J. E. CRUPPER.

Improvement in Plotting Instruments.

No. 116,163. Patented June 20, 1871.

Fig. 1.

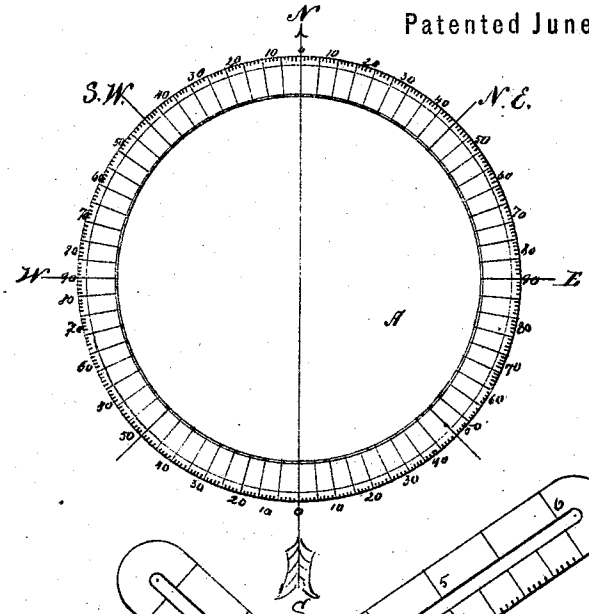


Fig. 2.

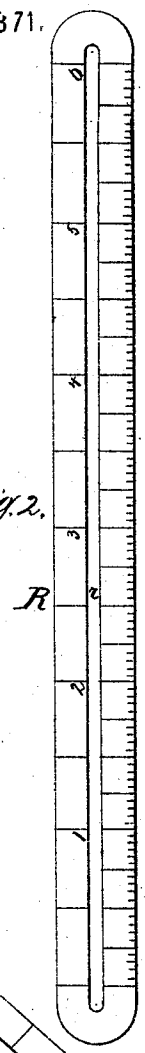
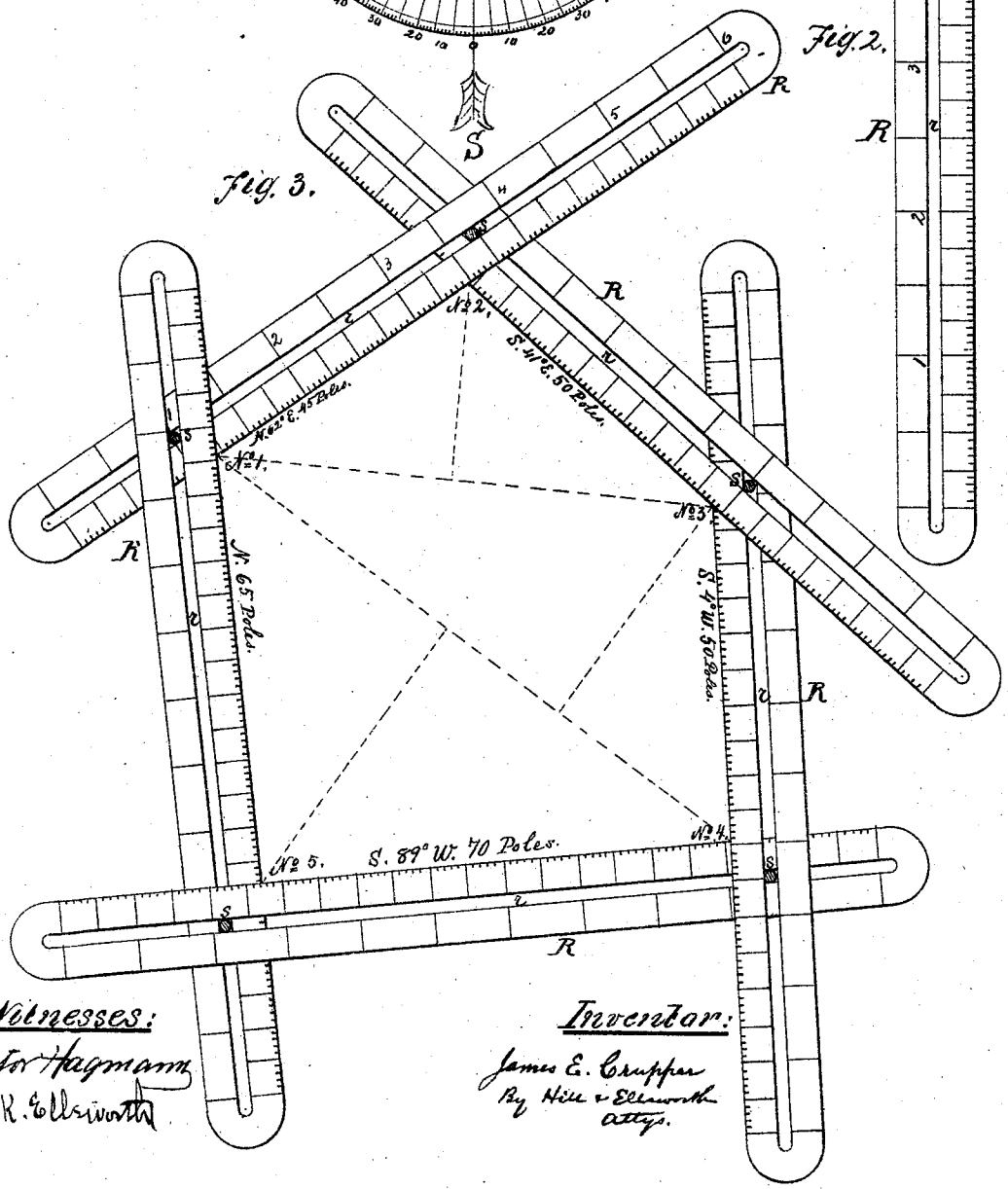


Fig. 3.



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AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

JAMES E. CRUPPER, OF BERLIN, KENTUCKY.

IMPROVEMENT IN PLOTTING INSTRUMENTS.

Specification forming part of Letters Patent No. 116,163, dated June 20, 1871.

To all whom it may concern:

Be it known that I, JAMES E. CRUPPER, of Berlin, in Bracken county, State of Kentucky, have invented an Improved Method of Draughting; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a plan of the protractor; Fig. 2, a plan of a single rule; and Fig. 3 represents the plan of a lot of ground, with the rule in position for draughting the plan.

Similar letters of reference in the accompanying drawing denote corresponding parts.

Heretofore in draughting plans surveyors have been accustomed to lay off a line, with a rule, from the starting point to the first corner, and then fix the angle with a semicircular protractor, and then lay off another line with the the same rule to the next corner, and so on till they come back to the point of beginning, the rule being removed from the paper as fast as the successive lines are laid off. My improved method is essentially different from this, in that I employ a number of rules corresponding to the sides of the plat, and fasten them all together in such manner that the inner edges of the series, when fastened, shall coincide with the periphery of the plan to be draughted. The invention consists, first, in the method of draughting; and secondly, in the adaptation of a set of instruments to successfully draughting by said method, as hereinafter set forth. The method I have already sufficiently described. The instruments consist, first, of an annular or circular protractor, A, as represented in Fig. 1, by which back angles can be fixed without moving the protractor, secondly, a set of rules, R R, each preferably three-fourths of an inch wide, formed with a straight longitudinal slot, *r*, preferably six inches long, and having their faces graduated into rods and decimals of rods, one rod to each inch of the rule; and thirdly, a number of set-screws, *s s*, fitted closely to the slots *r r*, and adapted to clamp any two of the rules together, as shown in Fig. 3, so that they will remain immovably fixed at the same relative inclination to each other, however much they may be handled.

The set-screws are used, of course, with two little clamping-plates that press against the flat upper and under surfaces of the rules at the angles, said plates being either square or round, as may be preferred, and one of them, if thought necessary, having a flange or other equivalent device projecting down into the slot or into a depression or rabbet along the edges of the slot, or turning down over the edge or edges of the rule, to prevent it from turning with the set-screws. The face of the protractor is graduated with degrees, minutes, and seconds, and has the points of the compass properly designated upon it.

Provided with instruments thus adapted to his work, the surveyor lays off the plan in the following manner: Beginning at No. 1, for example, as illustrated in Fig. 3, he places 1 in the center of the protractor, and finding the course to be N. 62° E. 45 poles, he slips down the rule to 45 and tightens the screw. He then brings No. 2 to the center, keeping No. 1 on the same degrees, and, taking the next course S. 41° E. 50 poles to No. 3, he slips the corresponding rule to place and tightens the screw as before, and so on to the end, always bearing in mind that the angles must be taken from the center of the protractor. When done, the inner edges of the rules will correspond to the outlines of the lot, and, by means of the rules thus clamped together, any desired number of copies of the plan may be taken with the greatest ease.

It is evident that these instruments will also greatly facilitate the computation of areas, since dividing the field into triangles, as shown by the dotted lines, Fig. 3, the base and perpendicular of each may be measured in rods and decimals of rods by simply applying the edge of the rule thereto. If at any time a single rule is too short for any purpose, two or more may be fastened together to extend in the same straight line.

The surveyor will be able to adjust the rules one to another in the field while the work is going on, if he desires, so that, as soon as the last course is run, he can, with a pen or pencil, without further delay, mark off as many copies of the plan as he desires. The convenience of the instrument, both on this account and in many other respects, will be obvious to any practical man at a glance, and need not be specially adverted to here. It is perfectly accurate, is cheap, not liable to get out of repair,

is very compact, and will save three-fourths of the time necessary for draughting by the old process. The same instrument is admirably fitted for laying off carpenter's work.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. The method of draughting herein described, consisting essentially in the simultaneous delineation of all the courses and distances to be draughted by means of a series of slotted rules, R R, clamped together, substantially as herein set forth.

2. The set of instruments, adapted to operate, in combination with each other, in carrying out the method herein described, such set consisting essentially of the slotted rules R R, graduated in rods and decimals of rods, the circular or annular protractor A, graduated in degeees, &c., and marked with the points of the compass, and the set-screws *s s*, for clamping the rules together, all adapted to and designed to be used in connection with each other, substantially as described.

J. E. CRUPPER.

Witnesses:

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