J. W. BRAMWELL.

DRAWING INSTRUMENT.

APPLICATION FILED MAR. 7, 1913.

1,116,231.

Patented Nov. 3, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

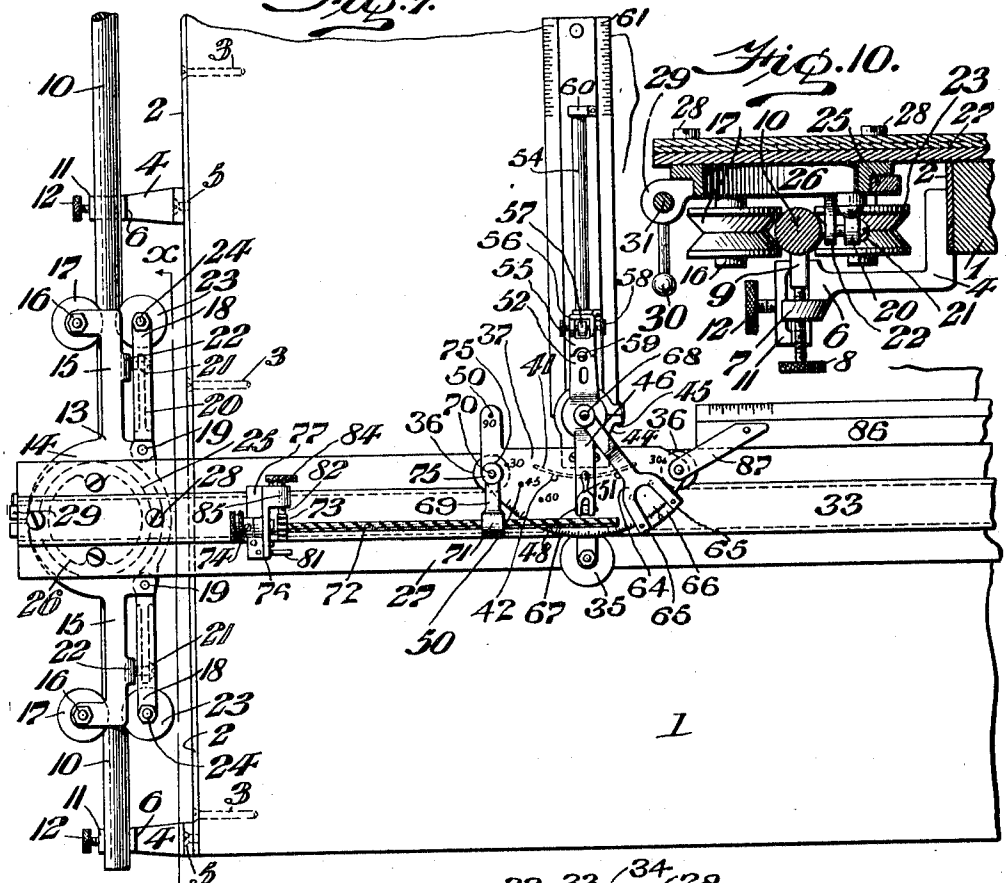


Fig. 10.

Fig. 2.

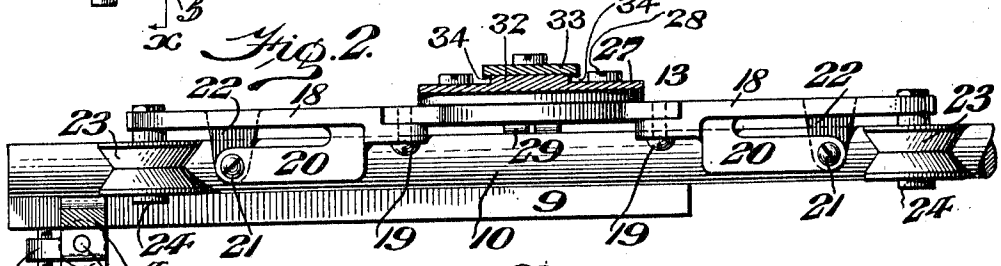
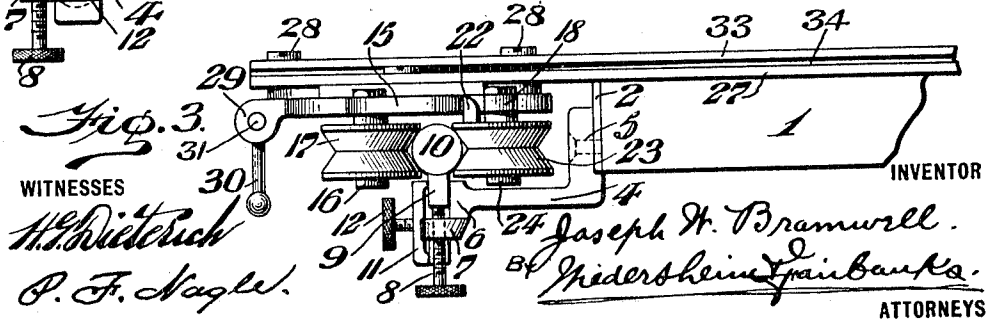


Fig. 3.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4.

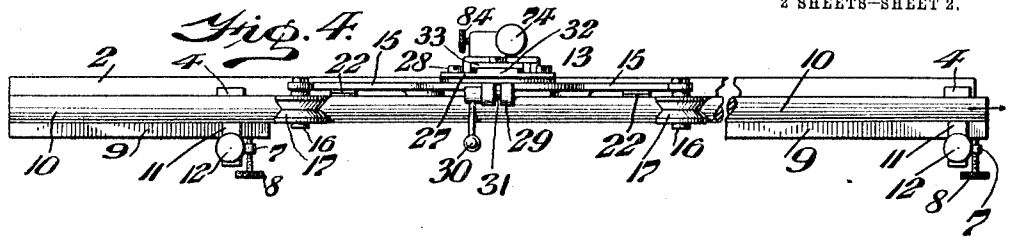


Fig. 5.

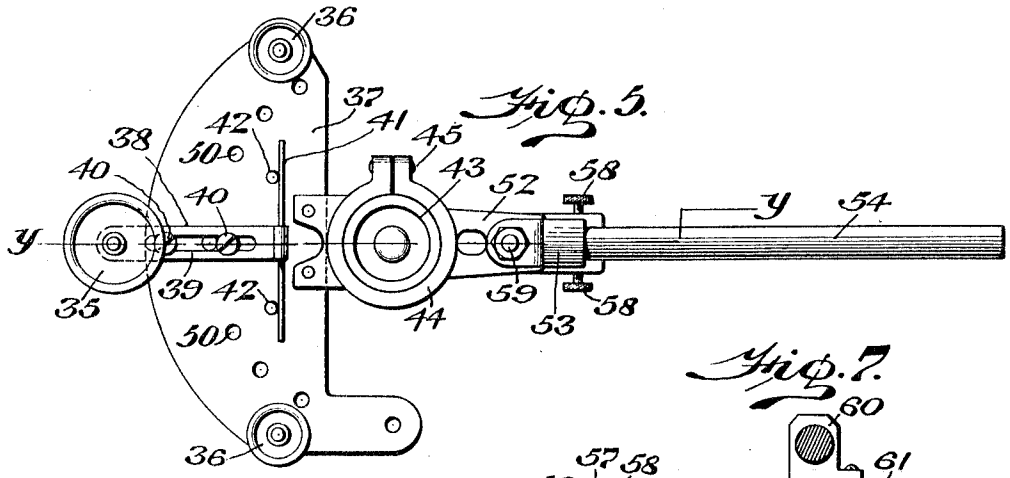


Fig. 7.

Fig. 6.

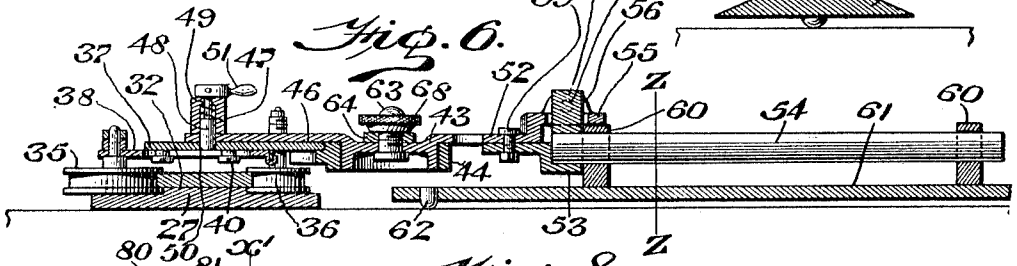
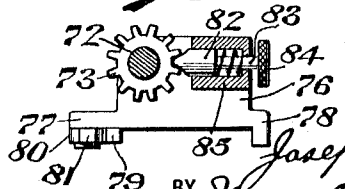


Fig. 8.



Fig. 9.



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DRAWING INSTRUMENT.

1,116,231. Specification of Letters Patent. Patented Nov. 3, 1914.

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To all whom it may concern:

Be it known that I, JOSEPH W. BRAMWELL, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Drawing Instrument, of which the following is a specification.

My invention relates to a novel construction of a drawing instrument, whereby I am enabled to utilize the blade of a T-square or similar device and its adjuncts within a greater range of adjustment than heretofore, provision being made for enabling the blade of the T-square to be manipulated or adjusted to a point beyond or outside of the edge of the drawing board or table to which the same is applied and the blade of the T-square being provided with novel adjusting or adjustable devices for facilitating cross-hatching and making of projections in a more accurate and expeditious manner than heretofore, provision being also made for adjusting the scale carried by the T-square blade to any desired angle with respect to said blade whereby accurate and minute adjustments can be more readily effected than heretofore.

To the above ends my invention consists of a novel construction of a drawing instrument, the principal features of which will be hereinafter fully described and particularly pointed out in the claims.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention, I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a plan view of a drawing instrument embodying my invention, showing a portion of the table or drawing board to which the same is applicable. Fig. 2 represents a section on line *x*—*x* Fig. 1. Fig. 3 represents an end elevation of a portion of the structure shown in Fig. 1. Fig. 4 represents, on a reduced scale, a side elevation of the structure illustrated in Fig. 1. Fig. 5 represents, on a slightly enlarged scale, a plan view of certain adjustable attachments for the blade of the instrument. Fig. 6 represents a section on line *y*—*y* Fig. 5, certain of the parts being shown in elevation. Fig. 7 represents a section on line *z*—*z* Fig. 6. Fig. 8 represents a side elevation of a portion of the device employed for cross-hatching. Fig. 9 represents a section on line *x'*—*x'* Fig. 8. Fig. 10 represents a section through the carriage and the end of the blade.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 designates a drawing board or table to one edge of which, as the left-hand edge, is secured a strip 2 by means of the fastening devices 3 which may be of any desired number. 4 designates arms secured to said strip by screws 5, in the present instance, although said arms may be cast on or be integral with said strip if desired. The arms 4 terminate in an upwardly extending lug 6 and a laterally extending lug 7, through which passes the screw 8, upon which rests the bottom of the guide piece 9 of the rod 10, said guide piece being secured in position by the clamping jaw 11, which is held in position by the screw 12. The rod 10 is preferably of about the same length or longer than the strip 2, and the guide piece 9 is preferably located at both ends of said rod 10 as will be understood from Fig. 4. In practice I employ but two of the arms 4, as will be understood from Fig. 1.

13 designates a carriage movable upon the rod 10, said carriage comprising the plate 14 having the arms 15 projecting oppositely therefrom from the outer portion of which depends the studs or bearings 16 upon which are mounted the rollers 17 there being two of said rollers, as will be understood from Figs. 1 and 4, said rollers being grooved or V-shaped so as to properly contact with the rod 10.

18 designates arms also extending from the plate 14 in opposite directions substantially parallel to the arms 15, but pivotally secured to said plate at the points 19, said arms 18 having lugs 20 cast thereon, in the ends of each of which lugs, the adjusting screw 21 is secured, said adjusting screw being adapted to contact with or screw into

the lug 22 cast on or secured to the arms 15, whereby it will be apparent that by adjusting the screw 21, the rollers 23 carried on the stud or bearings 24 can be brought into proper engagement or adjusted with respect to the rod 10, as will be understood from Figs. 1 and 2, since it will be apparent that as the screw 21 is screwed against or into or out of the lug 22, it will cause the lug 20 and arms 18 secured thereto together with the roller 23 carried thereby to be adjusted toward or away from the rod 10 of the opposite rollers 17, so that the carriage 13 may move freely on the rod 10, but without any excess of lost motion with respect thereto. The plate 14 is provided with a round opening or bearing 25 therein in which is seated a depending annular flange or the like 26 which can freely turn in said bearing and is secured to the under side of the blade 27 by means of screws or the like 28, which may be four in number, the bearing 25 for the annular flange or member 26 being tightened upon said flange by means of the screw 31 which engages the lugs 29 said screw being provided with a handle 30, whereby it can be readily manipulated, and after the blade 27 is adjusted to the desired position it can be locked therein by tightening said screw 31, as is evident.

It will be seen from the foregoing that by properly adjusting the screw 21, the roller 23 can be held against the rod 10 so that there will be practically no lost motion as the carriage 13 travels on said rod and furthermore by loosening the screws 12 and the clamps 11, the members 9 and the rod 10 can be moved to either of their extreme positions with respect to the arms 4 and then clamped therein and the rod 10 can be properly adjusted vertically by manipulating the screws 8 against the members 9. By the proper longitudinal adjustment of the rod 10 in the manner described it will be apparent that the blade 27 of the T-square can be used near either the extreme forward or rear edge of the drawing board 1, so that a wide range of adjustment is permitted to the blade 27 and the latter can be locked in any desired position with respect to the carriage 13, by proper manipulation of the handle 30 and screw 31 as will be apparent. The blade 27 can thus be utilized for all the purposes to which the blade of a T-square may be used and it may be further utilized for doing other work involving great nicety and exactness or for cross-hatching by means of adjuncts applied thereto, which will now be referred to in detail.

I provide the blade 27 in the present instance with a raised portion 32, best seen in Fig. 2 to which I attach in any suitable manner the longitudinally extending strip or track 33 whose edges overhang said raised portion, so that ways 34 will be formed on each side of the T-square, the edges of said strip 33 forming a track for the grooved roller 35, see Figs. 1, 5 and 6, and the two oppositely located preferably smaller rollers 36 which are mounted on suitable studs or bearings carried by the plate or quadrant 37.

I do not desire to be limited to any particular manner of supporting the studs or bearings for the rollers 35 and 36 and in Figs. 5 and 6 I have shown one conventional form which may be employed if desired. In order to take up the lost motion between the roller 35 and the opposite rollers 36 with respect to the track 33 therefor, I mount the roller 35 in the present instance on bearings upon the bar 38 which latter has a slot 39 guided upon the screws 40, the end of the arm 38 having secured therein the flat spring 41, which abuts against the two pins 42, it being apparent from the construction seen in Fig. 5, which is a plan view of the underside of the parts seen in Fig. 1, that as the roller 35 is pressed to the left of the position shown in Fig. 5 the spring 41 will be deflected as seen in Fig. 1 and the roller 35 as well as the rollers 36 will be caused to snugly hug or engage the track 33, as is evident.

43 designates a depending annular flange which is rotatably mounted in bearings formed with the split ring 44 which can be tightened by means of the screw 45 if desired, said flange having an arm 46 projecting in one direction therefrom, see Figs. 1 and 6, and provided with a casing 47, within which is contained the plunger 48 having the spring 49 bearing on the shoulder of said plunger, the effect of said spring being to force said plunger into one or the other of the holes 50 which are arranged in the arc of a circle and have opposite them certain indications as 90, 30, 45, 60, etc., as will be understood from the plan view in Fig. 1, so that the arm 46 and its adjuncts can be locked in the desired position with respect to the plate or quadrant 37, by permitting the plunger 48 to seat in the desired hole 50, said plunger being conveniently manipulated by the handle 51 pivotally attached thereto. 52 designates an arm also projecting from said flange 43 and in alinement with the arm 46 and having secured thereto a bearing 53 in which is mounted a rod 54. The extremity of the arm 52 is provided with an offset portion 55 having a slot 56 therein, through which projects the lug 57 attached to the member 53 said lug being in contact with the ends of the screws 58, it being apparent that the member 53 is secured in position by a screw 59, so that by adjusting the screws 59 and 58, the desired adjustment of the rod 54 and its adjuncts can be attained, said rod passing through an opening in the lugs 60, which

are attached to the scale 61 whereby the latter can be oscillated on said rod. The underside of said scale is provided with the rounded projections 62 whereby said scale can be slightly rocked so as to bring one edge or the other toward or against the drawing paper as may be desired.

63 designates a stud or threaded stem attached to the body of the flange or flange member 43 upon which is movably mounted the arm 64 which is provided with bifurcation 65, see Fig. 1, upon which is carried the scale 66 provided with suitable graduations, said scale 66 being located so as to register just outside of the quadrant or scale 67, secured to the quadrant or carriage 37, as will be understood from Fig. 1, said arm 64 being held in the desired position, by the nut 68 as will be understood from Figs. 1 and 6.

69 designates an arm secured to the blade 37 upon the threaded stem or stud 70 and terminating in the threaded portion 71, which is in threaded engagement with the threaded rod 72, which at its outer extremity has a pinion 73 secured thereto, the outer extremity of said rod terminating in the knurled head 74, said pinion 73, rod 72 and knurled head 74 rotating in unison.

75 designates a nut on the stud 70 for securing the arm 69 in position.

76 designates a plate in which the end of the threaded rod freely rotates, said plate being secured to the base member 77, which has a lug 78 engaging one side of the track 33, the other side of said track being engaged by the movable jaw 79 against which bears the pivoted cam 80, which is actuated by the handle 81, as will be understood from Figs. 8 and 9, whereby upon actuating the handle 81, the base member 77 and its adjuncts can be adjusted longitudinally of the track 33 according to requirements.

82 designates a plunger or detent having a stem 83 thereon and a head 84 said detent being normally caused to engage the teeth of the pinion 73, by reason of the spring 85, so as to temporarily hold the threaded rod 72 in desired position, said rod, however, being capable of being freely rotated by means of the knurled head 74.

86 designates a second scale which may be employed and which may be pivotally secured to the plate or quadrant 37 by means of the arm 87.

The raised track upon the blade and the grooved rollers upon the plate or quadrant 37 admit of said plate and the scale 61 being freely moved upon said track without lost motion and consequent disturbance of the angle at which the scale is adjusted to the blade, so that such scale may be used similarly to an adjustable T-square. When the scale is thus used and directly moved by hand, the detent can be withdrawn from the pinion to admit of the threaded rod 72 rotating freely.

By moving the quadrant or the bearing for the threaded rod so as to disengage the latter from the threaded arm of the quadrant, the quadrant and scale can be removed from the track by disengaging the movably supported roller 35 from the track and lifting quadrant and scale out, without the necessity of drawing the same out to the end of the track and blade. The quadrant can be placed back upon the track by placing the rollers 36 against one edge of the overhang and hooking the movable roller over the other overhang.

It will be apparent that there will be a slight elasticity or resiliency in the arm 20, best seen in Figs. 1 and 2, whereby any slight irregularities in the diameter of the rod 10 are permitted to be taken up as the rollers 23 and their adjuncts travel with respect to said rod.

It will now be apparent that I have devised a novel and useful construction of a drawing instrument, which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present instance, shown and described a preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

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

1. In a device of the character stated, a straight-edge ruler-blade having a longitudinal raised portion, a track secured to and having its longitudinal edges overhanging said raised portion, a plate provided with rollers traveling upon the opposite edges of said track, a scale supported upon said plate, a screw-threaded rod journaled upon said blade and having means for manually rotating it, and a nut upon said plate and engaged by said threaded rod.

2. In a device of the character stated, a straight-edge ruler-blade having a longitudinal raised portion, a track secured to and having its longitudinal edges overhanging said raised portion, a plate provided with rollers traveling upon the opposite edges of said track, a scale pivotally supported upon said plate to swing in the plane of the same, a rotary screw-threaded rod having journal-support upon said blade, and a nut upon said plate and engaged by said threaded rod.

3. In a device of the character stated, a straight-edge ruler-blade having a longitudinal raised portion, a track secured to and

having its longitudinal edges overhanging said raised portion, a plate, grooved rollers journaled upon said plate to engage one overhanging edge of said guide-track, a grooved roller having yielding support upon said plate to engage the opposite overhanging edge of the guide-track, a scale pivotally supported upon said plate to swing in the plane of the same, a rotary screw-threaded rod having journal-support upon said blade, and a nut upon said plate and engaged by said rod.

4. In a device of the character stated, a straight-edge ruler-blade formed with a longitudinal guide-track upon its upper side, a plate provided with rollers traveling upon said track, a scale pivotally supported upon said plate to swing in the plane of the same, a rotary screw-threaded rod having journal-support upon said blade, a pinion upon said rod, a spring-detent engaging said pinion, and a nut upon said plate and engaged by said threaded rod.

5. In a device of the character stated, a straight-edge ruler-blade formed with a longitudinal guide-track upon its upper side, a plate provided with rollers traveling upon said track, a scale pivotally supported upon said plate to swing in the plane of the same, a block slidable upon the track and having means for clamping it upon the same, a rotary screw-threaded rod journaled in said block, and a nut upon said plate and engaged by said threaded rod.

6. In a device of the character stated, a straight-edge ruler-blade formed with a longitudinal guide-track upon its upper side, a plate provided with rollers traveling upon said track, a scale pivotally supported upon said plate to swing in the plane of the same, a block slidable upon the track and having means for clamping it upon the same, a rotary screw-threaded rod journaled in said block, a pinion upon said rod, a spring-detent engaging said pinion, and a nut upon said plate and engaged by said threaded rod.

7. In a device of the character stated, a straight-edge ruler-blade, a plate slidable upon the same and having an arcuate series of graduated openings and an annular bearing at the center of such series, diametrically projecting arms having an annular flange at their joined inner ends fitting to rotate in such bearing, a spring-latch in one arm adapted to engage the openings in the plate, and a scale supported upon the other arm.

8. In a device of the character stated, a straight-edge ruler-blade, a plate slidable upon the same and having an arcuate series of graduated openings and an annular bearing at the center of such series, diametrically projecting arms having an annular flange at their joined inner ends fitting to rotate in such bearing, a spring-latch in one arm adapted to engage the openings in the plate, a rod extending from the end of the other arm, and a scale having perforated lugs upon its upper side suspended upon said rod, and rounded projections upon its under side.

9. In a device of the character stated, a straight-edge ruler-blade, a plate slidable upon the same, an arm pivoted to swing in the plane of said plate and having a slotted off-set end, a bearing movably supported upon said end and having a lug projecting through said slot, a rod secured in said bearing, a scale supported upon said rod, and screws passing through the sides of the slot and bearing against the lug upon the rod-bearing.

JOSEPH W. BRAMWELL.

Witnesses:
E. HAYWARD FAIRBANKS,
C. D. MCVAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."