

(No Model.)

2 Sheets—Sheet 1.

B. E. SAWYER.  
PARALLEL RULER.

No. 436,842.

Patented Sept. 23, 1890.

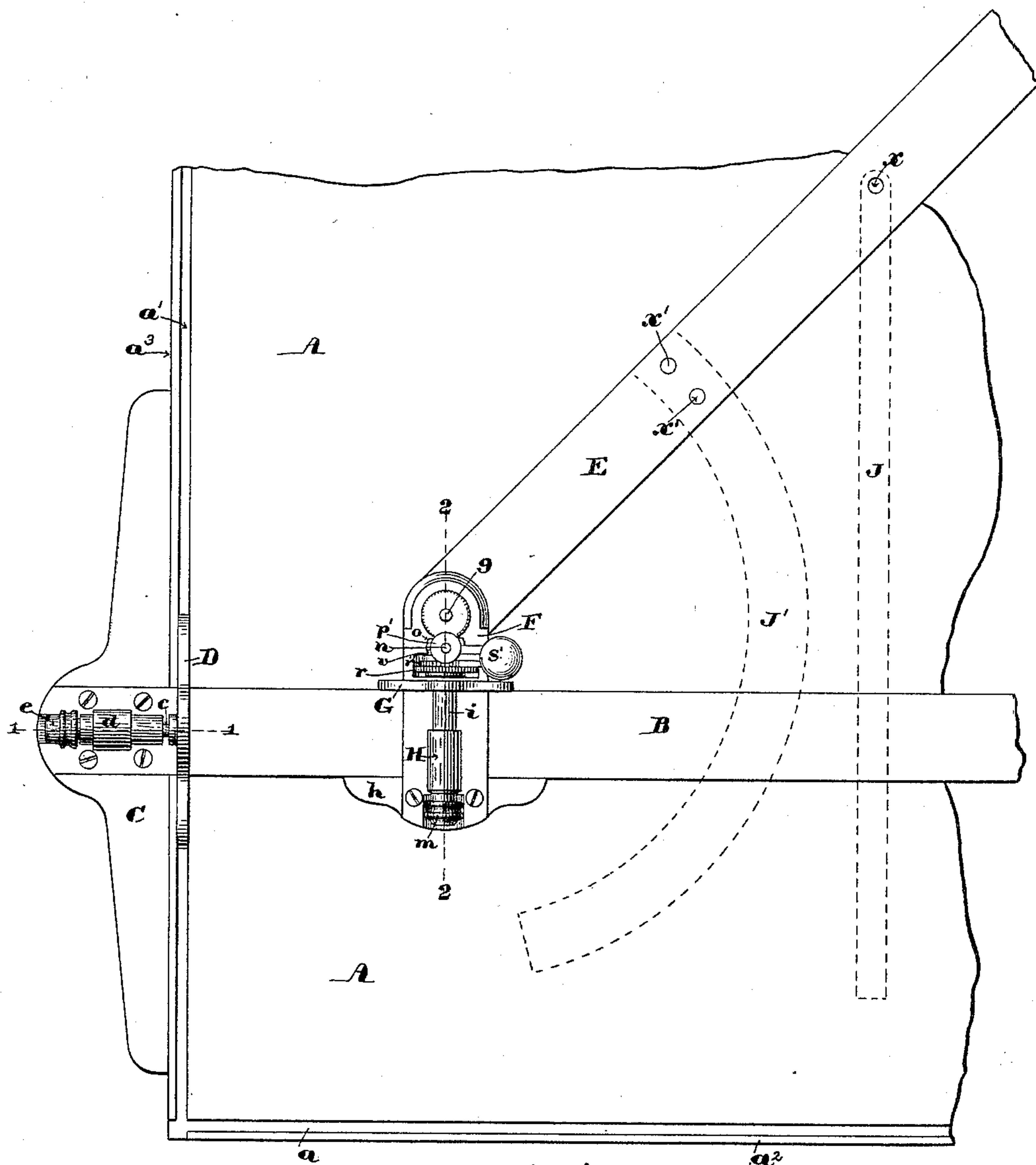


Fig. 1.

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M. H. Dusecory

Inventor:

Burnside E. Sawyer,  
by N. C. Lombard  
Attorney.

(No Model.)

2 Sheets—Sheet 2.

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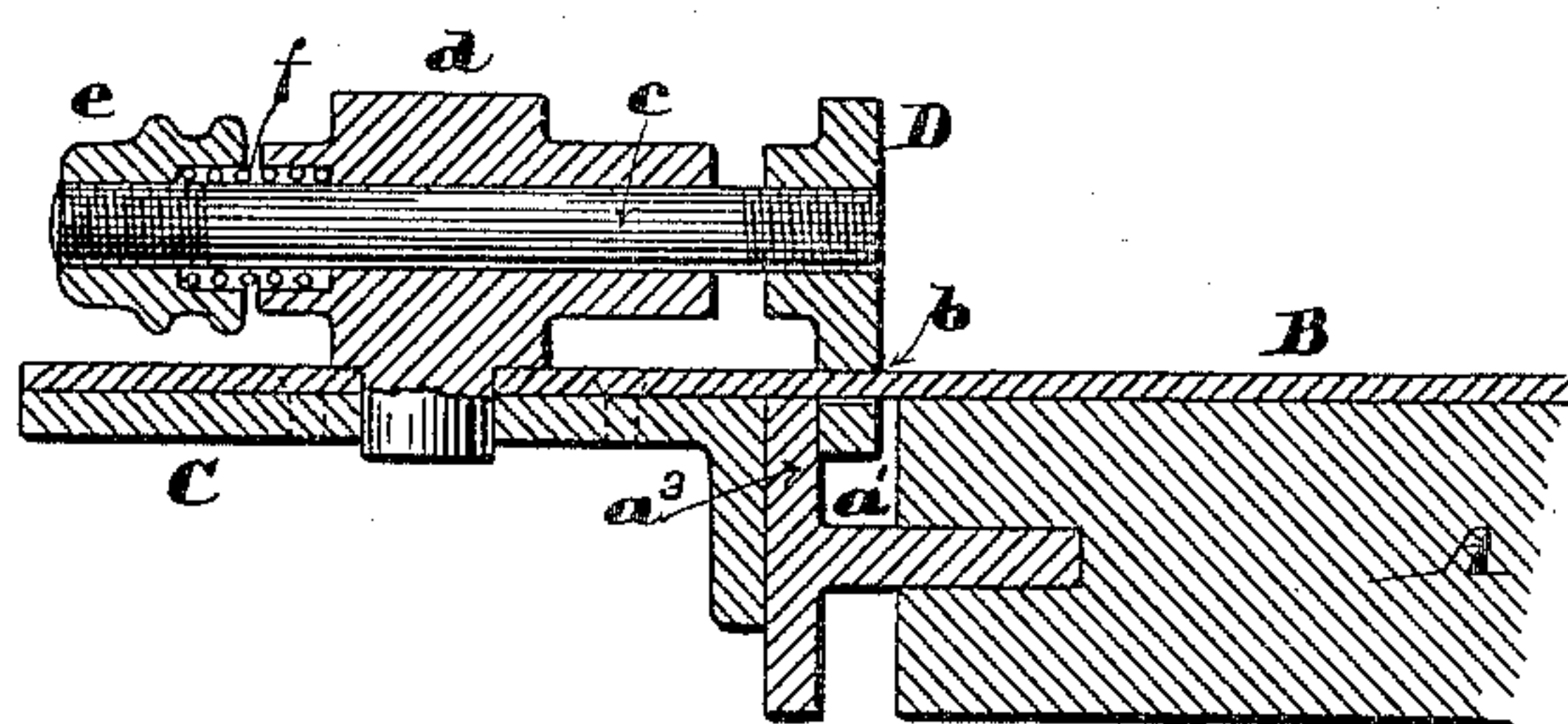


Fig. 2.

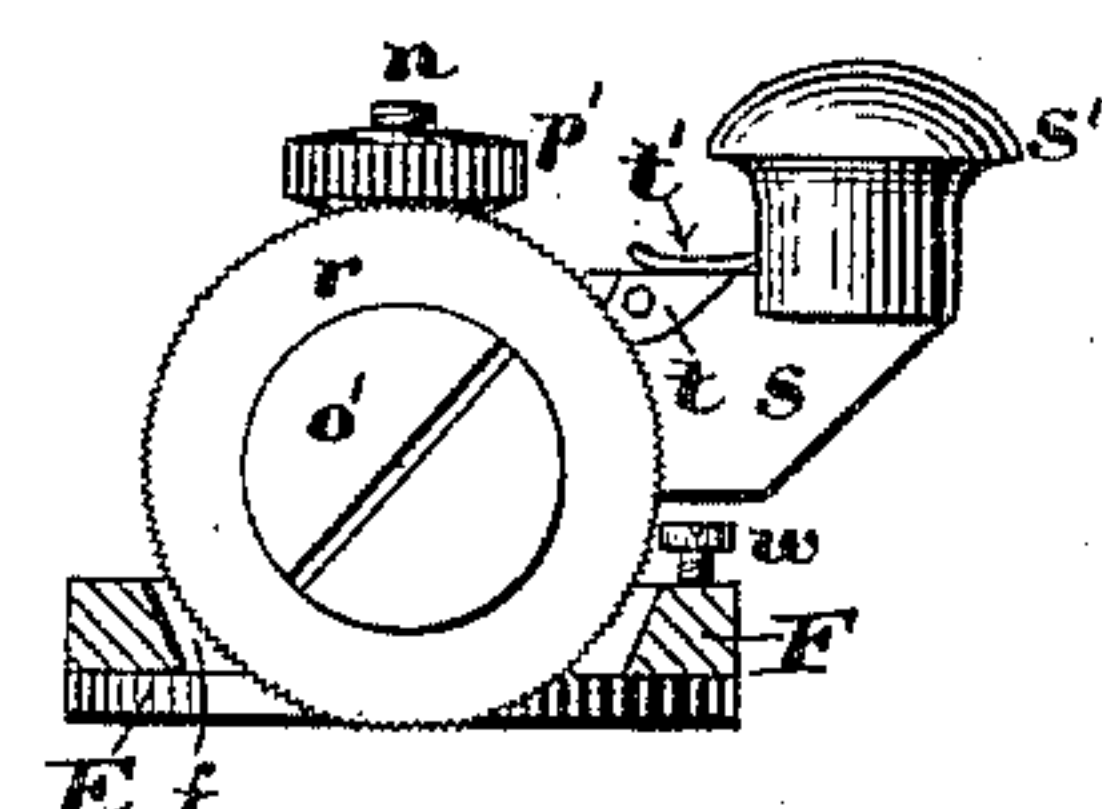


Fig. 4.

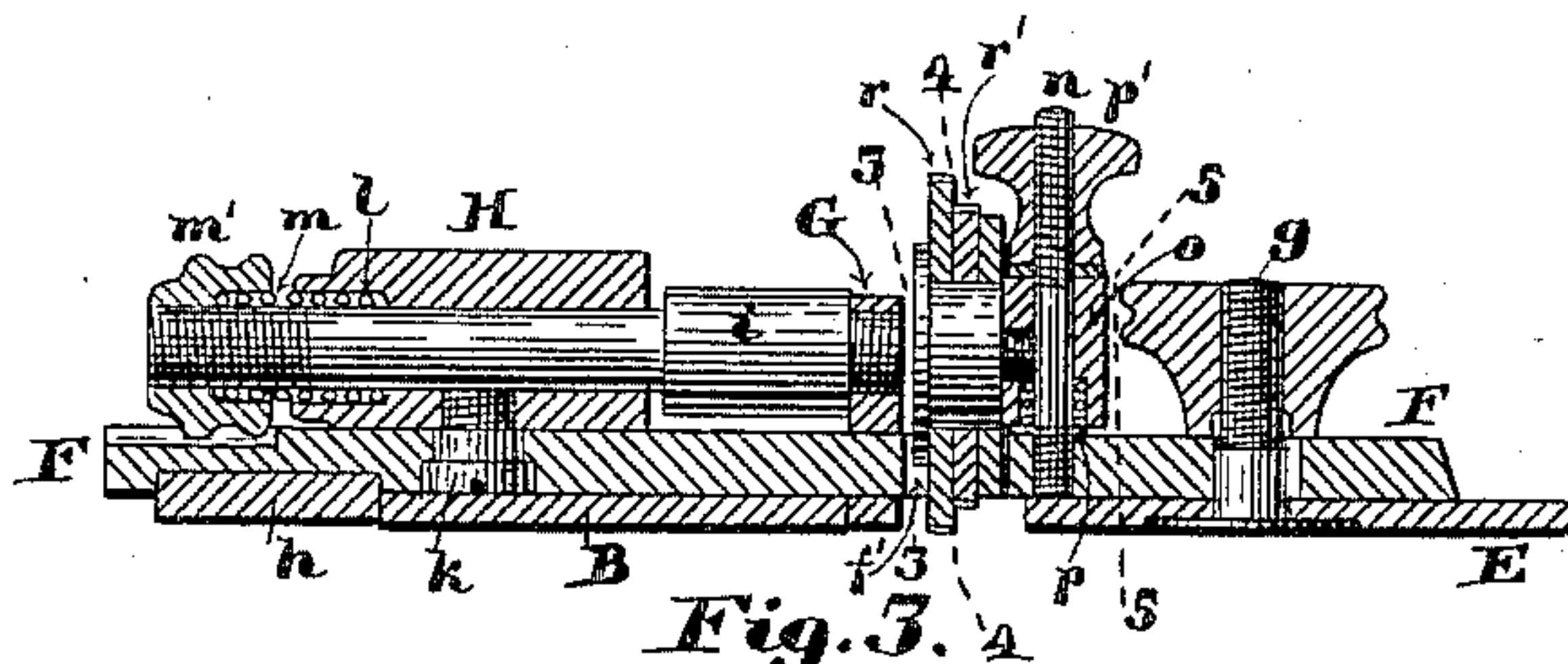


Fig. 5.

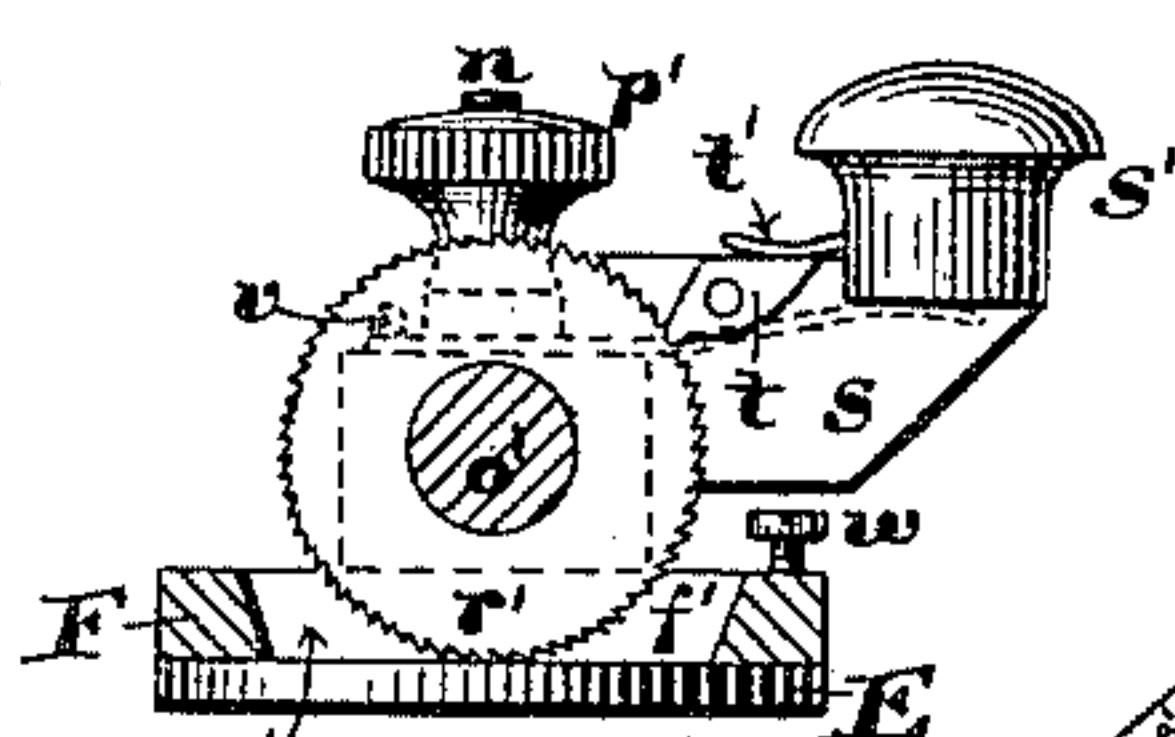


Fig. 6.

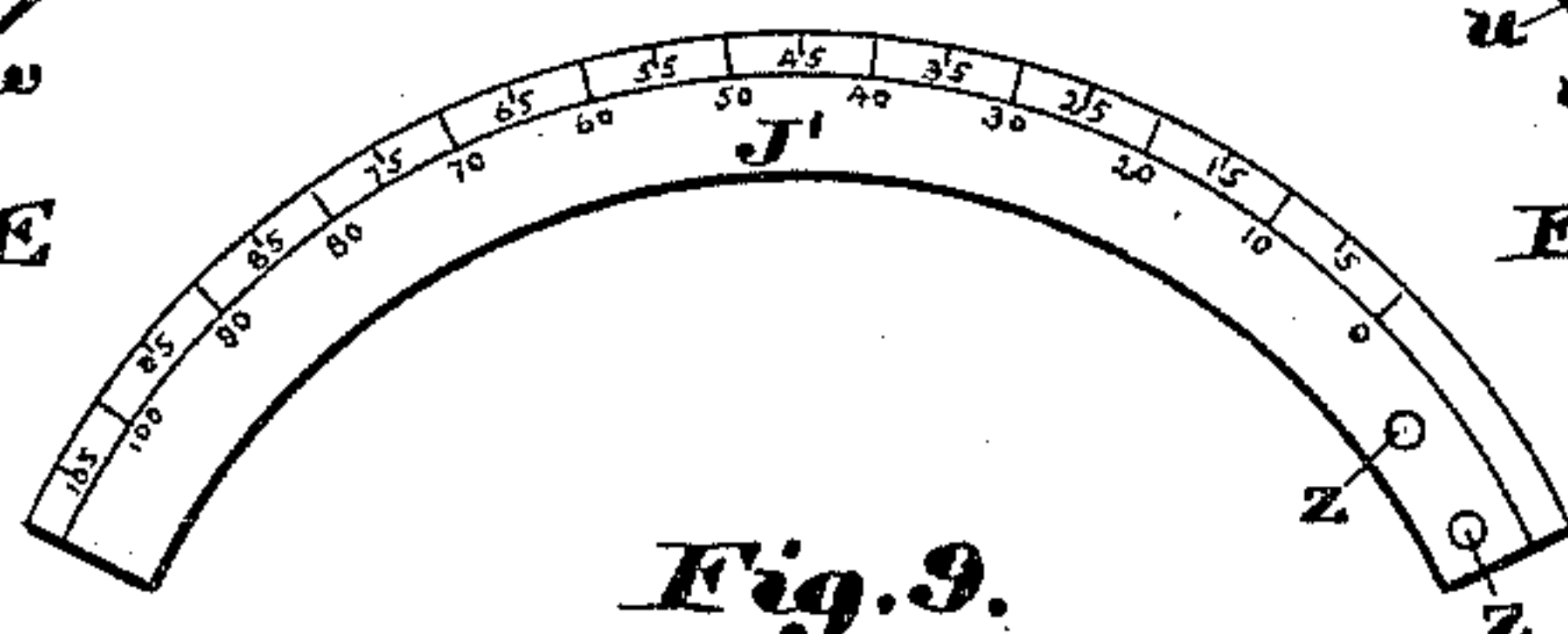


Fig. 9.



Fig. 8.

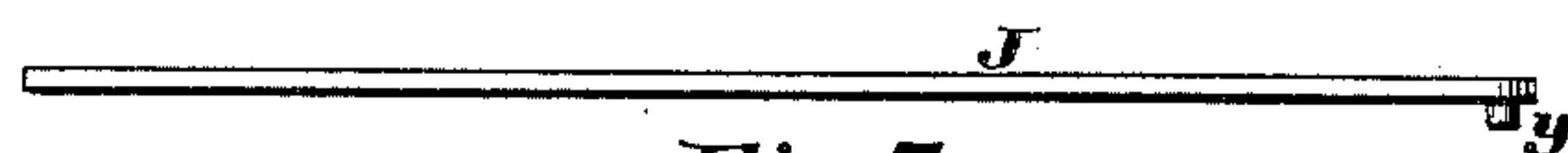


Fig. 7.

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# UNITED STATES PATENT OFFICE.

BURNSIDE E. SAWYER, OF ATHOL, MASSACHUSETTS.

## PARALLEL-RULER.

SPECIFICATION forming part of Letters Patent No. 436,842, dated September 23, 1890.

Application filed June 11, 1890. Serial No. 355,010. (No model.)

*To all whom it may concern:*

Be it known that I, BURNSIDE E. SAWYER, of Athol, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Combined T-Squares and Protractors or Angles, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to a combined T-square and protractor or angle; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the drawings, and to the claims hereinafter given, and in which my invention is clearly pointed out.

Figure 1 of the drawings is a plan of a drawing-board, a T-square, and a protractor or angle. Fig. 2 is a section through the beam and a portion of the tongue of the T-square and a small portion of the drawing-board on line 1 1 on Fig. 1. Fig. 3 is a section through the tongue of the square and the head of the protractor or angle on line 2 2 on Fig. 1. Fig. 4 is a transverse section of the protractor-head on line 3 3 on Fig. 3, and showing the parts at the right of said line in elevation. Fig. 5 is a similar view, the cutting-plane being on line 4 4 on Fig. 3. Fig. 6 is a section on line 5 5 on Fig. 3 and showing the parts at the left of said line in elevation, and Figs. 7 and 8 are, respectively, an edge view and a plan of the gage-bar for setting the tongue of the protractor or angle, and Fig. 9 is a plan of a modified form of the gage-bar.

In the drawings, A is the drawing-board, having formed in its upper surface along the frontside and one end the rectangular grooves *a* and *a'*, respectively.

B is the tongue of the T-square, and C is the head, rigidly secured thereto in a position at right angles to the edge of said tongue.

D is a secondary head or guide-plate provided with a slot *b* to receive the tongue B, and firmly secured on the inner end of the spindle or stem *c*, which in turn is mounted in a bearing in the hub or boss *d*, and has fitted upon its threaded outer end the thumb-nut *e*, as shown. The inner end of the thumb-nut *e* is counterbored to form a chamber to receive one end of the spring *f*, the opposite end of which fits into a corresponding cham-

ber or recess formed in the outer end of the hub or boss *d*, the tension of said spring tending to move the supplemental head D toward the fixed head C.

In using my improved T-square the head C is placed against the left-hand end of the drawing-board A. Then by pressing upon the outer end of the thumb-nut *e* the secondary head or plate D will be moved away from the head C until its lower edge is over the groove *a'*, into which it drops, when, if the pressure is removed from the end of the nut *e*, the spring *f* reacts to force the plate D hard against the inner side of the rib *a*<sup>3</sup> with just sufficient force to insure the contact of the edge of the head C with the edge of the board, while at the same time the square is free to be moved along the board in a direction at right angles to the edge of the tongue B.

E is the tongue of the protractor or angle, pivoted at *g* to a plate F, which has rigidly secured thereto the guide plate or head *h*, so as to project below the under surface of said plate a distance about equal to the thickness of the tongue B of the T-square and has formed therein the slot *f'*.

G is a secondary guide-plate or head provided with a rectangular slot to receive the plate F, below which it projects to the same level as the head *h*. The secondary guide-plate or head G is firmly attached to one end of the spindle or shank *i*, which is fitted to a bearing in the hub H, which is pivoted to the plate F at *k*, and is counterbored at its outer end to form an annular chamber *l* around said spindle for the reception of one end of the spiral spring *m*, the opposite end of which fits into a corresponding recess in the inner end of the milled thumb-nut *m'*, screwed upon the outer end of the spindle *i*, as shown in Fig. 3.

The spring *m* serves to press the guide-plate G toward the guide plate or head *h*, and thus insure contact of both of said guide plates or heads with the edges of the tongue of the T-square when placed thereon, in substantially the same manner as described in reference to the head of the T-square and the drawing-board.

A stud *n* is screwed into the plate F, upon which is mounted so as to be movable vertically thereon the semicircular boss or hub *o*,



in the flat vertical side of which is screwed the headed stud  $o'$ , as shown in Figs. 3, 4, and 5. The boss or hub  $o$  has placed between it and the plate  $F$  a spiral spring  $p$ , the tension of which tends to raise said hub, and the upper end of the stud  $n$  is threaded and has fitted thereon a milled thumb-nut  $p'$ , by means of which and the spring  $p$  said boss  $o$  may be adjusted vertically. A toothed feed-wheel  $r$ , having secured to its side a ratchet-wheel  $r'$  of somewhat less diameter, is mounted upon the stud  $o'$  so as to be revoluble thereon, the lower side of which wheels project into the slot  $f'$ , so that the wheel  $r$  may come in contact with the paper on the drawing-board. The stud  $o'$  also has loosely mounted thereon, contiguous to the ratchet-wheel  $r'$ , the lever  $s$ , provided at its free end with the finger pad or button  $s'$ , and having pivoted to its side the pawl  $t$  in position to engage with the teeth of the ratchet-wheel  $r'$ , into contact with which it is pressed by the spring  $t'$ . The free end of the lever  $s$  is moved upward by the spring  $u$ , (shown in Figs. 1 and 6,) its movement in said upward direction being limited by the stop-pin  $v$  coming in contact with the upper end of the boss or hub  $o$ , (see Fig. 6,) and its movement in a downward direction is limited by the stop-screw  $w$ , which is adjustable to vary the length of feed, as shown in Figs. 4, 5, and 6.

The tongue  $E$  of the protractor or angle is provided with perforations  $x$  and  $x'$  as a means of attaching to said tongue a graduated bar or arm for measuring the angle of said tongue  $E$  relative to the tongue of the T-square.

For instruments which are not to be used for purposes of a protractor for measuring all the degrees of angularity, but provided with the pivoted tongue  $E$  to be adjusted to ten, twenty, thirty, forty-five, and sixty degrees, I prefer to use the straight bar  $J$ , provided with a single pin  $y$ , and having marked thereon the proper graduations for said angles; but for instruments that are to be used for the purposes of a protractor, I prefer to use the segmental bar  $J'$ , having two pins  $z$  to fit the holes  $x'$ , and having its convex edge beveled and graduated, as shown in Fig. 9. The bars or arms  $J$  and  $J'$  are removed after measuring or gaging the angle.

The angle-tongue and its appendages will be found very useful in section-lining and tinting in lines, and the operation is as follows:

When not desired for ruling lines that are evenly spaced, the nut  $p'$  is so adjusted that the spring  $p$  will raise the boss or hub  $o$  and stud  $o'$  set therein to such a height that the teeth of the wheel  $r$  will not touch the paper on the drawing-board. If, however, it is desired to use the instrument for section-lining or laying an even tint in lines, the nut  $p'$  is screwed down upon the boss or hub  $o$  until the teeth of the wheel  $r$  bear upon the paper. The screw stop-pin  $w$  is adjusted to the

proper height to give the desired movement to the bevel-tongue at each depression of the lever  $s$ . The operator moves the angular portion of the instrument along the tongue of the square to bring the upper edge of the tongue or blade  $E$  to the position where he wants the first line, draws said line, depresses the lever  $s$  with the finger of his left hand, draws another line, depresses said lever again, and so continues the operation till the surface to be lined is covered.

When horizontal lines are to be drawn, the tongue  $E$ , with its plate  $F$ , is removed from the square tongue.

A great advantage is obtained in the use of the T-square having the secondary head and its attachments by virtue of the fact that the head  $C$  is always held firmly against the edge of the drawing-board without special attention being paid thereto by the draftsman.

I claim—

1. In combination with a T-square having a tongue or blade and beam or head rigidly attached thereto, a secondary head or gage plate provided with a slot to receive the square-tongue and projecting above and below said tongue, a stem or shank attached at one end to said secondary head and having a male screw-thread at its other end, a hub or boss pivoted to the fixed head of said square and provided with a bearing for said spindle or shank, a nut on the outer end of said shank, and a spring constructed and arranged to move said secondary head toward the fixed head.

2. The combination of a drawing-board having a groove  $a$  or  $a'$  in its upper face, a T-square composed of the tongue  $B$  and head  $C$ , rigidly connected together, the secondary head or guide-plate  $D$ , the spindle  $c$ , the pivoted boss or hub  $d$ , the thumb-nut  $e$ , and the spring  $f$ , all constructed, arranged, and operating substantially as described.

3. In combination with a T-square having a tongue and head rigidly attached together, the plate  $F$ , the head  $h$ , firmly secured to said plate  $F$  at right angles thereto, the tongue  $E$ , pivoted to said plate  $F$ , the boss or hub  $H$ , pivotally connected to said plate  $F$ , the guide-plate or secondary head  $G$ , provided with the spindle  $i$ , mounted in a bearing in the boss or hub  $H$ , the nut  $m'$ , and the spring  $m$ .

4. The combination, with a T-square, of the plate  $F$ , the fixed head  $h$ , the secondary head or guide-plate  $G$ , provided with the spindle or shank  $i$ , the pivoted hub  $H$ , the nut  $m'$ , the spring  $m$ , the tongue or blade  $E$ , pivoted to the plate  $F$  by a clamping-screw and having formed therein a perforation at a point removed from its pivotal connection, and a graduated gage bar or arm provided with a pin to engage the hole in said blade and adapted to locate and determine the angle of said blade relative to the square-tongue.

5. In combination with the tongue of a T-square, the plate  $F$ , provided with the opening  $f'$ , and the head  $h$ , rigidly secured thereto,



the boss or hub H, pivoted to said plate, the secondary head or guide-plate G, provided with the spindle or stem *i*, mounted in a bearing in said boss H, the nut *m'*, spring *m*, the  
5 spindle or stud *n*, set in said plate F, the boss or hub *o*, mounted thereon, the spring *p*, between said boss and the plate F, the nut upon the upper end of the stud *n*, the stud *o'*, set in the boss *o* in a horizontal position, the  
10 toothed wheels *r* and *r'*, mounted on said stud *o'*, the lever *s*, also mounted on the stud *o'*, the pawl *t*, mounted on said lever in position

to engage the teeth of the wheel *r'*, the spring *t'*, to act upon said pawl, and the spring *u* for raising the free end of the lever *s*, substantially as described. 15

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 7th day of June, A. D. 1890.

BURNSIDE E. SAWYER.

Witnesses:

HENRY H. KENDALL,  
N. C. LOMBARD.