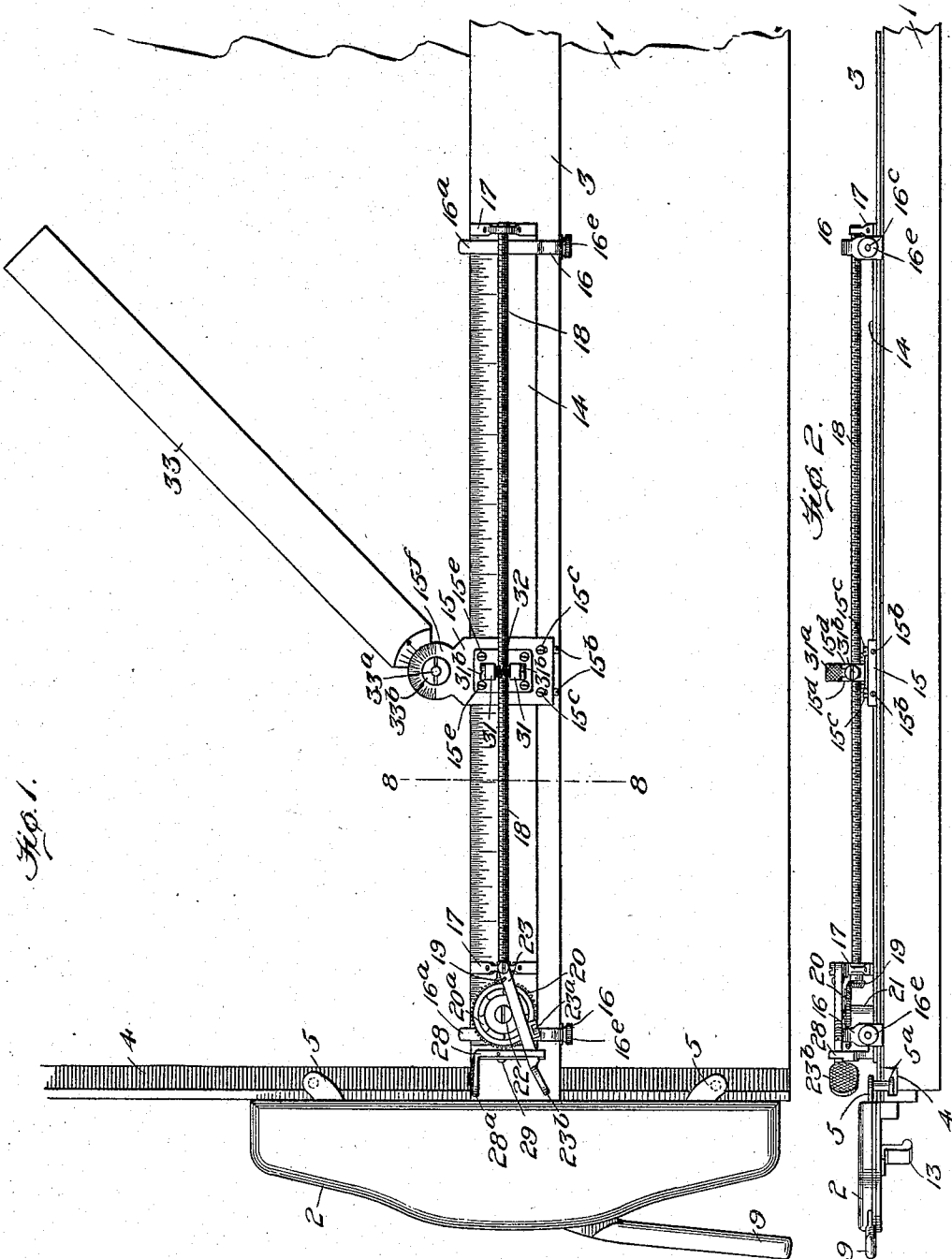


C. C. PAGE.
DRAWING INSTRUMENT.
APPLICATION FILED JUNE 3, 1909.

941,687.

Patented Nov. 30, 1909.

2 SHEETS—SHEET 1.



Witnesses

Edwin L. Bradford

E. L. Bradford

Clarence C. Page Inventor

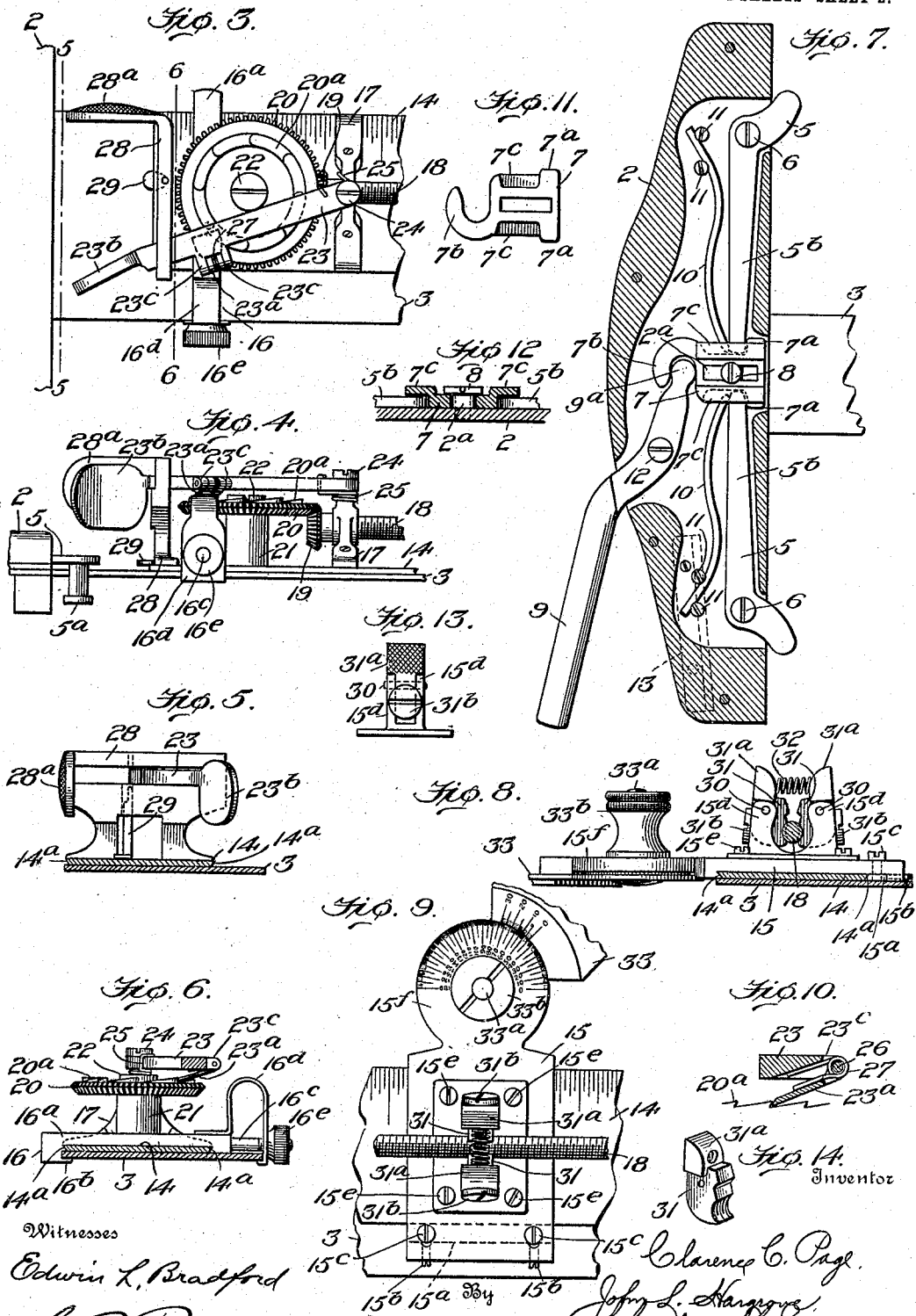
By *John L. Hargray*
Charles H. Brown his Attorney

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Charles B. Hargrove
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UNITED STATES PATENT OFFICE.

CLARENCE C. PAGE, OF PORTLAND, OREGON, ASSIGNOR OF ONE-HALF TO ROBERT TUCKER, OF PORTLAND, OREGON.

DRAWING INSTRUMENT.

941,687.

Specification of Letters Patent.

Patented Nov. 30, 1909.

Application filed June 3, 1909. Serial No. 499,926.

To all whom it may concern:

Be it known that I, CLARENCE C. PAGE, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Drawing Instruments, of which the following is a specification.

My invention relates to the construction of drafting instruments which are particularly designed to afford facile and accurate means for drawing a series of equidistant lines, and the object of the invention is to produce an appliance of this character which is strong and simple in construction, durable, and easily and conveniently adjusted and operated.

In the drawings chosen for the purpose of illustrating my invention, the scope whereof is pointed out in the claims, Figure 1 is a plan view of a drawing instrument embodying my invention, a portion of a drawing board with which it is specially adapted to coöperate being also shown; Fig. 2 is a side elevation of the devices illustrated in Fig. 1; Fig. 3 is a detail, plan view of the mechanism for rotating the threaded rod by which the section liner carriage is operated; Fig. 4 is a detail, side elevation of the devices illustrated in Fig. 3; Fig. 5 is a vertical section taken in the plane of the line 5—5, Fig. 3; Fig. 6 is a vertical section taken in the plane of the line 6—6, Fig. 3; Fig. 7 is a horizontal section of the head of the tee square, taken through the upper cover plate thereof to disclose the mechanism by which the tee square is releasably locked in any desired position on the drawing board; Fig. 8 is a detail, vertical section, taken in the plane of the line 8—8, Fig. 1; Fig. 9 is a detail, plan view of the devices shown in Fig. 8; Fig. 10 is a detail, vertical, central section showing the manner of mounting the spring pressed driving pawl; Fig. 11 is an inverted, detail, plan view of the slide by which the locking levers mounted on the tee square head are actuated; Fig. 12 is a detail vertical section of the slide illustrated in Fig. 11, showing its relation to the lower section of the tee square head and the locking levers mounted thereon; Fig. 13 is a detail elevation of one of the sections of the divided nut which is mounted upon the section liner carriage, the bracket in which such nut is pivoted being also shown; and Fig. 14 is a

detail perspective view of one of the sections of the divided nut.

Like symbols refer to like parts wherever they occur.

I will now proceed to describe my invention more fully, so that others skilled in the art to which it appertains may apply the same.

In the drawings, 1 is a drawing board, 2 the head of a tee square and 3 its blade. The edge of the drawing board upon which the tee square head 2 is designed to slide is preferably provided with a rectilinear groove or channel 4 that is adapted to receive the board engaging ends of the spring pressed, pivoted levers 5 by which the tee square is locked to the said board.

As shown more particularly in Figs. 2 and 4, the downwardly projecting outer ends of the levers 5 extend across the plane of operation of said levers and are preferably formed with flanges or heads 5^a which, when the tee square is locked upon the board, extend into the correspondingly undercut portion of the groove 4, to thus prevent the accidental disengagement of the said board and tee square.

The locking mechanism for releasably maintaining the apparatus in any desired position on the drawing board while the section liner is being used is mounted upon the head 2 of the tee square, said head being preferably formed with separable upper and lower metal sections which form an incasing guard or housing for the principal movable parts. In the form of such locking mechanism which I prefer to employ, two oppositely arranged, bell-crank levers 5 are pivotally mounted upon the lower section of the head 2 by suitable means, such as the cap screws 6, the shorter arms of said levers projecting beyond the guiding face of the said head, as heretofore described, and the longer arms 5^b extending toward each other and engaging a centrally located, longitudinally movable slide 7 which is interposed between them.

As a means for conveniently guiding and limiting the movements of the slide 7, said slide may be slotted longitudinally to receive a guide lug 2^a formed on the head 2 of the tee square, the said lug being of less length than the slot by the extent of the reciprocation of the slide. In order to prevent the disengagement of the slide from the

head 2, a cap screw 8 having a sufficiently large head may be passed through the slot in said slide and screwed into the guide lug 2^a. One end of the slide 7 is provided with oppositely located, transversely extending lugs 7^a which engage the respective locking levers 5 and cause the rotation thereof when said slide is actuated by the releasing lever 9, while the other end of the member 7 is suitably fashioned to afford means for forming a flexible connection with the releasing lever, said means, as shown, preferably consisting of a hook 7^b which is adapted to receive the rounded end 9^a of said releasing lever and permit the pivotal movement of the latter. The slide 7 is also preferably provided with longitudinally extending flanges 7^c which extend over the ends of the levers 5 and leaf springs 10 and thus insure the proper coöperation of these parts with the slide.

In order to maintain the locking levers 5 in such position that the depending ends thereof may engage and tightly grip the undercut wall of the groove or channel 4 in the drawing board, it is preferred to employ two stiff, leaf springs 10 which are secured to the lower section of the head 2 between pairs of cap screws 11 and the free ends of which bear upon the ends of the respective levers 5 beneath the flanges 7^c of the lever actuating slide 7. In order to obtain a very compact arrangement of parts and at the same time efficiently apply the pressure of the springs 10 to the levers 5, and through the latter to the slide 7, it is, as shown, preferred that each of said springs shall be in the form of a reversed curve.

Pivottally mounted upon the lower section of the head 2, as by means of a cap screw 12, is the releasing lever 9 by which, through the intermediacy of the slide 7, the locking levers 5 are disengaged from the drawing board. The longer arm of this lever 12 projects outwardly through the tee square head 2 upon the side opposite the blade 3, and extends opposite a plate 13 which is attached to and projects downwardly from the under surface of said head. This plate 13 affords a rest for the fingers permitting the lever 9 to be readily operated by the hand against the pressure of the springs 10, as will be readily understood.

Mounted upon the blade 3 of the tee square is a guide 14 upon which the section liner carriage 15 travels. This guide, which is conveniently formed as a plate having downwardly and inwardly beveled edges 14^a, and which may be graduated, if desired, is preferably secured to the blade 3 by means of clamps 16 which may be loosened at will to permit the guide 14 to be slid along the said blade to any desired point, a comparatively short guide thus fulfilling all the requirements of use.

As more particularly shown in Fig. 6, the form of clamp 16 which it is preferred to employ consists of a bar 16^a which is provided on its under side with a channel having beveled faces which abut the correspondingly beveled faces 14^a of the guide 14, said bar being also provided with a hooked end 16^b that is adapted to extend under the blade 2 and with a transversely extending threaded rod 16^c which passes through a similarly hooked end spring member 16^d which is rigidly mounted upon said bar, a nut 16^e serving to force the lower hooked end of the spring member 16^d under the blade 2 of the tee square, as will be readily understood.

Revolubly mounted in upright standards 17 secured to the guide plate 14 is a threaded rod 18 to one end of which, preferably the end adjacent to the head 2, is rigidly attached a bevel pinion 19 which meshes with a driving bevel gear wheel 20 that is journaled in a vertically extending, tubular bearing 21 with which the guide 14 is provided, a cap screw 22 serving to maintain said driving gear wheel in place.

The upper surface of the gear wheel 20 is provided near its circumference with a circular rack 20^a which coöperates with a spring pressed pawl 23^a that is mounted upon an operating lever 23.

As shown more particularly in Figs. 2 to 6, inclusive, the operating lever 23, which for convenience of manual operation may be provided with a plate-like finger rest 23^b, is preferably pivottally mounted upon the top of the adjacent standard 17 by means of a cap screw 24, a coiled spring 25 the ends of which are respectively connected to said standard and lever serving at the completion of each driving operation of the lever to return said lever 23 to an initial position in which the attached pawl 23^a is again ready to drive the gear wheel 20 through the circular rack 20^a thereof.

As shown in Figs. 3, 4, 6, and particularly Fig. 10, the driving pawl 23^a is preferably mounted between perforated lugs 23^c of the lever 23 by means of a pivot pin 26, the pivot engaging end of said pawl being preferably bifurcated to permit the passage of a spring 27 which is coiled around the pivot pin and bears on the pawl and lever to thus maintain said pawl in constant engagement with the rack 20^a, as will be readily understood.

For the purpose of guiding and limiting the movements of the operating lever 23, it is preferred to employ a vertically extending, slotted guide bracket 28 which is rigidly mounted on the guide 14 upon the opposite side of the bevel gear wheel 20 from the pivotal point of the said operating lever. As the operating lever 23 passes through the slot in the bracket 28, the extent of movement of the lever is limited by the length of said slot. In the drawings this slot is repre-

sented as of such length as will permit sufficient movement of the lever 23 to cause the bevel gear 20 to be rotated through an arc corresponding to two teeth of the curved rack 20^a. In order, however, to accurately vary the extent of motion of the operating lever 23, to thereby decrease the arc through which the bevel gear wheel 20 is driven at each stroke of said lever, it is preferred to provide a lever stop bar or member 29 which is slidably mounted in said guide bracket so as to be vertically movable across the slot therein at a point such that the operating lever will be arrested when the gear wheel 20 has been rotated through an arc corresponding to a single tooth of the rack 20^a. The stop bar 29, being light in weight, is maintained in operative position by frictional engagement with the guide bracket 28. In order that the lever 23 may be readily operated, the guide bracket 28, as shown, is preferably provided with a stationary finger rest 28^a which extends longitudinally toward the head 2 of the tee square and which may be of similar form to the corresponding finger rest 23^b of the operating lever.

For the purpose of mounting the section liner carriage 15 upon the guide 14 so that said carriage may slide smoothly and easily over said guide without lost motion between the parts, it is preferred to fashion the under side of the carriage with a channel which is substantially the same depth as the thickness of the guide 14, but which is wide enough to receive, in addition to said guide, a filler 15^a that is provided with a beveled face corresponding to the adjacent beveled face 14^a of the guide 14, the interior wall of said channel opposite said filler being also beveled to correspond with the beveled guide face 14^a next to it. Screws 15^b, which have threaded engagement with the frame of the carriage 15 and which bear against the back of the filler 15^a, serve to properly space and adjust said filler into parallelism with the beveled face formed on the opposite side of the carriage, while cap screws 15^c, which pass through transversely extending slots formed in the carriage frame and which have threaded engagement with the said filler, serve to retain said filler in proper position to maintain the section liner carriage on the guide 14. By tightening or loosening the screws 15^c, the friction of the carriage upon its guide may be easily regulated until the carriage slides as freely as desired. By this construction, also, wear, which would otherwise result in lost motion between the carriage and guide, may be readily compensated for.

Extending upwardly from the section liner carriage 15, and rigidly connected thereto are oppositely disposed pairs of pivot lugs 15^d between which the threaded rod 18 passes. As more particularly shown in Figs. 8 and 9, these pivot lugs are prefer-

ably formed integral with a base plate which is secured to the frame of the carriage 15 by means of cap screws 15^e. Pivottally mounted between the respective pairs of pivot lugs 15^d, as by means of pivot pins 30, are nut members 31 the opposing faces of which are threaded to correspond to the threads of the actuating rod 18. The threaded faces of these nut members are normally maintained in engagement with opposite sides of the rod 18 by means of a coiled spring 32 which is interposed between and socketed in the upper portions 31^a of said nut members, said upper portions 31^a thus affording means whereby the spring 32 may be easily compressed by the fingers to permit the disengagement of the threaded faces of the nut members from the threaded rod 18. When the threaded faces of the nut members 31 are disengaged from the rod 18, the carriage 15 and attached section liner 33 may be slid freely on the guide 14 until these parts assume the desired position with respect to the drawing board 1.

In order that the threaded faces of the nut members 31 shall not grip the threaded rod with such unnecessarily great pressure as might increase the wear of the threads, it is preferred to provide each section 31 of the divided nut with an adjustable stop 31^b which is adapted to bear against the adjacent pair of pivot lugs 15^d, to thus limit the gripping movement of the said nut sections toward the rod 18, said adjustable stops being, as shown, preferably in the form of cap screws which have threaded engagement with their respective nut sections.

The section liner or ruler 33, which is moved from left to right in a step-by-step manner by the carriage 15 is provided with a threaded pivot rod 33^a which passes through a central aperture in the circularly curved projection 15^f that is formed on the carriage for this purpose, a nut 33^b, which has threaded engagement with said pivot rod and bears against the upper surface of said curved projection, operating to maintain the ruler in any of the many angular positions in which it may be set.

As shown more particularly in Fig. 9, it is, for convenience in setting the ruler to any desired angle, preferred to graduate the circumference of the circular projection 15^f with a scale of angular measure and to provide the corresponding circular portion of the ruler 33 with a directly reading vernier.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a drafting appliance, the combination with a tee square having a head and blade, of a plurality of levers pivottally mounted on said head and projecting outwardly therefrom, resilient means for normally maintaining said levers in one posi-

tion, and devices including a slide movably mounted on said head for rotating said levers to energize said resilient means.

2. In a drafting appliance, the combination with a tee square having a head and blade, of levers pivotally mounted upon said head on opposite sides of said blade, each of said levers having an outer end portion which extends transversely of the plane of operation of the lever, springs acting upon said levers, and means for rotating said levers to energize said springs.

3. In a drafting appliance, the combination with a tee square having a blade and a head provided with a guiding face, of oppositely disposed bell crank levers pivotally mounted upon said head, the shorter arms of said levers extending beyond the guiding face of said head, springs acting upon the longer arms of said levers, a longitudinally movable slide mounted upon said head and engaging said levers, and a releasing lever pivoted on said head and engaging said slide to afford means for moving said slide against the pressure of said springs.

4. In a drafting appliance, the combination with a tee square having a blade and a head provided with a guiding face, of bell crank levers pivotally mounted upon said head on opposite sides of said blade, one arm of each of said levers projecting beyond the guiding face of said head, leaf springs acting upon said levers, a slide movably mounted upon said head and interposed between said levers, and means for actuating said slide to energize said springs and rotate said levers.

5. In a drafting appliance, the combination with a tee square having a blade and a head provided with a guiding face, of bell crank levers pivotally mounted upon said head on opposite sides of said blade, the shorter arm of each of said levers having an outer end portion extending transversely of the plane of operation of the lever and the longer arms of said levers extending toward each other, a slide movable on said head and engaging the longer arms of said levers, said slide being provided with a hook, of springs bearing upon the longer arms of said levers, and a lever pivotally mounted upon said head and engaging the hook of said slide.

6. In a drafting appliance, the combination with a tee square having a head and blade, of means for releasably locking said tee square to a drawing board or the like, a threaded rod revolubly mounted upon and extending longitudinally of said blade, a carriage mounted to slide longitudinally with respect to said blade, a divided nut having sections pivotally mounted upon said carriage, a spring for normally maintaining the sections of said divided nut in engage-

ment with said threaded rod, a ruler pivotally mounted on said carriage, a bevel pinion secured to one end of said rod, a bevel gear wheel meshing with said pinion, said gear wheel being provided with a circular rack, a pawl engaging said rack and adapted to rotate said gear wheel, and means for moving said pawl to rotate said gear wheel.

7. In a drafting appliance, the combination with a tee square having a head and blade, of a guide extending longitudinally of said blade, clamps for detachably securing said guide to said blade, a threaded rod journaled on said guide, a carriage slidably mounted on said guide, a divided nut mounted on said carriage, a ruler mounted on said carriage, a pinion rigidly secured to said rod, a gear wheel meshing with said pinion, said gear wheel having a circular rack, a lever pivoted to said guide, and a pawl pivotally mounted upon said lever and engaging said rack to rotate said gear wheel in one direction.

8. In a drafting appliance, the combination with a guide, of a carriage slidably mounted thereon, a threaded rod journaled upon said guide, a divided nut having threaded sections pivotally mounted upon said carriage, means for normally maintaining the sections of said divided nut in operative engagement with said rod, a ruler mounted upon said carriage, a pinion rigidly mounted upon said rod, a gear wheel journaled on said guide and meshing with said pinion, said gear wheel being provided with a curved rack, a lever pivotally mounted on said guide, and a pawl mounted on said lever and adapted to engage said rack.

9. In a drafting appliance, the combination with a guide, of a longitudinally extending threaded rod journaled thereon, a carriage slidably mounted upon said guide, a divided nut having threaded sections pivotally mounted upon said carriage, a spring interposed between said nut for normally maintaining the sections thereof in operative engagement with said rod, adjustable stops carried by the sections of said nut for limiting the movement of the threaded portions thereof toward each other, a ruler mounted on said carriage, and means for rotating said rod.

10. In a drafting appliance, the combination with a guide, of a longitudinally extending threaded rod journaled thereon, a carriage slidably mounted on said guide, a nut mounted on said carriage and engaging said guide, a ruler mounted on said carriage, a pinion rigidly secured to said rod, a gear wheel meshing with said pinion, said gear wheel being provided with a curved rack, a lever pivotally mounted on said guide, a pawl pivotally mounted on said

lever, and a guide bracket mounted on said guide and provided with means for arresting the movement of said lever.

11. In a drafting appliance, the combination with a tee square having a blade and a head provided with a guiding face, of means mounted on said head for releasably locking said tee square to a drawing board or the like, said means including movable members projecting beyond the guiding face of said head and spring means acting on said members, a lever mounted on said head and

adapted to actuate said releasable locking means, one arm of said lever projecting outwardly from said head, and a downwardly projecting finger rest attached to the said head and extending opposite the projecting arm of said lever. 15

In testimony whereof I affix my signature, in presence of two witnesses.

CLARENCE C. PAGE.

Witnesses:

C. O. MYERS,

ARTHUR LANGGUTH.