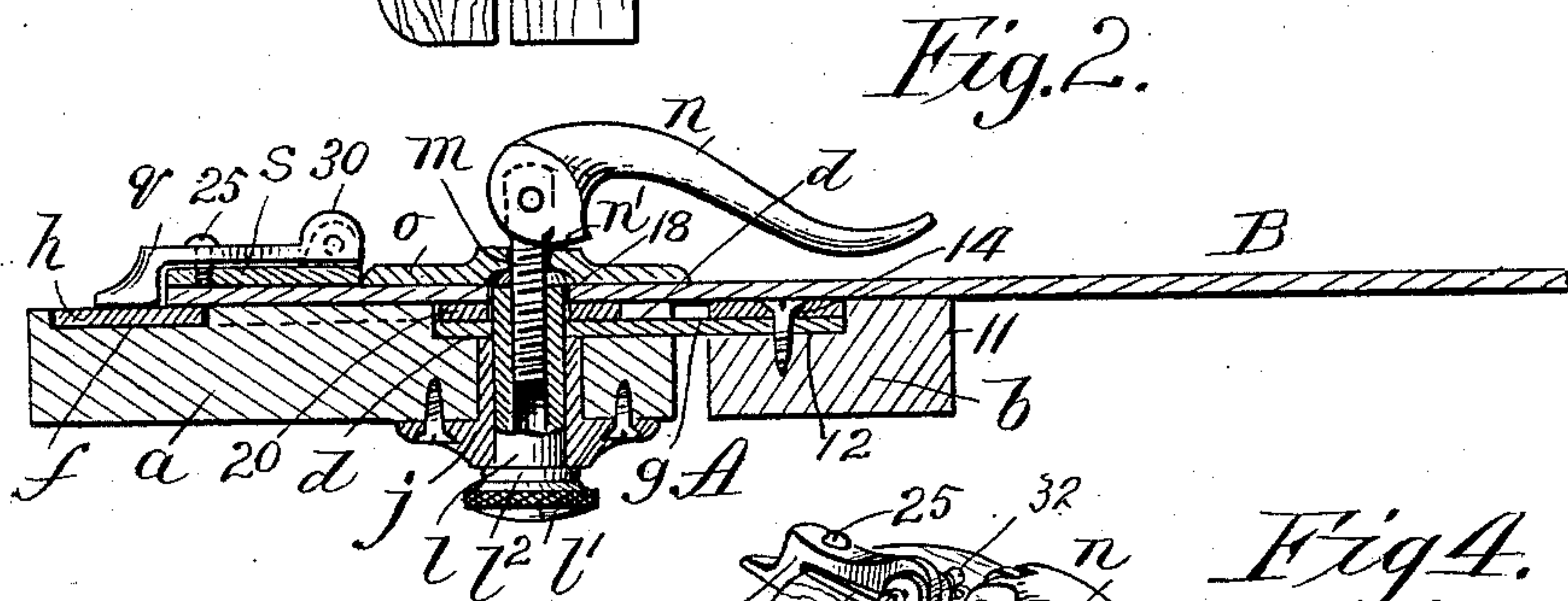
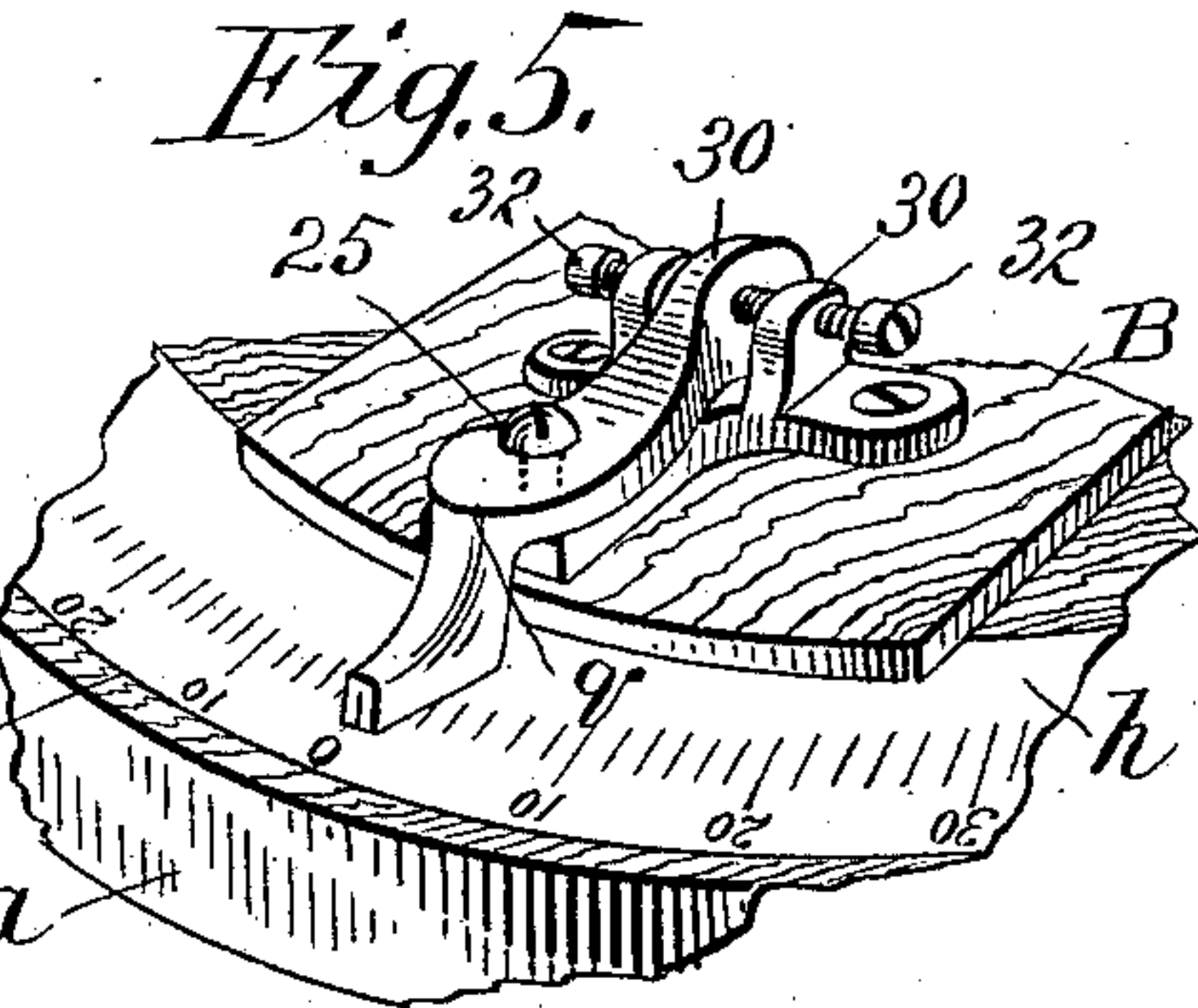
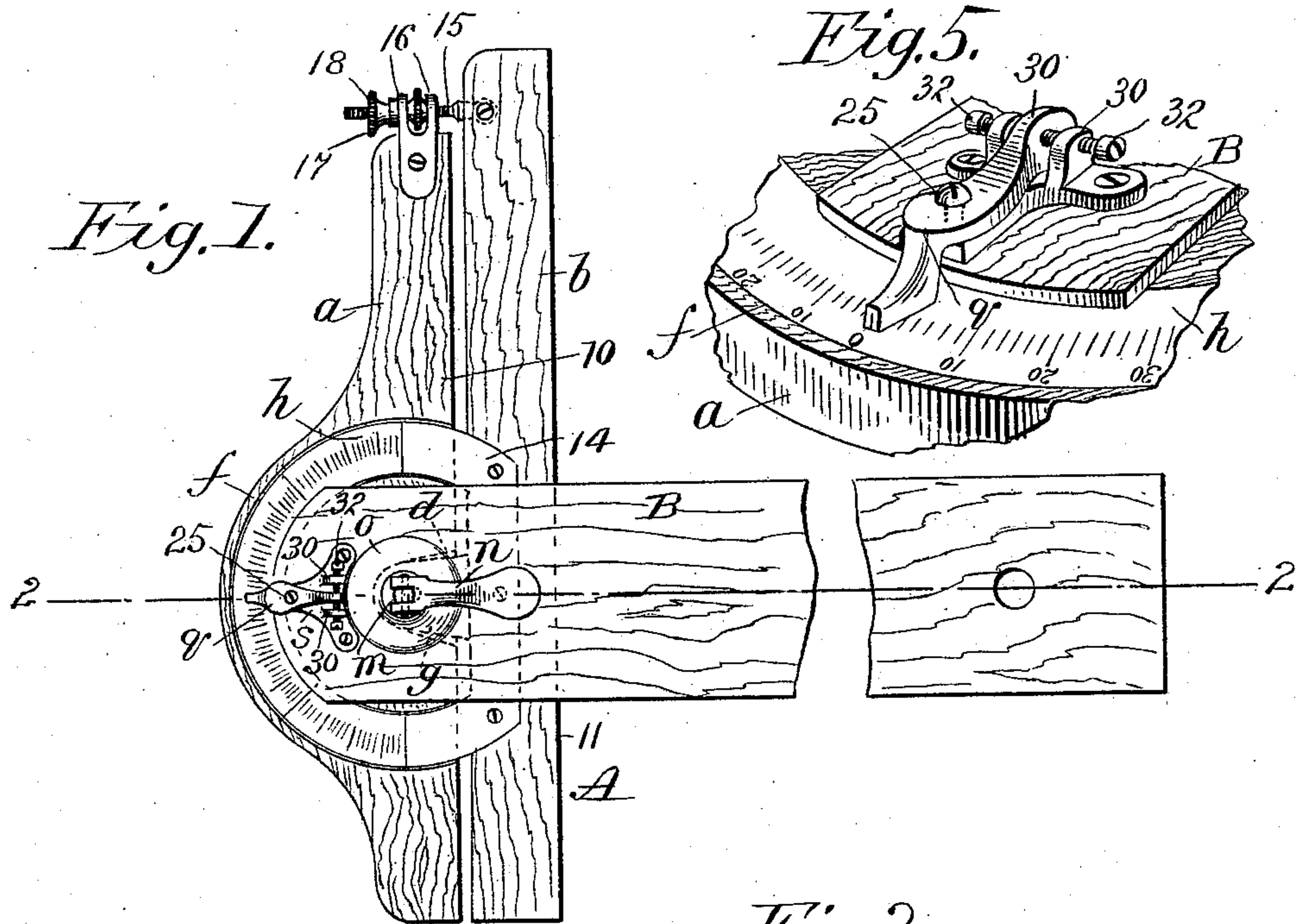


(No Model.)

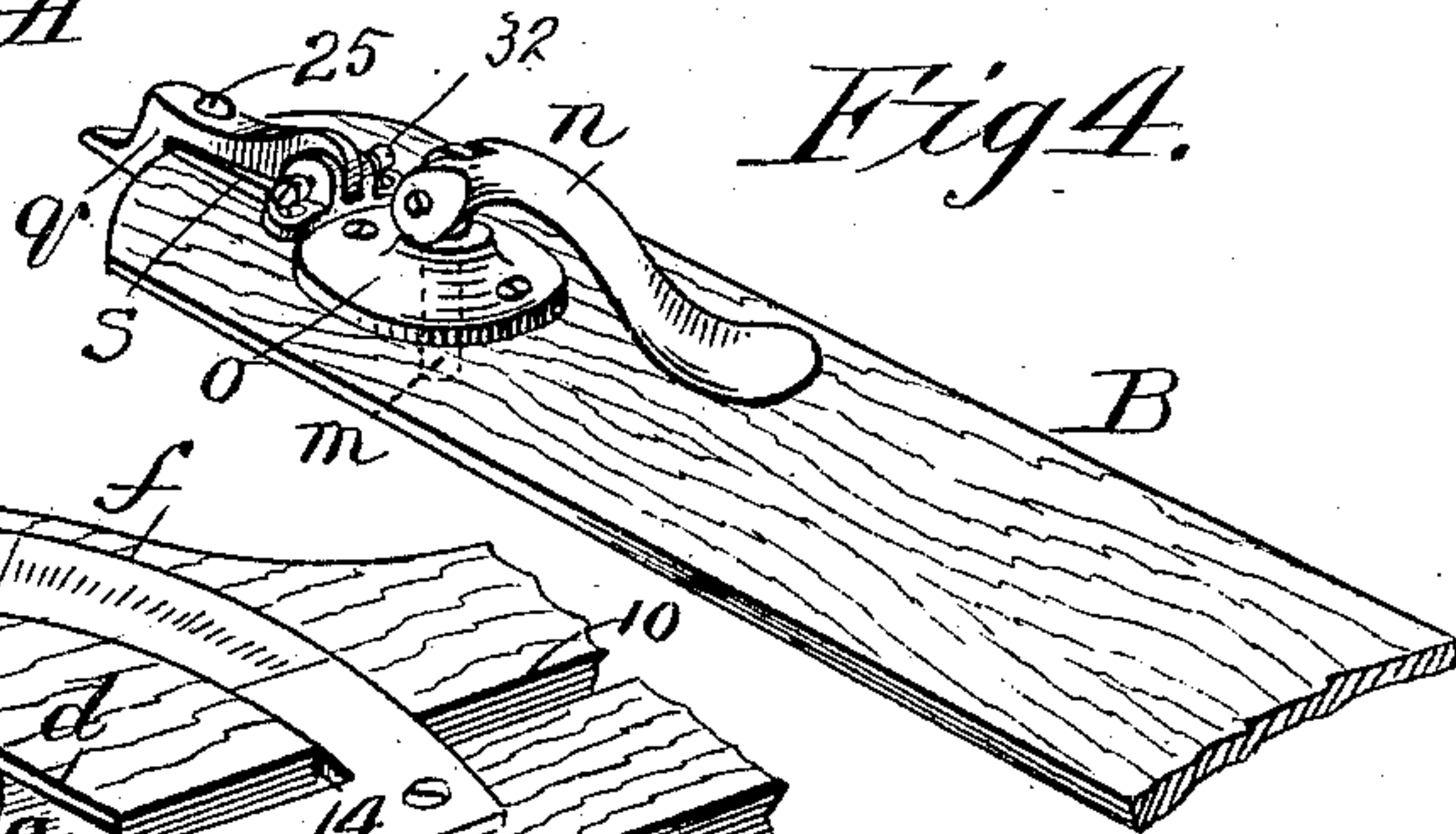
E. L. DEANE.  
SQUARE WITH ADJUSTABLE HEAD.

No. 472,525.

Patented Apr. 12, 1892.



*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

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## SQUARE WITH ADJUSTABLE HEADS.

SPECIFICATION forming part of Letters Patent No. 472,525, dated April 12, 1892.

Application filed May 18, 1891. Serial No. 393,135. (No model.)

*To all whom it may concern:*

Be it known that I, EZRA L. DEANE, a citizen of the United States, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Squares with Adjustable Heads, of which the following is a specification.

This invention relates to improvements in squares having adjustable heads, certain features of the invention being particularly applicable for T-squares, although, as will hereinafter appear, they are available for other forms of squares.

One object of the invention is to provide in a T-square adjustable means or devices on or relative to the head and blade, whereby the blade may be with great minuteness moved relative to the head, so as to line up or correspond with work or drawings which may be on different boards and when moved or adjusted to be held with certainty.

Another object of the invention is to provide a locking device for holding the blade in position relative to the head when set, which is most simple, convenient, and efficient.

The invention consists in the construction and combination or arrangements of parts, all substantially as will hereinafter more fully appear, and be set forth in the claims.

In the drawings constructions embodying the present improvement are illustrated, and Figure 1 is a plan or face view of the T-square, Fig. 2 being a section across the head and along the blade, taken on line 2 2, Fig. 1. Figs. 3 and 4 are respectively perspective views of the head and of the portion of the blade which is connected to the head with novel appliances thereon. Fig. 5 is a perspective view, on a larger scale, of adjustable index devices to be hereinafter more particularly mentioned.

In the drawings the head A comprises two members formed by the outer bar *a* and the inner bar *b*. The outer bar is widened at an intermediate portion thereof, and within its upper side toward the inner straight-edge 10 thereof the said bar is provided with a recess or depression *d*, said recess diverging or widening toward said edge 10, as more accurately indicated by the dotted lines in Fig. 1. An arc-formed channel or recess *f* is provided

in the said bar *a* on its upper face practically concentrically with the said recess *d*. The inner bar *d* is rabbeted or recessed at its upper side, as at 12, and has set and secured therein the lug *g*, which extends outwardly at right angles from the said bar *b* to lie within the depression *d* of the other bar, being pivotally confined in such relation, so that the bar *b* may be tilted or swung slightly with relation to the bar *a* and so that it may be maintained exactly parallel therewith or slightly out of parallelism. The opposite edges of the depression *d* have a greater convergence or separation than the width of the lug *g*, so that the stated movements of the lug and the bar *b*, which is as one therewith, may not be impeded with relation to the outer bar.

*h* represents a protractor, the same being comprised in the segment of a ring, which is secured, as at 14, upon the inner bar *b*, and the parti-circular protractor is concentric with the pivotal connection between said lug *g* and the outer bar and lies within the depression *f* of the outer bar. An engagement or confinement is had between end portions of the said bars *a* and *b* of the compound head, which engagement is susceptible of adjustment, so that the inner bar *b* may be held in parallelism with the other one *a* or forced slightly out of parallelism therewith and any appropriate form of adjustable and operating screw or device may be utilized at this connection, such device specifically forming no part of this invention; but the one shown is an efficient one, the same consisting of the screw 15, hung upon the end portion of the inner bar *b* and extended laterally through the separated lugs 16 16 on the bar *a*, the nut 17, engaging the screw 15, being held against endwise movement relative to the latter by the said separated lugs. 18 is a check-nut. The blade or tongue B of the T-square, which is connected to and supported upon the outer bar *a* of the head, has no engagement with the inner bar *b*, and where the protractor is employed in connection with a swiveling blade a suitable pivotal engagement of the blade with the part *a* of the head carrying it must be employed, and one which is capable of being locked or set to hold the blade fixed, and in the illustrations accompanying improvements pertaining to devices of this na-



ture are shown, and *l*, Fig. 2, represents a tubular stud internally screw-threaded, which passes through the bar *a* from the under side thereof and through the lug *g*, projected from the inner bar, and also with an opening 18 in the blade. The bar *a* is preferably provided with a bushing of metal, as indicated at *j*, Fig. 2, at the opening through which the stud *l* passes. *m* represents a threaded spindle or screw, which passes through the opening 18 in the blade and with an engagement into the internally-threaded stud *l*, and said screw-spindle has a bifurcated and cam-ended lever *n*, and overlying the face of the blade for a suitable or practical area is a clamp-plate *o*, upon the top of which the cam-formed end of the lever *n* impinges when the lever is downwardly swung. A washer 20 is preferably provided to surround the stud *l* and to lie between the blade *B* and the lug *d*. The lower end of the tubular stud *l* is provided with a knurled enlargement *l'*, whereby it may be turned, the shoulder *l''* inside of the head resting on the outer face of the bushing *j*. The screw-spindle *m*, with the cam-lever *n*, having been turned down, so that the face of the cam *n* is in nearly the desired working proximity with the face of the clamp-plate *o*, the degree of compression or bind of the cam may be nicely regulated by the turning of the stud *l* without rotating the screw-spindle. Of course this may also be insured by turning the cam-lever *n* and spindle *m*, the stud then being regarded as a non-rotatable part; but in this case the radial direction of the cam-lever *n* would be variable, and it is preferred to have it range in the direction of the length of the blade. The provision and arrangement of the stud *l* further afford convenient means of constituting the connection between the parts, substantially as set forth.

The purpose and advantage of the improved square will probably be more apparent on an explanation of an example of the use and operation thereof, and it will be assumed, for instance, that the T-square has been used in drawing upon a drawing-board which is absolutely true, the inner edge 10 of bar *a* being exactly parallel with the inner edge 11 of the bar *b*, which latter constitutes the working edge of the head, and that for right-angled work the edge of the blade is at right angles to said inner edge 11, and the pointer or index, which is indicated at *q*, (and which is longitudinally aligned with blade,) registers with 0 or the proper indication on the protractor to denote the right-angled relations of the parts, and then assuming that the T-square is to be used on work laid out or to be laid out on paper secured on another drawing-board, which is more or less—say a degree and a half—out of true, (it being a fact, especially well known to draftsmen, that it is not practically a possibility to maintain several drawing-boards in uniformity for any considerable length of time.) Therefore, for the change to work secured on the second draw-

ing-board the working edge 11 of inner bar *b* is placed against the edge of the drawing-board, when the nut 17 is turned sufficiently to force the bar *b* out of parallelism with the bar *a* (on which bar *a* the blade is then assumed to be immovably held) to compensate for the one and one-half degrees discrepancy between the lines of the two mounted drawings. Of course this operation involves the corresponding movement of the protractor as one with the bar *b*, the protractor having a movement relative to and independent of the bar *a* and of the blade, and the protractor graduation indicating the right angle of course will then be out of coincidence with the index *q* to the extent of a degree and a half. In order to compensate for the discrepancy thus created, the index *q* is capable of adjustment for a lateral deflection from the longitudinal line of the blade, and is therefore mounted on the blade as follows: *s* represents a foot-plate on the blade, on which the index-finger *q* is pivoted at 25 for a lateral swinging movement. The inner end of the intermediately-pivoted finger *q* projects between ear-pieces 30 30 of the foot-plate and is borne upon by the screws 32 32, having an engagement through such ear-pieces. On loosening one screw and turning in the other a minute or micrometer adjustment of the protractor-index may be insured. Of course the parts of the T-square having been once set or adjusted for the particular work at hand, the blade-swivel and protractor-indicator are utilized as ordinarily.

What I claim as my invention is—

1. In a T-square, in combination, a head consisting of an outer bar and an inner bar and a lug rigidly fixed upon the inner bar and extended laterally therefrom upon the outer bar, and the blade overlying both bars, and a stud passed through the blade, the said lug, and the outer bar for constituting a pivotal connection, whereby all the said parts may move relatively to each other about the axis of the stud, and a means for confining said parts in their adjusted relations, substantially as described.

2. In a T-square, a compound head consisting of two bars, the one pivotally connected on the other, whereby it may range parallel therewith or be swung more or less angular thereto, a device for swinging the one bar with relation to the other and confining same, the blade mounted on the one of said bars and adapted to be fixed thereon, and a protractor secured on the other bar and movable as one therewith independently of the bar on which the blade is secured, and an index which is adjustable on the blade laterally with relation to the length of the blade and adapted to register with the protractor, for the purposes set forth.

3. In a square wherein one member is pivotally and angularly mounted on the other, a spindle or post supported on and engaged with the one member and projected through



the other, and a cam pivoted on the spindle and adapted to be swung thereon to effect a compression between the said members, in the manner set forth.

5 4. In a T-square, a head therefor consisting of an outer bar and an inner bar and a lug extended from the inner bar across a portion of the outer bar, and a stud or pivot member engaging with said outer bar and said  
10 lug, a protractor secured upon the inner bar and overlying the outer bar concentric with said stud or pivot, a device for effecting the swinging of the one bar relative to the other, and the blade connected on the outer bar of  
15 the head, substantially as and for the purposes set forth.

5. In a T-square, a head consisting of two members or bars, an inner and an outer one, arranged substantially as described, a lug secured upon the inner and projected across a  
20 portion of the outer bar, the blade, and a pivot or stud passing through the outer bar, the said lug, and the blade, and adjusting and confining devices applied with relation  
25 to the said bars of the head for moving the one bar upon the other, for the purposes set forth.

6. In a T-square, the combination, with the outer bar provided with the depression *d*, the  
30 inner bar provided with the lug secured thereon and extended across the portion of the outer bar to lie within said depression below the face of the bar and adapted to have a play between the edges of said depression,  
35 the blade, and the pivot and confining-stud passing through same, said lug, and said outer bar, substantially as set forth.

7. In a T-square, the head consisting of an outer bar provided with the depression *d* and  
40 the arc-formed depression *f*, the inner bar provided with the lug secured thereon and extended across a portion of the outer bar to lie within said depression below the face of the bar and adapted to have a play between  
45 the edges of said depression, the protractor comprising the segment of a ring secured

upon the inner bar and extended therefrom to lie within the arc-formed depression of the outer bar, the blade and pivot member passing through said lug and the outer member  
50 of the head, and a device on the blade adapted to register with the graduations of the protractor, for the purposes set forth.

8. In a swivel-square, the combination, with one member apertured and having a tubular  
55 stud *l*, which is internally threaded and passed therethrough, of the other apertured square member and the screw-spindle *m*, passed through the latter member and with an engagement into said stud and having the cam-  
60 ended lever pivotally mounted thereon, and the clamp-plate *o*, surrounding said spindle, all arranged for operation substantially as set forth.

9. In a T-square, in combination, the bar *a*,  
65 having the recess *d* and the arc recess *f*, the bar *b*, having the lug *g* and the protractor *h*, and the adjusting and confining screw devices between said bars *a* and *b*, the blade  
70 passed loosely across the bar *b* and upon the face of bar *a*, the stud *l*, passing through bar *b*, said lug, and the blade, the screw-spindle *m* and the cam-lever thereon, and the clamp-plate *o*, and the index laterally adjustable on  
75 the blade, all arranged for operation substantially as described.

10. In a T-square, in combination, the head comprising the bars *a* and *b*, connected and adapted for movement substantially as described, and the latter having the protractor  
80 secured thereupon and projected to overlie and move relative to the bar *a*, the blade adapted to be fixed upon the bar *a* and having the adjustable index thereon, the same consisting of the pivoted finger *q*, the ear-  
85 pieces 30 30, and the adjusting-screws, substantially as described.

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Witnesses:

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