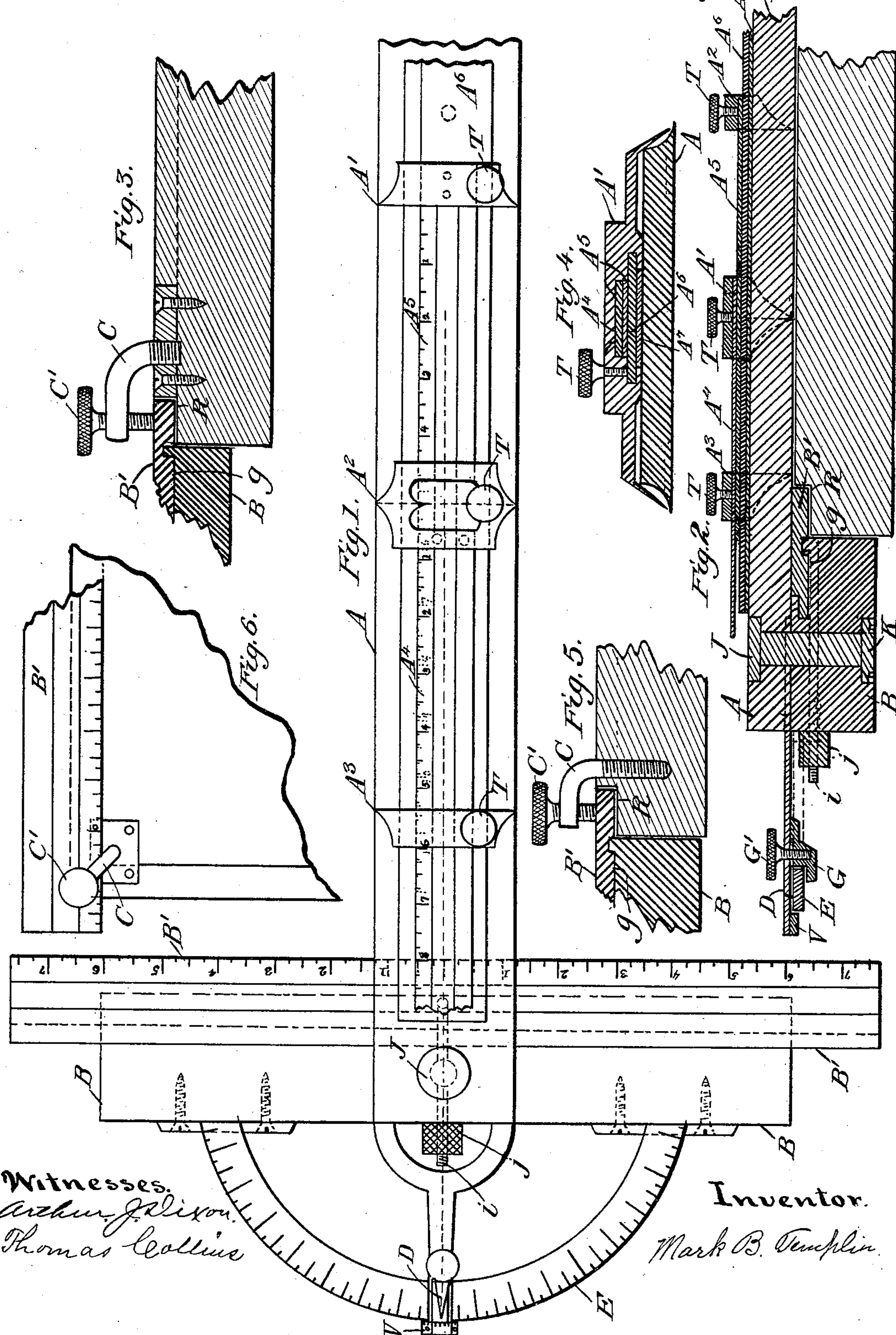


(No Model.)

M. B. TEMPLIN.
T-SQUARE.

No. 587,021.

Patented July 27, 1897.



Witnesses.
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T-SQUARE.

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To all whom it may concern:

Be it known that I, MARK B. TEMPLIN, a citizen of the United States, and a resident of Calla, county of Mahoning, State of Ohio, have
5 invented a new and useful Improvement in T-Squares; 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 pertains
10 to make and use the same, reference being had to the accompanying drawings, and the letters of reference marked thereon, which form a part of this specification.

My invention relates to an improved T-square; and the object of my invention is to
15 provide a tool that will be more rapidly and accurately operated than that ordinarily employed by draftsmen, in that it greatly facilitates the locating of points and accurate taking
20 of distances in any position on the drawing-board and largely dispensing with the ordinary methods of measurement by rules, dividers, &c.; and a further object of my invention is to provide a graduated rule or scale
25 on or within both the head and blade of the square, so that any required measurement can be laid off, beginning and ending at any point on the square or paper.

My invention is a novel construction and
30 combination of the several parts which will be hereinafter fully set forth, and definitely pointed out in the claims.

Similar characters of reference indicate corresponding parts in all the figures.

35 Figure 1 represents a plan or top view of the T-square in its entirety. Fig. 2 is a sectional view of the blade and head of the square along central dotted line *a*, Fig. 1. Fig. 3 is an enlarged sectional view of the head along
40 dotted line *b*, Fig. 1. Fig. 4 is a sectional view of blade along dotted line *x*, Fig. 1, showing terminal and central index or pointers to indicator. Fig. 5 is a sectional view of a portion of the drawing-board and head of square,
45 showing manner of attaching clamp into and near edge of board and holding head of square in position by the clamping of graduated strip *B'*. Fig. 6 shows plan or top view of a portion of drawing-board with clamp, showing
50 angle at which I place the projecting portion of clamp at corner of board, so as to secure graduated strip when the square is used at either the end or side of board to allow free passage of graduated strip or head of square

past body of clamp when working near end 55 or side of the board.

Referring to the drawings, B represents the head of square. Within the upper side and at the working edge of head B is made a longitudinal groove *g*, Figs. 2 and 3. Within
60 this groove and overlapping the working edge of head B and a portion of drawing-board is placed a thin strip of metal or its equivalent (shown at *B'*, Figs. 2 and 3) of such shape in
65 section as the material used in the manufacture of head and strip and manner of clamping; as shown in Fig. 2, may require and of a length preferably equal to the width of the drawing-board.

I make upper side or top of head B and
70 strip *B'* on same line or plane as the under side of blade A and top of drawing-board, which allows draftsman, as he moves a triangle or rule along working edge of blade A, to freely slide it over the head of square, an
75 advantage especially valuable in sectional work.

I make a recess R, Figs. 3 and 5, around the upper edge of the drawing-board equal in
80 depth and width to that portion of strip *B'* which overlaps the drawing-board. This I do to bring the top of head B and strip *B'* down to same level or flush with the top of board, as shown in Figs. 3 and 5 and for the
85 purpose as set forth above.

As an aid to the draftsman in taking measurements accurately and quickly I graduate strip *B'* along its entire length in inches and
90 fractions thereof, said graduations being preferably numbered consecutively from the center each way toward the ends, this system being preferable to graduating from one end to the other, as the required number of inches may be easily and quickly taken by adding
95 the number taken on both sides of the center. Graduated strip *B'* is so fitted into groove *g* as to allow same to easily slide or move within head B.

To relieve draftsman from the tiresome holding of the square in position against the
100 end or side of drawing-board and to allow the free use of both hands in making accurate and proper measurements along the blade of square, I secure graduated strip *B'* to the end or side of the drawing-board, when desired,
105 by clamps C C, Figs. 3, 5, and 6, said clamps being removably attached to drawing-board in such position as to allow free movement of

head B and graduated strip B' past the body of the clamps, Figs. 3, 5, and 6, if desired, thus permitting blade of square to be freely moved from side to side of board, even to contact

5 with body of clamps.

Clamps C C are removably attached to drawing-board by screwing into same, as shown in Fig. 5, or into sunken nuts or plates, as shown in Figs. 3 and 6, the clamps at the
10 corner of board to be placed at such distance from end and side of board, Fig. 6, as to permit the overreaching arm bearing the thumb-screw C' to properly clamp the graduated strip B' rigidly to the board and not interfere
15 with the movement of head B.

Graduated strip B' is so fitted into head B as to prevent its removal, except by drawing endwise out of groove *g*. When graduations on strip B' are not required for taking rapid
20 and accurate measurements, the square may, if desired, be used in the ordinary way by releasing hold of thumb-screws C' in arm of clamp C, Figs. 3, 5, and 6; or, if desired, graduated strip B' may be entirely removed
25 by withdrawing it from groove *g* in head of square. When graduated strip B' is secured to drawing-board, as described above, if draftsman so desires the head of square may be rigidly secured in any position on drawing-
30 board by means of clamping bolt or hook *i* and knurled thumb-nut *j*, Figs. 1 and 2, said bolt holding head B securely to graduated strip B', a feature especially valuable when using triangles against blade, as in sectional
35 work.

As an aid to the draftsman in making lines at any angle or to determine the angle of lines whose angle is not already known I make a pivotal joint between head B and blade A by
40 means of pivotal bolt J. (Shown in longitudinal section in Fig. 2.) The head of pivotal bolt J is preferably sunken into and made flush with top of blade A, so as to be out of the way of other working parts. (See Fig. 2.)
45 Nut K on lower end of pivotal bolt J is made flush with under side of head B, as shown in Fig. 2. Pivotal joint is made to the required degree of tightness by applying a screw-driver of common or special form to nut K.

To prevent turning of pivotal bolt into or out of nut K and the consequent tightening or loosening of pivotal joint by moving of the blade, I make a hole through the body of pivotal bolt J, through which I pass clamping
50 bolt or hook *i*, as shown in Figs. 1 and 2, thus preventing annoying results when blade of square is moved.

The end of blade A is made to extend some distance beyond the back edge of head B, terminating in a pointer D, as shown in Fig. 1.
60 An opening is made in this extension next to the head of square to allow access to knurled thumb-nut *j* on clamping-hook *i*, as shown in Fig. 1. Under this terminal point D of this
65 extension and attached to or made a part of back edge of head B is made a segment or protractor E, as shown in Figs. 1 and 2. Pro-

tractor is accurately graduated in degrees and fractions thereof, from which draftsman may readily read angles or set blade of square to
70 any angle required accurately and quickly.

When operator wishes to make a line or a series of lines at any required angle, the blade A is rigidly secured by means of grip G and thumb-screw G', Fig. 2. Grip G is also made
75 use of to hold blade A at perfect right angle to head B when used as a T-square, the pivotal bolt J being only used to make pivotal joint and not to hold rigidly.

By reference to Fig. 2 it is obvious that, since top of head B and graduated strip B' are made on same line or plane with under
80 side of blade A, perfect freedom of movement to pivotal joint is secured and that square can be moved along graduated strip B' when
85 set at any angle and clamped or secured in any position desired, as when used as a T-square.

Fig. 4 is a sectional view of blade A through dotted line *x*, Fig. 1, showing manner of attaching indicators and graduated scales to the
90 blade of the ordinary wooden T-square. Obviously when entire blade is made of metal or its equivalent the shape of blade A may be changed if necessary and the parts A⁶ and A⁷
95 be made a part of blade A and so changed in form as to best suit the manufacturer as to cost, &c., without departing from the scope of my invention.

Strips A⁶ and A⁷, Fig. 4, upon which indicators A¹, A², and A³ are closely grooved and fitted, so as to slide, may be made of metal in separate strips or in one solid piece, the whole secured firmly to upper surface of blade
100 A when attached to wooden square or made
105 a part thereof when blade is made of metal. A⁶ and A⁷ are preferably made of a length equal to length of blade. Indicators A¹, A², and A³ are so grooved within under side as to closely fit and readily slide upon A⁶, Fig.
110 4, along its entire length.

Within underside of indicator A² and above groove fitted by strip A⁶ is made a groove or recess of lesser dimensions (see Fig. 4) and equal in width and depth to a light strip of
115 metal or its equivalent, (shown in Fig. 2,) as A⁵ and A⁴. Strip A⁵ is secured to indicator A² rigidly by rivets or screws. A similar groove or recess is made within under side of indicator A¹, but within the edge next to head
120 of square or farther from A² groove is made of depth equal to thickness of both strips A⁵ and A⁴. To this edge strip A⁴ is rigidly secured. (See Fig. 1.) The additional depth to groove or recess, as mentioned above, is
125 made to allow strip A⁵ to pass beneath strip A⁴, as shown in Fig. 2. A similar groove is made within indicator A³ to allow both strips A⁵ and A⁴ to pass beneath, as above mentioned.

Strips A⁴ and A⁵ are preferably made of
130 light and thin metal. Their combined length should be equal to or greater than length of blade of square. These strips are graduated along their entire length in inches and frac-

tions thereof, and, when desired, may be divided longitudinally into two or more divisions, one of which may be graduated in inches, the others to any scale or scales the nature of work may require.

Graduations on strip A^4 are numbered and read from the center of A' . (See Fig. 1.) Graduations on strip A^5 are numbered and read consecutively from inner edge of A^2 . (See Fig. 1.)

To prevent accidental moving of indicators and errors resulting therefrom, indicators A' , A^2 , and A^3 are held rigidly in required position on blade of square by means of thumb-screws T T T, Fig. 2, which secure them to strip A^6 .

The terminals of indicators A' , A^2 , and A^3 are brought outwardly and downwardly to either or both edges of blade of square, as shown in Figs. 1 and 4, and sufficiently near to accurately indicate starting and stopping points, but in no way interfere with movement of pen or pencil.

The working edges of blade A are preferably made of a transparent material to enable operator to more readily locate position of connecting-lines when beneath blade of square.

When greater convenience and speed in taking measurements are desired and small additional cost is not objectionable, auxiliary indicators, like A^2 , with strip A^5 , but graduated in different scales, may be furnished, though to obtain measurements to any scale other than those given on graduated strips A^4 and A^5 it is only necessary to set indicators by use of dividers in the ordinary way, the indicators obviating the necessity of laying off measurements in light pencil-marks or in otherwise marking paper, which so often proves detrimental to neatness and cleanliness of work.

Fig. 2 is a sectional view of square in its entirety, showing head B with pivotal bolt J made flush with top and bottom of square, manner of inserting graduated strip B' into working edge of head B, manner of extending blade A and securing to protractor, manner of arranging indicators with graduated strips beneath and parallel with blade, and manner of securing indicators by thumb-screws.

Indicator A' is made sufficiently wide to allow an opening in its center, as shown in Fig. 1. Graduations on strip A^5 are read from the points centrally located within this opening, said points being in perfect alinement with terminal points of indicator. Indicators A^2 and A^3 may be made of less width, terminals of same being in alinement with inner edge. (See Fig. 1.)

When in connection with the use of the protractor-head greater accuracy in angles is required, vernier-gage V, Figs. 1 and 2, may be employed, the same to be attached to the side of extension of blade or to the end of same outside of segment.

In the operation of the square if, for example, it is desired to measure off a space in the center of paper ten by fifteen inches with a marginal line within, as required for Patent Office drawings, secure square to drawing-board by clamping graduated strip B' with clamps C C, as described. Move indicator A' to the center of paper. Move indicator A^2 to the right until pointer in the center of A' is at " $7\frac{1}{2}$ " on graduated strip A^5 . Move indicator A^3 to the left to " $7\frac{1}{2}$ " on graduated strip A^4 , securing each in turn by thumb-screws T T T. Now move the entire square along graduated strip B' until working edge of blade is at " 5 " on graduated strip B' . In this position the terminal points of indicators A^2 and A^3 give accurately the starting and stopping points for the first line. Next move the entire square toward other edge of drawing-board until other edge or same edge of blade is at " 5 " on other end of graduated strip B' . Indicators again give starting and stopping points and at exactly right angles to ends of lines already drawn. Make marginal lines one inch within the others by moving indicators A^2 and A^3 one inch nearer A' and secure as before. Move entire square to " 4 " on graduated strip B' and draw line by indicators, as before. Then move entire square to " 4 " on other end of strip B' and make line. These lines may all be drawn without waiting for the ink to dry. The ends of these lines may now be neatly connected by using triangle, in the ordinary way, or T-square attached to side of drawing-board, as previously described.

When taking measurements in the manner described, indicator A' gives central measurement between A^2 and A^3 , an advantage that will greatly aid the draftsman.

It is obvious from the foregoing description of working parts and manner of operation, together with reference to drawings, that the indicators and graduated strips may be used in this way to indicate starting and stopping points, together with central point, at any and all points on the drawing-board, thus in a great measure obviating the necessity of laying off in light pencil-lines, by which method much time is lost, or in any way marking the paper, which so often is fatal to neatness of work, and the use of rules, dividers, &c., as ordinarily employed.

Another valuable feature is that the graduations are always numbered and read consecutively, obviating the necessity of counting off the required number of inches and the consequent mental calculation which so often leads to errors when graduations are fixed immovably upon either head or blade of square.

It is obvious that many changes might be made in the construction of working parts herein described without departing from the scope of my invention, and I do not therefore confine myself to the exact form of construction described; but,

Having fully described my invention, its

construction and operation, what I do claim, and desire to secure by Letters Patent, is—

1. A T-square, the head of which is provided with and made to slide upon a graduated rule; said rule fitted and removably clamped into special recesses in the upper corners of a drawing-board, by removable clamping-screws; the blade provided with indicators having graduated rules attached thereto; the whole made to slide upon the top of blade, substantially as described.

2. A T-square, the head of which is provided with and made to slide upon a graduated rule, fitted within, flush with the top, and overlapping working edge of head; said rule of a length preferably equal to width of drawing-board and made attachable thereto, in recesses therein, by means of clamping-screws, and graduated along its entire length in inches and fractions thereof and laid off in longitudinal divisions, each of which is graduated in any units of measure desired; said graduations numbered and read from the center toward each end of rule, substantially as and for the purpose described.

3. A T-square, having in combination, a graduated rule fitted to slide within and overlap working edge of head, a drawing-board having a recess in its upper corners into which and flush with top of board said overlapping edge of rule is fitted and clamped when desired; said clamps removably attached to the drawing-board by screwing into plates set flush with top of same; the graduated rule when thus clamped also used as a straight and true edge for the working edge of the head of square, substantially as described.

4. A T-square, having in combination a graduated rule fitted to slide within and project over working edge of head; said rule graduated and numbered as described and clamped into recess in the drawing-board; a clamping bolt or hook placed through the center of the head; the hook on end of said bolt engaging a small recess in the under side of said rule as a means for rigidly securing head of square in desired position, substantially as and for the purpose described.

5. A T-square, having in combination a graduated rule fitted to slide within head, graduations numbered and read as described; a drawing-board having recess in upper corners into which said rule is clamped in the manner and for the purpose described; a clamping-hook for securing head of square to said rule; a pivotal joint between head and blade connected by a pivotal bolt whose head and nut are made flush with top and bottom of blade and head respectively; said pivotal bolt held from turning into and out of nut by passing clamping-hook through the body of pivotal bolt, substantially as and for the purpose described.

6. A T-square, having in combination a graduated rule fitted to slide within and overlap working edge of head, and graduated as described; a drawing-board with recesses

into which said rule is clamped; a pivotal joint secured by pivotal bolt; a clamping-hook for securing head to said rule; a portion of blade extending beyond back edge of head and terminating in a pointer beneath which, and attached to or made as a part of head, a protractor, graduated as required; said extension to blade movably and rigidly secured to protractor by a grip with set-screw; said grip also used to hold head and blade at perfect right angles; a vernier-gage attached to terminal of blade extension, substantially as described.

7. A T-square, having in combination a graduated rule fitted within head, graduations numbered from center toward the ends of rule; a drawing-board, into the recesses of which said rule is clamped as described; a pivotal joint with bolt for same, a clamping-hook to secure head to said rule; an extension to blade, protractor, and means for holding blade at required position; and attached to or made as a part of the entire length of top of blade, a strip of metal or equivalent upon which are fitted to slide two or more movable indicators whose ends are brought outward and downward to the working edges of head, substantially as described.

8. A T-square having a graduated rule fitted to slide within the head thereof and graduated as described; a drawing-board having a recess in upper corners and means for clamping said rule thereinto; a pivotal joint with bolt for same; a clamping-hook for securing head to said rule; an extension to blade, protractor and means for holding blade in required position; indicators fitted to slide upon top of blade, and strips of metal attached to the edge of said indicators and extending toward head of square; said strips or rules graduated along the entire length of their edges and longitudinal divisions in any desired fractions of an inch or other units of measurement, substantially as described.

9. A T-square having in combination a graduated rule within head, as described; a drawing-board with recesses and means for clamping said rule thereinto; a pivotal joint and bolt therefor; a clamping-bolt for securing head to said rule; an extension to blade, protractor and means for holding blade in desired position; indicators fitted to slide on the top of blade; graduated rules attached thereto and passing beneath adjacent indicators in small grooves made in under side of same; said indicators held in desired position by small thumb-screws, as a safeguard against accidental movement thereof, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in the presence of two witnesses, this 11th day of July, 1896.

MARK B. TEMPLIN.

Witnesses:

ARTHUR J. DIXON,
THOMAS COLLINS.