EDWARD BOSTOCK.

Improvement in Adjustable Rulers.

No. 115,019. Patented May 23, 1871.

Fig. 1

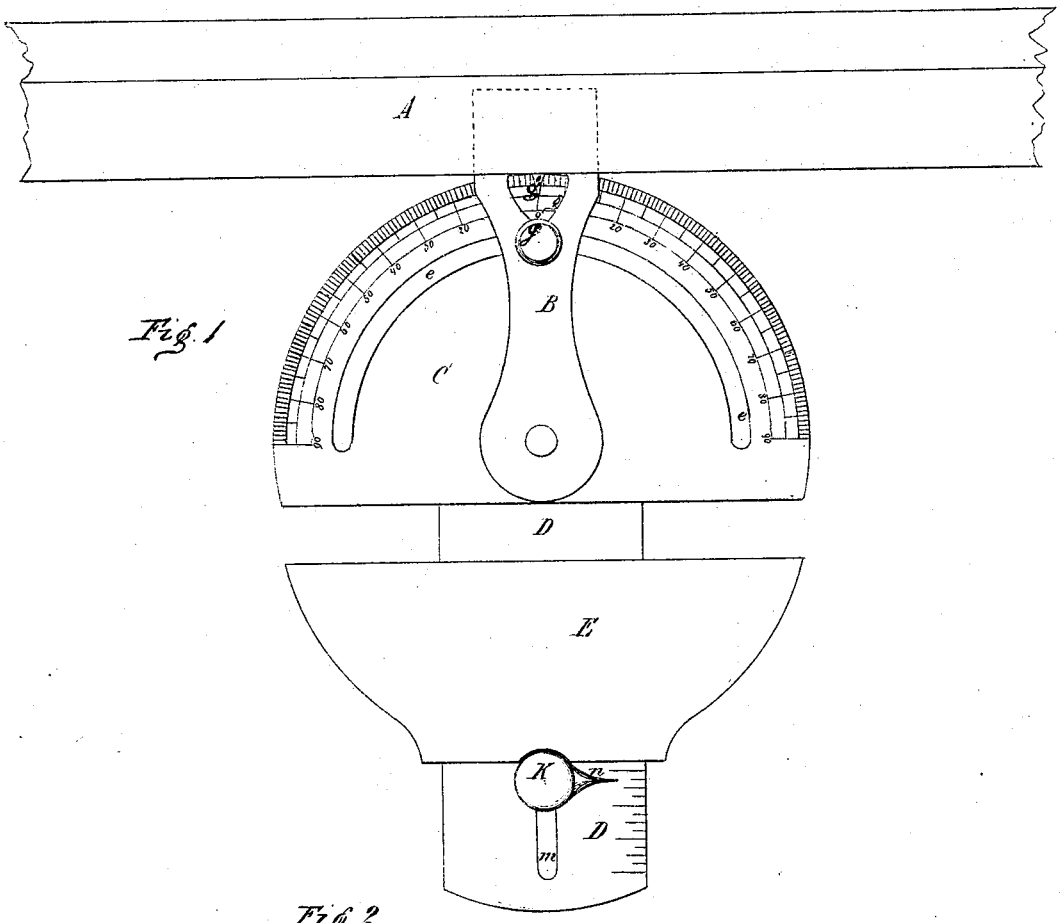


Fig. 2

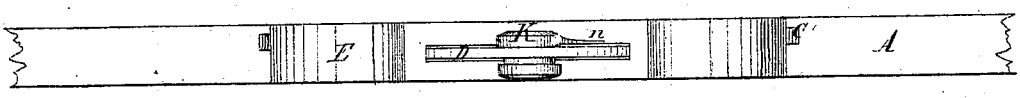
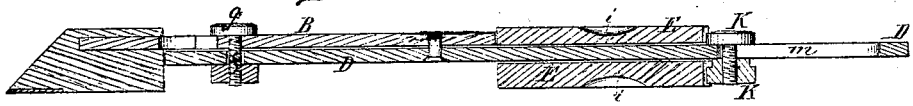


Fig. 3



Witnesses.

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UNITED STATES PATENT OFFICE.

EDWARD BOSTOCK, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN ADJUSTABLE RULERS.

Specification forming part of Letters Patent No. 115,019, dated May 23, 1871.

To all whom it may concern:

Be it known that I, EDWARD BOSTOCK, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain Improvement in Adjustable Rulers; and I do hereby declare that the following, taken in connection with the drawing with accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention consists in certain improvements in parallel rulers, whereby they are rendered more efficient and true in action, and less liable to get "out of true," and whereby, also, lines may be readily drawn at any required angle to each other, up to and including a right angle.

Figure 1 is a plan view, Fig. 2 an edge view, and Fig. 3 a central transverse section, of a ruler embodying my improvements.

Referring to Figs. 1, 2, and 3, A is the ruler, which may be brass-bound or otherwise, as preferred, and may be graduated on one or both sides, the instrument being so constructed that it may be instantly reversed and used with either side up without removing or changing any part. This rule is firmly supported at its center upon one end of the metal arm or lever B, to which I secure it permanently and at a right angle thereto. The mode of construction which I prefer is to mortise the end of the arm B into the rear edge of the rule, as shown. This prevents the surface of the arm from being or getting above that of the rule, and permits its being further fastened in any well-known manner. The other end of the arm B I pivot to a piece of metal, C, which I construct in the form of a semicircular protractor, with the arched side toward the rule, and having a broad flat tongue, D, projecting from its straight side, as shown. The point at which it is pivoted should be the center of that circle of which the arched line of the protractor forms a part. The protractor is marked on one or both sides, preferably both, with a graduated scale embracing one hundred and eighty degrees, but running from a central zero point each way ninety degrees, as shown. The tongue of the protractor I also mark on one or both sides, with a scale of inches and fractions thereof, or with any other scale desired. E is a broad wooden slide or scale head, having a transverse mortise, *h*, cut through the same, of such breadth as to permit the tongue D to slide therein, but without any liability of permitting the scale-head to get its forward straight-edge out of its true line—namely, at strict right angles to the axis of the tongue. The depth of this mortise I, however, make a little greater than the thickness of the tongue, so that the scale-head may be permitted a little vertical play thereon. This latter feature is important when in the act of ruling parallel lines, because when the scale-head is pressed to the paper it does not, by that act, press the rule itself to the paper, and so interfere with its being easily slid back to position for ruling the next parallel line, and, when the rule itself is pressed down, such pressure also leaves the scale-head free to be easily slid to place, the pressure on either imparting no pressure to the other. Depressions *i*, on the scale-head, receive the fingers of the operator, to facilitate his moving the same. An adjusting-pin, *k*, and nut *l*, or their equivalent, serve, in connection with a slot, *m*, in the tongue, to restrict the movement of the scale-head to the desired distance from the rule, to insure the proper distance apart of the parallel lines, a pointer, *n*, on the head or nut of the pin indicating upon the scale of the tongue such distance. The heads and nuts of the adjusting-pins, and all other parts, are so applied that none of them shall project above the planes or surfaces of the rule and scale-head. The instrument will thus lie perfectly flat on the paper whichever side is under. The protractor has a concentric slot, *e*, a little longer than a semicircle, the excess at each of its ends over the limit of a circle being just one-half the diameter of a headed adjusting-pin, *f*, which projects through the slot. This pin is connected with the arm B, and, with its thread and nut *g*, serves to set the rule to any position or angle desired around the protractor. A pointer, *g'*, on the arm B serves to indicate the point on the protractor-scale to which the rule is set, and, consequently, to designate the angle which the line to be drawn shall make with one previously drawn.

It will now be seen that when the rule is so set the pointer *g'* indicates zero, the rule is parallel with the straight-edge of the slid-

ing scale-head, and that by adjusting the pointer *n* so as to separate such edge from the rear edge of the rule the distance required between the two lines, such lines can be drawn at the outer edge of the rule with perfect parallelism, and with great rapidity and facility, by simply sliding back the rule to the scale-head and the scale-head to the pin *k*, alternately. By sliding the parts forward instead of backward the parallel lines may be drawn in advance, or forward of, instead of at the rear of each other. When the straight-edge is set at right angles to the tongue D by means of the nut *g*, as shown in Fig. 1, it will be seen that the parts A, B, C, and D become firmly attached together, as if they were all in one piece, and operated as described in the foregoing clause for drawing parallel lines. When it is desired to draw a line at less than a right angle to another line, it is only necessary to loosen the nut *g* and set the rule to that angle, as would be indicated by the pointer *g'*, and then draw the line, and lines parallel to this new line may be drawn, if desired, in the manner already described. As the ruler may be turned around the protractor to the right or left, as desired, it will be seen that lines may be drawn at any angle to another, either on the right or left of it. To draw a line at right angles to another no adjustment of the angle is needed, and no effort or skill of the operator, because, when the rule has been swung round to its extreme limit in either direction, it will stand at an exact right angle to the position it occupied when its pointer stood at zero, the length of the slot, as above stated, having been so made in excess of a semicircle as to bring the rule just to that position. As an additional guard against getting any excess beyond the right angle, the arm B I preferably make of such breadth that its edge will strike and be arrested by the scale-head when the latter is in contact with the rear line of the rule. By removing the rule and its center arm, and the scale-head, if desired, an efficient semicircular protractor is left as a complete instrument in itself.

In my present construction I dispense with two guide-rods and their removable knobs, and with a second full-length ruler, shown in my patent No. 67,487, dated August 6, 1867, and avoid any liability to derangement or getting out of parallelism, and do not have to take off or change any pieces in order to use the instrument with either side of the rule uppermost, which is often desirable and needful.

I claim—

The combination of the straight-edge, graduated scale-plate, protractor, and swinging arm, with its adjusting screw and nut, the whole forming an adjustable parallel and angular ruler, when the same is made and operated substantially as specified.

EDWARD BOSTOCK.

Witnesses:

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