

J. A. F. SVENSON.
PLOTTER.

No. 461,879.

Patented Oct. 27, 1891.

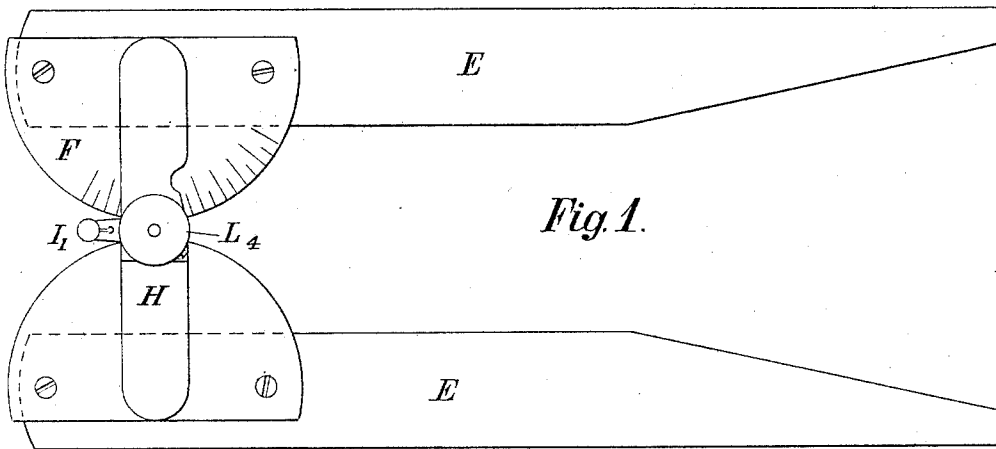


Fig. 1.

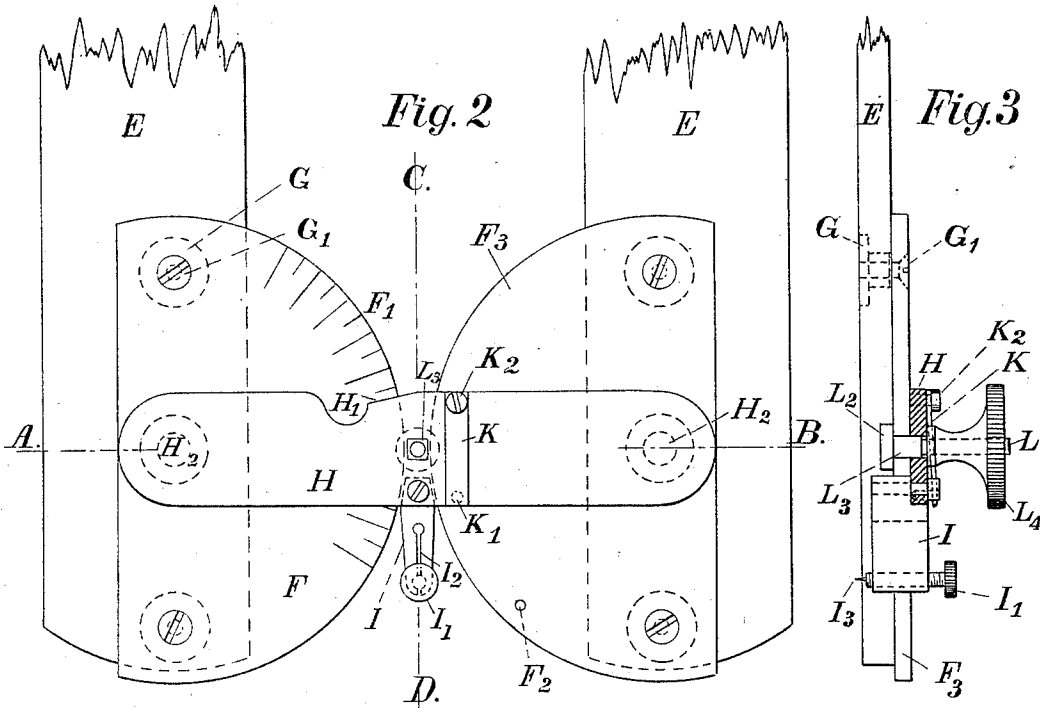


Fig. 2

Fig. 3

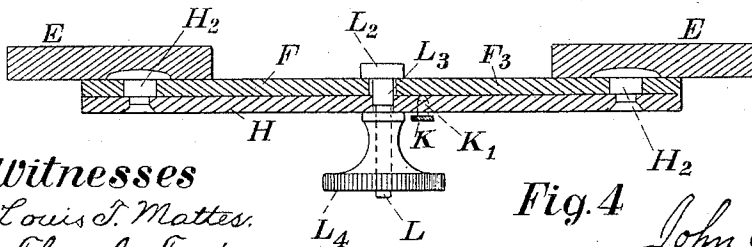


Fig. 4

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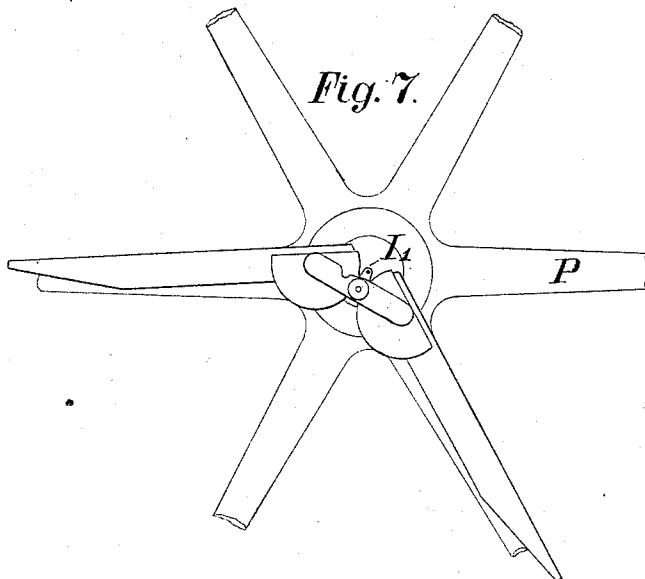
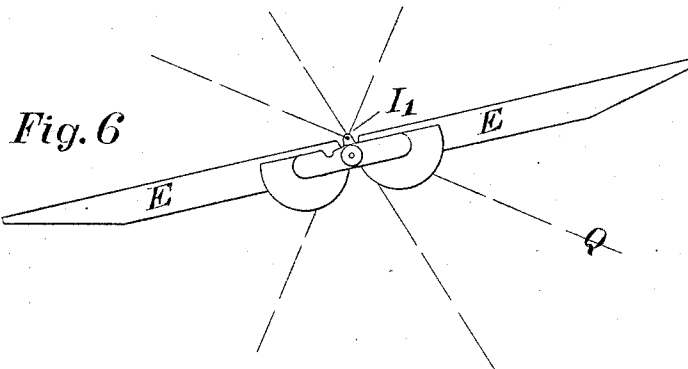
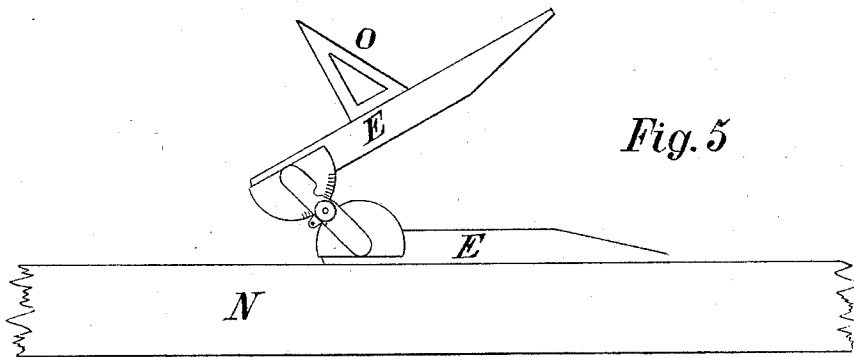
(No Model.)

2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

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PLOTTER.

SPECIFICATION forming part of Letters Patent No. 461,879, dated October 27, 1891.

Application filed February 4, 1891. Serial No. 380,211. (No model.)

To all whom it may concern:

Be it known that I, JOHN AXEL FERDINAND SVENSON, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented a new and useful Drafting-Instrument, of which the following is a specification.

My invention relates to instruments used by draftsmen in ruling straight lines, and particularly such that are not parallel to any drawing-board edge.

The object is to provide a simple, compact, and accurate device, which, in combination, contains the means for executing the drafting operations here enumerated. First, the easy adjustment in conjunction with the ordinary T-square or other parallel ruler, of a ruling-bar to any straight line of whatever inclination on the drawing, and the ruling of other lines of the same inclination in any locality on the drawing-board; second, the ready mensuration in degrees of any angle not exceeding ninety degrees; third, centrally-guided ruling of straight lines radiating from a common point; fourth, centrally-guided ruling of lines that are tangents to a common fixed circle.

Referring to the drawings, Figure 1 is a general view of the instrument. Fig. 2 is an enlarged plan of the working mechanism in which the thumb-nut designated at L^4 in other views has been removed. Fig. 3 is a side elevation showing the connecting-bar in section through the lines C D. Fig. 4 is a section through line A B. Fig. 5 shows the instrument applied to the ruling of parallel lines of any desired angle, and also the measuring in degrees of any such angle. Fig. 6 shows an application to ruling lines radiating from a common center. In Fig. 7 the instrument is applied to laying out the arms of a wheel, the outlines of which arms are tangents to the same fixed circle.

Similar letters refer to similar parts throughout the several views.

E E are two bars each having one accurately-straight edge for ruling. They may be made of wood, hard rubber, or any other suitable material. To each ruling-bar is secured a disk F and F^3 , respectively, preferably made of metal, of the form indicated and located

as shown. The method used in uniting disk and ruling-bar together is not essential to my invention. They may be made solid in one piece, but I prefer the construction clearly shown in Figs. 2 and 3.

G are nuts bedded into the ruling-bars and receiving corresponding screws G' , whose heads bear against and are countersunk into the disks F and F^3 .

At H^2 each disk is perforated to form bearings for pivots so adjusted that they fit closely but move with freedom within said bearings. The pivots are permanently secured, one to each end of a bar H, at such a distance apart that a space is left between the curved edges of disks F and F^3 . The curved outline of the disks is a circular arc concentric with corresponding pivot. It is evident that the bar H thus movably connects the two disks F and F^3 , the form of the disks allowing a partial and independent rotation upon the pivots. The screw L, entering a hole in the center of connecting bar H through the space left between said disks and having a head L^2 made to bear simultaneously against both disks, receives on the other side of bar H a nut L^4 , by the tightening of which the disks can be locked to the bar and firmly secured in the relative position attained by a previous adjustment. To prevent turning while operating the nut L^4 , the screw L has a square portion L^3 , where it passes through the bar H in a correspondingly-shaped hole. One of the disks F has engraved on it, as shown at F' , graduation-lines radiating from the semicircular edge toward center and spaced in such a way that the amount of displacement in degrees from a certain normal relation of disk to connecting-bar may be ascertained. To facilitate reading a portion of one side of bar H is made to take the direction of said graduation-lines, as shown at H' .

In laying out the graduation-lines on the otherwise complete instrument I prefer to proceed in the following manner: The parts are brought to such a relative position that the straight edges of bars E E take in an angle of ninety-degrees exactly by adjustment to a standard, and so that at the same time the line drawn through the two pivots H^2 H^2 will stand at forty-five degrees with either of said edges. At this point one graduation-line is

drawn along the specially prepared portion H' of bar H. This line will be marked 90. With the other disk F³ temporarily clamped to the connecting-bar, the nut L⁴ being loosened, the disk F is rotated in a direction to make the ruling-bars at their outer ends approach one another until their edges become parallel. In this position the other extremity of the scale is marked and numbered 0. Between the 90 mark and 0 the scale is then completed to any desired fineness of reading and the graduations numbered in suitable manner. Before the temporary clamp above referred to is removed a line or mark may be cut along one side of bar H into the blank disk F³, which mark is then sufficient as an indicator to set by in the subsequent use of the instrument. I may use in place of said mark another form of indicator consisting of a short cylinder K' fitting into and extending through a hole in the bar H and secured to one end of a spring K, whose other end is attached to bar H by means of screw K². The free end of the short cylinder K' is shaped into a blunt point, which by the spring is always kept in contact with the disk. When in rotating the disk F³ the small hole shown at F² is brought under the blunt point the latter enters, and this action decidedly marks the position which the blank disk should occupy in relation to bar H when the graduation-scale is in use. A slight effort only is required to force the blunt point again out of the recess.

I am aware that similar indicators have been in use before, but I am not aware that they have been employed to form a part of the combination herein described.

As shown by Figs. 2 and 3, an arm I is secured by a screw or some other suitable means to connecting-bar H. The outer end of this arm is formed into a split nut, which receives the needle-pointed screw I'. By turning this screw by means of its milled head the needle I³ may be forced down into the surface on which the instrument is placed, so as to make a fixed center, around which the instrument can be swung. When not in use the needle-point is carried entirely within the nut to protect it from accidental injury. By means of the slit I² a tendency may be given the two halves of aforesaid nut to close tightly upon the screw I', so as to effectually prevent its accidental loss.

Having now fully described the construction, I will proceed to indicate the application of my invention to the purposes previously set forth.

In Fig. 5 is shown how the instrument is used with a parallel ruler N, which may be an ordinary T-square. One of the bars E is kept in close contact with the edge of N, while the other bar E is adjusted to any existing inclined line of the drawings. The use of the triangle shown at O is obvious. The same figure also shows the instrument in readiness for angular mensuration.

In Fig. 6 the ruling-bars E have been clamped in the position where the needle-point of screw I' comes in line with the straight edges. The needle-point is forced into the paper and serves as a center in ruling the radial lines marked Q.

In Fig. 7 the ruling-bars have been clamped in a position to bring their edges in line with the tangents to a circle described around the needle-point I'. The instrument is here used in laying out the arms of a wheel indicated by P.

I claim—

1. A drafting-instrument comprising two bars for ruling straight lines, two semicircular disks, each secured at or near the end of one of the ruling-bars, one connecting-bar pivoted at each end to the center of one of said semicircular disks, a screw having a head to engage the curved edges of both said semicircular disks and passing through a hole in said connecting-bar, a nut to fit said screw, whereby the ruling-bars may be moved and secured in any desired angular position, for the purposes previously set forth.

2. In a drafting-instrument, the combination of two semicircular disks F' and F³, a connecting-bar H, pivoted at each end to one of said disks and having a portion of one side H' shaped to coincide with graduation-marks on disk F', a clamp-screw L and a nut L⁴, an indicator K', attached by a yielding connection K to said bar H and made to engage a hole F² in disk F³, substantially as described, and for the purpose specified.

3. In a drafting-instrument, the combination of a needle-pointed screw I' and the bar I, which latter at one end is formed into an elastic nut for said screw I', with a bar H, which at each end is pivoted to a semicircular disk which is attached to a ruling-bar, as described, and for the purpose set forth.

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Witnesses:

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