connection, substantially as set forth.

2. The herein-described drafting instrument, comprising the rule or straight edge A having an opening therein, the rule or straight-edge D having a countersunk or beveled hole or opening and a central boss, and the pivot passed through said openings and having a beveled head fitting in said beveled hole or opening together with a binding nut, as set forth.

3. The herein-described improved drafting instrument, comprising the rule or straight-edge A having a curved plate or projection, the barrel having an opening and a lower narrowed end, the rule or straight edge D having a central boss and beveled opening, the stud or screw having a beveled head and forming a pivot-bearing for said latter rule or straight edge, the vernier pivoted on said narrowed end of said barrel, and the adjustable nut carried by said vernier for engaging said curved plate or projection, as set forth.

4. The combination with the rules or straight edges, and a guide therefor having webs or flanges projecting therefrom, of an independent disconnected bar having a groove in which said webs or flanges fit, and of weight sufficient to retain its position, as set forth.

5. The combination with the rules or straight edges, and a guide therefor having webs or flanges, of an independent disconnected bar having an upper longitudinal V-shape groove or recess for said webs or flanges, and provided with adhesive pads or disks on its under side, said bar being of weight sufficient to retain its position, as set forth.

6. The combination with the two rules or straight-edges, of the guide having a groove for one of said rules or straight-edges and springs holding said rule or straight edge firm in said groove, substantially as set forth.

7. The combination with the two rules or



straight-edges, of the guide for one of said rules or straight-edges having a groove therein, and rollers bearing against one longitudinal edge of such rule or straight edge, substantially as set forth.

5 8. The combination with the two rules or straight-edges, of the guide for one of said rules or straight-edges, and the spring-pressed rollers bearing against one longitudinal edge  
10 of said rule or straight-edge, as set forth.

9. The combination with the two rules or straight-edges, of the guide for one of said

rules or straight-edges, having a groove and overhanging plates, the spring-plates attached to said guide and the rollers carried 15 by the free ends of said spring-plates, substantially as and for the purpose set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

THOMAS TOSTEVIN.

Witnesses:

J. NOTA MCGILL,

WM. S. HODGES.